

IFE Level 3 Diploma in Fire Science and Fire Safety

Unit 2: Fire Safety

Unit Reference Number: F/505/6006

Introduction

This unit focuses on the prevention and detection of fire in domestic, residential, commercial and industrial premises. It covers buildings and building materials, protection equipment and fire safety principles and practices. Candidates must demonstrate their ability to explain and apply the relevant fire safety principles in different situations.

Learning Outcomes

Candidates who achieve this unit should be able to:

- explain fire resistance in relation to different buildings and building materials
- explain the operation of fire protection equipment and assess their effectiveness in different situations
- explain and apply fire safety principles and practices
- assess risks in different situations and identify appropriate action to improve safety

Unit Status

This is a mandatory unit for candidates who wish to achieve the Level 3 Diploma in Fire Science and Fire Safety.

Content

1. Building Construction

Assessment Objective	Knowledge, Understanding and Skills
1.1 Explain the fire safety implications associated with different building materials, describe their behaviour in fire situations and assess their fire safety implications	<ul style="list-style-type: none"> • Timber – fire resistance of timber elements of structure and timber framed construction. • Concrete – fire resistance of concrete • Steel – fire resistance • Glass – fire rated glazing systems • Building boards, building slabs and insulating materials • Sandwich panels • Fire retardant/fire resisting materials that can be applied

<p>1.2 Explain the function of elements of structure and assess the impact of fire on them</p>	<ul style="list-style-type: none"> • Protected and unprotected steel columns • Beams • Walls – fire resistance, separation from adjacent properties • Stairways • Doors • Windows - exposures • Ceilings – fire resistance
<p>1.3 Describe the different types of heating, ventilation and air conditioning systems used in buildings and explain the influence(s) they may have on a fire situation</p>	<ul style="list-style-type: none"> • Heating systems • Ventilation • Air conditioning systems • Stairwell pressurisation systems • Ventilation and smoke control systems
<p>1.4 Assess the fire safety implications of providing services in buildings</p>	<ul style="list-style-type: none"> • Electricity • Oil • Gas – Natural and Liquefied Petroleum Gas • Bio mass • Water • Photoelectric systems including micro generation
<p>1.5 Explain the principles and roles that support structural fire resistance in certain elements of building construction</p>	<ul style="list-style-type: none"> • Separating walls including corridors • Compartment walls and floors • Junctions formed by elements of structure • Protected shafts and protecting structures – lifts and escalators • Fire resisting doors and other enclosures • Fire resisting ceilings • Fire resisting partitions • Active fire barrier systems • Atria • Building separation • External Cladding • Fire stopping and cavity barriers • Ductwork

2. Fire Safety Principles and Fire Protection Equipment

Assessment Objective	Knowledge, Understanding and Skills
<p>2.1 Explain and apply the principles of means of escape in case of fire</p>	<p>Principles of means of escape and effects of:</p> <ul style="list-style-type: none"> • Management control • Occupancy • Construction • Time of evacuation • Exits • Travel distance • Place of reasonable safety/Place of total safety • Dead end • Protected route

	<ul style="list-style-type: none"> • ASET (Available Safe Egress Time) and RSET (Required Safe Egress Time)
<p>2.2 Describe and assess the arrangements that need to be in place for means of escape of individuals and groups of people</p>	<ul style="list-style-type: none"> • Pre-planning arrangements for ensuring the safety of people • Principles of evacuation procedures that should be adopted in case of fire • How the behaviour of people in a fire, or potential fire, situation can adversely affect evacuation and means of escape • How the wellbeing of people can affect evacuation e.g. mobility, disability, health, age, size • Personal Emergency Evacuation Plan (PEEP)
<p>2.3 Explain and assess the use of fire precautions in the protection of people and property</p>	<ul style="list-style-type: none"> • The purpose of fire precautions in the protection of people and property • Use, siting and content of fire notices • Use and siting of different types of extinguishing systems including hand held fire extinguishers • Use of passive and active fire safety systems in the protection of people and property • Smoke, Heat, Carbon Monoxide and Flame fire detection systems • Fire warning systems – manual and automatic • Emergency lighting systems • Principles that apply to the installation of: <ul style="list-style-type: none"> ○ Smoke venting systems ○ Fire curtains ○ Fire barriers
<p>2.4 Explain and assess the fire precautions required to be applied in different premises</p>	<ul style="list-style-type: none"> • Commercial office premises • Retail premises • Factories and other places of work • Places of public entertainment including cinemas, theatres, dance halls and premises • Alcohol licensed premises • Hotels and other sleeping accommodation premises • Health and other care-related premises • Sports grounds • Flats/High-rise residential buildings • Safe storage of combustibles materials – prevention and control of fires • Large outdoor events • Caravan and camping site safety • Petrol filling stations • Animal premises and stables

3. Fire Safety Principles and Fire Protection Equipment

Assessment Objective	Knowledge, Understanding and Skills
3.1 Describe and explain the design features, installation, use, maintenance and operations of fixed installations and assessing their effectiveness in different fire suppression situations	<ul style="list-style-type: none"> • Sprinkler systems – commercial, residential and domestic • Drencher and water spray projector systems • Water mist systems • Rising mains • Hose reels • Foam systems • Gas/vapour systems • Dry powder systems

4. Fire Safety Review and Advice

Assessment Objective	Knowledge, Understanding and Skills
4.1 Identify and assess fire hazards and risks in and around different premises	<ul style="list-style-type: none"> • Define the terms “hazards” and “risks” • How to assess hazards, risks and fire precautions within different areas of the premises in relation to construction, layout and use • How to assess the type and level of risk associated with different hazards in different areas of premises • Identification of people who may be at risk • Identification of risks to property and the environment • Consequences of failing to identify hazards and control risks • Common causes of fire in different occupancies • Identification of suitable options to eliminate, reduce or control risk in different types of premises • How to prioritise risks and solutions
4.2 Review control measures in current and planned situations	<ul style="list-style-type: none"> • How to review the effectiveness of control measures • How to provide feedback on effectiveness of current control measures
4.3 Describe and explain the purpose of fire safety training and the testing of installed fire precautions	<ul style="list-style-type: none"> • Training needs of workplace staff • Training requirements for people with fire safety responsibilities (fire wardens and marshalls) • The importance of maintaining and testing installed fire safety equipment and how the testing is conducted
4.4 Explain the different methods of improving fire safety awareness	<ul style="list-style-type: none"> • Explain fire risks to members of the public and property owners/managers • How fire related incidents can impact on business continuity • The role of building managers in protecting people and property from the risks of fire • Fire hazards in the community and the promotion of fire safety awareness programmes • Development and implementation of fire safety education programmes in the community • How to engage with minority groups within larger community areas