

### Module Overview

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This module identifies and explains the basics of system layout, including design criteria, types of hazards, and coverage area for sprinklers.

### Prerequisites

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Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum*; *Sprinkler Fitting Level One*; *Sprinkler Fitting Level Two*; and *Sprinkler Fitting Level Three*.

### Objectives

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Upon completion of this module, the trainee will be able to do the following:

1. Explain system design, pipe sizing, and hydraulic calculations.
2. Identify and describe the four different system configurations.
3. Explain the differences between pipe schedule design and hydraulic design.
4. Identify and describe extra hazard, ordinary hazard, light hazard, and residential occupancies.
5. Identify and explain flow characteristics.
6. Explain pressure loss considerations.
7. Calculate branch line hydraulics.
8. Perform steps to calculate a branch line.
9. Calculate main piping hydraulics.
10. Explain how pipe schedule relates to hazard classifications.

### Performance Tasks

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Under the supervision of the instructor, the trainee should be able to do the following:

1. Determine the design criteria of a given room.
2. Calculate system pipe sizing using the pipe schedule design method.
3. Calculate system pipe sizing using the area/density design method.
4. Calculate pipe sizing based on flow characteristics.
5. Calculate branch line hydraulics for a given system.
6. Hydraulically calculate a main for a given system.
7. Hydraulically calculate the pressure loss/gain per foot of elevation change.

### Materials and Equipment

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Multimedia projector and screen  
*Sprinkler Fitting Level Four* PowerPoint®  
Presentation Slides (ISBN 978-0-13-272927-7)  
Computer  
Whiteboard/chalkboard  
Markers/chalk  
Pencils and scratch paper  
Appropriate personal protective equipment  
List of sample occupancies  
Basic trainee tools  
Ruler

Equivalent Schedule 40 steel pipe length chart  
Sample system drawing  
*NFPA 13*  
*NFPA 13R*  
*NFPA 13D*  
Various lengths and types of pipe  
Valves and fittings  
Copies of the Quick Quiz\*  
Module Examinations\*\*  
Performance Profile Sheets\*\*

\* Located at the back of this module.

\*\* Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.

## Safety Considerations

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Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. Make sure all trainees are briefed on appropriate safety procedures. This module may require that the trainees visit job sites. Ensure that trainees are briefed on site safety policies prior to any site visits.

## Additional Resources

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This module presents thorough resources for task training. The following resource material is suggested for further study.

*NFPA 13*, Latest Edition. Quincy, MA: National Fire Protection Association.

*NFPA 13D*, Latest Edition. Quincy, MA: National Fire Protection Association.

*NFPA 13R*, Latest Edition. Quincy, MA: National Fire Protection Association.

## Teaching Time For This Module

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An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 45 hours are suggested to cover *System Layout*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
<b>Sessions I and II. Introduction; System Design</b>	
A. Introduction	_____
B. Types of Systems	_____
C. System Configurations	_____
D. Pipe Schedule Design vs. Hydraulic Design	_____
<b>Sessions III through VII. Hydraulic Design and Pipe Schedule Methods</b>	
A. Determining Design Criteria	_____
B. Laboratory	_____
Give the trainees a list of sample occupancies and have them determine the design criteria of a given room. This laboratory corresponds to Performance Task 1.	
C. Hydraulic Design Methods	_____
D. Area/Density Method	_____
E. Laboratory	_____
Have trainees calculate system pipe sizing using the area/density design method. This laboratory corresponds to Performance Task 3.	
F. Room Design Method	_____
G. Special Design Approaches	_____
H. Pipe Schedule Method	_____
I. Laboratory	_____
Have trainees calculate system pipe sizing using the pipe schedule design method. This laboratory corresponds to Performance Task 2.	



### Module Overview

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This module identifies and explains the inspection, testing, and maintenance of wet pipe systems, dry pipe systems, preaction/deluge systems, and special systems.

