# CERTIFICATION CURRICULUM MANUAL

## CHAPTER FOUR

## FIRE INSPECTOR

### NFPA 1031, 2014 Edition

### Effective June 1, 2016

**Texas Commission on Fire Protection**
**P.O. Box 2286 Austin, Texas 78768-2286 (512) 936-3838**

# CHAPTER 4
# BASIC FIRE INSPECTOR
# CURRICULUM OUTLINE

(The Fire Inspector I and II curricula are to be completed for the Fire Inspector certification)

| FIRE INSPECTOR I | | |
|---|---|---|
| SECTION | SUBJECT | RECOMMENDED HOURS |
| 401-4.1 | General | 1 |
| 401-4.2 | Administration | 8 |
| 401-4.3 | Field Inspection | 81 |
| 401-4.4 | Plans Review | 0 |
| **FIRE INSPECTOR II** | | |
| SECTION | SUBJECT | RECOMMENDED HOURS |
| 402-5.1 | General | 1 |
| 402-5.2 | Administration | 4 |
| 402-5.3 | Field Inspection | 57 |
| 402-5.4 | Plans Review | 8 |
| | | |
| | **TOTAL RECOMMENDED HOURS** | **156** |

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

# 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* (8th ed.) (2016). Stillwater, OK: Fire Protection Publications. International Fire Service Training Association.

*Hazardous Materials for First Responders* (5th Ed.) (2017). 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* (2014 ed.). Quincy, MA: National Fire Protection Association. NFPA Publications.

*NFPA 472: Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents (*2013 ed.). Quincy, MA: National Fire Protection Association. NFPA Publications.

*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 the National Fire Protection Association (NFPA) 1031, *Standard for Professional Qualifications for Fire Inspector and Plan Examiner*, 2014 Edition.

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

To qualify for the Fire Inspector certification, the Fire Inspector I and II curricula must be completed.

To qualify for the Plan Examiner I certification, only the Plan Examiner I curriculum must be completed.

If a student completed training under the Fire Inspector with Plan Examiner I curriculum (offered prior to March 1, 2019), the student is eligible for both the Fire Inspector and Plan Examiner I certification if all sections of the exam are passed. If the student passes only the Inspector I and II sections of the exam, the student is only eligible for the Fire Inspector certification.

| Certification Level | TCFP Section Number | NFPA 1031 Chapter |
|---|---|---|
| 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 TCFP's Fire Inspector curriculum 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 (textbook) does not provide adequate information to ensure successful completion of the JPRs as listed in the curriculum.

## Components of the Curriculum

Each section of the curriculum identifies the NFPA 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. | Section number and NFPA JPR |
| **Requisite Knowledge**: The legal requirements pertaining to evidence rules in the legal system, types of legal proceedings. | Requisite knowledge statement |
| 1. The legal requirements pertaining to evidence rules in the legal system<br>a. Texas Rules of Evidence | First part of requisite knowledge |
| 2. Types of legal proceedings<br>a. Appeals<br>i. Appeals boards<br>ii. Appeals hearings<br>b. Criminal<br>c. Civil | Second part of requisite knowledge |
| **Requisite Skills:** The ability to maintain a professional courtroom demeanor, communicate, listen, and differentiate facts from opinions. | Requisite skills statement |

## Skills

NFPA requisite skill requirements are address in the corresponding skill sheets. The skills are combined depending on whether the skill relates to General, Field Inspection, Administration, or Plans Review.

## Levels of Certification

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.

# 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-A.4.1** The intent of the committee is that individuals at the Fire Inspector I level perform basic fire safety inspections. Individuals at this level can include fire fighters who are normally assigned to fire suppression or other individuals whose primary job responsibilities are not fire inspection.

## ***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-A.4.2** Maintaining an open dialogue with plan examiners and emergency response personnel is a key component of the duties of Fire Inspector I.

**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. 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.

**401-A.4.2.2** Situations or conditions requiring permits include new construction, operational conditions, and planned impairments involving building systems or facilities, as required by the AHJ.

