

# **CERTIFICATION CURRICULUM MANUAL**

## **CHAPTER FOUR**

### **FIRE INSPECTOR**

**NFPA 1031, 2009 Edition**

**EFFECTIVE JANUARY 1, 2011**



**Texas Commission on Fire Protection**  
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**BASIC FIRE INSPECTOR**

(All three curricula are to be completed for Basic Fire Inspector certification)

SECTION	SUBJECT	RECOMMENDED HOURS
401-4.1,5.1, & 7.1	General	3
401-4.2,5.2,& 7.2	Administration	18
401-4.3, & 5.3	Field Inspection	138
401-4.4, 5.4, & 7.3	Plans Review	37
	TOTAL RECOMMENDED HOURS *	196

\*The recommended hours includes time for skills evaluation and is based on 12 students. Hours needed depends on the actual number of students.

**BASIC FIRE INSPECTOR**

(All three curricula are to be completed for Basic Fire Inspector certification)

<b>FIRE INSPECTOR I</b>		
401-4.1	General	1
401-4.2	Administration	8
401-4.3	Field Inspection	81
401-4.4	Plans Review	0
<b>FIRE INSPECTOR II</b>		
402-5.1	General	1
402-5.2	Administration	4
402-5.3	Field Inspection	57
402-5.4	Plans Review	8
<b>PLAN EXAMINER I</b>		
470-7.1	General	1
470-7.2	Administration	6
470-7.3	Plans Review	29/33
	<b>TOTAL RECOMMENDED HOURS</b>	<b>196 *</b>

\*The recommended hours includes time for skills evaluation and is based on 12 students. Hours needed depends on the actual number of students.

**CHAPTER FOUR  
FIRE INSPECTOR  
COURSE PHASE OUTLINE**

<b>SECTION</b>	<b>SUBJECT</b>	<b>RECOMMENDED HOURS</b>
<b>FIRE INSPECTOR I &amp; II – PHASE I</b>		
<b>401-4.1</b> <b>402-5.1</b>	General	4
<b>401-4.2.1, 4.2.2, 4.2.4, 4.2.5, 4.2.6</b> <b>402-5.2.1, 5.2.3, 5.2.4</b>	Administration	3
<b>401-4.3.1, 4.3.2, 4.3.3, 4.3.4, 4.3.5,</b> <b>4.3.8, 4.3.14, 4.3.15, 4.3.16</b> <b>402-5.3.1, 5.3.2, 5.3.3, 5.3.4, 5.3.5,</b> <b>5.3.10, 5.3.12</b>	Field Inspection	27
<b>402-5.4.1, 5.4.2, 5.4.3, 5.4.5</b>	Plans Review	10
	Practical Exercises*	34
	<b>Total Recommended Hours</b>	<b>78</b>
<b>FIRE INSPECTOR I &amp; II – PHASE II</b>		
<b>401-4.1</b> <b>402-5.1</b>	General	4
<b>401-4.2.1, 4.2.3, 4.2.4</b> <b>402-5.2.2, 5.2.3, 5.2.5</b>	Administration	6
<b>401-4.3.4, 4.3.6, 4.3.7, 4.3.8, 4.3.9,</b> <b>4.3.10, 4.3.11, 4.3.12, 4.3.13,</b> <b>4.3.14, 4.3.15,</b> <b>402-5.3.3, 5.3.4, 5.3.6, 5.3.7, 5.3.8,</b> <b>5.3.9, 5.3.10, 5.3.11, 5.3.12,</b> <b>402-5.4.3, 5.4.4, 5.4.5, 5.4.6</b>	Field Inspection	27
	Plans Review	3
	Practical Exercises*	34
	Review and Comprehensive Final	4
	<b>Total Recommended Hours</b>	<b>78</b>
<b>PLAN EXAMINER – PHASE III</b>		
<b>470-7.1</b>	General	1
<b>470-7.2</b>	Administration	9
<b>470-7.3</b>	Plans Review	30
	<b>Total Recommended Hours</b>	<b>40</b>
<b>TOTAL HOURS RECOMMENDED</b>		<b>196</b>

\*The recommended hours for skills evaluation is based on 12 students. Actual hours needed will depend on the number of students, the number of examiners, availability of equipment, and the student skill level.

## RECOMMENDED REFERENCE LIST FOR THE BASIC FIRE INSPECTOR CURRICULUM

Certified Training Facilities approved to teach this curriculum must have the following reference materials:

*Emergency Response Guidebook*, (Current edition). U.S. Department of Transportation

*Fire Inspection and Code Enforcement* (7<sup>th</sup> ed.) (2009). Stillwater, OK: Fire Protection Publications. International Fire Service Training Association.

Local Codes and Standards.

*NFPA 1031: Standard for Professional Qualifications for Fire Inspector and Plan Examiner* (2008 ed.). Quincy, MA: National Fire Protection Association. NFPA Publications.

*NFPA 472: Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents* (2008 ed.) Quincy, MA: National Fire Protection Association. NFPA Publications.

*Plans Examiner for Fire and Emergency Services* (1<sup>st</sup> ed.) (2005). Stillwater, OK: Fire Protection Publications. International Fire Service Training Association.

*Standards Manual for Fire Protection Personnel*. Austin, TX: Texas Commission on Fire Protection.

## ***Course Instructor Information***

### ***Basic Fire Inspector***

#### **Overview**

The Fire Inspector curriculum is designed to provide clear guidance that ensures adequate presentation of the information required to meet the Job Performance Requirements (JPRs) of National Fire Protection Association (NFPA) 1031, Standard for Professional Qualifications for Fire Inspector and Plan Examiner, 2009 edition.

The Fire Inspector curriculum is chapter 4 of the Texas Commission on Fire Protection (TCFP) Curriculum Manual.

<b>Certification Level</b>	<b>TCFP Section Number</b>	<b>NFPA 1031 Chapter</b>
Fire Inspector I	401	4
Fire Inspector II	402	5
Plan Examiner I	470	7

#### **Layout**

The NFPA numbering sequence is mirrored to allow easy correlation between this document and the NFPA Standard. For example, 401-4.2.1 identifies the section in Fire Inspector that corresponds to NFPA section 4.2.1.

#### **NFPA Appendix Information**

When a section references information from “Annex A Explanatory Material” in the NFPA Standard, it is identified by adding an “A” to the section number. For example, 401-A.4.2.5 identifies the section in Inspector I that corresponds to NFPA Annex A information for NFPA section 4.2.5.

#### **TCFP Standards Manual**

It is critical that the Course Instructor review the chapters in the TCFP Standards Manual that apply to this curriculum. Of primary importance are the following chapters. Chapter 421, Standards for Certification; Chapter 437, Fees; Chapter 429, Fire Inspector Certification; Chapter 439 (e)(2), Examinations; Chapter 449.5, Certification as Head of a Prevention Only Department. These chapters do not address every issue that could impact this curriculum; therefore, the Course Instructor is encouraged to become familiar with the TCFP Standards Manual.

#### **Supplemental Information**

Instructors are expected to provide supplemental information if the main reference text does not provide adequate information to ensure successful completion of the Job Performance Requirements as listed in the curriculum.

### Components of the Curriculum

Each section of the curriculum identifies the NFPA Job Performance Requirement (JPR) and subdivides the requisite knowledge requirements into learning components. For example:

Curriculum	Explanation
401-4.2.6 Participate in legal proceedings, given the findings of a field inspection or a complaint and consultation with legal counsel, so that all information is presented and the inspector's demeanor is professional.	<b>Section Number and NFPA JPR</b>
<b>Requisite Knowledge:</b> The legal requirements pertaining to evidence rules in the legal system and types of legal proceedings.	<b>Requisite Knowledge Statement</b>
1. The legal requirements pertaining to evidence rules in the legal system	<b>First part of Requisite Knowledge</b>
2. Types of legal proceedings <ul style="list-style-type: none"> <li>a. Appeals               <ul style="list-style-type: none"> <li>i. Appeals boards</li> <li>ii. Appeals hearings</li> </ul> </li> <li>b. Criminal</li> <li>c. Civil</li> </ul>	<b>Second part of Requisite Knowledge</b>
<b>Requisite Skills:</b> The ability to maintain a professional courtroom demeanor, communicate, listen, and differentiate facts from opinions.	<b>Requisite Skills Statement</b>

### Skills

NFPA Requisite Skill requirements are addressed in the corresponding Skill Sheets. The skills are combined depending on whether the skill relates to General, Field Inspection, Administration, or Plans Review.

