



Hazards and Special Operations Plan Review

Course Plan

Course Details

Certification:	Plan Examiner
CTS Guide:	Plan Examiner (May 2015)
Description:	This course provides the knowledge and skills that prepare a plan examiner to evaluate plans associated with new construction, systems integration, alternative compliance, wildland urban interface areas, and special operations including hazardous materials and high-piled combustible storage.
Designed For:	Those desiring to become a plan examiner
Prerequisites:	Plan Examiner 1A Plan Examiner 1B
Standard:	Complete all activities and formative tests Complete all summative tests with a minimum score of 80%
Hours:	Lecture: 20:00 Activities: 6:30 Testing: 1:30
Hours (Total):	28:00
Maximum Class Size:	25
Instructor Level:	Primary Instructor
Instructor/Student Ratio:	1:25
Restrictions:	None
SFT Designation:	CFSTES

Required Resources

Instructor Resources

To teach this course, instructors need:

- *California Building Code*
 - Publisher: International Code Council (ICC)
 - Edition: edition currently adopted by the California Building Standards Commission (CBSC)
- *California Fire Code*
 - Publisher: ICC
 - Edition: edition currently adopted by the CBSC
- *California Wildfire Landscaping*
 - Author: Maureen Gilmer
 - Publisher: Taylor Publishing Company
 - Edition: 1994
- *Plan Review Manual (Based on the 2009 IBC)*
 - Publisher: International Code Council
 - Edition: based on the 2009 International Building Code
- *International Code Council Performance Code for Buildings and Facilities*
 - Publisher: ICC
 - Edition: 2009
- NFPA 13: Standard for the Installation of Fire Sprinkler Systems
 - Publisher: National Fire Protection Association (NFPA)
 - Edition: edition currently adopted by the CBSC
- Engineers scale
- Architectural scale
- Calculator

Online Instructor Resources

The following instructor resources are available online at

<http://osfm.fire.ca.gov/training/resources>:

- Hazards and Special Operations Plan Review course plan

Student Resources

To participate in this course, students need:

- *California Building Code*
 - Publisher: International Code Council (ICC)
 - Edition: edition currently adopted by the California Building Standards Commission (CBSC)
- *California Fire Code*
 - Publisher: ICC

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- Edition: edition currently adopted by the CBSC
- *International Code Council Performance Code for Buildings and Facilities*
 - Publisher: ICC
 - Edition: 2009
- NFPA 13: Standard for the Installation of Fire Sprinkler Systems
 - Publisher: National Fire Protection Association (NFPA)
 - Edition: edition currently adopted by the CBSC
- Engineers scale
- Architectural scale
- Calculator

Facilities, Equipment, and Personnel

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

- A large room with tables to accommodate full-size plans for up to 25 students
- Internet access for instructor and 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 the SFT-recommended Activities for topics 2-2, 4-1, 5-1, 5-2, and 5-3 as well as any other activities designed by the instructor)
 - One set for course activities
 - One set for testing

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?

Activities

1. To be determined by the instructor

Topic 1-2: Plan Examiner Certification Process

Terminal Learning Objective

At the end of this topic, a student will be able to identify different levels in the Plan Examiner certification track and the courses and requirements for certification, and be able to describe the certification task book and testing process.

Enabling Learning Objectives

1. Identify the different levels of certification in the Plan Examiner certification track
2. Identify the courses required for Plan Examiner certification

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- Plan Examiner 1A: Building Plan Review
 - Plan Examiner 1B: Fire Protection and Life Safety Systems Plan Review
 - Plan Examiner 1C: Hazards and Special Operations Plan Review
3. Identify any other requirements for Plan Examiner certification
 4. Describe the certification task book process
 - Complete all prerequisites and course work
 - Submit application and fees and request certification task book
 - Complete all job performance requirements included in the task book
 - Must have identified evaluator verify individual task completion via signature
 - Must have Fire Chief or authorized representative verify task book completion via signature
 - Must be employed by a California Fire Agency in the position prior to submitting completed task book to State Fire Training
 5. Describe the certification testing process
 - Complete course work
 - Schedule online certification exam
 - Schedule skills evaluation test

Discussion Questions

1. How many levels are there in the Plan Examiner certification track? What are they?

Activities

1. To be determined by the instructor

Unit 2: Design and Systems Integration

Topic 2-1: Evaluating Design Concepts

Terminal Learning Objective

At the end of this topic, a student, given a preliminary design presentation, will be able to evaluate a proposed design concept to verify that it meets the intent of applicable codes and standards and is in accordance with jurisdictional policies and procedures.