**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.

**401-A.4.2.4** The objective of a complaint investigation is the recognition and correction or removal of a fire of life safety hazard. At this professional level, the resolution of the complaint would not require the fire inspector to interpret a code or standard.

**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.

**401-A.4.2.5** The fire inspector should avoid enforcement of codes or standards that have not been legally adopted by the jurisdiction. The fire inspector should not retroactively apply codes and standards unless legally required by the jurisdiction.

**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.

**401-A.4.3.3** Examples of means of egress elements include exit access, exit enclosures, exit discharges, exit travel distances, arrangement, capacity, stairways, ramps, doors, hardware, exit markings, and illumination.

**Requisite Knowledge:**

1. Applicable codes and standards adopted by the jurisdiction related to means of egress elements

2. Maintenance requirements of egress elements

3. Types of construction

4. Occupancy egress requirements. The means of egress elements include:
    a. Exit access
    b. Exit
    c. Exit discharge
    d. Exit enclosures
    e. Exit travel distances
    f. Common path of travel
    g. Arrangement
    h. Exit passageway
    i. Delayed egress (Access controlled)
    j. Accessible means of egress
    k. Areas of refuge
    l. Capacity
    m. Stairways
    n. Ramps
    o. Corridors
    p. Doors
    q. Hardware
    r. Exit markings
    s. Illumination

5. The relationship of fixed fire protection systems to egress requirements and to approved means of egress elements, 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.

**401-A.4.3.4** A building description includes height and area dimensions, construction type, and construction materials.

**Requisite Knowledge:**

1. Applicable codes and standards adopted by the jurisdiction

2. Types of construction
    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** Individuals 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, $CO_2$, 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 above ground 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 standards (NFPA 11, NFPA 12, NFPA 12A, NFPA 17, NFPA 25, NFPA 72, and NFPA 2001).

**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** Individuals 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 NFPA 72. To meet this requirement, the Fire Inspector I 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** Individuals 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.

**401-A.4.3.8** The Fire Inspector I is expected to have knowledge of processes, equipment, and operations that include dust collection, kitchen hood and ducts, dip tanks, spray painting, and flammable and combustible liquids storage, dispensing, and use.

**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

**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.

**401-A.4.3.10** Emergency planning and preparation involves fire drills, announcements, evacuation plans, fire department access, response personnel, and standby personnel.

**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.

**401-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 or III.

**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 or III.

**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. *Competencies — Analyzing the Incident*
    b. *Detecting the Presence of Hazardous Materials/WMD*
    Given examples of various situations, awareness level personnel shall identify those situations where hazardous materials/WMD are present and shall meet the following requirements:
        i. Identify the definitions of both *hazardous material* (or *dangerous goods*, in Canada) and *WMD*.
            a) Hazardous materials (or dangerous goods in Canada) – a substance (solid, liquid, gas or energy) that when released is capable of creating harm to people, the environment, and property, including weapons of mass destruction (WMD) as defined in 18 U.S. Code, Section 2332a, as well as any other criminal

use of hazardous materials, such as illicit labs, environmental crimes, or industrial sabotage

b) Weapons of Mass Destruction (WMD) - (1) Any destructive device, such as any explosive, incendiary, or poison gas bomb, grenade, rocket having a propellant charge of more than four ounces, missile having an explosive or incendiary charge of more than one quarter ounce (7 grams), mine, or device similar to the above; (2) any weapon involving toxic or poisonous chemicals; (3) any weapon involving a disease organism; or (4) any weapon that is designed to release radiation or radioactivity at a level dangerous to human life.

ii. Identify the UN/DOT hazard classes and divisions of hazardous materials/WMD and identify common examples of materials in each hazard class or division.

a) Class 1 – Explosives

i) Division 1.1 Explosives with a mass explosion hazard. Examples of Division 1.1 explosives include black powder trinitrotoluene, dynamite, and trinitrotoluene (TNT).

ii) Division 1.2 Explosives with a projection hazard. Examples of Division 1.2 explosives include aerial flares, detonating cord, and power device cartridges.

