



Exam Qualifications Committee

July 5, 2024 | 2:30 p.m.

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In-person:

Board of Registration for Professional
Engineers and Land Surveyors

605 11th Ave SE, Suite 201
Olympia, WA 98501

Committee: Mike Harney, PE, Chair
James Wengler, PLS, CFedS
Maureen Jackson, PE

Support staff: Ken Fuller, PE, Director
Kristina Horton, PLS, Deputy Director
Vonna Cramer, Licensing Lead
Shanan Gillespie, Regulatory Board Manager

Discussion topics

- Decoupling exams
 - RCW/WAC changes required?
 - Do both PE & PLS need to be decoupled?
 - Is there value for our applicants for WA to decouple?
 - Does it affect the reputation of the board?
- Draft exam policy final approval
- Receiving NCEES records
 - How can we encourage the NCEES record?
 - RCW/WAC updates required?
- Committee review of a portion of applications for final review
 - How many per committee meeting?
 - What is the benefit?

Action items (from June 12, 2024)

- Stakeholder feedback before filing CR102 for WAC 196-26A and WAC 196-30
- Staff to provide the committee with the attestation examples to be received by NCEES for review.
- Staff to work with the AAG Advisor to see if an attestation letter would allow decoupling without legislative changes

Strategic Planning Items

- Review comity regulations for each profession and how they relate to other states
- Investigate decoupling all exams

Policy No. 000

State Examination Policy

Applies to: BRPELS staff, Board members, PLS & On-Site Subject Matter Experts (SMEs).

Effective Date: MM/DD/YYYY

Last Update: N/A

Next Review Date: MM/DD/2028

Approved by: _____

Ken Fuller, Director

STATE EXAMINATION POLICY

The Board of Registration for Professional Engineers and Land Surveyors develops and administers the Washington State Professional Land Surveyor's examination and the Washington State On-Site Wastewater Treatment Systems Designer Licensing examination.

Exams are administered in a paper/pencil format, and as a linear, fixed form (LFF). With LFF, all candidates having the exam administered on the same day receive the same test items. Exams use the classical test theory (CTT) psychometric model.

This State Prepared Examination *Policy* consists of 3 sections:

- ❖ **Exam Development** - provides procedures used to develop, score, and evaluate the performance of the state examinations.
- ❖ **Administration** - provides guidelines for administering the state examinations.
- ❖ **Security of Exam Material** – provides procedures for all individuals involved in the examination development or administration of the state examinations.

This policy should be reviewed as needed, or at least every four (4) years.

EXAM DEVELOPMENT

Developing exams requires enlisting subject matter experts to write and review items, maintaining the item banks, reviewing and pilot-testing new exams before administration, and supporting the scoring of the exams. A contract with a psychometrician, or psychometric firm may be required for such items as job task analysis (JTA), developing an exam blueprint, and item writing workshops.

❖ Subject Matter Experts (SMEs)

Subject Matter Experts (SMEs) are enlisted through: The Board's social media page(s), the Board's Constant Contact lists, presentations at various professional organization meetings, such as LSAW and WOSSA, and referrals from other SMEs.

Subject Matter Experts provide support to the Board in examinations and are divided into 2 teams - The Item Writing Team and the Testing Team.

The Item Writing Team is generally made up of 8-10 SMEs. These SMEs shall hold an active Washington State license as a Registered Professional Land Surveyor, On-Site Inspector / Certificate of Competency Holder, On-Site Designer, or Professional Engineer that practices on-site design.

The Testing Team needs at least 15-30 SMEs to test each new examination. These SMEs should hold an active license or be in "retired" status (PLS only) in the Board's records.

Each SME must sign the Examination Non-Disclosure Agreement ([Appendix A](#)) before becoming involved in any exam development activities.

❖ Writing New Items

Each item writing team is responsible for producing sufficient items for the Board to administer exams in the time frames indicated by the Board. Guidelines for writing multiple-choice items are shown in [Appendix B](#).

SMEs shall write items ~~that tests to~~ minimum competence. The minimally competent surveyor or on-site professional must demonstrate on the exam the minimum acceptable level of ability to apply their working knowledge and understanding across the subject areas in the applicable exam specification.

Items should be submitted using the *State Exam Question Template* ([Appendix C](#)). The item writer should document the following:

- Exam specification (domain/sub-domain/Knowledge Task)
- Statement of the item (Question)
- Distractors (with the correct answer highlighted)
- Source of information (References)
- Estimate of time required to solve the question
- Provide a difficulty score (Angoff)

Items may be submitted prior to an item development meeting, using a secure method provided by BRPELS staff, or they may be submitted at the meeting.