Enabling Learning Objectives

1. Describe a jurisdiction's preliminary plan review procedures
2. Identify the approval process for alternative fire protection methodologies
3. Evaluate code compliance of conceptual designs
 - Construction
 - Exits and egress
 - Access and water supply
 - Fire protection and life safety systems

Discussion Questions

1. What other departments should a plan examiner consult during a design concept evaluation?
2. What are some design features or issues that could render a preliminary design unacceptable?

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3. How are the design concept review and the adoption cycles for state and local codes and standards interrelated?

Activities

1. To be determined by the instructor

Instructor Notes

1. For more information on this topic, see *Guidance Document for Incorporating Risk Concepts into NFPA Codes and Standards* (Rose, Flamberg, and Leverenz / www.nfpa.org)

CTS Guide Reference: CTS 6-1

Topic 2-2: Evaluating Systems Integration

Terminal Learning Objective

At the end of this topic, a student, given a plan submittal, a life safety report, a sequence of operations report, and testing criteria, will be able to evaluate the integration of life safety, fire protection, security, and building service systems, ensuring that the integration of proposed systems meets the requirements or intent of applicable codes and standards and the fire and life safety objectives of the jurisdiction, and identifying, documenting, and reporting deficiencies in accordance with jurisdictional policies.

Enabling Learning Objectives

1. Describe the fire and life safety objectives of a jurisdiction
 - Building and property protection
 - Life safety
 - Protection
 - Evacuation
 - Building protection vs. life safety
2. Describe fire protection and life safety systems and their integration
 - Construction
 - Separation
 - Egress
 - Fire protection and life safety systems
3. Evaluate system integration

Discussion Questions

1. What fire and life safety concerns apply to security systems?
2. How might the fire and life safety objectives of a fire agency differ from those of a property owner? Or the public?

Activities

1. Given a high-rise plan, have students review the integrated systems to determine how the construction, fire protection and life safety, and building service systems work together to promote building and occupant survivability.

CTS Guide Reference: CTS 6-7

Unit 3: Alternative Compliance

Topic 3-1: Evaluating Performance-Based Design Concepts

Terminal Learning Objective

At the end of this topic, a student, given a preliminary design presentation, will be able to evaluate a performance-based design concept, ensuring that the proposed concept meets the intent of applicable codes and standards in accordance with jurisdictional policies and procedures.

Enabling Learning Objectives

1. Discuss performance-based concepts
2. Describe the approval process for alternative performance-based fire protection methodologies
3. Describe the development of appropriate input values based on building type and anticipated hazards and use
4. Identify jurisdictional and code requirements
5. Recognize deviations from the prescriptive code
6. Recognize and interpret performance-based proposals
7. Research professional reports and engineer evaluations
8. Determine and present appropriate design input values and parameters based on building type and anticipated hazards and use

Discussion Questions

1. What is the goal of performance-based design?
2. In what circumstances or building types might a plan examiner be more likely to encounter a performance-based design concept?

Activities

1. To be determined by the instructor

Instructor Notes

1. Please bring in examples of performance-based design from your jurisdiction.

CTS Guide Reference: CTS 6-11

Topic 3-2: Evaluating a Proposed Alternative Method for Compliance

Terminal Learning Objective

At the end of this topic, a student, given supporting documentation for a proposed alternate method of compliance, will be able to evaluate a proposed alternative method for compliance with applicable codes and standards, ensuring that the design meets the intent of applicable codes and standards.