iii) Division 1.3 Explosives with predominantly a fire hazard. Examples of Division 1.3 explosives include liquid-fueled rocket motors and propellant explosives.

iv) Division 1.4 Explosives with no significant blast hazard. Examples of Division 1.4 explosives include line-throwing rockets, practice ammunition, and signal cartridges.

v) Division 1.5 Very insensitive explosives with a mass explosion hazard. Examples of Division 1.5 explosives include pilled ammonium nitrate fertilizer–fuel oil mixtures (blasting agents).

vi) Division 1.6 Extremely insensitive articles. An example of Division 1.6 includes wetted cellulose nitrate.

b) Class 2 - Gases
   i) Division 2.1 Flammable gases. Examples of Division 2.1 gases include inhibited butadienes, methyl chloride, and propane.
   ii) Division 2.2 Non-flammable, non-toxic gases. Examples of Division 2.2 gases include anhydrous ammonia, cryogenic argon, carbon dioxide, and compressed nitrogen.
   iii) Division 2.3 Toxic gases. Examples of Division 2.3 gases include anhydrous hydrogen fluoride, arsine, chlorine, and methyl bromide.
c) Class 3 - Flammable liquids (and Combustible liquids [U.S.]) Examples of Class 3 liquids include acetone, amyl acetate, gasoline, methyl alcohol, and toluene.
d) Class 4 - Flammable solids; Spontaneously combustible materials; and Dangerous when wet materials/Water-reactive substances
   i) Division 4.1 Flammable solids. Examples of Division 4.1 materials include magnesium (pellets, turnings, or ribbons) and nitrocellulose.
   ii) Division 4.2 Spontaneously combustible materials. Examples of Division 4.2 materials include aluminum alkyls, charcoal briquettes, magnesium alkyls, and phosphorus.
   iii) Division 4.3 Water-reactive substances/Dangerous when wet materials. Examples of Division 4.3 materials include calcium carbide, magnesium powder, potassium metal alloys, and sodium hydride.
e) Class 5 - Oxidizing substances and Organic peroxides
   i) Division 5.1 Oxidizing substances. Examples of Division 5.1 materials include ammonium nitrate, bromine trifluoride, and calcium hypochlorite.

ii) Division 5.2 Organic peroxides. Examples of Division 5.2 materials include dibenzoyl peroxide, methyl ethyl ketone peroxide, and peroxyacetic acid.

f) Class 6 - Toxic substances and Infectious substances
   i) Division 6.1 Toxic substances. Examples of Division 6.1 materials include aniline, arsenic compounds, carbon tetrachloride, hydrocyanic acid, and tear gas.
   ii) Division 6.2 Infectious substances. Examples of Division 6.2 materials include anthrax, botulism, rabies, and tetanus.

g) Class 7 - Radioactive materials. Examples of Class 7 materials include cobalt, uranium hexafluoride, and "yellow cake."

h) Class 8 - Corrosive substances. Examples of Class 8 materials include nitric acid, phosphorus trichloride, sodium hydroxide, and sulfuric acid.

i) Class 9 - Miscellaneous hazardous materials/Products, Substances or Organisms. Examples of Class 9 materials include adipic acid, hazardous substances (e.g., PCBs), and molten sulfur.

iii) Identify the primary hazards associated with each UN/DOT hazard class and division.

a) Class 1 — Explosives
An explosive is any substance or article, including a device, that is designed to function by explosion (i.e., an extremely rapid release of gas and heat) or that, by chemical reaction within itself, is able to function in a similar manner even if not designed to function by explosion. Explosives in Class 1 are divided into six divisions. Each division has a letter designation.
   i) Division 1.1 consists of explosives that have a mass explosion hazard. A mass explosion is one that affects almost the entire load instantaneously.
   ii) Division 1.2 consists of explosives that have a projection hazard but not a mass explosion hazard.

iii) Division 1.3 consists of explosives that have a fire hazard and a minor blast hazard, a minor projection hazard, or both, but not a mass explosion hazard.