Faxes, unencrypted email attachments, and physical copies delivered by third parties are presumed to be compromised and are **not** acceptable ways to submit new items.

Once an item has been submitted to the item bank, it becomes the property of BRPELS. All related paper and electronic documentation outside the item bank must be destroyed.

❖ **Reviewing and Accepting Items**

Each item is reviewed by the SMEs at item review/development meetings. At a minimum, an item must fit the exam specifications (test blueprint) and be at an appropriate level of difficulty in terms of content and time required to solve it.

The SMEs should confirm: the domain, sub-domain, knowledge task, that there is a single correct solution for each item and verify references. SMEs should also ensure that each item has one correct answer, and distractors are plausible and mutually exclusive. As part of the review SMEs may need to provide an explanation of how an examinee might (incorrectly) select each of the distractors.

Whenever feasible, SMEs should fix items that have minor deficiencies to make them acceptable. Items that require more substantial revisions should be returned to the writer with constructive criticism that will guide the writer in making those changes required. If the author of the existing item is unknown, or is no longer an available SME, the item will be reassigned for later review.

❖ **Developing and Maintaining Item Banks**

In SharePoint and in the exam grading & reporting system, BRPELS staff maintain current item banks for the Washington State Professional Land Surveyor Examination and the On-Site Wastewater Treatment Systems Designer Examination. Staff also maintain separate folders for new items waiting for approval and new items that have been approved but not entered in the bank.

A contracted psychometrician will review the item banks and exam forms and provide analytics of each item to Board staff starting 4 years after the completion of the previous contract.

The exam writing team will review the item banks and exam forms every 2 years after the completion of the previous review.

Item banks contain a standardized numbering system based on profession, domain, sub-domain, knowledge task area, and item number within the sub-domain. **Appendix C – State Exam Question Template.**

To improve the quality and relevance of the items, any review of the item banks should be as follows:

- If an item is not to be revised or removed, the following issues should be evaluated:
 - Complexity of the item
 - Suitability of options/distractors
 - Performance of an item over multiple tests
 - Context of the item in regard to the current blueprint (specialized knowledge, areas of practice, or current practices)
- If revising the item is appropriate, do one or more of the following:
 - Condense the item.
 - Minimize the steps required to solve the item to a maximum of three.
 - Limit the references to a maximum of two.
 - Insert values from the reference or include as an exhibit.
 - Alter the distractors.
- If the item is no longer valid, inactivate it in the exam grading & reporting system to prevent its use on future exams.

❖ **Reviewing and Assembling Exams for Pilot-Testing**

Items selected for an exam must follow the test blueprint. Selected items should not repeat content or approaches of other items or contain information that directly answers another item in the assembled exam.

Reviewing exams

When reviewing exams, SMEs should ensure the following guidelines have been met.

1. Language and data are simple and direct. The exam is not a test of reading comprehension.
2. The exam conforms to the approved test blueprint.
3. The exam does not contain trick questions or ambiguous items.
4. The presentation of the exam conforms to BRPELS style and standards. The staff will provide recommendations for style and standard.
5. The statistical performance of previously used items is acceptable in terms of discrimination and difficulty.
6. All items have been properly reviewed and approved.
7. The time required to complete the exam is appropriate for the minimally competent candidate.
8. The level of difficulty is appropriate for the minimally competent candidate.
9. The Item Writing Team should use the pilot-test results to make necessary

adjustments to the exam during their final review.

10. Previous passing standards of the same exam format have been reviewed and the difficulty of the exam adjusted if these indicate the SMEs are producing exams that are inappropriately hard or easy.

After the exam has been pilot tested, the last step of the review process is to verify that the correct solutions provided by the SMEs on file are correct match what is shown as correct on the exam key. At least 3 BRPELS staff, including the Deputy Director, will verify the solutions provided by the SMEs are correct the correct answers on the exam key.

❖ Pilot-Testing Exams

Once the review process has been completed but before the last SME review, SMEs pilot-test the exams to ensure they meet all requirements. Exams with at least 70% reused items do not require pilot-testing. The goals of pilot-testing are to ensure that new items are correct before they are published in an exam and to ensure that the entire exam meets time constraints, that the types of items used are appropriate, and that overall exam quality meets standards.

The method of conducting pilot tests should follow these guidelines.

