

**REQUEST FOR BOARD OF DIRECTION ACTION
for meeting on July 28-29, 2017**

Topic:	Rescind Portland Board Outcome of “ceasing new legislative efforts to require a masters’ degree for P.E. license”
Background:	<p>In September 2016, as a result of the Raise the Bar Review Task Committee’s report to the Board, one of the Board’s directives to the Raise the Bar Committee was “ceasing new legislative efforts to require a masters’ degree for P.E. license.”</p> <p>Since late 2015, a grassroots effort has been underway in New Jersey to “raise the bar” by influencing change in the New Jersey licensure laws to require a masters’ degree or equivalent for P.E. licensure. Lobbyist Joseph Simonetta was hired in early 2016 to support the effort. Simonetta’s assessment of progress in February 2017 recommended not to move forward with introducing legislation. Efforts are currently underway to increase grassroots support and the viability of introducing legislation will be reassessed in September 2017.</p>
Issues:	<p>Though the Board’s directive to cease legislative efforts did not directly impact the New Jersey Raise the Bar Committee’s (NJRTBC) ongoing initiative, it did introduce further challenges and provided the opposition with reason to question the ASCE Board’s commitment to the RTB initiative.</p> <p>Though no other states plan to actively pursue legislative efforts at this time, the negative impact of the ASCE Board’s action on the New Jersey effort remains a concern of the Raise the Bar Committee (RTBC), the New Jersey Raise the Bar Committee, and lobbyist Simonetta. Also, if New Jersey is the only state permitted to pursue “Raise the Bar” legislation, reciprocity becomes a major concern for licensees from surrounding states and a strong argument for those opposed to raising the bar.</p>
Organizational Entities Impacted:	Both the RTBC and NJRTBC agree, per the recommendation of NJ advisor and lobbyist Joseph Simonetta, that the ASCE Board should rescind their directive to cease legislative efforts if the NJRTBC hopes to succeed in their efforts to require a masters’ degree or equivalent for P.E. licensure.
Budget Impact:	<p>Anticipated lobbyist expenses for July 2017-November 2018 are: \$6000 in FY17 \$10,000 in FY18 (pending a positive/viable assessment of proceeding)</p> <p>This funding is included in the RTBC’s FY17 & FY18 PAES budget.</p>

	The RTBC will not expend funds on legislative efforts in any other state without Board approval.
Action Requested:	<i>The Board of Direction will be asked to rescind their directive from September 2016 that the Raise the Bar Committee cease new legislative efforts to require a masters' degree for P.E. licensure and reaffirm their full support of the New Jersey Raise the Bar Committees' efforts.</i>
Prepared and Submitted by:	David Peterson, Chair, Raise the Bar Committee
Presenter:	David Peterson, Chair, Raise the Bar Committee

American Society of Civil Engineers

RAISE THE BAR COMMITTEE

Interim Report to the Board of Direction, July 2017

1.0 Committee Charge

The Raise the Bar Committee (RTBC) shall direct, oversee and coordinate the Society's implementation of ASCE's Raise the Bar (RTB) strategic initiative.

2.0 Meeting Dates

RTBC Web Meetings:

October 20, 2016
January 9, 2017
March 27, 2017
May 4, 2017
June 6, 2017

RTBC Face-to-Face meetings:

December 3 & 4, 2016 in Reston, VA
March 4 & 5, 2017 in San Diego, CA.
July 15 & 16, 2017 in Reston, VA

3.0 Strategy(ies) to Accomplish Charge or Issues Raised

The RTBC has continued to explore and address the list of ASCE Board of Direction Outcomes for Raise the Bar passed in Portland, OR, on September 27, 2016. Strategies to accomplish these tasks include:

- Forming subcommittees to address charged and directed tasks
- Holding regular subcommittees teleconferences to respond to assigned tasks
- Holding regular full committee teleconference for subcommittee updates and approvals
- Facilitating and holding strategic thinking discussions and exercises on the future of the Raise the Bar strategic initiative with various stakeholders (TRBG, ILC, ASCE staff, etc.)
- Engaging in ongoing communication with the Institutes for feedback on sub-discipline specific requirements
- Engaging with the Civil Engineering Certification (CEC) Board to consider ideas for developing new certification and promoting growth of the academies as alternate paths to increase civil engineering practice requirements
- Engaging with Younger Members and collaborating on sessions related to the future of the profession
- Meeting jointly with the Committee on Licensure to address licensure related charges and directives