### Descriptions of Certification Levels

The **Fire Inspector I** conducts basic fire inspections and applies codes and standards.

The **Fire Inspector II** conducts most types of inspections and interprets applicable codes and standards.

The **Plan Examiner I** analyzes building construction, hazardous processes and architectural drawings or plans to ensure compliance with building and fire codes.

**CERTIFICATION CURRICULUM MANUAL – CHAPTER FOUR**

# **INSPECTOR I**



## **SECTION 401**

### **INSPECTOR I**

#### **401-4.1**      **General**

The Fire Inspector I shall meet the job performance requirements defined in Sections 4.2 through 4.4. In addition, the Fire Inspector I shall meet the requirements of Section 4.2 of NFPA 472.

#### **401-4.2**      **Administration**

This duty involves the preparation of correspondence and inspection reports, handling of complaints, and maintenance of records, as well as participation in legal proceedings and maintenance of an open dialogue with the plan examiner and emergency response personnel, according to the following job performance requirements.

- 401-4.2.1**      Prepare inspection reports, given agency policy and procedures, and observations from an assigned field inspection, so that the report is clear and concise and reflects the findings of the inspection in accordance with the applicable codes and standards and the policies of the jurisdiction.

#### **Requisite Knowledge:**

1. Applicable codes and standards adopted by the jurisdiction
  - a. Model codes
  - b. Model code organizations
    - i. International Code Council (ICC)
    - ii. Legacy codes
    - iii. Building Officials and Code Administrators International (BOCA)
    - iv. International Conference of Building Officials (ICBO)
    - v. Southern Building Code Congress International (SBCCI)
    - vi. National Fire Protection Association (NFPA)
  - c. Code adoption
2. Policies of the jurisdiction
  - a. Inspection priorities and frequency
    - i. Permit model
    - ii. Inspection model

**Requisite Skills:** The ability to conduct a field inspection, apply codes and standards, and communicate orally and in writing.

- 401-4.2.2**      Recognize the need for a permit, given a situation or condition, so that requirements for permits are communicated in accordance with the applicable codes and standards and the policies of the jurisdiction.

#### **Requisite Knowledge:**

1. Permit policies of the jurisdiction

2. Rationale for the permit

**Requisite Skills:** The ability to communicate orally and in writing.

- 401-4.2.3** Recognize the need for plan review, given a situation or condition, so that requirements for plan reviews are communicated in accordance with the applicable codes and standards and the policies of the jurisdiction.

**Requisite Knowledge:**

1. Plan review policies of the jurisdiction
2. Rationale for the plan review

**Requisite Skills:** The ability to communicate orally and in writing.

- 401-4.2.4** Investigate common complaints, given a reported situation or condition, so that complaint information is recorded, the AHJ-approved process is initiated, and the complaint is resolved.

**Requisite Knowledge:**

1. Applicable codes and standards adopted by the jurisdiction
2. Policies of the jurisdiction

**Requisite Skills:** The ability to apply codes and standards, communicate orally and in writing, recognize problems, and resolve complaints.

- 401-4.2.5** Identify the applicable code or standard, given a fire protection, fire prevention, or life safety issue, so that the applicable document, edition, and section are referenced.

**Requisite Knowledge:**

1. Applicable codes adopted by the jurisdiction
2. Applicable standards adopted by the jurisdiction

**Requisite Skills:** The ability to apply codes and standards.

- 401-4.2.6** Participate in legal proceedings, given the findings of a field inspection or a complaint and consultation with legal counsel, so that all information is presented and the inspector's demeanor is professional.

**Requisite Knowledge:**

1. The legal requirements pertaining to evidence rules in the legal system
  - a. Texas Rules of Evidence
2. Types of legal proceedings
  - a. Appeals
    - i. Appeals boards

- ii. Appeals hearings
- b. Criminal
- c. Civil

3. Hearing preparation

**Requisite Skills:** The ability to maintain a professional courtroom demeanor, communicate, listen, and differentiate facts from opinions.

**401-4.3**

**Field Inspection**

This duty involves fire safety inspections of new and existing structures and properties for construction, occupancy, fire protection, and exposures, according to the following job performance requirements.

**401-4.3.1**

Identify the occupancy classification of a single-use occupancy, given a description of the occupancy and its use, so that the classification is made according to the applicable codes and standards.

**Requisite Knowledge:**

1. Occupancy classification types
2. Applicable codes, regulations and standards adopted by the jurisdiction
3. Operational features
4. Fire hazards presented by various occupancies

**Requisite Skills:** The ability to make observations and correct decisions.

**401-4.3.2**

Compute the allowable occupant load of a single-use occupancy or portion thereof, given a detailed description of the occupancy, so that the calculated allowable occupant load is established in accordance with applicable codes and standards.

**Requisite Knowledge:**

1. Occupancy classification types
  - a. Function of space
  - b. Net floor area
  - c. Gross floor area
2. Applicable codes, regulations, and standards adopted by the jurisdiction
  - a. International Building Code (IBC)
  - b. National Fire Protection Association (NFPA)
  - c. Other regulatory agencies
3. Operational features
4. Fire hazards presented by various occupancies
5. Occupant load factors - function

**Requisite Skills:** The ability to calculate occupant loads, identify occupancy factors related to various occupancy classifications, use measuring tools, and make field sketches.

**401-4.3.3** Inspect means of egress elements, given observations made during a field inspection of an existing building, so that means of egress elements are maintained in compliance with applicable codes and standards and deficiencies are identified, documented, and reported in accordance with the applicable codes and standards and the policies of the jurisdiction.

**Requisite Knowledge:**

1. Applicable codes and standards adopted by the jurisdiction related to means of egress
2. Maintenance requirements of egress elements
3. Types of construction
4. Occupancy egress requirements
  - a. Examples of means of egress elements include:
    - i. Exit access
    - ii. Exit
    - iii. Exit enclosures
    - iv. Exit discharges
    - v. Exit travel distances
    - vi. Common path of travel
    - vii. Arrangement
    - viii. Exit passageway
    - ix. Delayed egress (Access controlled)
    - x. Accessible means of egress
    - xi. Areas of refuge
    - xii. Capacity
    - xiii. Stairways
    - xiv. Ramps
    - xv. Corridors
    - xvi. Doors
    - xvii. Hardware
    - xviii. Exit markings
    - xix. Illumination
5. The relationship of fixed fire protection systems to egress requirements and to approved means of egress, including, but not limited to, doors, hardware, and lights

**Requisite Skills:** The ability to observe and recognize problems, calculate, make basic decisions related to means of egress, use measuring tools, and make field sketches.

**401-4.3.4** Verify the type of construction for an addition or remodeling project, given field observations or a description of the project and the materials being used, so that the construction type is identified and recorded in accordance with the applicable codes and standards and the policies of the jurisdiction.

**Requisite Knowledge:**

1. Applicable codes and standards adopted by the jurisdiction
2. Types of construction classification
  - a. Height and area dimensions
  - b. Construction type
  - c. Construction materials
3. Rated construction components
4. Accepted building construction methods and materials

**Requisite Skills:** The ability to read plans, make decisions, and apply codes and standards.

**401-4.3.5** Determine the operational readiness of existing fixed fire suppression systems, given test documentation and field observations, so that the systems are in an operational state, maintenance is documented, and deficiencies are identified, documented, and reported in accordance with the applicable codes and standards and the policies of the jurisdiction.

**401-A.4.3.5** Fire Inspectors should be able to confirm the operational status of fixed extinguishing systems by visual inspection of the control panels for automatic suppression systems (e.g., dry chemical systems, Halon, CO<sub>2</sub>, and clean agent systems), automatic fire pumps and booster pumps, and detection systems arranged to operate automatic systems.

