



# **Level 3 Certificate in Residential Sprinkler System Design**



# Qualification Handbook

## SFJ Awards Level 3 Certificate in Residential Sprinkler System Design

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# 1 Introduction

## 1.1 About us

SFJ Awards is part of the Workforce Development Trust, together with Skills for Justice and Skills for Health. For over 10 years Skills for Health and Skills for Justice have been working with employers, Governments of the UK and agencies within the skills system, to better equip workforces with the right skills now and for the future.

During this time both Skills for Health and Skills for Justice have earned an enviable reputation for their knowledge of the health and justice and security sectors and their proactive approach to the development of skills and qualifications, along with an ability to deliver genuinely workable solutions for the employers they represent.

SFJ Awards is an awarding organisation that builds upon this reputation. We work with employers in the policing, community safety, legal, armed forces, security, and health sectors and understand their specific challenges, enabling us to quality assure learning outcomes that are suited to the needs of the sectors.

Customer satisfaction is the cornerstone of our organisation, and is delivered through an efficient service, providing excellent value for money.

## 1.2 Customer Service Statement

Our Customer Service Statement is published on SFJ Awards website giving the minimum level of service that centres can expect. The Statement will be reviewed annually and revised as necessary in response to customer feedback, changes in legislation, and guidance from the qualifications Regulators.

## 1.3 Centre support

SFJ Awards works in partnership with its customers. For help or advice contact:

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Meadowcourt Business Park  
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Tel: 0114 284 1970

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Website: [www.sfjawards.com](http://www.sfjawards.com)

# 2 The Qualification

## 2.1 Qualification objective

This handbook relates to the following qualification:

### **SFJ Awards Level 3 Certificate in Residential Sprinkler System Design**

The main objective of this qualification is to provide individuals with the practical skills, technical knowledge and understanding to provide quotations and designs for residential sprinkler systems.

This qualification has been designed to meet the needs of individuals who work, or intend to work, in a position where they are involved in producing quotations and designing residential sprinkler systems.

It will also be appropriate for building control officers, approved inspectors, fire engineers, fire safety auditors, inspectors, fire risk assessors, insurance assessors, managers, surveyors, architects and fire safety professionals i.e. those who have the responsibility for specifying, auditing or regulating residential sprinkler systems.

The qualification has been developed by organisations involved in the sprinkler sector such as third party certification bodies, professional bodies, designers, installers, service engineers and training providers.

Note: For the purposes of this handbook, the term “residential” refers to systems in both residential and domestic occupancies.

## 2.2 Pre-entry requirements

There are no formal pre-entry requirements although individuals should be able to work at Level 2 or above, be proficient in the use of English Language and be proficient in mathematics with the ability to carry out equations and use scientific calculators. It is the responsibility of centres to ensure that all learners meet these requirements prior to enrolment and that they are of sufficient maturity. For quality assurance purposes, centres must retain records relating to these checks.

In addition, individuals should:

- have basic knowledge and understanding to carry out structured tasks and activities in the installation of residential sprinkler systems

## 2.3 Qualification structure

This qualification is made up of 4 mandatory units. To be awarded this qualification the learner must pass all 4 mandatory units as shown in the table below.

Mandatory Units					
Unit Number	Odyssey Reference	Unit Title	Level	GLH	TQT
1	5718	Identify requirements for sprinkler systems	3	15	25
2	5719	Identify requirements for designing residential sprinkler systems	3	15	30
3	5720	Design residential sprinkler systems	3	40	60
4	5721	Produce quotations for residential sprinkler systems	3	15	30

Learners are required to achieve all 4 units within 2 years of registration.

In order to achieve this qualification and to work within the residential sprinkler sector, learners will need to be familiar with, and able to refer to and apply, a wide range of national and industry specific Legislation, Regulations, Standards, Codes of Practice and Guidance. Information on relevant documents, together with additional recommended reading materials, is provided in Appendix 1.

## 2.4 Total Qualification Time (TQT)

Values for Total Qualification Time<sup>1</sup>, including Guided Learning, are calculated by considering the different activities that Learners would typically complete to achieve and demonstrate the learning outcomes of a qualification. They do not include activities which are required by a Learner's Teacher based on the requirements of an individual Learner and/or cohort. Individual Learners' requirements and individual teaching styles mean there will be variation in the actual time taken to complete a qualification. Values for Total Qualification Time, including Guided Learning, are estimates.