- Meeting jointly via teleconference with the chairs of the Committee on Education (COE) and the Body of Knowledge 3 Task Committee (BOK3TC) to begin development of a draft report as directed
- Monitoring and remaining aware of other organizations' efforts and positions related to Raise the Bar (NCEES, NSPE, ACEC)

4.0 **Progress on Strategy(ies) and Tasks**

The following outcomes are considered addressed or **COMPLETE**:

- B. The Board of Direction **CHARGED** the current Raise the Bar Committee to:*
- Better define the problem to be solved;*
 - Consider whether the initiative should be rebranded;*
 - Authorize the President to appoint at least two members of the Raise the Bar Task Committee to serve as members of the Raise the Bar Committee.*
- C. The Board of Direction **DIRECTED** the Raise the Bar Committee and the Committee on Education to develop a joint report on:*
- Consider the potential application of the initiative globally.*
- D. The Board of Direction **CONCURRED** that the Raise the Bar initiative should focus solely on civil engineering.*
- E and F. The Board of Direction **DIRECTED** the Raise the Bar Committee to collaborate with other committees and report to the Board on:*
- Ceasing new legislative efforts to require a masters' degree for P.E. license*
 - Exploring the viability of making the P.E. exam more rigorous.*

The following outcomes are considered **IN PROGRESS**:

- B. The Board of Direction **CHARGED** the current Raise the Bar Committee to:*
- Create a communication plan for the revised initiative*
 - Devise a path that allows for different requirements by civil discipline*
 - Present interim reports to the Board of Direction with a final report to the Board for its Spring 2018 meeting;*
- C. The Board of Direction **DIRECTED** the Raise the Bar Committee and the Committee on Education to develop a joint report on:*
- Assessment of the effectiveness of the Body of Knowledge;*
 - The need and form of a masters' degree;*
 - Giving credit toward P.E. license for non-engineering masters' degrees*
- E and F. The Board of Direction **DIRECTED** the Raise the Bar Committee to collaborate with other committees and report to the Board on:*
- Evaluation of requiring advanced discipline-specific licenses in lieu of raising P.E. bar;*
 - Defining alternate paths to increase civil engineering practice requirements including but not limited to specialty certification, ASCE member grade qualifications, and qualifications for engineering technologists*

Progress on each individual outcome is detailed below. The Board of Direction Outcomes for the RTBC are shown below *in italics*. All tasks' statuses are noted as "**COMPLETE**" or "**IN PROGRESS**" with specific progress bulleted just below the status.

ASCE Board of Direction Outcomes for RTBC from Portland, OR

B. The Board of Direction **CHARGED** the current Raise the Bar Committee to:

i. *Better define the problem to be solved;*

COMPLETE

- Formed Communications subcommittee charged with better defining the problem
- Communications subcommittee developed draft problem statement with feedback from ASCE Communications staff and consideration to Sutter Report
- 7 Versions of Problem Statement were developed and reviewed by the Communications subcommittee, ASCE Communications staff, and the RTBC
- Seventh Version shown below was approved by RTBC on May 4, 2017

Raise the Bar Problem Definition

The American Society of Civil Engineers (ASCE), as the acknowledged leader of the civil engineering profession, has a responsibility to establish the standards of our profession and to fulfill its mission to protect the public health, safety, and welfare. This responsibility includes the establishment of a body of knowledge (BOK) to describe the minimum qualifications necessary for entry into professional practice. ASCE has prepared the BOK for civil engineering and, in so doing, has determined there is a significant gap between the BOK and the current educational requirements for entry into the professional practice of civil engineering in the United States. Hence, additional education breadth and depth is required for the future civil engineer to be prepared for professional practice.