Operational status of sprinkler systems, including wet-pipe, dry-pipe, deluge, foam-water, and preaction systems, can be confirmed by visually inspecting aboveground water supply control valves, spring testing underground water supply control valves, inspecting water levels in tanks and reservoirs, and observing sprinkler system drain tests. Periodic inspections and tests should be documented as noted in the applicable NFPA standards.

**Requisite Knowledge:**

1. A basic understanding of the components and operation of fixed fire suppression systems
  - a. Sprinkler systems
  - b. Types of sprinklers
  - c. Standpipes
  - d. Other extinguishing systems
2. Applicable codes and standards

**Requisite Skills:** The ability to observe, make decisions, recognize problems, and read reports.

**401-4.3.6** Determine the operational readiness of existing fire detection and alarm systems, given test documentation and field observations, so that the systems are in an operational state, maintenance is documented, and all deficiencies are identified, documented, and reported in accordance with the policies of the jurisdiction.

**401-A.4.3.6** Fire Inspectors should be able to confirm the operational status of fire detection systems by visual inspection of the control panels for the detection system. Operational testing, maintenance, and sensitivity testing of detectors, where applicable, should be documented in accordance with applicable NFPA standards. To meet this requirement, the fire inspector is required to simply verify that valves are open and secured, control panels are on with no trouble indications, and fire extinguishers or systems are sealed with proper gauge readings. Documentation of maintenance would include inspection tags and records of alarm system and device tests, sprinkler or standpipe main drain tests, and so forth.

**Requisite Knowledge:**

1. A basic understanding of the components and operation of fire detection and alarm systems and devices
2. Applicable codes and standards

**Requisite Skills:** The ability to observe, make decisions, recognize problems, and read reports.

**401-4.3.7** Determine the operational readiness of existing portable fire extinguishers, given field observations and test documentation, so that the equipment is in an operational state, maintenance is documented, and deficiencies are identified, documented, and reported in accordance with the policies of the jurisdiction.

**401-A.4.3.7** Fire Inspectors should be able to confirm the operational status of extinguishers by visually examining the units, checking gauges, checking that they are tagged and hydrostatically tested in accordance with NFPA 10, and checking that they are correctly located and marked. Extinguishers should also be confirmed to be appropriate for the hazard.

**Requisite Knowledge:**

1. A basic understanding of portable fire extinguishers
  - a. Components
  - b. Placement
2. Applicable codes and standards

**Requisite Skills:** The ability to observe, make decisions, recognize problems, and read reports.

**401-4.3.8** Recognize hazardous conditions involving equipment, processes, and operations, given field observations, so that the equipment, processes, or operations are conducted and maintained in accordance with applicable codes and standards and deficiencies are identified, documented, and reported in accordance with the applicable codes and standards and the policies of the jurisdiction.

**Requisite Knowledge:**

1. Practices and techniques of code compliance inspections
2. Fire behavior
3. Fire prevention practices
4. Ignition sources
5. Safe housekeeping practices
6. Classification of hazardous materials
7. Dust hazard processes
8. Kitchen hood and ducts
9. Dip tanks
10. Flammable finishing operations
11. Flammable and combustible liquids storage, dispensing, and use
12. Welding and thermal cutting operations
13. Dipping and coating operations
14. Quenching operations
15. Dry cleaning operations
16. Asphalt and tar kettles
17. Semiconductor/Electronics manufacturing

**Requisite Skills:** The ability to observe, communicate, apply codes and standards, recognize problems, and make decisions.

**401-4.3.9** Compare an approved plan to an existing fire protection system, given approved plans and field observations, so that any modifications to the system are identified, documented, and reported in accordance with the applicable codes and standards and the policies of the jurisdiction.

**Requisite Knowledge:**

1. Fire protection symbols
2. Terminology

**Requisite Skills:** The ability to read and comprehend plans for fire protection systems, observe, communicate, apply codes and standards, recognize problems, and make decisions.

- 401-4.3.10** Verify that emergency planning and preparedness measures are in place and have been practiced, given field observations, copies of emergency plans, and records of exercises, so that plans are prepared and exercises have been performed in accordance with applicable codes and standards and deficiencies are identified, documented, and reported in accordance with the applicable codes and standards and the policies of the jurisdiction.

**Requisite Knowledge:**

1. Requirements relative to emergency evacuation drills that are required within the jurisdiction
  - a. Emergency planning
  - b. Emergency preparation
2. Ways to conduct and/or evaluate fire drills in various occupancies
  - a. Fire drills
  - b. Announcements
  - c. Evacuation plans
  - d. Fire department access
  - e. Response personnel
  - f. Standby personnel
3. Human behavior during fires and other emergencies

**Requisite Skills:** The ability to identify the emergency evacuation requirements contained in the applicable codes and standards and interpret plans and reports.

- 401-4.3.11** Inspect emergency access for an existing site, given field observations, so that the required access for emergency responders is maintained and deficiencies are identified, documented, and corrected in accordance with the applicable codes, standards, and policies of the jurisdiction.

- A.4.3.11** Emergency access includes emergency vehicle access roadways, pathway access from roadways to the building, key box facilities, gate access, and door access into structures. The Fire Inspector I is expected to be able to find and correct deficiencies and obstructions to fire and emergency personnel access into buildings, such as blocked roadways, missing or outdated keys in key boxes, locked gates, and inaccessible doors. Actual response operations, safe zones, and vehicle size, width, and turning capabilities should be evaluated for a given site. For sites with topographical limitations, such as a riverfront or mountainside setting, alternate methods to provide access should be evaluated based upon the



requirements of the responding personnel to approach and address incidents within the site.

**Requisite Knowledge:**

1. Applicable codes and standards
2. Policies of the jurisdiction
3. Emergency access and accessibility requirements

**Requisite Skills:** The ability to identify the emergency access requirements contained in the applicable codes and standards, observe, make decisions, and use measuring tools.

**401-4.3.12** Verify code compliance for incidental storage, handling, and use of flammable and combustible liquids and gases, given field observations and inspection guidelines from the AHJ, so that applicable codes and standards are addressed and deficiencies are identified, documented, in accordance with the applicable codes and standards and the policies of the jurisdiction.

**401-A.4.3.12** It is anticipated that the Fire Inspector I will find nominal amounts of flammable and combustible liquids or gases in occupancies usually considered to be "low-hazard." These nominal amounts, referred to as incidental or exempt amounts, depending on the code adopted by the jurisdiction, are needed for normal maintenance or daily operations could include cleaning fluids, lubricating oils, or propane for a forklift. Once incidental or exempt amounts are exceeded, additional building and fire requirements are triggered. At that point, the inspection should be referred to the Fire Inspector II.

**Requisite Knowledge:**

1. Classification
2. Properties
3. Labeling
4. Storage
5. Handling
6. Use of incidental amounts of flammable and combustible liquids and gases
7. Applicable codes and standards (Incidental or exempt amounts allowed)

**Requisite Skills:** The ability to observe, communicate, apply codes and standards, recognize problems, and make decisions.

**401-4.3.13** Verify code compliance for incidental storage, handling, and use of hazardous materials, given field observations, so that applicable codes and standards for each hazardous material encountered are addressed and all deficiencies are

identified, documented, and reported in accordance with the applicable codes and standards and the policies of the jurisdiction.

**401-A.4.3.13** Moderate amounts of hazardous materials will be found in many occupancies that are not classified as “Hazardous” or “Group H” occupancies. These materials could be on display in a wholesale/retail setting or used for maintenance purposes or operation of equipment. They could include swimming pool or water purification chemicals, refrigeration equipment, or a single chemical process such as a dip tank. These moderate amounts of hazardous materials are referred to as incidental or exempt amounts, depending on the code adopted by the jurisdiction. Once incidental or exempt amounts are exceeded — whether in storage, use, or wholesale/retail sales settings — additional building and fire requirements are triggered. At that point, the inspection should be referred to the Fire Inspector II.

