Fire Protection and Life Safety Systems Plan Review (2024)

Course Plan

Course Details

Certification: Fire Plans Examiner

CTS Guide: Fire Plans Examiner (2024)

Description: This course provides the knowledge and skills that prepare a fire plans examiner to evaluate fire flow compliance and identify requirements and review installation plans for fire protection and life safety systems.

Designed For: Personnel preparing to pursue Fire Plans Examiner certification or anyone who performs the duties of a fire plans examiner within their agency

Prerequisites: Fire Plans Examiner 1A: Building Plan Review (2024)

Standard: Complete all activities and formative tests

Complete all summative tests with a minimum score of 80%

Hours (Total): 30 hours

(19.5 lecture / 8.5 application / 2 testing)

Maximum Class Size: 30

Instructor Level: SFT Fire Plans Examiner Registered Instructor

Instructor/Student Ratio: 1:30 (lecture)

1:15 (application)

Restrictions: None

SFT Designation: CFSTES

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Required Resources

Instructor Resources

To teach this course, instructors need:

- *Fire Protection, Detection, and Suppression Systems* (IFSTA, 5th edition, 2016)
- *Plans Examiner for Fire and Emergency Services* (IFSTA, 2016)
- California Building Code (CBC) (CCR, Title 24, current edition)
- California Fire Code (CFC) (CCR, Title 24, current edition)
- NFPA 13: Standard for the Installation of Sprinkler Systems (current edition)
- NFPA 14: Standard for the Installation of Standpipe and Hose Systems (current edition)
- NFPA 17A: Standard for Wet Chemical Extinguishing Systems (current edition)
- NFPA 20: Standard for the Installation of Stationary Pumps for Fire Protection (current edition)
- NFPA 24: Standard for the Installation of Private Fire Service Mains and Their Appurtenances (current edition)
- NFPA 72: National Fire Alarm and Signaling Code (current edition)
- NFPA 291: Recommended Practice for Water Flow Testing and Marking of Hydrants (current edition)
- NFPA 1030: Standard for Professional Qualifications for Fire Prevention Program Positions (current edition)
- NFPA 1142: Standard on Water Supplies for Suburban and Rural Firefighting (current edition)
- U.S. Fire Administration Water Supply Systems and Evaluation Methods Volume I: Water Supply System Concepts (FEMA, October 2008)
    - https://www.usfa.fema.gov/downloads/pdf/publications/water_supply_systems_volume_i.pdf
- U.S. Fire Administration Water Supply Systems and Evaluation Methods Volume II: Water Supply System Concepts (FEMA, October 2008)
    - https://www.usfa.fema.gov/downloads/pdf/publications/water_supply_systems_volume_ii.pdf
- Engineering scale
- Architectural scale
- Calculator

Online Instructor Resources

The following instructor resources are available online at https://osfm.fire.ca.gov/what-we-do/state-fire-training/professional-certifications:

- None

Student Resources

To participate in this course, students need:

- California Building Code (CCR, Title 24, current edition)
- California Fire Code (CCR, Title 24, current edition)
- NFPA 13: Standard for the Installation of Sprinkler Systems (current edition)
- NFPA 72: National Fire Alarm and Signaling Code (current edition)
- Engineering scale
- Architectural scale
- Calculator

Facilities, Equipment, and Personnel

The following facilities, equipment, or personnel are required to deliver this course:

- Standard learning environment or facility, which may include:
    - Writing board or paper easel chart
    - Markers, erasers
    - Amplification devices
    - Projector and screen
    - Laptop or tablet with presentation or other viewing software
    - Internet access with appropriate broadband capabilities
- A large room with tables to accommodate full-size plans for up to 30 students
- Two sets of plans, specifications, and details for each student or student group (At a minimum, documents should be sufficient to meet the objectives of Application activities designed by the instructor)
    - One set for course activities
    - One set for testing

Timetable

Segment	Lecture	Application	Unit Total
Unit 1: Introduction			
Topic 1-1: Orientation and Administration	0.50	0.00	
Topic 1-2: Fire Plans Examiner Certification Process	0.50	0.00	
Unit 1 Totals	**1.00**	**0.00**	**1.00**
Unit 2: Fire Flow			
Topic 2-1: Evaluating Fire Flow Compliance	2.50	1.50	
Unit 2 Totals	**2.50**	**1.50**	**4.00**
Unit 3: Fire Protection and Life Safety Systems			
Topic 3-1: Identifying Requirements for Fire Protection or Life Safety Systems	1.00	0.50	
Topic 3-2: Reviewing Fire Protection and Life Safety System Installation Plans	15.00	6.50	
Unit 3 Totals	**16.00**	**7.00**	**23.00**
Formative Assessments			
Determined by AHJ or educational institution	**0.00**	**0.00**	**0.00**
Summative Assessment			
Determined by AHJ or educational institution	**0.00**	**2.00**	**2.00**
Course Totals	**19.50**	**10.50**	**30.00**