iv) Division 1.4 consists of explosive devices that present a minor explosion hazard. No device in the division can contain more than 0.9 oz (25 g) of a detonating material. The explosive effects are largely confined to the package, and no projection of fragments of appreciable size or range are expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package.

v) Division 1.5 consists of very insensitive explosives. This division comprises substances that have a mass explosion hazard but are so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal conditions of transport.

vi) Division 1.6 consists of extremely insensitive articles that do not have a mass explosive hazard. This division comprises articles that contain only extremely insensitive detonating substances and that demonstrate a negligible probability of accidental initiation or propagation.

b) Class 2 — Gases

i) Division 2.1 (flammable gas) consists of materials that are a gas at 68°F (20°C) or less and 14.7 psi (101.3 kPa) of pressure, have a boiling point of 68°F (20°C) or less at 14.7 psi (101.3 kPa), and have the following properties:

(1) Are ignitable at 14.7 psi (101.3 kPa) when in a mixture of 13 percent or less by volume with air

(2) Have a flammable range at 14.7 psi (101.3 kPa) with air of at least 12 percent regardless of the lower limit

ii) Division 2.2 (nonflammable, nonpoisonous compressed gas, including compressed gas, liquefied gas, pressurized cryogenic gas, and compressed gas in solution, asphyxiant gas, and oxidizing gas) consists of materials (or mixtures) that exert in the packaging an absolute pressure of 41 psi (280 kPa) at 68°F (20°C). A cryogenic liquid is a refrigerated liquefied gas having a boiling point colder than –130°F (–90°C) at 14.7 psi (101.3 kPa).

iii) Division 2.3 (gas poisonous by inhalation) consists of materials that are a gas at 68°F (20°C) or less and a pressure of 14.7 psi, or 1 atm (101.3 kPa), have a boiling point of 68°F (20°C) or less at 14.7 psi (101.3 kPa), and have the following properties:

(1) Are known to be so toxic to humans as to pose a hazard to health during transportation

(2) In the absence of adequate data on human toxicity, are presumed to be toxic to humans because, when tested on laboratory animals, they have an $LC_{50}$ value of not more than 5000 ppm.

c) Class 3 — Flammable and Combustible Liquids

i) Flammable liquids are liquids having a flash point of not more than 140°F (60°C) or materials in a liquid phase with a flash point at or above 100°F (37.8°C) that are intentionally heated and offered for transportation or transported at or above their flash point in a bulk packaging. Examples of flammable liquids include acetone, amyl acetate, gasoline, methyl alcohol, and toluene.

ii) Combustible liquids are liquids that do not meet the definition of any other hazard class and that have a flash point above 140°F (60°C) and below 200°F (93°C).

Flammable liquids with a flash point above 100°F (38°C) can be reclassified as combustible liquids. Examples of combustible liquids include mineral oil, peanut oil, and No. 6 fuel oil.

d) Class 4 — Flammable Solids
   i) Division 4.1 (flammable solids) comprised of the following three types of materials:
      (1) Desensitized explosives — explosives wetted with sufficient water, alcohol, or plasticizers to suppress explosive properties
      (2) Self-reactive materials — materials that are thermally unstable and that can undergo a strongly exothermic decomposition even with participation of oxygen (air)
      (3) Readily combustible solids — solids that can cause a fire through friction and any metal powders that can be ignited.
   ii) Division 4.2 (spontaneously combustible material) comprises the following materials:
      (1) Pyrophoric materials — liquids or solids that, even in small quantities and without an external ignition source, can ignite within 5 minutes after coming in contact with air
      (2) Self-heating materials — materials that, when in contact with air and without an energy supply, are liable to self-heat
   iii) Division 4.3 (dangerous-when-wet materials) is comprised of materials that, by contact with water, are liable to become spontaneously flammable or to give off flammable or toxic gas at a rate greater than 1 L/kg of the material per hour.

e) Class 5 — Oxidizers and Organic Peroxides
   i) Division 5.1 (oxidizers) is comprised of materials that can, generally by yielding

oxygen, cause or enhance the combustion of other materials.

