



***Backflow Prevention Exam Provider***

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***Backflow Certification  
Program Manual***



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## **Certification Program Manual Section One**

### **Formation of Program**

#### **How It Started**

The development of the Backflow Prevention Exam Provider (BPEP) Backflow Assembly Tester Certification examinations began in Spring 2021, initiated by a dedicated group of experts collectively known as The Team. These professionals possess extensive knowledge in backflow prevention assembly testing and repair, program administration, and have considerable experience teaching certification courses and delivering professional presentations.

#### **Purpose and Focus**

The primary objective of The Team was to design comprehensive written and practical examinations that thoroughly evaluate participants' competencies and proficiency in identifying proper installations and conducting accurate testing of backflow prevention assemblies.

#### **The Team**

All members of The Team are obligated to comply with strict confidentiality requirements. Any violation of these agreements will result in immediate dismissal from team activities and may impact the validity of the individual's Backflow Tester Certification.



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## **Types of Certification**

### **Backflow Assembly Tester Certification**

The Backflow Assembly Tester Certification examination consists of both written and practical components. Candidates who successfully complete these assessments are granted certification to conduct testing on Backflow Prevention Assemblies.

### **Program Administration Certification**

The Program Administration Certification examination evaluates competency in the administration and management of backflow programs. Individuals who pass this examination receive certification as a Program Administrator.

## **Certification Program Manual**

### **Section Two**

## **Rules of Backflow Assembly Tester Certification**

### **Exam Fee**

Exam fees must be pre-paid and are non-refundable or transferable. The exam fee will include both the written and performance exams.

### **Written Exam – Backflow Assembly Tester**

The Backflow Prevention Exam Provider's written examination is a closed-book assessment consisting of 100 multiple-choice questions, which are derived from the BPEP Need to Know criteria. Candidates may use scratch paper and a basic, battery-operated numeric calculator during the exam; however, cellular phones, internet-enabled devices, and all other electronic equipment are prohibited. Examinees are allotted three hours to complete the written portion, after which all exams must be submitted, regardless of completion status.

A minimum score of 70% is required to pass the written exam.

Exams will be reviewed and graded on-site by the Exam Monitor, with results provided directly to each applicant.



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The questions are formulated from various sources, including:

- Uniform Plumbing Code (UPC)
- International Plumbing Code (IPC)
- National Fire Protection Association (NFPA)
- AWWA Manual M14 - Backflow Prevention and Cross-Connection Control Recommended Practice
- IAPMO - Backflow Prevention Reference Manual
- PNWS – AWWA Cross-Connection Control Manual
- Backflow Prevention: Theory and Practice - University of Florida (TREEO)
- EPA – Cross Connection Control Manual
- University of Southern California (USC) 10<sup>th</sup> edition

Test procedure questions are gained from the **University of Southern California (USC) 10<sup>th</sup> edition test procedures**. These include basic test procedures and diagnostic questions.

The BPEP Team reviews the bank of questions to ensure there is a balance of questions about the following.

- Degree of Hazard Determination
- Various Methods of Backflow Prevention
- Safety
- Installation Requirements
- Program Elements and Responsibilities
- Testing Equipment
- Test Procedures – including diagnostic procedures
- Record Keeping
- Rules and Regulations
- Hydraulics

Questions on the exam are regularly evaluated for accuracy and relevance, reflecting changes or updates to source materials. If more than fifty percent of participants miss a specific question, that question will be assessed for correct content and wording. The Team holds at least one annual meeting to review changes in guidance resources and exam content. Additional items may be added to the exam if deemed necessary.



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## **Performance Exam - Backflow Assembly Tester**

The Backflow Prevention Exam Provider's performance examination is a closed-book, proctor witnessed practical assessment designed to evaluate the applicant's proficiency in conducting field tests for the Reduced Pressure Principle Assembly (RP), Double Check Valve Assembly (DC), Pressure Vacuum Breaker Assembly (PVB), and Spill Resistant Vacuum Breaker Assembly (SVB).