References

- 1) ASCE. Society Mission - Deliver value to our members, advance civil engineering, and protect the public health, safety, and welfare.
- 2) ASCE. (2008). Civil engineering body of knowledge for the 21st century: Preparing the civil engineer for the future, 2nd Ed., Reston, VA.
- 3) Ressler, Stephen J. (2011). Sociology of Professions: Application to the Civil Engineering "Raise the Bar" Initiative, Reston, VA.
- 4) ASCE. (2007). The Vision for Civil Engineering in 2025, Reston, VA.
- 5) ASCE. (2104). Policy Statement 465 - Academic Prerequisites for Licensure and Professional Practice

ii. *Consider whether the initiative should be rebranded;*

COMPLETE

- Communications subcommittee also charged with considering rebranding
- Rebranding was discussed on most recent Communications subcommittee teleconference on April 21, 2017
- The RTBC's recommendation is not to rebrand, based on the summary below

Raise the Bar Rebranding Recommendation

The Raise the Bar Committee carefully considered the current branding associated with the "Raise the Bar" strategic initiative, as well as previous efforts, and concluded that "rebranding" is not advisable. It is the committee's recommendation that ASCE retain the phrase "Raise the Bar" to represent the broad initiative to better prepare civil engineers for practice in the future. Moving forward, "Raise the Bar" should have a broader

meaning than increasing education requirements through enhanced licensure laws, which will allow for flexibility based on the future strategic direction of the initiative.

The Raise the Bar Committee does recommend consideration of a new positioning statement, or tagline, to accompany the Raise the Bar brand, as well as changes to the visual identity, which would signal a new approach. Further, the committee concurs with the Board's directive to develop and implement a robust communications strategy primarily focused on ASCE members.

Background

Establishing a successful brand requires thoughtful development of a visual and verbal identity and consistent application and interpretation of that brand identity in all interactions with the target audiences. In the nearly 20 years since Policy Statement 465 was first adopted, this effort has undergone near continuous change in both name and definition. Consequently, in the most recent comprehensive member survey on this issue, nearly half of all respondents reported low awareness of "Raise the Bar," and that percentage increased to well over half among those aged 35 and under.

In the committee's estimation, that low level of current awareness represents an opportunity within the decision not to rebrand. "Rebranding" is both time- and resource-intensive—the cost to effectively research, develop and execute a new brand is estimated at \$100,000. (This is benchmarked against recent branding efforts by other ASCE initiatives.) While ASCE leaders may identify "Raise the Bar" specifically with efforts to change licensing laws to require a master's degree or equivalent prior to licensure, that connection has yet to be firmly established among the broader membership. In fact, one potential strategic focus is to place special emphasis on communicating this initiative to students and younger members, whose perceptions are not yet cemented.

Recent and past research has identified several promising communications strategies. As noted above, targeting our communications to our student and younger members (our future leaders and those with the most at stake) is one such example. In addition, there is widespread support (75% or greater) among ASCE members for the need for additional education to prepare civil engineers for practice in our rapidly changing world. Strong support for this broader perspective is a solid foundation from which to build.

The committee, therefore, recommends retaining the Raise the Bar brand, while developing a new tagline reflective of the new direction. (This will be accomplished upon Board approval of the new policy statement.) We also recommend adoption of new visual identify that both signals an update in direction and appeals to our younger target demographic. This approach will allow us to save time and money and move swiftly and effectively to implement a new communications plan.

iii. Create a communication plan for the revised initiative;

IN PROGRESS

- Communications subcommittee also charged with creating communications plan
- Creating a communications plan was discussed on most recent teleconference, specifically the major components of a Communications plan:
 1. Developing a problem statement (i.e. what are we trying to accomplish?)
 2. Determining interim milestones and metrics for success
 3. Writing communications objectives
 4. Developing tactics for accomplishing objectives

- Communications subcommittee will address 1-3 by final report; tactics should not be developed until strategy is determined

iv. *Devise a path that allows for different requirements by civil discipline;*

IN PROGRESS

- Peterson attended and presented at TRBG meeting in January 2017 to begin dialogue with Institutes on civil sub-discipline specific requirements
- Discussions with Committee on Licensure (COL) in March 2017 about licensure by civil sub-discipline was not positive
- Email received from COL on March 21, 2017, "This is not a function of engineering licensure, and this objective can be easily and reasonably accomplished by a roster designation. The PE Board can review a licensee's education, experience and examinations passed, and put a designation of sub-discipline on the PE Board's on-line roster."
- The possibility of post-PE credentialing by civil sub-discipline will be further explored and included as part of the final report in March 2018

v. *Present interim reports to the Board of Direction with a final report to the Board for its Spring 2018 meeting; and*

