



# Water-Based Systems Layout Certification

## Level IV Content Outline

(Updated Exams Released July 8, 2024)

### Senior Engineering Technician

The candidates for NICET certification at Level IV in Water-Based Systems Layout should have the knowledge, experience, and skills needed to supervise other technicians. Their work includes complex or specialized water-based systems. They have a comprehensive understanding of codes and standards. Level IV technicians have at least 10 years of experience in water-based systems layout.

#### 4.1 Safety and Environmental Compliance

(Questions related to these tasks make up 1-11% of the exam.)

- 4.1.1 Manage compliance with environmental requirements. <sup>1</sup>
- 4.1.2 Manage personnel safety. <sup>14, 15</sup>

#### 4.2 Contract Documents

(Questions related to these tasks make up 1-9% of the exam.)

- 4.2.1 Review contracts. <sup>1</sup>

#### 4.3 Survey Existing Conditions

(Questions related to these tasks make up 1-11% of the exam.)

- 4.3.1 Evaluate existing complex fire protection systems. <sup>1</sup>
- 4.3.2 Plan internal system obstruction investigations. <sup>4</sup>

#### 4.4 Codes and Standards

(Questions related to these tasks make up 29-39% of the exam.)

- 4.4.1 Interpret the intent of fire protection codes/standards. <sup>1, 3, 13</sup>
- 4.4.2 Identify the differences between NFPA standards and FM Global data sheets. <sup>1, 6, 7, 8, 9</sup>
- 4.4.3 Address revisions between new and previous editions of codes/standards. <sup>1, 2, 3</sup>

#### 4.5 System Layout

(Questions related to these tasks make up 35-45% of the exam.)

- 4.5.1 Layout sprinkler systems with special occupancy requirements (per NFPA 13). <sup>1</sup>
- 4.5.2 Mitigate corrosion issues. <sup>1</sup>
- 4.5.3 Resolve fire pump system issues. <sup>1, 2, 3</sup>
- 4.5.4 Resolve issues with multiple considerations (e.g., changes in occupancy, system types, density, water supply). <sup>1, 10, 11</sup>
- 4.5.5 Resolve water supply issues. <sup>1, 2, 3</sup>
- 4.5.6 Evaluate system hydraulics. <sup>1</sup>
- 4.5.7 Hydraulically calculate complex systems. <sup>1, 2</sup>
- 4.5.8 Apply advanced concepts of bracing/restraints (e.g., seismic, end head restraints). <sup>1</sup>
- 4.5.9 Coordinate complex interfaces with other fire protection systems. <sup>1, 12</sup>
- 4.5.10 Incorporate pre-engineered system layouts (e.g., kitchen hood systems). <sup>1, 13</sup>

#### 4.6 Project Management

(Questions related to these tasks make up 5-15% of the exam.)

- 4.6.1 Oversee management of multiple projects. <sup>1, 5</sup>
- 4.6.2 Manage subcontractors. <sup>1</sup>
- 4.6.3 Develop project budgets. <sup>5</sup>
- 4.6.4 Monitor project progress and manage expenses. <sup>5</sup>
- 4.6.5 Prepare complex maintenance or testing plans. <sup>4</sup>