Applicants must demonstrate comprehensive knowledge and skill in executing the correct procedures for field-testing fully operational assemblies. Additionally, candidates are expected to take appropriate measures when diagnosing simulated conditions. Completion of a written test report will be required to verify the applicant's capability to accurately and thoroughly document all necessary information for reporting purposes.

There will be no strict time limit imposed for the completion of the performance exam. Applicants who are actively engaged in the testing demonstration may continue without interruption. However, if an applicant is unable or appears not to be making progress, the proctor, at their discretion, will inform the applicant that they must proceed, or the exam will be terminated.

The results of the hands-on performance exam are provided immediately upon completion.

## **Pass/Fail Criteria**

If an applicant fails to pass both examinations, they may retain the score of any successfully completed portion for a period of one year (365 days) from the date achieved. It is not necessary to retake the previously passed section if the failed portion is attempted again within this one-year timeframe. Upon successful completion of both the written and performance examinations, a certificate will be issued, appropriately dated, and valid for three (3) years from the date of passing.

Applicants who do not achieve a passing score on one or both examinations must observe a minimum waiting period of 15 days before reattempting. A new exam application and payment of the applicable fee are required for each subsequent attempt.



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## **Rules of Program Administration Certification**

### **Exam Fee**

Exam fees must be pre-paid and are non-refundable or transferable.

### **Written Exam - Program Administrator**

Backflow Prevention Exam Provider's Program Administration certification exam is closed book and consists of 100 multiple choice questions. These questions will be generated from the BPEP Need to Know criteria. Scratch paper and a simple numeric battery-operated calculator will be allowed. Cellular, internet and all other electronic devices will not be allowed. A three-hour time frame is given to complete the exam. After three hours written exams must be turned in whether completed or not.

The content for these questions is drawn from several sources, including:

- Uniform Plumbing Code (UPC)
- International Plumbing Code (IPC)
- National Fire Protection Association (NFPA)
- AWWA Manual M14 - Backflow Prevention and Cross-Connection Control Recommended Practice
- IAPMO - Backflow Prevention Reference Manual
- PNWS – AWWA Cross-Connection Control Manual
- Backflow Prevention: Theory and Practice - University of Florida (TREEO)
- EPA – Cross Connection Control Manual
- University of Southern California (USC) 10<sup>th</sup> edition

The Team evaluates the pool of questions to confirm that there is an appropriate balance addressing the following areas.

- Plan review
- Surveying
- Various Methods of Backflow Prevention
- Degree of Hazard Determination
- Safety



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- Installation Requirements
- Program Elements and Responsibilities
- Test Procedures
- Proper Report Submission
- Record Keeping
- Rules and Regulations
- Enforcement
- Emergency Response

Additional items may be added if deemed necessary.

Passing score for the written exam is 70% or higher. Results will be provided to applicants within a two-week period.

Once an applicant has successfully passed exam, they will be issued certification as a Program Administrator. The date on the certificate will be valid for a time frame of three (3) years from the date of passing.

Candidates who do not pass the exam are not required to undergo additional training, although it is recommended. To retake the exam, applicants must submit a new application and payment.



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## **Certification Program Manual Backflow Assembly Tester Certification Written Exam Need to Know Criteria**

Backflow Prevention Exam Provider's written exam is closed book. The applicant is permitted to bring with them writing instruments, scratch paper, and a basic numeric calculator. Cellular, internet and all other electronic devices must be stored with the test monitor, prior to beginning the exam. Passing score for the written exam is 70% or higher.

The written exam consists of 100 multiple-choice questions regarding the following:

Industry practices

Codes and Regulations

Hydraulics – How backflow happens

Types of Cross Connections

Degrees of Hazard

Methods of Backflow Prevention – Both testable and non-testable

Conditions that can affect how assemblies operate

Tester Responsibilities

- Safety procedures

- Test procedures

- Regulatory requirements

- Test report submission and record keeping

- Test equipment accuracy and maintenance

Testable Assemblies

- Design and Operation

- Components

- Application and specific uses

- Installation requirements

University of Southern California Field Test Procedures (10<sup>th</sup> edition)

- Reduced Pressure Principle Assembly (RP) / procedures & diagnostics

- Double Check Valve Assembly (DC) / procedures & diagnostics

- Pressure Vacuum Breaker Assembly (PVB) / procedures & diagnostics

- Spill Resistant Pressure Vacuum Breaker (SVB) / procedures & diagnostics



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## **Certification Program Manual Backflow Assembly Tester Certification Performance Exam Need to Know Criteria**

The backflow assembly tester performance exam is designed to evaluate an applicant's ability to properly conduct a test on each of the testable backflow prevention assemblies utilizing the University of Southern California (USC) 10<sup>th</sup> edition field test procedures. This exam is closed book, with no manuals, notes or aids of any kind permitted.