**Requisite Knowledge:**

1. Classification
2. Properties
3. Labeling
4. Transportation
5. Storage
6. Handling
7. Use of hazardous materials
8. Applicable codes and standards (Incidental or exempt amounts allowed)
9. Hazardous Materials Awareness Level Personnel ((NFPA 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents* section 4.2 – Analyzing the Incident)
  - a. The Fire Inspector candidate shall identify and be able to describe the purpose, goals, and definitions of the NFPA standards applicable to Hazardous Materials/WMD.
  - b. The Fire Inspector candidate shall demonstrate knowledge of safety principles applicable to hazardous materials /WMD response.
  - c. The Fire Inspector candidate shall identify how hazardous materials incidents are different from other emergencies.
  - d. The Fire Inspector candidate shall identify principles pertaining to the recognition of hazardous materials/WMD.
  - e. The Fire Inspector candidate shall identify the definition of hazardous materials/WMD.
  - f. The Fire Inspector candidate shall identify the following nine UN/DOT hazardous classes or divisions and give examples of common materials in each hazard class or division, and the primary hazards associated with each hazard class or division.

- i. Class 1 – Explosives
  - ii. Class 2 – Gases
  - iii. Class 3 – Flammable liquids
  - iv. Class 4 – Flammable solids
  - v. Class 5 – Oxidizers
  - vi. Class 6 – Non-gaseous poisonous materials
  - vii. Class 7 – Radioactive material
  - viii. Class 8 – Corrosive
  - ix. Class 9 – Miscellaneous
- g. The Fire Inspector candidate shall identify typical occupancies and locations in the community or facility where hazardous materials /WMD are manufactured, transported, stored, used or disposed of.
- h. The Fire Inspector candidate, given various examples of typical container shapes, shall identify:
- i. Those which may contain a hazardous material /WMD
  - ii. Those which would contain liquids, gases, or solids
  - iii. Markings on fixed facility containers that would indicate:
    - a) Size of container
    - b) Product contained
    - c) Site identification numbers
- i. The Fire Inspector candidate shall identify facility and transportation markings and colors that indicate hazardous materials/WMD, including the following:
- i. Transportation markings, including UN/NA identification number marks, marine pollutant mark, elevated temperature (HOT) mark, commodity markings, and inhalation hazard mark
  - ii. NFPA 704, Standard System for the Identification of the Hazards of Materials for Emergency Response, markings
  - iii. Military hazardous materials/WMD markings
  - iv. Special hazard communication markings for each hazard class
  - v. Pipeline markings
  - vi. Container markings
- j. The Fire Inspector candidate, given an example of an NFPA 704 marking, shall identify the significance of the following components.
- i. Five degrees of hazard - (4-0)
  - ii. Three categories of hazard
    - a) Health - Blue color
    - b) Flammability - Red color
    - c) Reactivity - Yellow color
    - d) Special information – White color
  - iii. Special hazards that may be indicated
    - a) ACID - Acid
    - b) ALK - Alkali
    - c) COR- Corrosive
    - d) OX – Oxidizer
    - e) W – Reacts with water
- k. The Fire Inspector candidate shall identify and describe U.S. and Canadian placards and labels that would indicate hazardous materials/WMD.

- I. The Fire Inspector candidate shall identify the following information from material safety data sheets (MSDS) and shipping papers that indicates hazardous materials/WMD.
  - i. The Fire Inspector candidate shall identify where to find MSDS
    - a) Manufacturer
    - b) CHEMTREC
    - c) Shipper
    - d) Fixed facility
  - ii. Entries on an MSDS that indicate the presence of hazardous materials/WMD containers by their shape
  - iii. The Fire Inspector candidate shall identify the following in regards to shipping papers:
    - a) Information that would indicate the presence of hazardous materials/WMD
    - b) Name of the shipping papers in regards to the mode of transportation
      - i) Air - Air Bill
      - ii) Highway - Bill of Lading or Freight Bill
      - iii) Water - Dangerous Cargo Manifest
      - iv) Rail - Waybill and/or Consist
    - c) Where the shipping papers are found in each mode of transportation
    - d) The person responsible for having the shipping papers in each mode of transportation
    - e) Where the shipping papers may be found in an emergency in each mode of transportation
  - m. The Fire Inspector candidate shall identify examples of clues (other than occupancy/location, container shape, markings/color, placards/labels, MSDS, and shipping papers) that use the senses of sight, sound, and odor to indicate hazardous materials/WMD.
    - i. Odors
    - ii. Gas leak
    - iii. Fire
    - iv. Vapor cloud
    - v. Visible corrosive actions
    - vi. Visible chemical reactions
    - vii. Pooled liquids
    - viii. Sound of a pressure release
    - ix. Condensation line on pressure tank
    - x. Injured persons or casualties
  - n. The Fire Inspector candidate shall describe the limitations of using the senses in determining the presence or absence of hazardous materials/WMD.
  - o. The Fire Inspector candidate shall identify at least four types of locations that could become targets for criminal or terrorist activity using hazardous materials/WMD.
    - i. Public assembly
    - ii. Public building
    - iii. Mass transit system
    - iv. Places with high economic impact

- v. Telecommunications facilities
- vi. Places with historical or symbolic significance
- vii. Military installations
- viii. Airports
- ix. Industrial facilities
- p. The Fire Inspector candidate shall describe the difference between a chemical and a biological incident.
- q. The Fire Inspector candidate shall identify at least four indicators of possible criminal or terrorist activity involving chemical agents.
- r. The Fire Inspector candidate shall identify at least four indicators of possible criminal or terrorist activity involving biological agent
- s. The Fire Inspector candidate shall identify at least four indicators of possible criminal or terrorist activity involving radiological agents.
- t. The Fire Inspector candidate shall identify at least four indicators of possible criminal or terrorist activity involving illicit laboratories (clandestine laboratories, weapons lab, and ricin lab).
- u. The Fire Inspector candidate shall identify at least four indicators of possible criminal or terrorist activity involving explosives.
- v. The Fire Inspector candidate shall identify at least four indicators of secondary devices.
- w. The Fire Inspector candidate shall identify the hazardous materials/WMD in each situation by name, UN/NA identification number, or type placard applied, and meet the following requirements, given examples of facility and transportation situations involving hazardous materials/WMD:
  - i. Identify difficulties in determining specific names of hazardous materials/WMD in both facilities and transportation.
  - ii. Identify sources for obtaining the names of, UN/NA identification numbers for, or types of placard associated with hazardous materials/WMD in transportation.
  - iii. Identify sources for obtaining the names of hazardous materials/WMD in a facility.
- x. The Fire Inspector candidate, utilizing the most current edition of the DOT Emergency Response Guidebook, shall:
  - i. Identify the three methods for determining the appropriate guide page for a specific hazardous material/WMD.
    - a) Locate UN number in the yellow-bordered pages.
    - b) Locate name of material in the alphabetic listing in the blue-bordered pages.
    - c) Locate a matching placard in the table of placards and consult the two-digit guide number located next to the similar placard.
  - ii. Identify at least two general types of hazards found on each guide page.
    - a) Fire
    - b) Explosion
    - c) Health

**Requisite Skills:** The ability to observe, communicate, apply codes and standards, recognize problems, and make decisions.

**401-4.3.14** Recognize a hazardous fire growth potential in a building or space, given field observations, so that the hazardous conditions are identified, documented, and reported in accordance with the applicable codes and standards and the policies of the jurisdiction.

**Requisite Knowledge:**

1. Basic fire behavior
2. Flame spread ratings of contents
3. Smoke development ratings of contents
4. Interior finishes
5. Building construction elements
6. Decorations
7. Decorative materials
8. Furnishings
9. Safe housekeeping practices

**Requisite Skills:** The ability to observe, communicate, apply codes and standards, recognize hazardous conditions, and make decisions.

**401-4.3.15** Determine code compliance, given the codes, standards, and policies of the jurisdiction and a fire protection issue, so that the applicable codes, standards, and policies are identified and compliance is determined.

**401-A.4.3.15** The Fire Inspector should be able to identify the correct code, standard, or policy, including edition, and correctly interpret and apply the adopted codes, standards, and referenced documents.