1. Pilot-testing should occur in a controlled environment that mimics the conditions in which examinees will be taking the exam, and the exam materials can be supervised and controlled. Staff will be present at the pilot-test sites. If you have more than one examination and one location for pilot-testing, half of the testers in each location should get each form (Half get form A and half get form B). This helps rule out any group differences and balances things out.
2. Exams should be pilot tested by 15-30 Test Taking SMEs who have never seen the items. Not all testers have to take the same exam on the same day.
3. Physical distribution of pilot tests must follow security protocols. While the exam materials are being used by the pilot testers, they must maintain the confidentiality and security of the documents in accordance with policy, procedures, and confidentiality agreements (**Appendix A**).
4. The pilot testers should time their performance and comment on any items that take too long to solve.

Post pilot-test exam actions

Staff should be present during the comment review phase of the pilot-testing process. Pilot-test comments and responses are documented and provided to the Item Writing Team to make any necessary adjustments to the item.

❖ **Establishing Cut Scores**

A cut score is the lowest raw score required to pass the exam. Any score below the cut score is a failing score. A procedure called a standard-setting study is used to establish the cut score for benchmark exams. The benchmark exam is the first administration of a new exam or the first exam after a specification change. Any SME that was part of the Test Taking Team must be excluded from participating in the cut score meeting.

❖ **Providing Item Performance Reports**

After a pilot-test exam has been administered, BRPELS staff, and an on-site or PLS SME will review the performance statistics for each of the items used in an exam, as well as examinees' comments that indicate a possible problem with an item. The purpose of providing positive and negative feedback is to improve the performance of future items. Staff may reach out to SME item writing team members to review performance statistics.

Examinee Comments

- Each examinee receives a comment sheet to fill out as part of the examination packet. It is noted on the comment sheet that it is not the Board's intent to provide feedback on the comments.
- Staff reviews the comments to determine whether sufficient information and cause exist to allow an additional review by SMEs.
- If immediate review is warranted, staff posts the item, solution (if needed) and examinee comment on a secure platform for review by the SMEs.
- If comment does not warrant immediate review, staff will provide information to SMEs for consideration at the next Exam Writing Team meeting.

Examination Administration

The exams are administered twice a year, usually the third Friday in March and September. If these dates need to be changed, the Director, and/or Deputy Director will determine a new examination date.

Examinations are currently administered in person, in a pencil and paper format.

❖ Exam Locations – Western & Eastern Washington

Start at least 2-3 months prior to exam date

The Executive Assistant and/or Administrative Assistant will begin securing exam locations 2-3 months prior to the exam date. Consideration is given to cost to the state and accessibility to examinees. State-owned or public owned facilities take priority over renting or leasing private facilities.

The Licensing Lead, will work with the Executive Assistant and/or Administrative Assistant to obtain exam rooms for each exam location, including any special equipment or room for those requesting reasonable accommodation. (See Appendix D - *Requests for Reasonable Accommodations*)

○ Exam room set-up

- Set up is classroom style, in rows, with 2 head proctor tables at the front of the room.
- Need the ability to add more tables if more examinees are added. **Final exam count – 2 weeks prior to the exam date.**
- Should hold a minimum of 40 examinees for westside location.
- Should hold a minimum of 20 examinees for eastside location.
- If using 6-foot x 2 ½ foot (72" x 30") tables, use one table for each examinee.
- If using 8-foot x 2 ½ foot (96" x 30") tables, use one table for every 2 examinees.

Each location has a Head Proctor and 1-2 other staff members to help proctor the examinations. The Deputy Director determines staffing for the exams and travel arrangements.

2 weeks prior to the exam date

The Licensing Lead will provide a final examinee count to the Deputy Director, Executive Assistant and/or Administrative Assistant at least 2 weeks prior to the exam date.

Each location, including any additional information (parking, room name, directions) should be finalized 2 weeks prior to the exam date, and information provided to the Deputy Director and Licensing Lead as soon as possible.

The Executive Assistant and/or Administrative Assistant will coordinate any necessary travel and/or lodging for exam proctors and support staff as determined by the Deputy Director.

❖ **Creating Examinations & Assembling Exam Packets**

Within 2 weeks of the exam date

After an exam has been created in the exam grading & reporting system the Licensing Lead will print one copy and provide it to a staff member and the Deputy Director to conduct a quality check. Concurrent with the quality check, the Licensing Lead will update the exam cover sheets and back page instructions (if needed).

When the quality check is completed (including a review of the cover sheets), the exam books need printed. A licensing staff member needs to mail merge the roster (name and ID number) with label sheets (2 sets) to create individual exam books and packets. At least 2 extra exam books for each profession need to be created for each location.