Some examples of activities which can contribute to Total Qualification Time include

- Independent and unsupervised research/learning
- Unsupervised compilation of a portfolio of work experience
- Unsupervised e-learning

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<sup>1</sup> Total Qualification Time, Ofqual

<https://www.gov.uk/guidance/ofqual-handbook/section-e-design-and-development-of-qualifications>

- Unsupervised e-assessment
- Unsupervised coursework
- Watching a pre-recorded podcast or webinar
- Unsupervised work-based learning
- All Guided Learning

Some examples of activities which can contribute to Guided Learning include:

- Classroom-based learning supervised by a Teacher
- Work-based learning supervised by a Teacher
- Live webinar or telephone tutorial with a Teacher in real time
- E-learning supervised by a Teacher in real time
- All forms of assessment which take place under the Immediate Guidance or Supervision of a lecturer, supervisor, tutor or other appropriate provider of education or training, including where the assessment is competence-based and may be turned into a learning opportunity.

The Total Qualification Time and Guided Learning Hours for this qualification are as follows:

Qualification Title	TQT	GLH
SFJ Awards Level 3 Certificate in Residential Sprinkler System Design	145	85

## 2.5 Age range and geographical coverage

This qualification is available to learners aged 18 years and over and is regulated in England and Wales.

## 2.6 Opportunities for progression

This qualification creates a number of opportunities for progression into existing fire safety qualifications and employment in a range of roles responsible for specifying, auditing or regulating residential sprinkler systems.

## 2.7 Use of languages

SFJ Awards business language is English and we provide assessment materials and qualification specifications that are expressed in English. Assessment specifications and assessment materials may be requested in Welsh or Irish and, where possible, SFJ Awards will try to fulfil such requests. SFJ Awards will provide assessment materials and qualification specifications that are expressed in Welsh or Irish and support the assessment of those learners, where the number of learners makes it economically viable for SFJ Awards to do so. More information is provided in the SFJ Awards' Use of Language Policy.

For learners seeking to take a qualification and be assessed in British Sign Language or Irish Sign Language, please refer to SFJ Awards' Reasonable Adjustments Policy. A learner may be assessed in British Sign Language or Irish Sign Language where it is permitted by SFJ Awards for the purpose of Reasonable Adjustment.

Policies are available on our website [www.sfjawards.com](http://www.sfjawards.com) or on request from SFJ Awards.

### 3 Qualification Units

<b>Title</b>	Identify requirements for sprinkler systems	
<b>Level</b>	3	
<b>Unit Number</b>	1	
<b>TQT</b>	25	
<b>GLH</b>	15	
<b>Learning Outcomes</b> <i>The learner will:</i>	<b>Assessment Criteria</b> <i>The learner can:</i>	<b>Guidance and/or Indicative Content</b>
1. Understand sprinkler system standards	1.1 Summarise sprinkler systems <b>standards</b> and how they are applied to buildings	<b>Standards:</b> See Appendix 1. <b>Other standards:</b> British, European and American standards, insurance companies e.g. Factory Mutual (FM), Underwriter Laboratories (UL). See Appendix 1.
	1.2 Describe sprinkler system <b>standards</b> for residential premises	
	1.3 Describe sprinkler system <b>standards</b> for commercial premises	
	1.4 Describe <b>other standards</b> relevant to sprinkler system components	



2. Understand legislative and regulatory requirements relevant to sprinkler systems	2.1	Identify <b>legislation</b> relevant to <b>sprinkler system</b> installations	<p><b>Legislation:</b> Building regulations, fire safety legislation, conservation legislation, acts, orders, regulations and statutory instruments.</p> <p><b>Sprinkler system:</b> Design, installation, commissioning, servicing and maintenance, Standards, codes of practice, manufacturers and other guidance, best practice, new developments. See Appendix 1.</p> <p><b>Building regulation:</b> Building control consultations, compartmentation, fire stopping, structural loading (water tanks).</p> <p><b>Water undertaker:</b> Legislation requirements, water regulations, water undertaker consultations, water supply consultations, water main connections, backflow prevention, booster pumps, tank air gaps, vortex and overflow requirements. Ofwat requirements. See Appendix 1.</p> <p><b>Electrical:</b> Legislation requirements, electrical regulations. See Appendix 1.</p> <p><b>Regulators:</b> AHJ (Authority Having Jurisdiction), building control, fire authority, local authority departments, planning and conservation bodies, water undertaker, insurance companies, HSE, third party certification bodies.</p>
	2.2	Identify <b>building undertaker</b> requirements relevant to <b>sprinkler system</b> installations	
	2.3	Identify <b>water regulation</b> requirements relevant to <b>sprinkler system</b> installations	
	2.4	Identify <b>electrical regulation</b> requirements relevant to <b>sprinkler system</b> installations	
	2.5	Explain the interaction between legislation, regulation, sprinkler system standards and <b>regulators</b>	
3. Understand how to research industry developments and improvements relevant to sprinkler systems	3.1	Explain how to conduct <b>research</b> relevant to sprinkler systems	<p><b>Research:</b> Using internet, communication with regulators, manufactures, experienced competent individuals.</p> <p><b>Developments and improvements:</b> Legislation, regulations, standards, codes of practice, guidance, best practice, products.</p>
	3.2	Describe industry <b>developments and improvements</b> relevant to sprinkler systems	

