

USC Foundation's Cross-Connection Control Tools

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Chief Engineer

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USC Foundation's CCC Tools

- At the Foundation's laboratory



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USC Foundation's CCC Tools





- Field Tools



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USC Foundation's CCC Tools

- Field Tools



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**USC Foundation's
Cross-Connection Control
Tools**

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**USC Foundation
CCC Tools**

- Different Tools Needed
 - Water Suppliers
 - Health Agencies
 - Backflow Prevention Assembly Testers

- Scum sucking salesmen.....

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USC Foundation CCC Tools

- Manual of Cross-Connection Control, Tenth Edition
- Laminated field test procedures
- Field testing backflow preventers instructional video
- Webinars On Demand
- *Working Together for Safe Water* informational brochure

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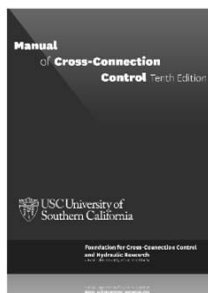
USC Foundation CCC Tools

- *Cross-Connections in Household Plumbing* informational brochure
- *Essentials of Cross-Connection Control* PowerPoint presentation
- *Working Together for Safe Water* informational video

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Training Tools Tenth Edition Manual

- 2009



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Training Tools Tenth Edition Manual



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Training Tools Laminated Field Test Procedures

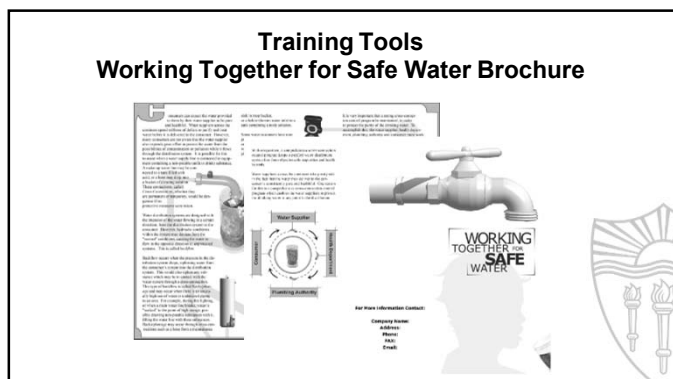


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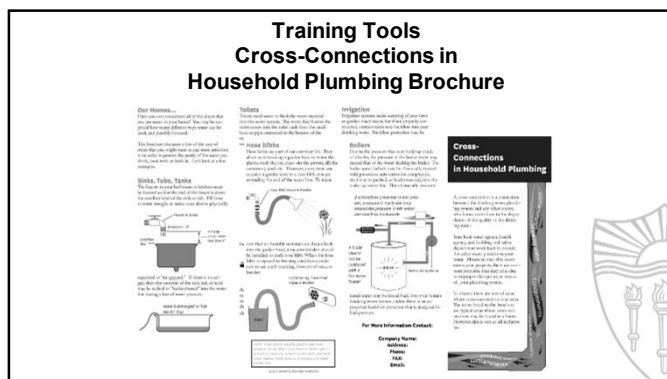
Training Tools FTBP Instructional Video



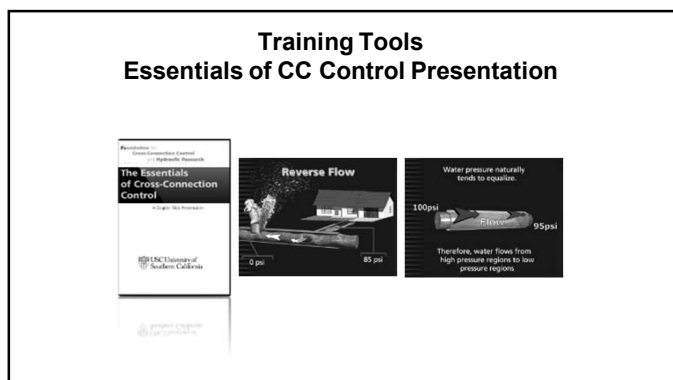
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Training Tools Tester Training Course

- Since 1969 – 5 day format (“short” course)
- Background, theory
- Testing procedures
- Diagnostics/Troubleshooting

Training Tools Tester Training Course



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Training Tools Program Specialist Course