Timetable Key

1. The Timetable documents the amount of time estimated to deliver the content included in the course plan.

2. Time is documented using the quarter system: 15 min. = .25 / 30 min. = .50 / 45 min. = .75 / 60 min. = 1.0.

3. The Course Totals do not reflect time for lunch (1 hour) or breaks (10 minutes per each 50 minutes of instruction or assessment). It is the instructor's responsibility to add this time based on the course delivery schedule.

4. Application (activities, skills exercises, and formative testing) time will vary depending on the number of students enrolled. The Application time documented is based on the maximum class size identified in the Course Details section.

5. Summative Assessments are determined and scheduled by the authority having jurisdiction. These are not the written or psychomotor State Fire Training certification exams. These are in-class assessments to evaluate student progress and calculate course grades.

Unit 1: Introduction

Topic 1-1: Orientation and Administration

Terminal Learning Objective

At the end of this topic, a student will be able to identify facility and classroom requirements and identify course objectives, events, requirements, assignments, activities, resources, evaluation methods, and participation requirements in the course syllabus.

Enabling Learning Objectives

1. Identify facility requirements
    - Restroom locations
    - Food locations
    - Smoking locations
    - Emergency procedures
2. Identify classroom requirements
    - Start and end times
    - Breaks
    - Electronic device policies
    - Special needs and accommodations
    - Other requirements as applicable
3. Review course syllabus
    - Course objectives
    - Calendar of events
    - Course requirements
    - Student evaluation process
    - Assignments
    - Activities
    - Required student resources
    - Class participation requirements

Discussion Questions

1. What is a formative test? What is a summative test?

Application

1. Determined by instructor

Topic 1-2: Fire Plans Examiner Certification Process

Terminal Learning Objective

At the end of this topic a student will be able to identify the requirements for Fire Plans Examiner certification and describe the certification task book and examination process.

Enabling Learning Objectives

1. Identify the levels of certification in the Fire Plans Examiner certification track
2. Identify other Fire Prevention certification tracks
   - First Responder Inspector (2024) of Fire Inspector 1 (2014)
   - Fire Inspector (2024) or Fire Inspector 2 (2014)
   - Fire Marshal (2014 or 2024)
3. Identify the prerequisites for Fire Plans Examiner certification
   - None
4. Identify the course work required for Fire Plans Examiner certification
   - Fire Plans Examiner 1A: Building Plan Review (2024)
   - Fire Plans Examiner 1B: Fire Protection and Life Safety Systems Plan Review (2024)
   - Fire Plans Examiner 1C: Hazards and Special Operations Plan Review (2024)
   - Statutes and Regulations (SFT)
5. Identify the exams requirements for Fire Plans Examiner certification
   - Not applicable
6. Identify the task book requirements for Fire Plans Examiner certification
   - Fire Plans Examiner Certification Task Book (2024)
7. Identify the experience requirements for Fire Plans Examiner certification
   - Has a minimum of one (1) year full-time paid experience or two (2) years' volunteer or part-time paid experience in a recognized California fire agency in a fire prevention role with plan review as their primary responsibility
8. Identify the position requirements for Fire Plans Examiner certification
   - None
9. Describe the certification task book process
10. Describe the certification testing process
    - Not applicable
    - All formative and summative testing is completed in individual courses
    - Schedule skills evaluation test

Discussion Questions

1. Determined by instructor

Application

1. Determined by instructor

Unit 2: Fire Flow

Topic 2-1: Evaluating Fire Flow Compliance

Terminal Learning Objective

At the end of this topic a student, given a submittal package, codes and standards, and fire flow test results, will be able to evaluate code compliance for required fire flow and hydrant location and spacing so that hydrants are correctly located, required fire flow is determined, and deficiencies are identified, documented, and reported in accordance with AHJ policies and procedures.