**Requisite Knowledge:**

1. Basic fire behavior
2. Flame spread ratings of contents
3. Smoke development ratings of contents
4. Interior finishes
5. Building construction elements
6. Life safety systems

7. Decorations
8. Decorative materials
9. Furnishings
10. Safe housekeeping practices

**Requisite Skills:** The ability to observe, communicate, apply codes and standards, recognize hazardous conditions, and make decisions.

**401-4.3.16** Verify fire flows for a site, given fire flow test results and water supply data, so that required fire flows are in accordance with applicable codes and standards and deficiencies are identified, documented, and reported in accordance with the applicable codes and standards and the policies of the jurisdiction.

**Requisite Knowledge:**

1. Types of water distribution systems
2. Other water sources in the local community
3. Water distribution system testing
4. Characteristics of public water supply systems
5. Characteristics of private water supply systems
6. Flow testing procedures

**Requisite Skills:** The ability to use Pitot tubes, gauges, and other data gathering devices as well as calculate and graph fire flow results.

**401-4.4**

**Plans Review**

There are no plan review job performance requirements for Fire Inspector I.

**CERTIFICATION CURRICULUM MANUAL – CHAPTER FOUR**

# **INSPECTOR II**



## **SECTION 402**

### **INSPECTOR II**

#### **402-5.1**

#### **General**

The Fire Inspector II shall meet the job performance requirements defined in Chapter 4 and Sections 5.2 through 5.4.

#### **402-5.2**

#### **Administration**

This duty involves conducting research, interpreting codes, implementing policy, testifying at legal proceedings, and creating forms and job aids, according to the following job performance requirements.

##### **402-5.2.1**

Process a permit application, given a specific request, so that the application is evaluated and a permit is issued or denied in accordance with the applicable codes, standards, policies, and procedures of the jurisdiction.

#### **Requisite Knowledge:**

1. Permit application process
2. Applicable codes, standards, policies, and procedures of the jurisdiction

**Requisite Skills:** The application of the requisite knowledge.

##### **402-5.2.2**

Process a plan review application, given a specific request, so that the application is evaluated and processed in accordance with the applicable codes and standards and the policies of the jurisdiction.

#### **Requisite Knowledge:**

1. Plan review application process
2. Code requirements of the jurisdiction
3. Policies and procedures of the jurisdiction

**Requisite Skills:** The ability to communicate orally and in writing on matters related to code requirements, policies, and procedures of the jurisdiction.

##### **402-5.2.3**

Investigate complex complaints, given a reported situation or condition, so that complaint information is recorded, the investigation process is initiated, and the complaint is resolved in accordance with the applicable codes and standards and the policies of the jurisdiction.

##### **402-A.5.2.3**

The objective of a complaint investigation is the recognition and correction or removal of a fire or life safety hazard. At this professional level, the resolution of the complaint will depend heavily on the technical evaluation of the complaint and the selection of possible corrective actions. More than one solution might be available.

#### **Requisite Knowledge:**

1. Applicable codes and standards adopted by the jurisdiction
2. Policies of the jurisdiction

**Requisite Skills:** The ability to interpret codes and standards, recognize problems, and refer complaints to other agencies when required.

**402-5.2.4** Recommend modifications to the adopted codes and standards of the jurisdiction, given a fire safety issue, so that the proposed modifications address the problem, need, or deficiency.

**402-A.5.2.4** Local or regional modifications to codes and standards developed through the consensus process can be made to address specific local environmental and societal factors with adequate input from affected parties and oversight by the jurisdiction's governing body. Such modifications should be based on substantiated information, compiled and presented to justify the impacts of the regulation or modification proposed. Data professionally presented can support a request for a governing body to modify a code or a standard far more effectively than supposition or fear.

**Requisite Knowledge:**

1. State statutes or local ordinances establishing or empowering the agency to adopt, enforce, and revise codes and standards
2. The legal instruments establishing or adopting codes and standards
3. The development and adoption process for fire and life safety legislation or regulations

**Requisite Skills:** The ability to recognize problems, collect and develop potential solutions, and identify cost/risk benefits.

**402-5.2.5** Recommend policies and procedures for the delivery of inspection services, given management objectives, so that inspections are conducted in accordance with the policies of the jurisdiction and due process of the law is followed.

**402-A.5.2.5** Mandated inspection frequencies, follow-up visits, and timely response to complaints require good time-management skills of the Fire Inspector and a coordinated management program. Improvements in the delivery of inspection services can often be originated at the inspector level.

**Requisite Knowledge:**

1. Policies and procedures of the jurisdiction related to code enforcement
2. Sources of detailed and technical information relating to fire protection and life safety
  - a. Fire loss data
    - i. Local (e.g., fire department reporting system)
    - ii. State (e.g. Texas Fire Incident Reporting System – TEXFIRS)

- iii. Federal (e.g., National Fire Incident Reporting System – NFIRS, National Institute of Occupational Safety and Health – NIOSH, US Fire Administration, National Fire Academy)
- iv. NFPA
- b. Loss prevention bulletins (e.g. Factory Mutual Global, Consumer Product Safety Commission, Underwriter’s Laboratory)

**Requisite Skills:** The ability to identify approved construction methods and materials related to fire safety, read and interpret construction plans and specifications, educate, conduct research, make decisions, recognize problems, and resolve conflicts.

**402-5.3**      **Field Inspection**

This duty involves code enforcement inspections and analyses of new and existing structures and properties for construction, occupancy, fire protection, and exposures, according to the following job performance requirements.

- 402-5.3.1**      Compute the maximum allowable occupant load of a multi-use building, given field observations or a description of its uses, so that the maximum allowable occupant load calculation is in accordance with applicable codes and standards.

**Requisite Knowledge:**

- 1. How to calculate occupant loads for an occupancy
- 2. How to calculate occupant loads for building use
- 3. Code requirements presented by various occupancies
  - a. International Building Code (IBC)
  - b. National Fire Protection Association (NFPA)
- 4. Regulations presented by various occupancies
  - a. Local regulatory agencies
  - b. Other regulatory agencies
- 5. Operational features presented by various occupancies
- 6. Fire hazards presented by various occupancies

**Requisite Skills:** The ability to calculate occupant loads, identify occupancy factors related to various occupancy classifications, use measuring tools, read plans, and use a calculator.

- 402-5.3.2**      Identify the occupancy classifications of a mixed-use building, given a description of the uses, so that each area is classified in accordance with applicable codes and standards.

- 402-A.5.3.2**      Judgment should be exercised in the classification of occupancies within a mixed-use building. Small uses that are accessory to a major occupancy should be evaluated within the framework of the adopted codes and standards,

recognizing that not all spaces require separation while some spaces will always require separation.

**Requisite Knowledge:**

1. Occupancy classification presented by various occupancies
  - a. Building code use
  - b. Use groups
  - c. Incidental use area
  - d. Accessory use area
2. Applicable codes, and standards presented by various occupancies
  - a. IBC
  - b. NFPA
3. Operational features presented by various occupancies
4. Fire hazards presented by various occupancies

**Requisite Skills:** The ability to interpret code requirements and recognize building uses that fall into each occupancy classification.

**402-5.3.3** Evaluate a building's area, height, occupancy classification, and construction type, given an approved set of plans, and construction features, so that it is verified that the building is in accordance with applicable codes and standards.

402-A.5.3.3 The Fire Inspector II should be able to assess proper construction type based on new construction or changes to a building that have occurred since the original occupancy of the building. Examples of such changes may include renovations or additions, changes in storage commodity, changes in occupancy classification, and similar changes that might occur throughout the life of a building.

**Requisite Knowledge:**

1. Building construction with emphasis on fire-rated construction
2. Evaluation of methods of construction
3. Assemblies for fire rating
4. ~~3.~~ Analysis of test results
5. ~~4.~~ Manufacturer's specifications

**Requisite Skills:** The ability to identify characteristics of each type of building construction and occupancy classification.

**402-5.3.4** Evaluate fire protection systems and equipment provided for life safety and property protection, given field observations of the facility and documentation, the hazards protected, and the system specifications, so that the fire protection systems provided are approved for the occupancy or hazard being protected. Evaluate installation for compliance with applicable codes and standards so that

deficiencies are identified, documented, and reported in accordance with the policies of the jurisdiction.