Enabling Learning Objectives

1. Describe how a building should perform under adverse conditions, including the objectives and performance requirements reflecting the equivalent level of safety required by the jurisdiction or other performance-based regulation for a process or operation
2. Evaluate alternative proposals to prescriptive codes and standards

Discussion Questions

1. When should performance-based design be considered?
2. What liabilities can accepting alternate means of protection create?

Activities

1. To be determined by the instructor

CTS Guide Reference: CTS 6-6

Unit 4: Wildland Urban Interface Areas

Topic 4-1: Evaluating Development/Community or Wildland Urban Interface Landscape Plans

Terminal Learning Objective

At the end of this topic, a student, given a set of development/community landscape plans and a set of wildland urban interface area landscape plans, will be able to evaluate those plans, ensuring compliance with applicable codes and standards and identifying, documenting, and reporting deficiencies according to jurisdictional policies and procedures, resulting in the issuance of required or applicable permits.

Enabling Learning Objectives

1. Describe basic wildland fire behavior
2. Describe wildland urban interface fire progression
3. Define wildland urban interface zones
 - Moderate fire hazard severity zone
 - High fire hazard severity zone
 - Very high fire hazard severity zone
 - Designated wildland urban interface areas
4. Describe codes and standards related to public areas of a development/community landscape plan
5. Describe codes and standards related to a wildland urban interface area landscape plan
6. Describe the infrastructure considerations for grading and improvement plans
7. Identify and evaluate design and maintenance standards for open space areas adjacent to new development projects
8. Describe how to evaluate a vegetation management plan for buildings in a wildland urban interface area
9. Coordinate with applicable building and planning departments

Discussion Questions

1. At what point in a development or design process should wildland urban interface protection methods be identified?
2. What resources can a plan examiner use when evaluating wildland fuel hazards?

Activities

1. Given landscape drawings for a residence in a very high fire hazard severity zone, have students evaluate the drawings for compliance with applicable codes and standards.

CTS Guide Reference: CTS 3-10

Unit 5: Special Operations

Topic 5-1: Evaluating Plans for Storage, Handling, and Use of Hazardous Materials

Terminal Learning Objective

At the end of this topic, a student, given plans and specifications, will be able to evaluate plans for storage, handling, and use of hazardous materials for compliance, identifying, documenting, and reporting deficiencies in accordance with applicable codes and standards and jurisdictional policies and procedures.

Enabling Learning Objectives

1. Describe properties of hazardous materials
2. Discuss applicable standards for the storage, handling, and use of hazardous materials
3. Identify reference materials related to hazardous materials
4. Verify the classification of hazardous materials using reference materials

Discussion Questions

1. How are the storage requirements for flammable liquids in a mercantile display different from storage requirements in a laboratory?
2. What hazards are associated with the resale of flammable compressed gas in a mercantile occupancy?
3. How would a plan reviewer address the use of hazardous materials or flammable liquid storage cabinets during the plan review process?

Activities

1. Given applicable codes and standards and a list of occupancy types and use(s) with associated hazardous materials management plans (HMMP), have students research and identify the thresholds for maximum allowable quantities of hazardous materials in multiple occupancies.

CTS Guide Reference: CTS 6-4

Topic 5-2: Evaluating Plans for a Process or Operation

Terminal Learning Objective

At the end of this topic, a student, given plans and specifications, will be able to evaluate plans for a process or operation, reviewing the process or operation for compliance with applicable codes and standards and identifying, documenting, and reporting deficiencies in accordance with applicable codes and standards and jurisdictional policies and procedures.

Enabling Learning Objectives

1. Describe the hazards of various operations used in commercial and industrial occupancies
 - Aerosol products
 - Amusement buildings
 - Assemblies

- Aviation facilities
 - Battery systems
 - Carnivals and fairs
 - Christmas tree lots
 - Combustible fiber storage
 - Commercial rubbish handling operation
 - Dry cleaning plants
 - Dust-producing operations
 - Exhibits and trade shows
 - Fireworks, pyrotechnics, special effects
 - Fueled vehicles or equipment in assembly buildings
 - Hazardous materials
 - High-piled combustible storage
 - Live audiences
 - Lumber yards
 - Open burning
 - Ovens, industrial baking, drying
 - Parade floats
 - Production facilities
 - Refrigeration equipment
 - Spraying and dipping operations
 - Tents, temporary membrane structures
 - Tire storage
 - Welding and other hot work operations
 - Wood products
2. Identify applicable standards for arrangement and protection of various processes and operations used in commercial and industrial occupancies
 3. Interpret and apply codes and standards

Discussion Questions

1. How does your jurisdiction handle operational permits?
2. What operations create significant hazards for firefighters and response personnel?