Enabling Learning Objectives

1. Describe types of water supply and distribution systems
2. Describe characteristics and components of public and private water supply systems, including:
   - Water meters
   - Backflow prevention
   - Fire hydrants
   - Valves and pipes
   - Other devices that can impact fire flow
3. Describe water distribution system test methods
4. Analyze the effects of friction loss and elevation on water flow
5. Describe the potential impact of state health regulations on fire flow
6. Describe how to graph water supply
   - Water supply line
   - Demand points (fire flow, sprinkler system design, etc.)
   - Residual pressure
   - Static pressure
   - Flow pressure
7. Read fire flow graphs
8. Interpret fire flow test results
9. Describe applicable AHJ codes and standards related to fire flow in the jurisdiction
   - Municipal requirements
   - Rural requirements
10. Identify standard civil engineering symbols
11. Determine fire hydrant locations and spacing

Discussion Questions

1. How should fire flow be distributed through multiple hydrants?
2. How do fire flow requirements vary in rural versus urban areas and/or commercial versus residential buildings?

Application

1. Given a submittal package and the California Fire Code, have students determine compliance for fire flow and hydrants along fire apparatus access.

Instructor Notes

1. See “The World's First Web-Based Hydraulic Graph N^1.85 for Water Supply and Demand Information” available at https://pingfire.com/ for graphing water supply lines and evaluating fire flow demand.

CTS Guide Reference: CTS 3-7

Unit 3: Fire Protection and Life Safety Systems

Topic 3-1: Identifying Requirements for Fire Protection or Life Safety Systems

Terminal Learning Objective

At the end of this topic a student, given a submittal package, will be able to identify the requirements for a fire protection or life safety system so that deficiencies are identified, documented, and reported in accordance with AHJ policies and procedures.

Enabling Learning Objectives

1. Identify applicable code requirements for:
    - Life safety systems
        - Fire alarm
        - Smoke control
    - Fire extinguishers
    - Fire protection systems
        - Sprinkler (with and without foam)
            - Wet
            - Dry
            - Pre-action
            - Deluge
        - Standpipe
        - Engineered and pre-engineered
            - Clean agent
            - Dry chemical
            - Dry powder
            - Wet chemical
            - CO_2
            - Water wash
            - Mist
        - Fire pumps
2. Identify the symbols used on a set of plans
3. Identify the components of a basic submittal package
    - Plans or shop drawings
        - Engineering or designer stamp
    - Approved construction drawings for reference
        - Architectural
        - Civil
        - Mechanical
        - Electrical
        - Plumbing
        - Other based on scope
    - Cut sheet
    - Listing sheet
    - Specifications

- Calculations

4. Read floor plans or shop drawings
5. Apply codes and standards

Discussion Questions

1. How much contact should a fire plans examiner have with a designer during the review process?
2. When construction drawings reference fire protection and life system systems to be installed, and build coordination into the construction drawings prior to deferred submittals being submitted, how can you ensure coordination and reconciliation between the construction drawings and the deferred submittals?
3. Do voluntary fire protection and life safety systems have to meet the same standards are required systems.

Application

1. Given a submittal package, have students evaluate the completeness and scope of work to determine if the required fire and life safety systems are in place.

Instructor Notes

1. None

CTS Guide Reference: CTS 3-1

Topic 3-2: Reviewing Fire Protection and Life Safety System Installation Plans

Terminal Learning Objective

At the end of this topic a student, given a plan submittal, will be able to evaluate plans for the installation of fire protection and life safety systems so that the systems and equipment are reviewed, and deficiencies are identified, documented, and reported in accordance with applicable codes and standards and with the policies and procedures of the AHJ.

Enabling Learning Objectives

1. Describe basic physical science as it relates to fire behavior and fire suppression
2. Identify basic system design criteria and applicable codes and standards for life safety systems
    - Fire alarm
    - Smoke management
    - Communication
3. Identify basic system design criteria and applicable codes and standards for fire protection systems
    - Water sources
    - Flow and hydraulics
    - Fire underground
    - Fire pumps
    - Fire sprinklers
    - Standpipes
    - Engineered and pre-engineered
4. Describe approved material listing requirements and specifications
5. Identify installation components of fire protection and life safety systems
    - Fire alarm
        - Initiation device
        - Notification device
        - Control panel
        - Annunciators
        - Backup power
        - Conductors/wire
        - Communicators
    - Smoke management
        - Controllers
        - Dampers
        - Annunciators
        - Interlocks
        - Fans
        - Exhaust
        - Initiation device
    - Communication
        - Fire department communication system
        - Refuge area communication