ii) Division 5.2 (organic peroxides) is comprised of organic compounds that contain oxygen (O) in the bivalent -O-O- structure that can be considered a derivative of hydrogen peroxide, where one or more of the hydrogen atoms have been replaced by organic radicals.

f) Class 6 — Poisonous Materials

i) Division 6.1 (poisonous materials) comprises materials other than gases that either are known to be so toxic to humans as to afford a hazard to health during transportation or in the absence of adequate data on human toxicity are presumed to be toxic to humans, including materials that cause irritation.

ii) Division 6.2 (infectious substances) comprises materials known to contain or suspected of containing a pathogen. A pathogen is a micro-organism (including viruses, plasmids, and other genetic elements) or a proteinaceous infectious particle (prion) that has the potential to cause disease in humans or animals. The terms *infectious substance* and *etiologic agent* are synonymous.

g) Class 7 — Radioactive Materials
Radioactive material is any material containing radionuclides where both the activity concentration and the total activity in the consignment exceed specified values.

h) Class 8 — Corrosive Materials
Corrosive materials are liquids or solids that cause full-thickness destruction of skin at the site of contact within a specified period of time. A liquid that has a severe corrosion rate on steel or aluminum is also a corrosive material.

i) Class 9 — Miscellaneous Hazardous Materials
Miscellaneous hazardous materials are materials that present a hazard during transport but that do not meet the definition of

any other hazard class. Miscellaneous hazardous materials include the following:

i) Any material that has an anesthetic, noxious, or other similar property that could cause extreme annoyance or discomfort to a flight crew member so as to prevent the correct performance of assigned duties
ii) Any material that is not included in any other hazard class but that is subject to DOT requirements (e.g. elevated-temperature material, hazardous substance, hazardous waste, marine pollutant).

iv. Identify the difference between hazardous materials/WMD incidents and other emergencies.
    a) Size
    b) Complexity
    c) Intent
    d) Crime scene management
    e) Secondary devices/attacks and armed
v. Identify typical occupancies and locations in the community where hazardous materials/WMD are manufactured, transported, stored, used, or disposed of.
vi. Identify typical container shapes that can indicate the presence of hazardous materials/WMD.
    a) Non-bulk containers
    b) Bulk containers
    c) Fixed facility storage systems
    d) Pipelines
    e) Ships & marine vessels
vii. Identify facility and transportation markings and colors that indicate hazardous materials/WMD, including the following:
    a) Transportation markings, including UN/NA identification number marks, marine pollutant mark, elevated temperature (HOT) mark, commodity marking, and inhalation hazard mark
    b) NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response*, markings
    c) Military hazardous materials/WMD markings

d) Special hazard communication markings for each hazard class (i.e., Hazardous Material Identification System – HMIS)
e) Pipeline markings
f) Container markings

viii. Given an NFPA 704 marking, describe the significance of the colors, numbers, and special symbols.
a) Categories of hazards
i) Health – blue color
ii) Flammability – red color
iii) Reactivity – yellow color
iv) Special hazards (white color with symbol)
b) Five degrees of hazards (0 – 4)

ix. Identify U.S. and Canadian placards and labels that indicate hazardous materials/WMD. (see ERG or DOT Chart)

x. Identify the following basic information on material safety data sheets (MSDS) or safety data sheets (SDS) and shipping papers for hazardous materials:
a) Identify where to find MSDS/SDS.
b) Identify major sections of an MSDS/SDS.
i) Basic information that indicates hazardous materials
ii) Entries that indicate the presence of hazardous materials containers by their shape
c) Identify the entries on shipping papers that indicate the presence of hazardous materials.
d) Match the name of the shipping papers found in transportation (air, highway, rail, and water) with 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
e) Identify the person responsible for having the shipping papers in each mode of transportation.
f) Identify where the shipping papers are found in each mode of transportation.
g) Identify where the papers can be found in an emergency in each mode of transportation.