### Prerequisites

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Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Sprinkler Fitting Level One; Sprinkler Fitting Level Two; Sprinkler Fitting Level Three; and Sprinkler Fitting Level Four*, Module 18401-13.

### Objectives

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Upon completion of this module, the trainee will be able to do the following:

1. Describe the reasons for unsatisfactory sprinkler system performance.
2. Explain initial system testing and inspections for aboveground, underground, and overhead pipe.
3. Describe the flushing process for underground piping/mains.
4. Describe the importance of periodic inspections of sprinkler systems.
5. Explain the report of inspection and how it must relate to the chapters included in *NFPA 25*.
6. Explain the difference between warranty repair and owner repair.
7. Explain the general preparations for system repair.
8. Describe the specific repair considerations for deluge and preaction systems.
9. Describe the general preparation procedures for inspection, maintenance, and repair of special systems.
10. Explain the required procedures to test all types of valves.
11. Perform a main drain test.
12. Complete inspection and testing of water-based and wet standpipe systems and complete the required documentation.

### Performance Tasks

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Under the supervision of the instructor, the trainee should be able to do the following:

1. Inspect and test water-based fire protection systems.
2. Complete the Report of Inspection, Testing and Maintenance of Water Based Fire Protection Systems.
3. Inspect and test wet standpipe systems.
4. Complete the Report of Inspection, Testing and Maintenance of Standpipe Systems.
5. Conduct a main drain test.

## Materials and Equipment

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Multimedia projector and screen  
*Sprinkler Fitting Level Four PowerPoint®*  
Presentation Slides (ISBN 978-0-13-272927-7)  
Computer  
Whiteboard/chalkboard  
Markers/chalk  
Pencils and scratch paper  
Appropriate personal protective equipment  
Basic trainee tools  
Air compressor  
Test equipment  
Sample valve(s)  
Piping test certificates  
Sample inspection checklist  
Sample site-specific inspection forms  
Report of Inspection, Testing and Maintenance of  
Water-Based Fire Protection Systems  
Report of Inspection and Testing of Wet Stand-  
pipe Systems  
*NFPA 13 Contractor's Material and Test Certificate  
for Aboveground Piping*  
*NFPA 13 Contractor's Material and Test Certificate  
for Underground Piping*

Report of Inspection, Testing and Maintenance of  
Water-Based Fire Protection Systems  
Report of Inspection, Testing and Maintenance of  
Wet Pipe Fire Sprinkler Systems  
Report of Inspection, Testing and Maintenance of  
Standpipe Systems  
Report of Inspection, Testing and Maintenance of  
Private Fire Service Mains  
Report of Inspection, Testing and Maintenance of  
Fire Pump Assemblies  
Report of Inspection, Testing and Maintenance of  
Water Storage Tanks  
*NFPA 24, Private Fire Service Mains*  
*NFPA 25, Standard for Inspection, Testing, and  
Maintenance of Water-Based Fire Protection  
Systems*  
Access to a water-based fire protection system  
Access to a wet standpipe system  
Access to a main drain  
Copies of the Quick Quiz\*  
Module Examinations\*\*  
Performance Profile Sheets\*\*

\* Located at the back of this module.

\*\* Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.

## Safety Considerations

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Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module requires trainees to inspect and test water-based fire protection systems. Make sure all trainees are briefed on appropriate safety procedures. This module may require that the trainees visit job sites. Ensure that trainees are briefed on site safety policies prior to any site visits.

## Additional Resources

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This module presents thorough resources for task training. The following resource material is suggested for further study.

*NFPA 13, Standard for the Installation of Sprinkler Systems*, Latest Edition. Quincy, MA: National Fire Protection Association.

*NFPA 25, Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, Latest Edition. Quincy, MA: National Fire Protection Association.

*NFPA 70, National Electrical Code*, Latest Edition. Quincy, MA: National Fire Protection Association.

*NFPA 72, National Fire Alarm Code*, Latest Edition. Quincy, MA: National Fire Protection Association.