Activities

1. Given a plan, an application to perform a special process or operation, and applicable codes and standards, have students evaluate for compliance with applicable codes and standards.

CTS Guide Reference: CTS 6-3

Topic 5-3: Evaluating a Plan with Special (High-piled Combustible) Storage Arrangements

Terminal Learning Objective

At the end of this topic, a student, given a plan with special (high-piled combustible) storage arrangements, will be able to evaluate a plan with special (high-piled combustible) storage arrangements, identifying, documenting, and reporting deficiencies in accordance with adopted codes and standards and jurisdictional policies.

Enabling Learning Objectives

1. Discuss codes and standards adopted by the jurisdiction for special (high-piled combustible) storage arrangements
2. Determine commodity types and storage arrangements
 - I
 - II
 - III
 - IV
 - High hazard commodities
 - Plastics
 - Group A
 - Group B
 - Group C
 - Mixed Commodities

Discussion Questions

1. How can a plan examiner address firefighter safety regarding high-piled combustible storage?
2. When is storage limited to six feet in height?

Activities

1. Given a plan (that includes high-piled combustible storage), measuring tools, and applicable codes and standards, have students classify commodities and identify additional building requirements to permit storage above 12 feet.

CTS Guide Reference: CTS 6-9

Time Table

Segment	Lecture Time	Activity Time	Total Unit Time
Unit 1: Introduction			
Topic 1-1: Orientation and Administration			
Lecture	0:30		
Activity 1-1: To be determined by instructor		0:00	
Topic 1-2: Plan Examiner Certification Process			
Lecture	0:30		
Activity 1-2: To be determined by instructor		0:00	
Unit 1 Totals	1:00	0:00	1:00
Unit 2: Design and Systems Integration			
Topic 2-1: Evaluating Design Concepts			
Lecture	2:00		
Activity 2-1: Determined by instructor		0:00	
Topic 2-2: Evaluating Systems Integration			
Lecture	1:00		
Activity 2-2: Recommended by SFT		1:00	
Unit 2 Totals	3:00	1:00	4:00
Unit 3: Alternate Compliance			
Topic 3-1: Evaluating Performance-Based Design Concepts			
Lecture	1:00		
Activity 3-1: Determined by instructor		0:00	
Topic 3-2: Evaluating a Proposed Alternative Method for Compliance			
Lecture	1:00		
Activity 3-2: Determined by instructor		0:00	
Unit 3 Totals	2:00	0:00	2:00
Unit 4: Wildland Urban Interface Areas			
Topic 4-1: Evaluating Development/Community or Wildland Urban Interface Landscape Plans			
Lecture	3:00		
Activity 2-5: Recommended by SFT		1:00	
Topic 4 Totals	3:00	1:00	4:00
Unit 5: Special Operations			

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Segment	Lecture Time	Activity Time	Total Unit Time
Topic 5-1: Evaluating Plans for Storage, Handling, and Use of Hazardous Materials			
Lecture	8:00		
Activity 5-1: Recommended by SFT		2:00	
Topic 5-2: Evaluating Plans for a Process or Operation			
Lecture	1:00		
Activity 5-2: Recommended by SFT		1:30	
Topic 5-3: Evaluating a Plan with Special (High-piled Combustible) Storage			
Lecture	2:00		
Activity 5-1: Recommended by SFT		1:00	
Unit 5 Totals	11:00	4:30	15:30
Lecture, Activity, and Unit Totals:	20:00	6:30	26:30

Course Totals

Segment Type	Time
Total Lecture Time (LT)	20:00
Total Activity Time (AT)	6:30
Total Testing Time (TT)	1:30
Total Course Time	28:00