- 402-A.5.3.4** Includes buildings under construction or demolition. Building documentation includes performance-based design documents to ensure input features remain applicable to the building as it is currently configured. The design documentation should include an Operations and Maintenance Manual, which acts as a user guide to the performance-based design. The Operations and Maintenance Manual includes the assumptions and estimates made during the design regarding concepts such as selected fire scenarios and fuel loads, building use, occupant characteristics, and system reliability. The inspector should be able to compare these original assumptions and estimates to those that would be used to evaluate the building as it is currently configured.

**Requisite Knowledge:**

1. Applicable codes and standards for fire protection systems
2. Basic physical science as it relates to fire behavior and fire suppression
3. Implications and hazards associated with system operation
4. Installation techniques
5. Acceptance inspection
6. Testing
7. Reports of maintenance of completed installations
8. Use and function of various systems

**Requisite Skills:** The ability to recognize problems, use codes and standards, and read reports, plans, and specifications.

- 402-5.3.5** Analyze the egress elements of a building or portion of a building, given observations made during a field inspection, so that means of egress elements are provided and located in accordance with applicable codes and standards and all deficiencies are identified, documented, and reported in accordance with the policies of the jurisdiction.

**Requisite Knowledge:** Acceptable means of egress devices.

**Requisite Skills:** The ability to calculate egress requirements, read plans, and make decisions related to the adequacy of egress.

- 402-5.3.6** Evaluate hazardous conditions involving equipment, processes, and operations, given field observations and documentation, so that the equipment, processes, or operations are installed in accordance with applicable codes and standards and

all deficiencies are identified, documented, and reported in accordance with the policies of the jurisdiction.

- 402-A.5.3.6 The Fire Inspector II is expected to have knowledge of processes and operations that include milling operations and the manufacture, storage, and use of hazardous chemicals and explosives.

**Requisite Knowledge:**

1. Applicable codes and standards
2. Accepted fire protection practices
3. Fire behavior
4. Ignition sources
5. Safe housekeeping practices
6. Additional reference materials related to protection of hazardous processes and code enforcement.

**Requisite Skills:** The ability to observe, communicate, interpret codes, recognize problems, and make decisions.

- 402-5.3.7** Evaluate emergency planning and preparedness procedures, given existing or proposed plans and procedures and applicable codes and standards, so that compliance is determined.

- 402-A.5.3.7 Emergency planning might include components for building evacuation, sheltering of occupants in place, and securing occupants from outside threats.

**Requisite Knowledge:**

1. Occupancy requirements for emergency evacuation plans
2. Fire safety programs for crowd control
3. Roles of agencies and individuals in implementation and development of emergency plans
4. Information sources for emergency evacuation plans
  - a. Other occupancies with approved plans
  - b. Other jurisdictions
  - c. Emergency response agencies (e.g. Red Cross)

**Requisite Skills:** The ability to compare submitted plans and procedures with applicable codes and standards adopted by the jurisdiction.

- 402-5.3.8** Verify code compliance for storage, handling, and use of flammable and combustible liquids and gases, given field observations and inspection guidelines from the authority having jurisdiction, so that deficiencies are identified,

documented, and reported in accordance with the applicable codes and standards and the policies of the jurisdiction.

**Requisite Knowledge:**

1. Flammable and combustible liquids properties and hazards
2. Material safety data sheet
3. Safe handling practices
4. Applicable codes and standards
  - a. Quantity
  - b. Limits
5. Fire protection systems and equipment approved for the material
6. Fire behavior
7. Safety procedures
8. Storage compatibility

**Requisite Skills:** The ability to identify typical fire hazards associated with processes or operations utilizing flammable and combustible liquids and to observe, communicate, interpret codes, recognize problems, and make decisions.

- 402-5.3.9** Evaluate code compliance for the storage, handling, and use of hazardous materials, given field observations, so that deficiencies are identified, documented, and reported in accordance with the applicable codes and standards and the policies of the jurisdiction.

**Requisite Knowledge:**

1. Hazardous materials properties and hazards
2. Material safety data sheet
3. Safe handling practices
4. Applicable codes and standards
  - a. Quantity
  - b. Limits
5. Fire protection systems
6. Equipment approved for the material
7. Fire behavior
8. Safety procedures

9. Chemical reactions

10. Storage compatibility

**Requisite Skills:** The ability to identify fire hazards associated with processes or operations utilizing hazardous materials and to observe, communicate, interpret codes, recognize problems, and make decisions.

**402-5.3.10** Determine fire growth potential in a building or space, given field observations or plans, so that the contents, interior finish, and construction elements are evaluated for compliance and deficiencies are identified, documented, and corrected in accordance with the applicable codes and standards and the policies of the jurisdiction.

**402-A.5.3.10** Fire growth is dependent on several factors, including heat content of the materials involved, exposed surface area, material height and array, continuity of combustible materials within a space, ceiling height, and ventilation or openness of the space. Availability of an ignition source is usually not considered since fire growth is evaluated on the assumption that a fire has already begun and is not predicated on whether a fire will or will not start.

**Requisite Knowledge:**

1. Basic fire behavior
2. Flame spread ratings of contents
3. Smoke development ratings of contents
4. Interior finishes
5. Building construction elements
6. Decorations
7. Decorative materials
8. Furnishings
9. Safe housekeeping practices

**Requisite Skills:** The ability to observe, communicate, interpret codes and standards, recognize hazardous conditions, and make decisions.

**402-5.3.11** Verify compliance with construction documents, given a performance-based design, so that life safety systems and building services equipment are installed, inspected, and tested to perform as described in the engineering documents and



the operations and maintenance manual that accompanies the design, so that deficiencies are identified, documented, and reported in accordance with the applicable codes and standards and the policies of the jurisdiction.

- 402-A.5.3.11 Performance-based design involves the evaluation of risk through a systematic process. See Rose, Flamberg, and Leverenz, *Guidance Document for Incorporating Risk Concepts into NFPA Codes and Standards*, for further information.

**Requisite Knowledge:**

1. Applicable codes and standards for installation and testing of fire protection systems
  - a. Fire sprinklers (e.g. NFPA 13)
  - b. Standpipe systems (e.g. NFPA 14)
  - c. Fire alarm systems (e.g. NFPA 72)
  - d. Fire pumps (e.g. NFPA 20)
  - e. Means of egress (e.g. International Building Code or NFPA 101)
  - f. Smoke control (e.g. International Building Code or NFPA 92A)
  - g. Emergency and/or standby power requirements (e.g. International Building Code and applicable electrical code(s))
  - h. Heating Ventilation Air Conditioning (HVAC) (e.g. International Mechanical Code, NFPA 90A)
  - i. Elevator and moving pedestrian equipment (e.g. International Building Code)
2. Means of egress
3. Building services equipment

**Requisite Skills:** The ability to witness and document tests of fire protection systems and building services equipment.

- 402-5.3.12 Verify code compliance of heating, ventilation, air conditioning, and other building service equipment and operations, given field observations, so that the systems and other equipment are maintained in accordance with applicable codes and standards and deficiencies are identified, documented, and reported in accordance with the policies of the jurisdiction.

- 402-A.5.3.12 The Fire Inspector II should coordinate that have other agencies within the jurisdiction with expertise in the area of mechanical equipment to provide a uniform approach to achieve a fire-safe environment.

**Requisite Knowledge:**

1. Types of building service equipment
2. Installation of building service equipment
3. Maintenance of building service equipment
4. Use of building service equipment

5. Operation of smoke and heat vents
6. Installation of kitchen cooking equipment (including hoods and ducts)
7. Installation of laundry chutes
8. Installation of elevators
9. Installation of escalators
10. Applicable codes and standards adopted by the jurisdiction

**Requisite Skills:** The ability to observe, recognize problems, interpret codes and standards, and write reports.

**402-5.4**

**Plans Review**

This duty involves field verification of shop drawings, plans, and construction documents to ensure that they meet the intent of applicable codes and standards for fire and life safety, according to the following job performance requirements.