- Since 1988 – 5 day format
- Policies and Procedures
- Rules and Regulations
- Record Keeping
- Public Relations
- Site Surveys
- Plan Checks

Training Program Specialist Course



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Training Tools Live Webinars



Training Tools Webinars

- Opportunity to be refreshed on backflow prevention and cross-connection control topics
 - Modifications voiding Approval
 - Recycled Water Shutdown tests
 - Different Facilities, Different Cross-Connections
 - and many more.....
- Attendees eligible for CEU's

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Training Tools Webinars



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Training Tools Webinars On Demand



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The USC Foundation

- Research Projects



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USC Foundation Research Projects

- Assessment of Cross-Connections in North America - AWWARF
- Prevalence of Cross-Connections in Household Plumbing Systems – USEPA
- Vulnerability Project – AWWARF

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USC Foundation Research Projects

- Assessment of Cross-Connections in North America – AWWARF
- Survey to 4,500 water agencies
- ~800 respondents
- Cross-connection control programs
- Backflow incidents

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USC Foundation Research AwwaRF Project

38-Which of the following customer complaints has your agency received as a result of conducting/administering your cross-connection control program?

- 82% Cost
- 60% Unneeded (no perceived risk)
- 41% Reduction in water pressure due to backflow preventer




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**USC Foundation Research
 AwwaRF Project**

16-Do you conduct site surveys to determine the extent of cross-connections on a premise as part of your cross-connection control program?

- 80% Yes
- 20% No




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**USC Foundation Research
 AwwaRF Project**

F-19 If not, what is done in lieu of site surveys?

- 78% Blanket programs
- 6% Surveys by another administrative authority
- 3% Surveys by third party
- 2% Mail in questionnaire
- 1% Surveys by phone
- 4% other
- 6% Nothing is being done



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**USC Foundation
 Research Projects**

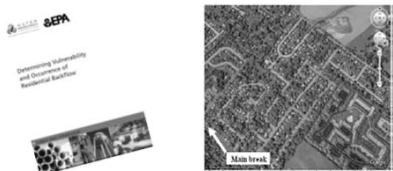
- Prevalence of Cross-Connections in Household Plumbing Systems – USEPA
- ~200 Residential surveys
- 95% - Direct or indirect cross-connection to a health hazard
- 91% - Unprotected hose bibbs

PDF available at fccchr.usc.edu

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**USC Foundation
 Research Projects**

- Vulnerability Project – AWWARF
- Real-time sensors in distribution system
- Backflow detecting water meters




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Foundation for Cross-Connection Control and Hydraulic Research

The USC Foundation


List of Approved Backflow Prevention Assemblies



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**USC List of Approved Backflow
 Prevention Assemblies**


- Make
- Model
- Size
- Edition of Manual under which assembly was approved
- Approval/renewal date



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USC List of Approved Backflow Prevention Assemblies

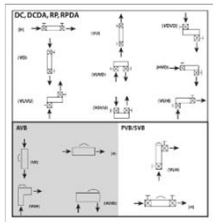

- Acceptable shutoff valves
- Water Meters
- Orientation
- $\leq 0.25\%$ Pb
- Spare Parts Only



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USC List of Approved Backflow Prevention Assemblies

- Acceptable shutoff valves
- Water Meters
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USC List of Approved Backflow Prevention Assemblies

- Acceptable shutoff valves
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USC List of Approved Backflow USC List on Mobile Devices

usclist.com




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USC List of Approved Backflow USC List on Mobile Devices

usclist.com




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USC List of Approved Backflow USC List – No Longer Approved

usclist.com

- No Longer Approved
 - When first approved
 - When removed from List
 - Stopped manufacturing
 - For cause

Foundation for Cross-Connection Control and Hydraulic Research

List of Assemblies
No Longer Approved



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The USC Foundation
Approval of Backflow Prevention Assemblies



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Approval of Backflow Prevention Assemblies


- Not a rating system 
- Two part process
 - Laboratory evaluation
 - Field evaluation



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Approval of Backflow Prevention Assemblies Laboratory Evaluation



- Submission of working drawings
- Head loss vs. flow rate
- Elastomer specifications
- Spring specifications
- Thermal loop
- Cycle test



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Approval of Backflow Prevention Assemblies Laboratory Evaluation