	3.3 Evaluate the suitability of industry <b>developments and improvements</b> for use in sprinkler systems	
<b>Additional information about the unit</b>		
Delivery guidance	<p>This unit is about identifying legislation, regulations and standards relevant to residential and commercial sprinkler systems. It includes discussing industry developments and improvements.</p> <p>The unit is recommended for practitioners, i.e. anyone who is employed or contracted to work with others in an organisation – specifiers, designers, installers, commissioners, service and maintenance engineers, regulators, specifiers, owners, facility and building managers - to ensure that, within the scope of their responsibility, suitable and sufficient residential and commercial sprinkler systems are specified, designed, installed, commissioned, serviced and maintained.</p> <p>The unit has been designed to meet the needs of individuals who work, or intend to work, in a position where they are involved in residential and commercial sprinkler systems.</p> <p>It is also appropriate for those involved in regulating and advising on sprinkler systems, i.e. anyone who has the responsibility for ensuring the requirements of residential and commercial sprinkler systems and associated regulation are being met through cooperation or enforcement.</p>	
Assessment guidance	<p>For the knowledge and understanding component of the unit, assessment from a learning and development environment is allowed.</p> <p>For the practical components, assessment can take place either in the workplace or in a realistic working environment (RWE).</p> <p>Further guidance can be found in Section 5: Assessment.</p>	
Links	<p>This unit is based on National Occupational Standards: SFS MFP 1: Establish customer requirements for a mechanical fire protection system.</p>	

<b>Title</b>	Identify requirements for designing residential sprinkler systems	
<b>Level</b>	3	
<b>Unit Number</b>	2	
<b>TQT</b>	30	
<b>GLH</b>	15	
<b>Learning Outcomes</b> <i>The learner will:</i>	<b>Assessment Criteria</b> <i>The learner can:</i>	<b>Guidance and/or Indicative Content</b>
1. Be able to identify requirements for residential sprinkler systems	1.1 Identify <b>customer</b> requirements	<p><b>Customer:</b> Sprinkler system requirements, fire strategy, occupancy and use of building.</p> <p><b>Stakeholder requirements:</b> Fire strategy, vulnerable persons, compensatory features, special circumstances, occupancy, fire loading, aesthetics, deviations, areas of noncompliance, timescales, data protection, commercial confidentiality.</p> <p><b>Stakeholders:</b> AHJ; building control, fire authority, local authority departments, planning and conservation bodies, water undertaker, insurance companies, HSE, third party certification bodies.</p> <p><b>Authority:</b> Level of authority, control and responsibility.</p> <p><b>Communicate/understanding:</b> Communication skills, advice, explanation, impartial, cost effective, advantages and disadvantages of sprinkler systems, recording methods, professionalism.</p>
	1.2 Identify <b>stakeholder requirements</b>	
	1.3 Identify <b>stakeholders' authority and understanding</b>	
	1.4 Identify <b>legislation</b> relevant to residential sprinkler system installations	
	1.5 Identify <b>building regulation</b> requirements relevant to residential sprinkler system installations	
	1.6 Identify <b>sprinkler system requirements</b>	