**402-5.4.1**

Classify the occupancy, given a set of plans, specifications, and a description of a building, so that the classification is made in accordance with the applicable codes and standards and the policies of the jurisdiction.

**Requisite Knowledge:**

1. Occupancy classification of various occupancies
2. Applicable codes and standards of various occupancies
3. Regulations for various occupancies (e.g. applicable state licensing rules, Texas Health and Safety Code)
4. Operational features presented by various occupancies
5. Fire hazards presented by various occupancies
  - a. Assembly (e.g. decorations)
  - b. Business (e.g. combustible waste)
  - c. Education (e.g. ignition sources)
  - d. Factory/Industrial (e.g. fabrication)
  - e. High-hazard (e.g. hazardous materials)
  - f. Institutional (e.g., egress)
  - g. Mercantile (e.g., fire load)
  - h. Residential (e.g., occupant activities)
  - i. Storage (e.g., storage arrangement)
  - j. Utility/miscellaneous (e.g. combustible waste)

**Requisite Skills:** The ability to read plans.

**402-5.4.2** Compute the maximum allowable occupant load, given a floor plan of a building or portion of the building, so that the calculated occupant load is in accordance with the applicable codes and standards and the policies of the jurisdiction.

**Requisite Knowledge:**

1. How to calculate occupant loads for an occupancy and building use
2. Code requirements
3. Regulations
4. Operational features such as fixed seating
5. Fire hazards presented by various occupancies
  - a. Assembly (e.g. decorations)
  - b. Business (e.g. combustible waste)
  - c. Education (e.g. ignition sources)
  - d. Factory/Industrial (e.g. fabrication)
  - e. High-hazard (e.g. hazardous materials)
  - f. Institutional (e.g., egress)
  - g. Mercantile (e.g., fire load)
  - h. Residential (e.g., occupant activities)
  - i. Storage (e.g., storage arrangement)
  - j. Utility/miscellaneous (e.g. combustible waste)
6. Mixed-use occupancies
  - a. Incidental use areas
  - b. Accessory use areas
7. Design Occupant Load
  - a. Actual occupant load
  - b. Occupant load factors
  - c. Occupant load combinations
  - d. Increased occupant load
8. Posting of occupant load
9. Outdoor area occupant loads

**Requisite Skills:** The ability to calculate accurate occupant loads, identify occupancy factors related to various occupancy classifications, use measuring tools, read plans, and use a calculator.

**402-5.4.3** Review the proposed installation of fire protection systems, given shop drawings and system specifications for a process or operation, so that the system is reviewed for code compliance and installed in accordance with the approved drawings, and deficiencies are identified, documented, and reported in accordance with the applicable codes and standards and the policies of the jurisdiction.

**Requisite Knowledge:**

1. Proper selection, distribution, location, and testing of portable fire extinguishers (e.g. NFPA 10, International Fire Code)
2. methods used to evaluate the operational readiness of water supply systems used for fire protection (e.g. NFPA 24, 25, 13, 14)
3. Evaluation and testing of automatic sprinkler, water spray, and standpipe systems and fire pumps (e.g. NFPA 13, 14, 17, 20)
4. Evaluation and testing of fixed fire suppression systems (e.g. NFPA 15, 16, 17A, 18, 19)
5. Evaluation and testing of automatic fire detection and alarm systems and devices (e.g. NFPA 72, International Fire Code)

**Requisite Skills:** The ability to read basic floor plans or shop drawings and identify symbols used by the jurisdiction.

- 402-5.4.4 Review the installation of fire protection systems, given an installed system, shop drawings, and system specifications for a process or operation, so that the system is reviewed for code compliance and installed in accordance with the approved drawings, and deficiencies are identified, documented, and reported in accordance with the applicable codes and standards and the policies of the jurisdiction.

**Requisite Knowledge:**

1. Proper selection, distribution, location and testing of portable fire extinguishers
2. Methods used to evaluate the operational readiness of water supply systems used for fire protection
3. Evaluation and testing of automatic sprinkler, water spray, and standpipe systems and fire pumps
4. Evaluation and testing of fixed fire suppression systems
5. Evaluation and testing of automatic fire detection and alarm systems and devices

**Requisite Skills:** The ability to read basic floor plans or shop drawings.

- 402-5.4.5 Verify that means of egress elements are provided, given a floor plan of a building or portion of a building, so that all elements are identified and checked against applicable codes and standards and deficiencies are discovered and communicated in accordance with the policies of the jurisdiction.

**Requisite Knowledge:**

1. Applicable codes and standards adopted by the jurisdiction
2. Identification of standard symbols used in plans
3. Field verification practices

**Requisite Skills:** The ability to read plans and research codes and standards.

**402-5.4.6**

Verify the construction type of a building or portion thereof, given a set of approved plans and specifications, so that the construction type complies with the approved plans and applicable codes and standards.

**Requisite Knowledge:**

1. Building construction with emphasis on fire-rated construction
2. Evaluation of methods of construction and assemblies for fire rating
3. Analysis of test results
4. Manufacturer's specifications

**Requisite Skills:** The ability to identify characteristics of each type of building construction.

**CERTIFICATION CURRICULUM MANUAL – CHAPTER FOUR**

# **PLANS EXAMINER I**

## SECTION 470

### PLAN EXAMINER I

#### **470-7.1**

##### **General**

The Plan Examiner I shall meet the job performance requirements defined in Sections 7.2 and 7.3.

#### **470-7.2**

##### **Administration**

This duty involves the review of plans, preparation of correspondence and plan review reports, communication with fire inspectors and emergency response personnel, handling of complaints, maintenance of records, participation in legal proceedings, identification of when additional expertise is required, and familiarity with procedures used by the jurisdiction to evaluate alternative methods, according to the following job performance requirements.

#### **470-7.2.1**

Prepare reports, given observations from a plan review, so that the report is clear and concise, and reflects the findings of the plan review in accordance with applicable codes and standards and the policies and procedures of the jurisdiction.

##### **Requisite Knowledge:**

1. Codes and standards
  - a. Reasons for construction permits
  - b. Ordinances
  - c. Code amendments
  - d. Code models
  - e. Code types
  - f. Code references
  - g. Plans review checklists
2. Legal requirements for plan review reports
  - a. Administrative
  - b. Judicial
3. Accepted practices, policies, and procedures of the jurisdiction
  - a. Plan review
  - b. Building and life safety components
  - c. Design, permitting and construction processes
  - d. Plans review organizations
  - e. Plans

**Requisite Skills:** The ability to conduct code-related research and write reports.

#### **470-7.2.2**

Facilitate the resolution of deficiencies identified during the plan review, given a submittal and the established policies and procedures of the jurisdiction, so that deficiencies are identified, documented, and reported to the plan submitter with applicable references to codes and standards and alternative methods for compliance are identified.

- 470-A.7.2.2** The plan review process should not select or direct the design of fire protection features; it is intended to evaluate the compliance of a proposed fire protection feature for a given hazard.

**Requisite Knowledge:**

1. Policies and procedures of the jurisdiction regarding the communication of discrepancies
2. The appeals process
  - a. Plans review process
  - b. Plan submittal and processing
  - c. Legal proceedings
3. Codes and standards
  - a. Code references
4. Alternate design
  - a. Materials
  - b. Methods
  - c. Equivalencies
  - d. Board of appeals
  - e. Performance-based codes
  - f. Performance-based design process

**Requisite Skills:** The ability to communicate orally and in writing.

- 470-7.2.3** Process plan review documents, given a set of plans and specifications, so that required permits are issued in accordance with the policies of the jurisdiction.

**Requisite Knowledge:**

1. Plan review policies and procedures of the jurisdiction
  - a. Design analysis
  - b. Abbreviations and symbols
  - c. Measurements
  - d. Plan set organization
2. Site, plot, utility and landscape plans
3. Architectural plans
4. Structural plans
5. Mechanical plans
6. Electrical plans
7. Fire protection system plans



8. Hazardous materials and processes
9. Membrane structures and tents

**Requisite Skills:** The ability to review applications for completeness.

**470-7.2.4** Determine the applicable code or standard, given a fire protection issue, so that the proper document, edition, and section are referenced.