Submission of working drawings



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Approval of Backflow Prevention Assemblies Laboratory Evaluation



- Submission of Working Drawings
- Failure to comply with Design Requirements



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Approval of Backflow Prevention Assemblies Laboratory Evaluation

- Submission of Working Drawings
- Failure to comply with Design Requirements



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Approval of Backflow Prevention Assemblies Laboratory Evaluation

- Submission of Working Drawings
- Failure to comply with Material Requirements



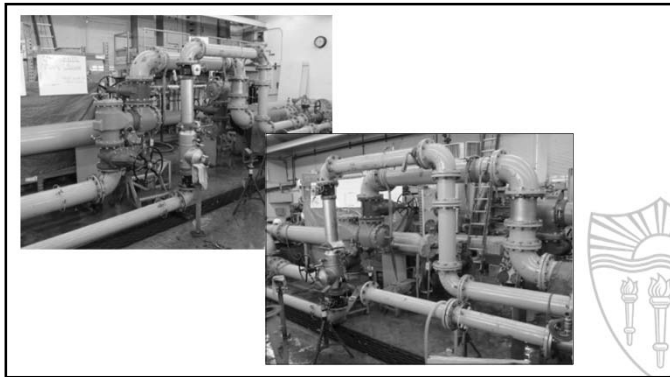
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Approval of Backflow Prevention Assemblies Laboratory Evaluation

Pressure loss vs.
flow rate



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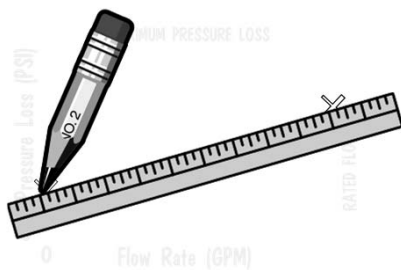
Approval Program Laboratory

- Pressure Loss vs Flow Rate Protocol
- NOT only a single point
- At rated flow



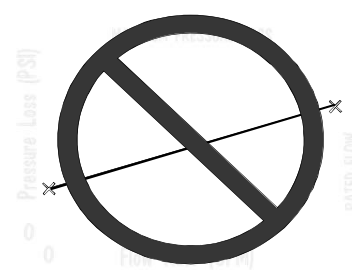
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Approval Program Laboratory

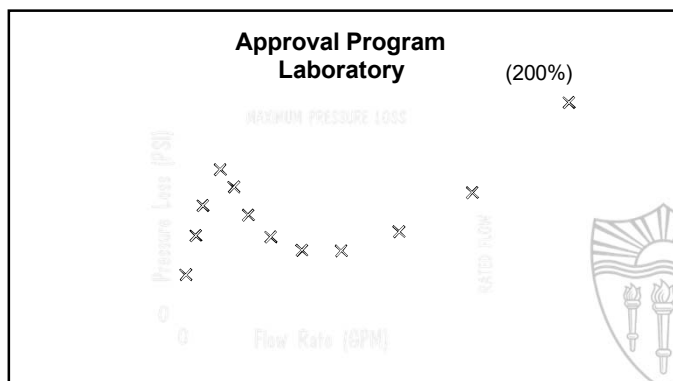


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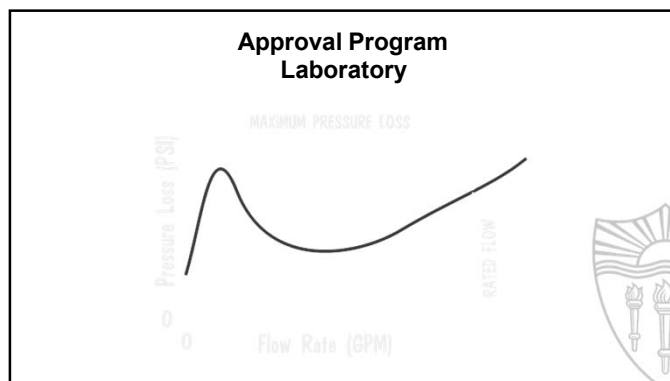
Approval Program Laboratory