	1.7 Identify <b>water undertaker</b> requirements relevant to residential sprinkler system installations	<p><b>Legislation:</b> Building regulations, fire safety legislation, conservation legislation, acts, orders, regulations and statutory instruments.</p> <p><b>Building regulation:</b> Building control consultations, compartmentation, fire stopping, structural loading (water tanks).</p> <p><b>Sprinkler system requirements:</b> Technical standards, manufacturers guidance, standards, codes of practice, manufacturers and other guidance, best practice, new developments. Design, installation, commissioning, servicing and maintenance requirements. See Appendix 1.</p> <p><b>Water undertaker:</b> Legislation requirements, water regulations, water undertaker consultations, water supply consultations, water main connections, backflow prevention, booster pumps, tank air gaps, vortex and overflow requirements. Ofwat requirements. See Appendix 1.</p> <p><b>Electrical regulation:</b> Legislation requirements, electrical regulations. See Appendix 1.</p>
	1.8 Identify <b>electrical regulation</b> requirements relevant to residential sprinkler system installations	
	1.9 <b>Communicate</b> requirements for residential sprinkler systems to <b>customer</b> and <b>stakeholders</b>	
	1.10 Confirm <b>customer</b> and <b>stakeholder understanding</b> of residential <b>sprinkler system requirements</b>	
2. Be able to identify and collate information for the design, installation, commissioning, servicing and maintenance of residential sprinkler systems	2.1 Explain how <b>building construction</b> impacts on the design, installation, commissioning, servicing and maintenance of residential sprinkler systems	<p><b>Building construction:</b> Construction of building, specialist advice, plan drawing, interpreting and preparing plans, weight impact (water storage).</p> <p><b>Impact:</b> Accessibility, occupied buildings, risk assessment, hazards, obstructions to head spray pattern e.g. shadowing, beams, light fittings. Existing services, suitability, integration, conflicts. Conservation requirements. Component location, valve set, tanks, drainage points. Drainage requirements for commissioning, servicing and maintenance. System components</p>
	2.2 Identify issues which <b>impact</b> on residential sprinkler system requirements	

	2.3 Explain suitable options for <b>water supplies to customer and stakeholders</b>	<p>sprinkler head types, pipe type, water supplies type and location, location of valve work, electrical supplies, frost protection. Fire strategy, evacuation strategy, alarm options and arrangements, monitored systems, alarm receiving centres.</p> <p><b>Water supplies:</b> Water supply options, water mains and tank feed supplies, fluctuations in towns mains, dynamic flow and pressure, pump, booster pumps, pump controller location and options, tank options and location.</p> <p><b>Customer:</b> Sprinkler system requirements, fire strategy, occupancy and use of building.</p> <p><b>Stakeholders:</b> AHJ; building control, fire authority, local authority departments, planning and conservation bodies, water undertaker, insurance companies, HSE, third party certification bodies.</p> <p><b>Other services:</b> Suitability of existing e.g. water and electrical, integration issues, HVAC systems, gas, electrical, drainage etc.</p> <p><b>Technical requirements:</b> Legislation requirements, national requirements, technical standards, manufacturers guidance, standards, codes of practice, manufacturers and other guidance, best practice, new developments. See Appendix 1.</p> <p><b>Site survey:</b> Construction of building, specialist advice, plan drawing, interpreting and preparing plans, recording methods, risk assessment, recognised survey methods.</p>
2.4 Identify <b>other services</b> which may impact on sprinkler system requirements		
2.5 Check the <b>technical requirements</b> of other services		
2.6 Agree suitable options for system components with <b>customer and stakeholders</b>		
2.7 Agree location options of system components with <b>customer and stakeholders</b>		
2.8 Agree evacuation and alarm arrangements with <b>customer and stakeholders</b>		
2.9 Confirm <b>customer and stakeholders'</b> understanding of sprinkler system options and their <b>impact</b>		
2.10 Conduct a <b>site survey</b>		

3. Be able to determine type and category of sprinkler systems	3.1 Identify requirements to determine <b>type and category</b> of system	<b>Type and category:</b> Technical standards, manufacturers guidance, Standards, codes of practice, manufacturers and other guidance, best practice, new developments. National requirements, building and occupancy type, design density, duration of supply, vulnerable persons, compensatory features, special circumstances, fire loading, deviations, areas of non-compliance. Fire strategy.
	3.2 Determine <b>type and category</b> of system	
4. Be able to agree criteria for sprinkler system specifications	4.1 <b>Explain specification options to stakeholders</b>	<b>Explain/confirm:</b> Communication skills, advice, impartial, cost effective, advantages and disadvantages of system specification, recording methods, professionalism, data protection, commercial confidentiality. <b>Specification:</b> Legislation requirements, standards, codes of practice, manufacturer's guidance, guidance documents, best practice. Fire strategy, category of system, vulnerable persons, compensatory features, special circumstances, occupancy, fire loading, deviations, areas of non-compliance, aesthetics, site specific requirements, integration with other services, timescales. Type and location of sprinkler heads, pipework, valves, water supplies, pumps, frost protection, alarm arrangements and their associated equipment. Methodology for installation, commissioning, servicing and maintenance. <b>Customer:</b> Sprinkler system requirements, fire strategy, occupancy and use of building. <b>Stakeholders:</b> AHJ; building control, fire authority, local authority departments, planning and conservation bodies, water undertaker, insurance companies, HSE, third party certification bodies.
	4.2 <b>Confirm specification for sprinkler system with customer and stakeholders</b>	