**470-A.7.2.4** The plan examiner should enforce only those codes and standards that have been legally adopted by the jurisdiction. The plan examiner should retroactively apply codes and standards only when authorized to do so by the jurisdiction.

**Requisite Knowledge:**

1. Applicable codes and standards adopted by the jurisdiction
  - a. Automatic sprinkler systems
  - b. Standpipes
  - c. Fire alarm and detection systems
  - d. Automatic elevators
  - e. Fire command center
  - f. Restaurant kitchen systems
  - g. Gaseous extinguishing agents and systems
  - h. Smoke control systems
  - i. Portable fire extinguishers
2. Format of codes and standards
  - a. Code models
  - b. Code types
  - c. Code references
3. Interrelationship of codes and standards
  - a. Nationally recognized codes and standards
  - b. Jurisdiction adopted codes and amendments
  - c. State statute, rules and regulations
4. Procedures adopted by the organizations responsible for promulgating these documents
  - a. Model code groups
  - b. Nationally recognized standards
  - c. Local jurisdiction

**Requisite Skills:** The ability to conduct code-related research, apply codes and standards, and make decisions.

**470-7.3**

**Plans Review**

This duty involves the review and approval of plans for life and fire issues including interior finish, occupancy type, height and area limitations, construction type, and general fire safety and the identification of the requirements for fire

protection systems and permits, to ensure that the plans meet the intent of applicable codes and standards for fire and life safety, according to the following job requirements.

- 470-7.3.1** Identify the requirements for fire protection or a life safety system, given a set of plans, so that deficiencies are identified, documented, and reported in accordance with the policies and procedures of the jurisdiction.

**Requisite Knowledge:**

1. Applicable code requirements for life safety systems
  - a. Occupancy classification
  - b. Means of egress
  - c. Fire protection features
  - d. Building services
2. Interior finish
3. Third-party testing and evaluation

**Requisite Skills:** The ability to read basic floor plans or shop drawings and identify symbols used and apply codes and standards.

- 470-7.3.2** Verify the occupancy classification, given a set of plans, specifications, and a description of a building and its intended use, so that the classification is made in accordance with the applicable codes and standards and the policies of the jurisdiction.

**Requisite Knowledge:**

1. How to calculate occupant loads for an occupancy and for building use
2. Code requirements presented by various occupancies
3. Regulations for various occupancies
4. Operational features presented by various occupancies
5. Fire hazards presented by various occupancies

**Requisite Skills:** The ability to calculate occupant loads, identify occupancy factors related to various occupancy types, and use measuring tools.

- 470-7.3.3** Verify the construction type, given a set of plans, including the occupancy classification area, height, number of stories, and location, so that the building is in accordance with applicable codes and standards and deficiencies are identified, documented, and reported.

**Requisite Knowledge:**

1. Types of construction

2. Fire-related construction components
3. Typical building construction methods and materials
4. Code requirements related to construction types

**Requisite Skills:** The ability to read plans, determine construction types, and conduct code-related research.

**470-7.3.4** Verify the occupant load, given a set of plans, so that the maximum allowable occupant load is in accordance with applicable codes and standards.

**Requisite Knowledge:**

1. How to calculate occupant loads for an occupancy and for building use
2. Code requirements presented by various occupancies
3. Regulations for various occupancies
4. Operational features presented by various occupancies
5. Fire hazards presented by various occupancies

**Requisite Skills:** The ability to calculate occupant loads, identify occupancy factors related to various occupancy types, and use measuring tools.

**470-7.3.5** Verify that required egress is provided, given a set of plans and an occupant load, so that all required egress elements are provided and deficiencies are identified, documented, and reported in accordance with the policies of the jurisdiction.

**470-A.7.3.5** This individual should be able to calculate occupant loads and determine occupant egress capabilities and systems. He or she should be able to cite multiple references from various codes and standards that reflect an understanding of the topic.

**Requisite Knowledge:**

1. Applicable code requirements for means of egress elements
  - a. Components
  - b. Capacity
  - c. Number
  - d. Arrangement
  - e. Travel distance
  - f. Discharge
  - g. Illumination
  - h. Emergency lighting
  - i. Marking
  - j. Special provisions

2. Occupancy egress requirements
  - a. General
  - b. Specific
3. The relationship of fixed fire protection systems to egress requirements
  - a. Fire alarm
  - b. Fire suppression
  - c. Smoke control
  - d. Elevator controls

**Requisite Skills:** The ability to determine egress requirements based on occupant load and research codes.

**470-7.3.6** Evaluate code compliance for required fire flow and hydrant location and spacing, given a plan, codes and standards, and fire flow test results, so that hydrants are correctly located, required fire flow is determined, and deficiencies are identified, documented, and reported in accordance with the policies and procedures of the jurisdiction.

**Requisite Knowledge:**

1. Standard civil engineering symbols
2. Types of water supply and distribution systems
3. Water distribution system test methods
4. Characteristics of public and private water supply systems,
5. Water meters, backflow prevention and other devices that can impact on fire flow
6. The effects of friction loss and elevation on water flow
7. Potential impact of state health regulations on fire flow
8. The applicable codes and standards related to fire flow in the jurisdiction

**Requisite Skills:** The ability to interpret fire flow test results, determine fire hydrant locations and spacing, and read fire flow graphs.

**470-7.3.7** Evaluate emergency vehicle access, given a plan, so that emergency access is provided in accordance with applicable codes and standards and all deficiencies are identified, documented, and reported in accordance with the policies of the jurisdiction.

**Requisite Knowledge:**

1. Operating requirements for fire department apparatus
  - a. Minimum inside/outside radii

- b. Minimum width
  - c. Minimum vertical clearance
  - d. Weight
2. Planning and zoning requirements
3. Emergency access and accessibility requirements of applicable codes and standards
  - a. Acceptable surfaces
  - b. Specifications for dead end roads, turnarounds, cul-de-sacs and access gates
  - c. Markings

**Requisite Skills:** The ability to interpret and use plan scale.

- 470-7.3.8** Recommend policies and procedures for the delivery of plan review services, given management objectives, so that plan reviews are conducted in accordance with the policies of the jurisdiction and due process of the law is followed.

**Requisite Knowledge:**

1. Policies and procedures of the jurisdiction related to plan review
2. Sources of detailed and technical information relating to fire protection and life safety
  - a. Nationally recognized codes and standards
  - b. Professional organizations
  - c. Trade organizations

**Requisite Skills:** The ability to identify construction methods and materials related to fire safety, read and interpret construction plans and specifications, communicate orally and in writing, educate, research, make decisions, recognize problems, and resolve conflicts.

- 470-7.3.9** Participate in legal proceedings, given the findings of a plan review and consultation with legal counsel, so that testimony is accurate and the plan reviewer's demeanor is appropriate to the proceeding.

- 470-A.7.3.9** The committee intends that this requirement encompass preparation, documentation, and presentation in a formal proceeding, such as a deposition, administrative hearing, or court proceeding.

**Requisite Knowledge:**

1. The legal requirements pertaining to evidence rules in the legal system
  - a. Vernon's Civil Statutes
  - b. Code of Criminal Procedure
  - c. Texas Rules of Evidence
2. The types of legal proceedings

- a. Civil
- b. Criminal
- c. Administrative (e.g., Board of Appeals, sanctions, fire marshal order)
- d. Statutory

**Requisite Skills:** Familiarity with courtroom demeanor, communication, and listening skills and the ability to differentiate facts from opinions.

**470-7.3.10** Evaluate plans for the installation of fire protection and life safety systems, given a plan submittal, so that the fire protection systems, including pre-engineered systems, and equipment are reviewed and deficiencies are identified, documented, and reported in accordance with the policies and procedures of the jurisdiction.

**Requisite Knowledge:**

1. Applicable codes and standards for fire protection systems
2. Basic physical science as it relates to fire behavior and fire suppression
3. Basic system design criteria
4. Material listing requirements
5. Material specifications
6. Installation techniques
7. Acceptance inspection/testing of completed installations
8. Construction types and techniques
9. Classification of occupancies

**Requisite Skills:** The ability to review specifications, read plans, classify occupancies, and apply standards.