IN PROGRESS

- Presented interim report to BOD in March 2017
- This report is presented to BOD for July 2017
- Anticipating interim report to BOD in October 2017
- Final report with recommendations will be presented to BOD in March 2018

vi. *Authorize the President to appoint at least two members of the Raise the Bar Task Committee to serve as members of the Raise the Bar Committee.*

COMPLETE

- Karen Kabbes and Renee Schwecke were appointed to the RTBC in November 2016

C. *The Board of Direction **DIRECTED** the Raise the Bar Committee and the Committee on Education to develop a joint report on:*

i. *Assessment of the effectiveness of the Body of Knowledge;*

IN PROGRESS

- Discussed on COE & RTB teleconferences held on May 3, 2017 and May 22, 2017
- Anticipating response from Body of Knowledge 3 Task Committee (BOK3TC) chair Ken Fridley

ii. *The need and form of a masters' degree;*

IN PROGRESS

- Began discussion on COE & RTB teleconferences held on May 3, 2017 and May 22, 2017; to be continued

iii. *Giving credit toward P.E. license for non-engineering masters' degrees; and*

IN PROGRESS

- Began discussion on COE & RTB teleconferences held on May 3, 2017 and May 22, 2017; to be continued

iv. *Consider the potential application of the initiative globally.*

COMPLETE

- Discussion among the RTBC concluded that the P.E. license is a U.S. regulated credential, therefore it has limited application globally
- Should the RTBC continue pursuing changes to licensure laws, there is no global application for the Raise the Bar initiative
- Should the RTBC pursue development of a post-P.E. certification or other association-offered credential, it could be recognized and offered globally

D. *The Board of Direction **CONCURRED** that the Raise the Bar initiative should focus solely on civil engineering.*

COMPLETE

- Policy statement 465 was revised to apply to civil engineering practice only and was approved by the Board in March 2017 – see current PS 465 below
- All branding, communications and messaging will need to be revised to reflect the civil-centric focus

ASCE Policy Statement 465 - Academic Prerequisites for Civil Engineering Related Licensure and Professional Practice

Approved by the Raise the Bar Committee on January 9, 2017
Approved by the Public Policy Committee on January 27, 2017
Adopted by the Board of Direction on March 17, 2017

Policy

The American Society of Civil Engineers (ASCE) supports the attainment of the Civil Engineering Body of Knowledge for entry into the practice of civil engineering at the professional level, i.e., practice professional engineer, through appropriate engineering education and experience, and validation by passing the licensure examinations. To that end, ASCE supports an increase in the amount of engineering education, such that the requirements for licensure would comprise a combination of:

- a baccalaureate degree in civil engineering;
- a master's degree in engineering, or no less than 30 graduate or upper level undergraduate technical and/or professional practice credits or the equivalent agency/organization/professional society courses which have been reviewed and approved as providing equal academic quality and rigor with at least 50 percent being engineering in nature; and
- appropriate experience based upon broad technical and professional practice guidelines which provide sufficient flexibility for a wide range of roles in engineering practice.

ASCE encourages institutions of higher education, governments, employers, engineers, and other appropriate organizations to endorse, support, promote, and implement the attainment of an appropriate engineering body of knowledge for individual engineers. For civil engineering, the established Body of Knowledge includes (1) the fundamentals of math, science, and engineering science, (2) technical breadth, (3) breadth in the humanities and social sciences, (4) professional practice breadth, and (5) technical

depth or specialization. Attainment of the Civil Engineering Body of Knowledge requires additional education beyond the bachelor's degree for the practice of civil engineering at the professional level. The implementation of a path to attain the Civil Engineering Body of Knowledge should occur through establishing appropriate curricula in the formal education process, appropriate experience guidelines in the workplace and related education and experience standards in the law and rules of each of the engineering licensing jurisdictions.