**Additional information about the unit**

**Delivery guidance**

This unit is about responding to requests for designing residential sprinkler systems, collecting and recording information for the design, supply, installation, commissioning, servicing and maintenance of residential sprinkler systems. It includes discussing customer and stakeholder requirements, advising on options available, requirements of residential sprinkler systems and conducting site surveys.

The unit is recommended for practitioners, i.e. anyone who is employed or contracted to work with others in an organisation – specifiers, designers, installers, commissioners, service and maintenance engineers, regulators, specifiers, owners, facility and building managers - to ensure that, within the scope of their responsibility, suitable and sufficient residential sprinkler systems are specified, designed, installed, commissioned, serviced and maintained.

The unit has been designed to meet the needs of individuals who work, or intend to work, in a position where they are involved in the design and quotation of residential sprinkler systems.

It is also appropriate for those involved in regulating and advising on residential sprinkler systems, i.e. anyone who has the responsibility for ensuring the requirements of residential sprinkler systems and associated regulation are being met through cooperation or enforcement.

**Assessment guidance**

For the knowledge and understanding component of the unit, assessment from a learning and development environment is allowed.

For the practical components, assessment can take place either in the workplace or in a realistic working environment (RWE).

Further guidance can be found in Section 5: Assessment.

**Links**

This unit is based on National Occupational Standards: SFS MFP 1: Establish customer requirements for a mechanical fire protection system.

<b>Title</b>	Design residential sprinkler systems	
<b>Level</b>	3	
<b>Unit Number</b>	3	
<b>TQT</b>	60	
<b>GLH</b>	40	
<b>Learning Outcomes</b> <i>The learner will:</i>	<b>Assessment Criteria</b> <i>The learner can:</i>	<b>Guidance and/or Indicative Content</b>
1. Be able to determine specification for residential sprinkler systems	1.1 <b>Review specification</b> options for sprinkler systems with <b>customer</b> and <b>stakeholders</b>	<p><b>Customer:</b> Including owner, architect, facilities management company, occupier etc.</p> <p><b>Stakeholder:</b> AHJ; building control, fire authority, local authority departments, planning and conservation bodies, water undertaker, insurance companies, HSE, third party certification bodies.</p> <p><b>Requirements:</b> Fire strategy, vulnerable persons, compensatory features, special circumstances, occupancy, fire loading, aesthetics, deviations, areas of non-compliance, timescales, professionalism, data protection, commercial confidentiality.</p> <p><b>Review/agree:</b> Communication skills, advice, impartial, cost effective, recording methods, professionalism, scope, limitations, information gaps, site access, timescales, integration with other services, advantages and disadvantages of system, data protection, commercial confidentiality.</p> <p><b>Specification:</b> Legislation requirements, standards, codes of practice, manufacturer's guidance, guidance documents, best practice. Fire strategy, category of system, vulnerable persons,</p>
	1.2 <b>Agree</b> sprinkler system <b>specification</b> with <b>customer, stakeholders, building control</b> and <b>water undertakers</b>	