Applicants are required to demonstrate the knowledge and ability necessary in the proper steps for testing a reduced pressure principle assembly, double check valve assembly, pressure vacuum breaker assembly and the spill-resistance vacuum breaker, in a simulated operational environment. Each of these test assemblies may or may not have conditions set to provide simulations of leaking shut off valves, failing checks, or other operational conditions. These simulations are to support the evaluation of the applicant, and their ability to properly utilize the USC 10<sup>th</sup> edition backflow testing field procedures, evaluation of the assembly's condition and correctly report the results.



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## **Certification Program Manual Section Three Examination Requirements**

### **Backflow Assembly Tester**

Prospective candidates for the Backflow Assembly Tester examinations are required to complete and apply, along with the applicable fee, no later than 15 days before the scheduled examination date. Applicants must also provide documentation verifying a minimum of 32 hours of training that covers the BPEP Need-to-know criteria and test procedures as outlined in the University of Southern California (USC) 10th edition, inclusive of diagnostic steps. Individuals who currently hold certification as backflow assembly testers from a BPEP-recognized agency and utilize the USC 10th edition test procedures are exempt from the 32-hour training requirement. Please be advised that experience in installation or possession of a current plumbing license does not qualify as meeting the eligibility requirements for the BPEP examinations.

On the day of the examination, all applicants must present a valid government-issued photo identification prior to the commencement of testing. All necessary materials for the written examination, as well as pencils for the performance component, will be provided by BPEP. Candidates are responsible for supplying their own differential test gauge, sight tube assembly, bleed-off valve, and any additional tools required for the performance portion; these may, in certain circumstances, be arranged through the training course provider.

### **Backflow Program Administrator**

Applicants who wish to take the Backflow Program Administrator exam must demonstrate completion of a 20-hour training course covering the BPEP Need-to-know criteria. On the day of the examination, candidates are required to present a government-issued photo identification prior to beginning the test. Relevant experience managing a cross-connection control program for at least two years may be considered in lieu of the required training.



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## **Certification Program Manual**

### **Section Four**

#### **Backflow Assembly Tester - Examination Proctor Requirements**

Proctors are required to be current testers with sufficient experience in backflow assembly testing, as determined by the Exam Administrator.

Backflow Prevention Exam Provider's Proctors must successfully complete a proctor training course to validate the needed skills to evaluate the performance of applicants taking the hands-on performance exam and monitor written exams.

The Proctor Training course consists of affirming backflow assembly testing procedures in correlation with the USC 10<sup>th</sup> edition test procedures with the basic tests and diagnostics. Review of BPEP's rules concerning the exam process and accurate recording of exam results from the performance exam will also be included in the course.

Individuals possessing proctoring experience from other organizations who wish to become BPEP proctors will undergo an individual evaluation. Furthermore, these candidates must complete the BPEP proctor training to ensure familiarity with BPEP procedures.

All Proctors will be required to maintain a current certification by challenging and passing a certification exam within the time frame required.

#### **Backflow Program Administrator - Examination Proctor Requirements**

Proctors assigned to administer the Program Administrator examinations must be reliable individuals authorized by the Certification Administrator. They are also expected to complete security training, which provides comprehensive guidance on proper procedures for administering, collecting, and returning completed Program Administrator exams.



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### **Section Five**

## **Compensation for Proctoring**

Proctors will be monetarily compensated per exam proctored with a set fee. Proctors will receive re-imbursement for lodging at a reasonable cost and mileage at the current federal rate. In addition to those benefits, active Proctors will not have to pay for their own re-certification exams.