xi. Identify examples of clues (other than occupancy/ location, container shape, markings/color, placards/

labels, MSDS, and shipping papers) to include sight, sound, and odor of which indicate hazardous materials/WMD.

a) Odors
b) Gas leak
c) Fire
d) Vapor cloud
e) Corrosive actions
f) Visible chemical reactions
g) Pooled liquids
h) Sound of a pressure release
i) Condensation line on pressure tank
j) Injured persons or casualties

xii. Describe the limitations of using the senses in determining the presence or absence of hazardous materials/WMD.

a) Exposes responder to possible ill health effects; or
b) Death

xiii. Identify at least four types of locations that could be targets for criminal or terrorist activity using hazardous materials/WMD.

a) Public assembly areas
b) Public buildings
c) Mass transit systems
d) Places with high economic impact
e) Telecommunications facilities
f) Places with historical or symbolic significance
g) Military installations
h) Airports
i) Industrial facilities

xiv. Describe the difference between a chemical and a biological incident.

a) Chemical – characterized by rapid onset of symptoms
b) Biological – symptoms requires days or weeks to manifest

xv. Identify at least four indicators of possible criminal or terrorist activity involving chemical agents.

a) The presence of hazardous materials/WMD or laboratory equipment that is not relevant to the occupancy
b) Intentional release of hazardous materials/WMD

c) Unexplained patterns of sudden onset of similar, nontraumatic illnesses or deaths (patterns that might be geographic, by employer, or associated with agent dissemination methods)
d) Unexplained odors or tastes that are out of character with the surroundings
e) Multiple individuals exhibiting unexplained signs of skin, eye, or airway irritation
f) Unexplained bomb- or munitions-like material, especially if it contains a liquid
g) Unexplained vapor clouds, mists, and plumes
h) Multiple individuals exhibiting unexplained health problems such as nausea, vomiting, twitching, tightness in chest, sweating, pinpoint pupils (miosis), runny nose (rhinorrhea), disorientation, difficulty breathing, convulsions, or death
i) Trees, shrubs, bushes, food crops, and/or lawns that are dead, discolored, abnormal in appearance, or withered (not due to a current drought and not just a patch of dead weeds)
j) Surfaces exhibiting oily droplets/films and unexplained oily film on water surfaces
k) An abnormal number of sick or dead birds, animals, or fish
l) Unusual security, locks, bars on windows, covered windows, or barbed wire

xvi. Identify at least four indicators of possible criminal or terrorist activity involving biological agents.
a) Unusual number of sick or dying people or animals (any number of symptoms; time before symptoms are observed dependent on the agent used but usually days to weeks)
b) Healthcare facilities reporting multiple casualties with similar signs or symptoms
c) Unscheduled or unusual spray being disseminated, especially if outdoors during period of darkness
d) Abandoned spray devices (devices with no distinct odors)

xvii. Identify at least four indicators of possible criminal or terrorist activity involving radiological agents.
a) Radiation Symbols

b) Unusual metal debris
c) Heat-emitting material
d) Glowing material
e) Sick people/animals

xviii. Identify at least four indicators of possible criminal or terrorist activity involving illicit laboratories (e.g., clandestine laboratories, weapons lab, ricin lab).
a) Structures with unusual or multiple vents
b) Buildings with heavy security
c) Obscured windows
d) Odd or unusual odors
e) May include mobile facilities, i.e. mobile meth labs

xix. Identify at least four indicators of possible criminal or terrorist activity involving explosives
a) Prior warning or threat of attack
b) Unknown explosions
c) Multiple fires or explosions
d) Unattended packages, backpacks and other objects left in high traffic public areas
e) Fragmentation damage or injuries
f) Craters
g) Small metal objects, i.e. nuts, bolts, nails used as shrapnel

xx. Identify at least four indicators of secondary devices
a) Containers with unknown liquids or materials
b) Unusual devices or containers with electronic components such as wires, circuit boards, cellular phones, antennas and other items attached or exposed
c) Devices containing quantities of fuses, fireworks, match heads, black powder, incendiary materials or other unusual materials
d) Materials attached to or surrounding an item such as nails, bolts, drill bits that could be used for shrapnel
e) Ordnance such as blasting caps, detcord, explosives, grenades, etc.