## Teaching Time For This Module

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An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 17½ hours are suggested to cover *Inspection, Testing, and Maintenance*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
<b>Session I. Introduction; Initial System Testing and Inspections</b>	
A. Introduction	_____
B. Initial System Testing and Inspections	_____
<b>Sessions II through IV. Periodic Inspections; Report of Inspection</b>	
A. Periodic Inspections	_____
B. Report of Inspection	_____
C. PT/Laboratory Have trainees inspect and test a water-based fire protection system and complete a sample report. This laboratory corresponds to Performance Tasks 1 and 2.	_____
D. PT/Laboratory Have trainees inspect and test a wet standpipe system and complete the Report of Inspection, Testing & Maintenance of Standpipe Systems. This laboratory corresponds to Performance Tasks 3 and 4.	_____
<b>Sessions V and VI. Repair; Special Systems</b>	
A. Repair	_____
B. Special Systems	_____
C. PT/Laboratory Have trainees conduct a main drain test. This laboratory corresponds to Performance Task 5.	_____
<b>Session VII. Review and Testing</b>	
A. Review	_____
B. Module Examination	_____
1. Trainees must score 70% or higher to receive recognition from NCCER.	
2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.	
C. Performance Testing	_____
1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.	
2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.	

### Module Overview

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This module identifies and explains exposure systems, water spray systems, foam systems, carbon dioxide systems, Halon systems, auxiliary systems, and local alarm systems.

### Prerequisites

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Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Sprinkler Fitting Level One; Sprinkler Fitting Level Two; Sprinkler Fitting Level Three; and Sprinkler Fitting Level Four*, Modules 18401-13 and 18402-13.

### Objectives

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Upon completion of this module, the trainee will be able to do the following:

1. Describe the three methods of heat transfer.
2. Explain the basic principles of exposure protection.
3. Identify what piping and fitting materials can be used and where they must be located in an exposure system.
4. Explain where water spray systems are typically used.
5. Explain the general concepts of using foam as opposed to water as an extinguishing agent.
6. Describe the different classes of foam concentrates and foam sprinkler system configurations.
7. Explain how to measure density using a refractometer.
8. Identify the five basic automatic fire detection methods that can be used for electric release.
9. Describe the dangers when working with a carbon dioxide system.
10. Describe the different classes of fire extinguishers and what the rating designations mean.

### Performance Tasks

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Under the supervision of the instructor, the trainee should be able to do the following:

1. Perform a water discharge test.
2. Demonstrate the proper use of a CO<sub>2</sub> monitor.
3. Demonstrate how to swab a pipe interior.

### Materials and Equipment

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Multimedia projector and screen  
*Sprinkler Fitting Level Four* PowerPoint®  
Presentation Slides (ISBN 978-0-13-272927-7)  
Computer  
Whiteboard/chalkboard  
Markers/chalk  
Pencils and paper  
Appropriate personal protective equipment  
Basic trainee tools  
Various joints and pipes  
Joint sealant  
Galvanized pipe and fittings  
Access to water for discharge testing  
CO<sub>2</sub> monitors  
*NFPA 13, Standard for the Installation of Sprinkler Systems*

*NFPA 11, Standard for Low-Expansion Foam*  
*NFPA 12, Standard on Carbon Dioxide Extinguishing Systems*  
*NFPA 15, Standard for Water Spray Fixed Systems for Fire Protection*  
*NFPA 17, Standard for Dry Chemical Extinguishing Systems*  
*NFPA Fire Protection Handbook*  
*Montreal Protocol on Substances that Deplete the Ozone Layer*  
Americans With Disabilities Act (ADA)  
Accessibility Guidelines  
Copies of the Quick Quiz\*  
Module Examinations\*\*  
Performance Profile Sheets\*\*

\* Located at the back of this module.

\*\* Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.

## Safety Considerations

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Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. Make sure all trainees are briefed on appropriate safety procedures. This module may require that the trainees visit job sites. Ensure that trainees are briefed on site safety policies prior to any site visits.