Issue

The Civil Engineering Body of Knowledge prescribes the necessary depth and breadth of knowledge, skills, and attitudes required of an individual entering the practice of civil engineering at the professional level in the 21st Century. This Civil Engineering Body of Knowledge exceeds today's typical civil engineering baccalaureate degree, even when coupled with the practical experience gained prior to licensure.

The civil engineering profession is undergoing significant, rapid, and revolutionary changes that have increased the Civil Engineering Body of Knowledge required of the profession. Beyond the expanded technical considerations reflected in the Body of Knowledge, civil engineers more than ever need to consider the immediate and long-term environmental, societal, political, legal, aesthetic, and economic implications of engineering decisions

These and other changes have created a need for civil engineers to have a greater breadth of capability and specialized technical competence, placing increased expectations on civil engineers in their role of protecting the health, safety and welfare of the public. Despite this broad and significant increase in the challenges facing practitioners at the professional level, the number of credits required to earn the traditional four-year undergraduate engineering degree-the maximum amount of formal education currently required-has decreased significantly over the past decades.

Rationale

While current engineering baccalaureate programs across disciplines regularly undergo reform in their approaches, they still retain a nominal four-year education process. This length of time limits the ability of these programs to provide a formal education consistent with the increasing demands of the practice of civil engineering at the professional level. Diametrically opposed forces are trying to fit more content into the baccalaureate curriculum while at the same time reducing the credit hours necessary for the baccalaureate degree. The result is a baccalaureate engineering degree satisfactory for a future entry-level position, but inadequate for the future professional practice of civil engineering. While essential to achieving the Civil Engineering Body of Knowledge, the pre-licensure engineering work experience-gained during the generally four-year engineer-intern period-cannot make up for the expanded engineering body of knowledge that would be gained from additional education.

Requiring education beyond the baccalaureate degree for the future practice of civil engineering at the professional level is consistent with other learned professions. A century ago, engineering led all professions, requiring four years of formal schooling. This later became the standard for medical, law and architectural professionals. While the education requirements for physicians, attorneys, accountants,

pharmacists, architects and other professionals have subsequently been increased to five to eight years in response to the growing demands of their respective professions, the requirements for the practice of engineering have remained virtually unchanged. In this regard, engineers are truly a "leader no longer." Retaining a four-year undergraduate engineering education will negatively impact civil engineers' professional stature as leaders and thus impair their ability to both champion the needed engineering advancements for society and attract motivated prospective students to follow in their footsteps.

ASCE Policy Statement 465
First Approved 1998

*E and F. The Board of Direction **DIRECTED** the Raise the Bar Committee to collaborate with other committees and report to the Board on:*

i. Evaluation of requiring advanced discipline-specific licenses in lieu of raising P.E. bar;

IN PROGRESS

- Civil-specific licensure was discussed with COL during March and July 2017 joint meetings
- Anticipating a white paper from COL summarizing for the options for implementing Civil specific licensure

ii. Defining alternate paths to increase civil engineering practice requirements including but not limited to specialty certification, ASCE member grade qualifications, and qualifications for engineering technologists;

IN PROGRESS

- Formed subcommittee charged with exploring an alternate path via certification
- RTBC has been engaged in ongoing discussions with CEC and Institutes to discuss the viability of a certification program
 - CEC President Bill Kelly participated in a certification discussion the March 2017 RTBC meeting
 - Peterson & Dooley attended the CEC Board teleconference in May 2017
- The RTBC has identified support for the idea of creating a post-P.E. certification that would substantiate fulfillment of the CEBOK
- The RTBC will continue to explore an alternate path to raise the bar through certification, including benefits, challenges, resource commitment, and potential framework(s) of certification program; Recommendations will be presented with the final report in March 2018

iii. Ceasing new legislative efforts to require a masters' degree for P.E. license; and

COMPLETE

- No new legislative efforts have initiated since September 2016
- This has negatively impacted the ongoing effort in New Jersey

ACTION: Request the Board rescind this directive and permit legislative efforts to require a masters' degree for P.E. license

iv. Exploring the viability of making the P.E. exam more rigorous.