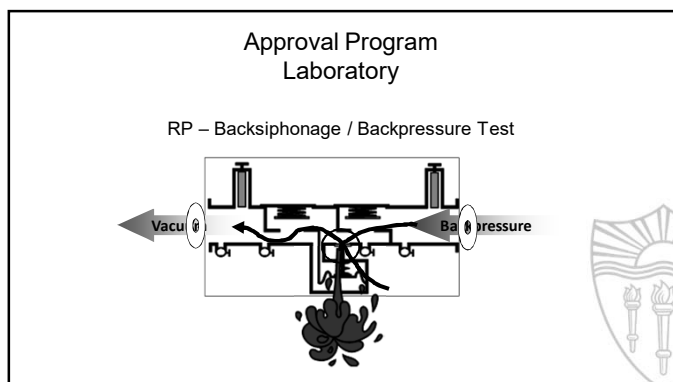
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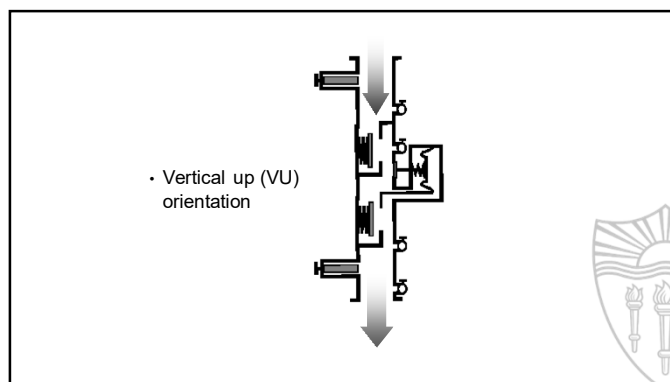
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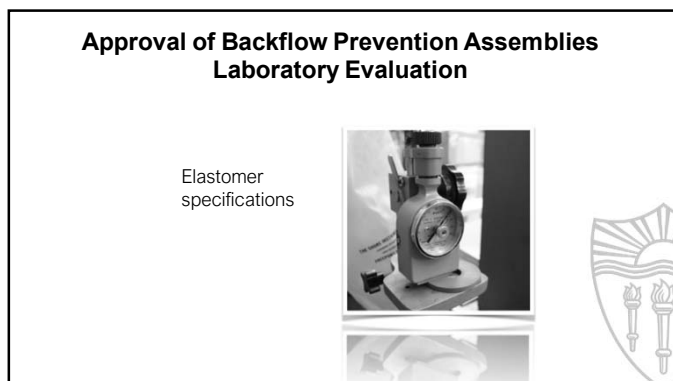
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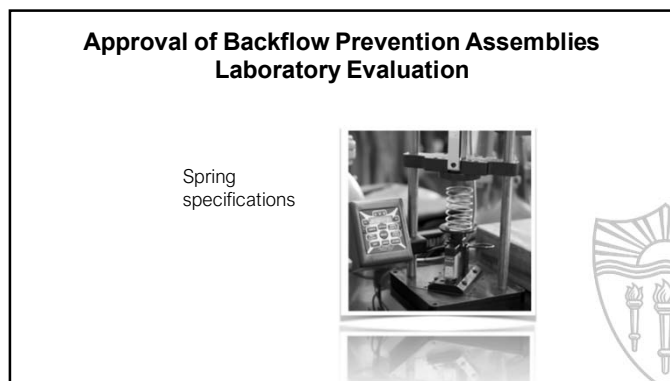
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Approval of Backflow Prevention Assemblies Laboratory Evaluation



Thermal loop



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Approval of Backflow Prevention Assemblies Laboratory Evaluation



Cycle test



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Approval of Backflow Prevention Assemblies Field Evaluation


Field Evaluation



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Approval of Backflow Prevention Assemblies Field Evaluation


- Twelve months trouble-free service
- Three sites for each make, model, size and orientation
- Initial field test and inspection
- Monthly field tests
- Final field test and inspection



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Approval of Backflow Prevention Assemblies Field Evaluation



- Approximately 30% of the assemblies passing the USC laboratory evaluation do not pass the field evaluation the first time
- Of those that fail the field evaluation, approximately 70% fail in the last three months



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The USC Foundation

Foundation Membership



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USC Foundation Membership



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Contact Information

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-  [@uscfcchr](https://instagram.com/uscfcchr)

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Questions?



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