## Additional Resources

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This module presents thorough resources for task training. The following resource material is suggested for further study.

- NFPA 10*, Latest Edition. Quincy, MA: National Fire Protection Association.
- NFPA 12*, Latest Edition. Quincy, MA: National Fire Protection Association.
- NFPA 11*, Latest Edition. Quincy, MA: National Fire Protection Association.
- NFPA 13*, Latest Edition. Quincy, MA: National Fire Protection Association.
- NFPA 13D*, Latest Edition. Quincy, MA: National Fire Protection Association.
- NFPA 15*, Latest Edition. Quincy, MA: National Fire Protection Association.
- NFPA 20*, Latest Edition. Quincy, MA: National Fire Protection Association.
- NFPA 70*, Latest Edition. Quincy, MA: National Fire Protection Association.
- NFPA 2001*, Latest Edition. Quincy, MA: National Fire Protection Association.

## Teaching Time For This Module

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An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 42½ hours are suggested to cover *Special Extinguishing Systems*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
<b>Sessions I and II. Introduction; Exposure Systems</b>	
A. Introduction	_____
B. Exposure Systems	_____
<b>Sessions III through VI. Water Spray Systems; Foam Systems</b>	
A. Water Spray Systems	_____
B. Laboratory	_____
Have trainees practice using joint sealant to make watertight joints.	
C. Laboratory	_____
Have trainees practice swabbing a pipe interior. This laboratory corresponds to Performance Task 3.	
D. Laboratory	_____
Have trainees practice performing a water discharge test. This laboratory corresponds to Performance Task 1.	
E. Foam Systems	_____



**Sessions VII through IX. Flow Control Valves; Carbon Dioxide (CO<sub>2</sub>) Systems**

- A. Flow Control Valves
- B. Carbon Dioxide (CO<sub>2</sub>) Systems
- C. Laboratory

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Have trainees practice using a CO<sub>2</sub> monitor. Note the proficiency of each trainee. This laboratory corresponds to Performance Task 2.

**Sessions X through XIII. Halon Systems; Halon Alternatives; Dry Chemical Systems**

- A. Halon Systems
- B. Halon Alternatives
- C. Dry Chemical Systems

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**Sessions XIV and XV. Auxiliary Alarm Systems and Local Alarms**

- A. Auxiliary Alarm Systems and Local Alarms

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**Session XVI. Fire Extinguishers; Water Mist Suppression Systems**

- A. Fire Extinguishers
- B. Water Mist Suppression Systems

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**Session XVII. Review and Testing**

- A. Review
- B. Module Examination

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1. Trainees must score 70% or higher to receive recognition from NCCER.
2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.

- C. Performance Testing

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1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.
2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.

### Module Overview

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This module describes the qualities and responsibilities of a foreman, including an explanation of documentation and tracking.

### Prerequisites

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Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Sprinkler Fitting Level One; Sprinkler Fitting Level Two; Sprinkler Fitting Level Three; and Sprinkler Fitting Level Four*, Modules 18401-13 through 18403-13.

### Objectives

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Upon completion of this module, the trainee will be able to do the following:

1. Explain the foreman's responsibilities to the project coordinating staff or project owner.
2. Explain the job safety responsibilities.
3. Describe job cleanliness and material organization.
4. Explain responsibilities for project close-out.
5. Describe project layout and coordination.
6. Identify and describe the scope of project and the scope letter.
7. Describe job specifications and project drawings.
8. Record changes on a shop drawing for as-builts.
9. Complete daily, weekly time, and progress reports.
10. Identify and explain materials documentation.

### Performance Tasks

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Under the supervision of the instructor, the trainee should be able to do the following:

1. Prepare a request for information (RFI).
2. Prepare a foreman's report of accident.
3. Compare daily, weekly time, and progress reports.
4. Record changes on a shop drawing for as-builts.