c. *Surveying Hazardous Materials/WMD Incidents*
Given examples of hazardous materials/WMD incidents, awareness level personnel shall, from a safe location, identify the hazardous material(s)/WMD involved in each situation by name, UN/NA identification number, or type placard applied by completing the following requirements:

i. Identify difficulties encountered in determining the specific names of hazardous materials/WMD at facilities and in 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.
    a) Shipping documents
    b) Labels
    c) Placards
    d) DOT *Emergency Response Guidebook* (ERG)
iii. Identify sources for obtaining the names of hazardous materials/WMD at a facility.
    a) Shipping documents
    b) Labels
    c) Placards
    d) ERG
    e) Safety Data Sheets (SDS)/Material Safety Data Sheets (MSDS)
    f) Facility documents
    g) Facility pre-plans

d. *Collecting Hazard Information*
Given the identity of various hazardous materials/WMD (name, UN/NA identification number, or type placard), awareness level personnel shall identify the fire, explosion, and health hazard information for each material by using the current edition of the DOT *Emergency Response Guidebook* by completing the following requirements:
i. Identify the three methods for determining the guidebook page for a 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 or container shape and consult the appropriate guide number
ii. Identify the two general types of hazards found on each guidebook page.
    a) Fire/explosive
    b) 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 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.

# 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-A.5.1*** The intent of the committee is that individuals at the Fire Inspector II level perform fire safety inspections with moderate technical challenges. This level can include Fire Inspector I individuals who through experience and formal continuing education have achieved the prerequisite knowledge and skills noted and graduates of degree programs in associated fields who can demonstrate the prerequisite knowledge and skills noted. Formal continuing education is essential to maintain the skill level of a Fire Inspector II and to continue an individual's advancement to the more skilled Fire Inspector III level.

## ***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-A.5.2*** The responsibilities and duties of this position are at a higher level than that of Fire Inspector I. If functions are similar or overlapping, it is assumed that those performed at this level will be at a higher technical level and will require more professional expertise, as should be visible in presentation, performance, and quality.

**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 individual 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 can 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. Analysis of test results

5. 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.

**402-A.5.3.4** This requirement 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.
7. Quenching operations
8. Dry cleaning operations
9. Asphalt and tar kettles
10. Semiconductor/electronics manufacturing

11. Welding and thermal cutting operations

**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.

**402-A.5.4.1** For facilities that might qualify for more than one occupancy classification, additional information should be sought from the applicant following the initial review of a given set of plans. Occupancy classifications affect the construction type permitted or might limit the use of the building in the future. A different construction type or a more flexible future use of the building might be possible. 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 building code, recognizing that not all spaces might require separation while some spaces will always require separation.

**Requisite Knowledge:**

1. Occupancy classification presented by various occupancies

2. Applicable codes and standards presented by various occupancies

3. Regulations presented by 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.

**402-A.5.4.2** Occupant load calculation procedures should recognize the intended use of a given space and are determined in the model codes based on applying a load factor to either the net or gross area of the space. Except for public assembly occupancies, these factors are based on the overall use of a facility and do not guarantee a minimum space allocation per individual in a space.

**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.

**402-A.5.4.3** The Fire Inspector II is expected to be able to evaluate proposed fire protection systems and equipment for moderately technical applications.

Knowledge of the compatibility and effectiveness of the protection systems and equipment with the hazard to be protected is essential.

**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., NPFA 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.

**402-A.5.4.6** The Fire Inspector II should be familiar with current building materials, concepts and technologies. New building materials, processes, and technologies are continually being introduced in new building systems. The individual should be able to recognize new systems; research information relevant to the fire, life safety, and security impacts of a new system; and request a professional evaluation of a new system from the design engineer-of-record or architect-of-record. The individual should also be able to determine when further evaluation by an independent third party might be required.

**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.