Assembling the examination packet

An examination packet is provided for each examinee which consists of a manilla envelope labeled with examinee name and ID number and contains the following:

- Examination (either PLS or On-Site) labeled with the examinee name and ID number
- Scantron MC Answer Sheet
- Comment Sheet

❖ **Preparing Examination Materials**

At least 1 week prior to exam date

Each Head Proctor (East & West) needs to ensure they have, at the minimum, the following materials.

- Correct number of PLS and On-Site exams (plus two) for their side of the state.
- Exam Rosters for both PLS & On-Site exams for both sides of the state (obtain from the Licensing Lead)
- Proctor Instructions
- General Announcements
- Extra No.2 pencils and sharpener (if necessary)

❖ **Administering the Examination**

Date of Exam

See **Proctor Instructions (Appendix E)**

❖ **Grading the Examinations (After the exam)**

The week after the Examinations

Board staff disassembles the exam packets and need to check the Scantron sheet to make sure there is an exam ID number on it. If not, staff will only darken the ID number “bubbles” so the examination scoring can be completed.

- **Used Exam books** can be destroyed after the exam results are sent. The destruction **must** be documented on the in-house destruction spreadsheet. Save one unused examination book for each exam to be sent to Archives. Shred all other unused exam books.
- **Answer sheets** are scanned and saved in the SharePoint site under the exam folder. Then they are scanned through the exam grading & reporting system for grading. See BRPELS records retention schedule for retention period.
- **Comment sheets** are scanned and saved in SharePoint under the exam folder. Paper copies can be shredded. Destruction must be documented on in-house destruction spreadsheet. (toss unused)

The Licensing Lead checks the multiple-choice Scantron answer sheets to make sure they are readable and scans them through the exam grading & reporting system for grading.

- **Providing Exam Performance Reports**

After each exam administration, staff will provide a report of examinee performance to the Exam Qualifications Committee (EQC) for presentation to the Board.

- ❖ **Examination Appeals**

BRPELS does not allow post-administration access to or review of exam material by examinees or their representatives.

If a regrade of an examination is requested, the Licensing Lead will regrade the examination through the exam grading & reporting system and/or hand grade the examination. Hand grading should be done by one staff member and reviewed by another staff member and any differences resolved.

MAINTAINING SECURITY OF EXAM MATERIAL

Exam material must remain confidential to protect the integrity of the licensing process. Because of the potential harm to the public by a person who improperly obtains a license, staff, board members and volunteers (subject matter experts) must safeguard exam material throughout the entire exam processes.

- ❖ Any exam development documents, including psychometric documents, or electronic files containing **ANY** item content or key items are considered secure and confidential materials. Access to exam development folders is restricted only to staff involved with exam development.
- ❖ Secure materials should not be printed remotely when possible. If documentation must be printed, it must be shredded when the task is concluded.
- ❖ Only select SMEs may have remote access to the item bank, and only for critical activities for a limited time, such as reviewing items or for an exam development committee meeting. When the activity is completed, remote access to secure materials must be terminated by staff.
- ❖ SMEs with remote access may **not** save items to any removeable storage device.
- ❖ Upon request by BRPELS staff, the SMEs will surrender any examination materials in their possession, whether in paper or electronic form.
- ❖ When transporting examination materials to the exam location, BRPELS staff must ensure that the exam materials remain in the physical possession of BRPELS staff except when:
 - Locked in a hotel room registered to BRPELS staff.
 - Stored under lock and key, and out of sight, as in a car trunk.
- ❖ For airline travel, examination materials should not be checked through to baggage claim.

Definitions

Angoff Score: A well-established method of standard setting. Subject Matter Experts (SMEs) rate each item/question between 0% and 100% based on its level of difficulty, expressed as the proportion of minimally competent candidates that will answer it correctly. Therefore, harder items will have a lower rating than easier items.

If there is a low rater agreement (i.e. significant differences in ratings applied by SMEs), another round of ratings may be required.

Revised/Modified Angoff rating – A ‘modified Angoff’ rating may be applied which allows the SME to change their initial rating, either after discussion, or after seeing item performance data (such as from beta-testing), which may make them re-think the initial rating they applied.

Cut Score: The average of the difficulty rating (Angoff score) for all items within a test form becomes the cut score for that test form. The process for establishing the cut score is also called a “standard setting study.”

Minimum competence: The minimum level of knowledge and skills an individual must demonstrate to practice and be in responsible charge in a manner that will safeguard the health, safety, and welfare of the public.

Option: Includes the correct answer and three (3) distractors.

Test Blueprint: Describes the key elements of a test, including the content areas to be covered and the number of questions allocated to each content area (domain). A domain contains major knowledge and skill content area. Domains are broken down into subdomains. Subdomains include specific Knowledge and Task (KT) statements detailing specific competencies within the content area.