### Materials and Equipment

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Multimedia projector and screen  
*Sprinkler Fitting Level Four* PowerPoint®  
Presentation Slides (ISBN 978-0-13-272927-7)  
Computer  
Whiteboard/chalkboard  
Markers/chalk  
Pencils and scratch paper  
Appropriate personal protective equipment  
*Occupational Safety and Health Act (OSHA) of 1970*

Sample RFI forms  
Sample foreman's report of accident forms  
Sample daily, weekly time, and progress reports  
Sample as-built drawings  
Sample building addition drawing  
Module Examinations\*\*  
Performance Profile Sheets\*\*

\*\* Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.

## Safety Considerations

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Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module may require that the trainees visit job sites. Ensure that trainees are briefed on site safety policies prior to any site visits.

## Additional Resources

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This module presents thorough resources for task training. The following resource material is suggested for further study.

- NFPA 13, Latest Edition. Quincy, MA: National Fire Protection Association.
- American Medical Association (AMA), [www.ama-assn.org](http://www.ama-assn.org)
- American Society for Training and Development (ASTD), [www.astd.org](http://www.astd.org)
- Architecture, Engineering, and Construction Industry (AEC), [www.aecinfo.com](http://www.aecinfo.com)
- CIT Group, [www.citgroup.com](http://www.citgroup.com)
- Construction Work Development Center, [www.construction-work.org](http://www.construction-work.org)
- Equal Employment Opportunity Commission (EEOC), [www.eeoc.gov](http://www.eeoc.gov)
- Knowledge Center's Manager's Toolkit, [www.knowledgecenters.versaware.com](http://www.knowledgecenters.versaware.com)
- National Association of Women in Construction (NAWIC), [www.nawic.org](http://www.nawic.org)
- National Census of Fatal Occupational Injuries (NCFOTI), <http://stats.bls.gov/news.release/cfoi.toc.htm>
- National Center for Construction Education and Research, [www.nccer.org](http://www.nccer.org)
- National Institute of Occupational Safety and Health (NIOSH), [www.cdc.gov/niosh](http://www.cdc.gov/niosh)
- National Safety Council, [www.nsc.org](http://www.nsc.org)
- Occupational Safety and Health Administration (OSHA), [www.osha.gov](http://www.osha.gov)
- Project Management Tools, American Fire Sprinkler Association.
- Society for Human Resources Management (SHRM), [www.shrm.org](http://www.shrm.org)
- The Leadership Ladder, American Fire Sprinkler Association.
- United States Bureau of Mine Safety and Health Administration (MSHA), [www.msha.gov](http://www.msha.gov)
- United States Census Bureau, [www.census.gov](http://www.census.gov)
- United States Department of Labor, [www.dol.gov](http://www.dol.gov)
- USA Today*, [www.usatoday.com](http://www.usatoday.com)

## Teaching Time For This Module

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An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 20 hours are suggested to cover *Introductory Skills for the Foreman*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
<b>Session I. Introduction; Foreman Responsibilities; Project Responsibilities</b>	
A. Introduction	_____
B. Foreman Responsibilities	_____
C. Foreman's Project Responsibilities	_____
<b>Session II. Becoming a Foreman; Project Planning</b>	
A. Becoming a Foreman	_____
B. Characteristics of Leaders	_____
C. Project Layout and Coordination	_____
D. Stages of Planning	_____

**Sessions III and IV. Project Documentation**

- A. Project Documentation \_\_\_\_\_
- B. Sprinkler Shop Drawings and As-Builts \_\_\_\_\_
- C. Laboratory \_\_\_\_\_  
Have trainees record changes on an as-built drawing. This laboratory corresponds to Performance Task 4.
- D. Stocklists and Stock Transfers \_\_\_\_\_
- E. Equipment and Tools Control \_\_\_\_\_
- F. Time and Material Sheets and Daily Reports \_\_\_\_\_
- G. Request for Information \_\_\_\_\_
- H. Laboratory \_\_\_\_\_  
Have trainees prepare a request for information (RFI). This laboratory corresponds to Performance Task 1.
- I. Weekly Time and Progress Reports \_\_\_\_\_
- J. Laboratory \_\_\_\_\_  
Have trainees complete daily, weekly time, and progress reports. This laboratory corresponds to Performance Task 3.
- K. Expense Reports and Foreman’s Report of Accident \_\_\_\_\_
- L. Laboratory \_\_\_\_\_  
Have trainees prepare a foreman’s report of accident. This laboratory corresponds to Performance Task 2.