    - Repeaters
        - External
        - Internal
    - Public address
- Fire underground
    - Pipe
    - Thrust block
    - Backflow prevention devices
    - Valves
    - Fire department connection
    - Cathodic protection
        - Mastic
        - Wrap
- Fire pumps
    - Controllers
    - Fuel system
    - Prime movers
    - Hangers and braces
    - Pressure maintenance (jockey) pump
- Fire sprinkler
    - Pipe
    - Hangers
    - Braces
    - Heads
    - Valves
- Standpipes
    - Pipe
    - Valves
        - Pressure reducing
        - Restrictor plates
        - Outlets
    - Hangers and braces
    - Hose
    - Nozzles
    - Fire department connection
- Engineered and pre-engineered
    - Suppression or extinguishing product(s)
    - Pipe
    - Valves
    - Nozzles
    - Heads
    - Hangers and braces
    - Interlocks
    - Fire alarm initiation device

    - System notification device
    - Abort switch
    - Agent
    - Agent container
    - Mixer/proportioner
6. Describe engineering calculations for fire suppression and life safety systems
7. Describe phased inspection and acceptance inspection/testing of completed installations
8. Verify engineering calculations
    - Battery
    - Voltage drop
    - Hydraulic
    - Seismic
    - Thrust block
9. Review specifications and read plans
10. Classify occupancies for fire suppression systems
    - Light hazard
    - Ordinary hazard
    - Extra hazard
    - Special occupancy hazard
11. Classify commodity classes
    - I
    - II
    - III
    - IV
    - High hazard commodities
    - Plastics
        - Group A
        - Group B
        - Group C
    - Mixed Commodities
12. Interpret and apply codes and standards

Discussion Questions

1. What should be considered when specifying the location of fire department connections (FDCs)?
2. How does occupancy classification influence the need for fire protection and life safety systems?
3. How does a fire command center influence the coordination of fire protection and life safety systems?

Application

1. Given shop drawings for a fire alarm system, a fire sprinkler system, and a pre-engineered system, have each student evaluate each system for compliance with the minimum codes and standards.

Instructor Notes

1. See “The World's First Web-Based Hydraulic Graph N^1.85 for Water Supply and Demand Information” available at https://pingfire.com/ for graphing water supply lines and evaluating sprinkler system design demand.

CTS Guide Reference: CTS 3-17

How to Read a Course Plan

A course plan identifies the details, logistics, resources, and training and education content for an individual course. Whenever possible, course content is directly tied to a national or state standard. SFT uses the course plan as the training and education standard for an individual course. Individuals at fire agencies, academies, and community colleges use course plans to obtain their institution's consent to offer course and provide credit for their completion. Instructors use course plans to develop syllabi and lesson plans for course delivery.

Course Details
The Course Details segment identifies the logistical information required for planning, scheduling, and delivering a course.

Required Resources
The Required Resources segment identifies the resources, equipment, facilities, and personnel required to deliver the course.

Unit
Each Unit represents a collection of aligned topics. Unit 1 is the same for all SFT courses. An instructor is not required to repeat Unit 1 when teaching multiple courses within a single instructional period or academy.

Topics
Each Topic documents a single Terminal Learning Objective and the instructional activities that support it.

Terminal Learning Objective
A Terminal Learning Objective (TLO) states the instructor's expectations of student performance at the end of a specific lesson or unit. Each TLO includes a task (what the student must be able to do), a condition (the setting and supplies needed), and a standard (how well or to whose specifications the task must be performed). TLOs target the performance required when students are evaluated, not what they will do as part of the course.

Enabling Learning Objectives
The Enabling Learning Objectives (ELO) specify a detailed sequence of student activities that make up the instructional content of a lesson plan. ELOs cover the cognitive, affective, and psychomotor skills students must master to complete the TLO.

Discussion Questions
The Discussion Questions are designed to guide students into a topic or to enhance their understanding of a topic. Instructors may add to or adjust the questions to suit their students.

Application
The Application segment documents experiences that enable students to apply lecture content through cognitive and psychomotor activities, skills exercises, and formative testing. Application experiences included in the course plan are required. Instructors may add additional application experiences to suit their student population if time permits.

Instructor Notes
The Instructor Notes segment documents suggestions and resources to enhance an instructor's ability to teach a specific topic.

CTS Guide Reference
The CTS Guide Reference segment documents the standard(s) from the corresponding Certification Training Standard Guide upon which each topic within the course is based. This segment is eliminated if the course is not based on a standard.

Skill Sheet
The Skill Sheet segment documents the skill sheet that tests the content contained within the topic. This segment is eliminated if the course does not have skill sheets.