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## **Certification Program Manual Section Six**

### **BPEP Sample Exam Questions for Backflow Assembly Tester**

- 1) To exert a pressure of one (1) psi at the base of a column of water, the column would have to be how high? **(EPA Cross Connection Control Manual – page 13)**
  - A. 33.9 inches high
  - B. 27.75 inches high
  - C. 14.7 inches high
  - D. 2.13 ft high
  
- 2) A residential irrigation system may have an AVB for backflow protection if: **(PHCC Manual of Cross Connection Control second edition – chapter 8 page 67)**
  - A. There are no solenoid valves on the system
  - B. There are sprinkler heads above the AVB
  - C. There are control valves after the AVB
  - D. The system is looped with another meter
  
- 3) When mandating the type of cross connection required for a facility, the most important consideration is: **(IAPMO Backflow Prevention Reference Manual – Chapter 15 page 4)**
  - A. Cost
  - B. Pressure requirements
  - C. Degree of Hazard
  - D. Size
  
- 4) When conducting a SVB field test when the bleed screw is removed the air inlet opens at 3.0 and the gauge falls to zero. What does this indicate? **(USC Manual of Cross Connection Control / Tenth Edition – page 316)**
  - A. The check is faulty
  - B. The air inlet is faulty
  - C. There is backpressure present
  - D. The # 2 shut off valve is leaking by



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- 5) Fire suppression systems supplied from a potable water source which include a Siamese connection from a non-potable water source capable of being used by the fire department as a secondary water supply shall be protected which of the following? **(2021 Uniform Plumbing Code – chapter 6 / 603.5.14.1)**
  - A. Double check detector assembly
  - B. Double check assembly
  - C. Reduced pressure principle assembly
  - D. Air gap
  
- 6) When returning a backflow prevention assembly to service what step should the tester take to avoid creating a water hammer to the system? **(General operational practices)**
  - A. Close the # 1 shut off valve after opening the # 2 shut off valve
  - B. Close the # 2 shut off valve after opening the # 1 shut off valve
  - C. Pressurize the assembly slowly and then slowly pressurize the downstream system
  - D. Pressurize the downstream system slowly and the slowly pressurize the assembly
  
- 7) During the test of a reduced pressure principle assembly the differential test gauge is used to determine the differences of what? **(USC Manual of Cross Connection Control / Tenth Edition – page 411)**
  - A. High side pressure and low side pressure
  - B. Water pressure at the # 1 test cock and the # 4 test cock
  - C. Water pressure at the # 2 test cock and the # 4 test cock
  - D. High side pressure and gauge pressure
  
- 8) When determining which type of backflow protection is needed the first consideration must be what? **(USC Manual of Cross Connection Control / Tenth Edition – page 57)**
  - A. The cost
  - B. The degree of hazard
  - C. The available space for the installation
  - D. If there is adequate drainage available



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- 9) The 1996 Safe Drinking Water Act places the primary responsibility for the quality of the public water supply on which of the following? (**USC Manual of Cross Connection Control / Tenth Edition – page 32**)
- A. The backflow assembly tester
  - B. The owner of the valve
  - C. The water purveyor
  - D. The contractor installing the assembly
- 10) When a backflow prevention assembly requires repairs the tester should not (**USC Manual of Cross Connection Control / Tenth Edition – page 88**)
- A. Follow the manufacturer's instructions
  - B. Use lubricants USDA food grade approved
  - C. Modify the internal components
  - D. Use manufacturer approved replacement parts



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## Answers

- 1) B
- 2) A
- 3) C
- 4) A
- 5) C
- 6) C
- 7) A
- 8) B
- 9) C
- 10) C

The following is a list of references of where questions are compiled from.

University of Southern California Foundation for Cross Connection Control and Hydraulic Research (USC) Manual of Cross Connection Control 10<sup>th</sup> Edition

USEPA Cross Connection Control Manual

International Association of Plumbing and Mechanical Officials (IAPMO) Backflow Prevention Reference Manual

Uniform Plumbing Code

American Water Works Association (AWWA) Manual M14