**Sessions VI and VII. Materials Documentation; Leaving the Project; Continuing Education**

- A. Materials Documentation \_\_\_\_\_
- B. Leaving the Project \_\_\_\_\_
- C. Continuing Education \_\_\_\_\_

**Session VIII. Review and Testing**

- A. Review \_\_\_\_\_
- B. Module Examination \_\_\_\_\_
  - 1. Trainees must score 70% or higher to receive recognition from NCCER.
  - 2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.
- C. Performance Testing \_\_\_\_\_
  - 1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.
  - 2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.

### Module Overview

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This module explains the importance of following proper procedures and accurate documentation for a project.

### Prerequisites

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Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Sprinkler Fitting Level One; Sprinkler Fitting Level Two; Sprinkler Fitting Level Three; and Sprinkler Fitting Level Four*, Modules 18401-13 through 18404-13.

### Objectives

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Upon completion of this module, the trainee will be able to do the following:

1. Recognize the consequences of improper system installation.
2. Identify the five Cs of project documentation.
3. Recognize unsafe acts and conditions on a work site.
4. Identify the hazards associated with specific tasks.
5. Discuss the procedures for responding to an accident.
6. Describe the procedures for emergency response to water damage.
7. Explain how to handle a water damage claim.

### Performance Tasks

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This is a knowledge-based module. There are no performance tasks.

### Materials and Equipment

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Multimedia projector and screen  
*Sprinkler Fitting Level Four* PowerPoint®  
Presentation Slides (ISBN 978-0-13-272927-7)  
Computer  
Whiteboard/chalkboard  
Markers/chalk  
Pencils and scratch paper  
Appropriate personal protective equipment  
Basic trainee tools  
Samples of frozen pipes

Samples of couplings or fittings that have failed  
Samples of frozen glue joints  
Samples of sprinklers that have overheated or frozen, and that have sustained mechanical damage, corrosion, or sabotage  
Sample information on a sprinkler system failure  
Samples of documents from a typical project  
Module Examinations\*\*

\*\*Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.

## Safety Considerations

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Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. Make sure all trainees are briefed on appropriate safety procedures. This module may require that the trainees visit job sites. Ensure that trainees are briefed on site safety policies prior to any site visits.

## Additional Resources

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This module presents thorough resources for task training. The following resource material is suggested for further study.

US Department of Labor Occupational Safety and Health Administration, [www.osha.gov](http://www.osha.gov)

The American Society of Safety Engineers, [www.asse.org](http://www.asse.org)

*Root Cause Analysis Handbook: A Guide to Effective Incident Investigation*, 1999. JBF Associates Division. Rockville, MD: Government Institutes.

## Teaching Time For This Module

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An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 20 hours are suggested to cover *Procedures and Documentation*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources.

Topic	Planned Time
<b>Sessions I and II. Introduction; Case Histories</b>	
A. Introduction	_____
B. Case History: Improper Piping Installation	_____
C. Case History: Improper Threading	_____
<b>Session III. Importance of Proper Documentation</b>	
A. Importance of Proper Documentation	_____
B. Project Documents	_____
<b>Session IV. Responding to Accidents</b>	
A. Responding to Accidents	_____
B. Accident Reports	_____
<b>Session V. Causes of System Failures</b>	
A. Causes of System Failures	_____
<b>Session VI. Response to Water Damage</b>	
A. Response to Water Damage	_____
<b>Session VII. Module Review</b>	
A. Module Review	_____
<b>Session VIII. Testing</b>	
A. Module Examination	_____
1. Trainees must score 70% or higher to receive recognition from NCCER.	
2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.	