COMPLETE

- P.E. exam rigor was discussed during March 2017 joint meeting with COL

- COL has provided input to NCEES in the hopes to influence the rigor of the P.E. exam – shown below under “Practice Questions for the PE Exam”
- The RTBC has determined that influencing exam rigor is outside the scope of the RTB initiative
- The RTBC recognizes that influencing exam rigor is related to “raising the bar” and will continue to collaborate and engage with COL on their ongoing effort

Practice Questions for the PE Exam

The following commentary is a compilation of suggestions to NCEES leadership. We ask that these suggestions be reviewed and subsequently addressed by the appropriate NCEES exam development and standing committees.

The ASCE Committee on Licensure (COL) has been involved in developing policies regarding PE exam content. The COL is fortunate enough to have a number of members who have served on NCEES PE exam development committees in Civil and Environmental Engineering. A number of suggestions and comments have come from this group on how the PE exam might be revised to better achieve the goal of being more practice sensitive. The COL would like to share these comments with NCEES.

We believe the PE exam should contain questions that require a minimum of four years of progressive experience and discriminate between knowledge gained through education and that gained through practice.

1. **Exam performance statistics** focusing on Rbs rather than P+ have merit.

Rbs - How well the question discriminates between examinees passing and not passing the exam (rbiserial); i.e. how many who passed the test correctly answered a particular question **versus**

P+ - Number between 0 and 1 representing the % of all test takers (both those who passed and those who failed) who answer correctly

The practice type questions would be written to test examinees with a minimum of four years of progressive experience. When these type questions are given, they may have a P+ value which would be below the normally selected range and cause the questions to not be used in the item banks.

Can questions be selected on the basis of the rbiserial that perform well for those with four years of experience and not as well for those with less? A certain number of these could be utilized to achieve the desired outcome. It may be necessary to ensure a cut score determination did not assign such a low rating to these type questions so as to put their expectation of being answered correctly near random guessing. It is almost as if these type questions would have to be considered as a test within a test – hence the title “Principles and Practice”. Perhaps there can be some thought to an exam within an exam. A successful candidate would be required to achieve a passing score on the overall exam but would also need to get a certain percentage of the “practice” questions correct. This could be done in an open manner by separating the “practice” questions in a separate section and requiring that section be passed to be eligible to pass the entire exam.

2. Innovative item types

Writing questions in a non-multiple choice format lend to better opportunities for practice based questions. Examples are essay, drag and drop, fill in the blank, multiple choice questions based on one stem question. Prior to the current multiple choice format, the exams had essay questions in the morning and ten-part multiple choice questions in the afternoon based on one stem question. The various questions did not require the candidate to correctly answer the previous question to correctly answer the next part. We believe these questions better tested knowledge gained through practice in part because all the information needed to solve the multiple questions was provided in the stem and the candidate had to use engineering judgment to select the appropriate data for each part. In part they succeeded because the multi-question format could be used to plumb the depths of the candidates' knowledge to a deeper level. Would it be possible to allow for some questions to be part of a group of say three or four questions based on a common stem? Questions from the ten-part multiple choice item bank could be revised and used if this format is used. Utilizing this type of question would transition the exam from a linear exam to more of a mastery exam.

It is also suggested that word questions asking a candidate to select what information is necessary for a particular problem solution may well be a better test of progressive experience than giving data to be used in a "plug-and-chug" formula.

5.0 Identify the Next Steps to be Taken by the Committee

- Creating a communications plan including problem statement, milestones and metrics for success, and communications objectives
- Continue exploring benefits, challenges, and framework(s) of a potential post-P.E. credential
- Continuing collaboration with COE to develop a joint report
- Preparing and presenting a session at ASCE Convention

6.0 Recommendations and/or Actions to be Approved by Board

- Request the Board rescind the directive of "*ceasing new legislative efforts to require a masters' degree for P.E. license*" and permit legislative efforts to require a masters' degree or equivalent for P.E. license (see Board action form for more details).

7.0 Next Meeting Date

- January 2018 (exact date TBD)
- Monthly Web Meetings (next web meeting will be in August)

8.0 Committee Members

Dave Peterson, RTBC Chair
Horst Brandes
Jean-Louis Briaud

Eric Flicker
Bernie Gagnon
Karen Kabbes
Robin Kemper
Lance Mearig
Jon Nelson
Ken Rosenfield
Renee Schwecke
Marlee Walton