		<p>compensatory features, special circumstances, occupancy, fire loading, deviations, areas of non-compliance, aesthetics, site specific requirements, integration with other services, timescales. Type and location of sprinkler heads, pipework, valves, water supplies, pumps, frost protection, alarm arrangements and their associated equipment. Methodology for installation, commissioning, servicing and maintenance.</p> <p><b>Building control:</b> Local authority building control, approved inspectors.</p> <p><b>Water undertaker:</b> Legislation requirements, water regulations, water undertaker consultations, water supply consultations, water main connections, backflow prevention, booster pumps, tank air gaps, vortex and overflow requirements. Ofwat requirements. See Appendix 1.</p>
<p>2. Understand issues which impact on design, installation, commissioning and maintenance of residential sprinkler systems</p>	<p>2.1 Identify issues which <b>impact</b> on system design</p>	<p><b>Impact:</b> Aesthetics, accessibility, occupied buildings, risk assessment, hazards, obstructions to head spray pattern e.g. shadowing, beams, light fittings. Existing services, suitability, integration, conflicts. Conservation requirements. Component location, valve set, tanks, drainage points. Commissioning, servicing and maintenance drainage, accessibility and other requirements for. System components sprinkler head types, pipe type, water supplies type and location, location of valve work, electrical supplies, frost protection. Fire strategy, evacuation strategy, alarm options and arrangements, monitored systems, alarm receiving centres. Space for installation, storage of tools, equipment and components, parking, unloading, overnight accommodation.</p>
	<p>2.2 Identify issues which <b>impact</b> on system installation</p>	
	<p>2.3 Identify issues which <b>impact</b> on system commissioning, servicing and maintenance</p>	

3. Be able to determine type of sprinkler heads, pipework and valve arrangements for residential sprinkler systems	3.1 Determine type and make of <b>sprinkler heads</b>	<p><b>Sprinkler heads:</b> National requirements, technical standards, manufacturers guidance, Standards, codes of practice, manufacturers and other guidance, best practice, new developments. Aesthetics, occupancy, sprinkler head type, make and model, side wall, concealed, pendant, recessed, component performance, manufacturer data sheet. Building and occupancy type, design density.</p> <p><b>Pipework:</b> National requirements, technical standards, manufacturers guidance, Standards, codes of practice, manufacturers and other guidance, best practice, new developments. Aesthetics, occupancy, types, component performance, CPVC, copper, steel, brackets, sealants, manufacturer data sheet.</p> <p><b>Valve:</b> National requirements, technical standards, manufacturers guidance, standards, codes of practice, manufacturers and other guidance, best practice, new developments. Aesthetics, occupancy, type, location, component performance, manufacturer data sheet.</p>
	3.2 Determine type of <b>pipework</b>	
	3.3 Determine <b>valve</b> arrangements	
4. Be able to determine location of sprinkler heads for residential systems	4.1 Determine <b>areas of coverage</b>	<p><b>Area of coverage:</b> National requirements, technical standards, manufacturers guidance, standards, codes of practice, manufacturers and other guidance, best practice, new developments. Definitions, manufacturer data sheet, design density, sloped ceilings, area of operation, head spacing limitations, heat sources, obstructions e.g. beams, light fittings, shadowing.</p> <p><b>Sprinkler heads:</b> National requirements and technical standards options; manufacturer data sheet, aesthetics, flow and pressure characteristics, types of head, commercial considerations.</p>
	4.2 Determine location of <b>sprinkler heads</b>	

5. Be able to determine full hydraulic calculations for residential sprinkler systems	5.1 Determine type and <b>category of sprinkler system</b>	<p><b>Category of sprinkler system:</b> Legislation requirements, national requirements, technical standards, manufacturers guidance, Standards, codes of practice, manufacturers and other guidance, best practice, new developments. Fire strategy, vulnerable persons, compensatory features, special circumstances, occupancy, fire loading, site specific requirements, deviations, areas of non-compliance.</p> <p><b>Remote and favourable locations:</b> Hydraulically most remote heads, hydraulically most favourable heads, technical standards, codes of practice, definitions, manufacturer's guidance.</p> <p><b>Area of operation:</b> national requirements, technical standards, manufacturers guidance, standards, codes of practice, manufacturers and other guidance, best practice, new developments. Fire strategy.</p> <p><b>Full hydraulic calculations:</b> National requirements, sprinkler head data sheets, design density, Hazen Williams formula, K factor, full hydraulic calculations (FHC), hydraulically most remote, hydraulically most favourable, area of operation, design density. Mathematical calculations, scientific calculators.</p> <p><b>Recognised sprinkler design software:</b> Full hydraulic calculation software e.g. Canute FHC, AutoSPRINK, Elite Fire, HASS, SprinkCAD, OmniCADD, Revit Fire Sprinklers. Hydraulically most remote, hydraulically most favourable, area of operation, design density, 'tree' pipe arrangements, hydraulic calculations, looped and grid pipe arrangements hydraulic calculations, pump curves, Qmax.</p>
	5.2 Determine hydraulically most <b>remote and favourable locations</b> and <b>area of operation</b>	
	5.3 Using calculators, determine <b>full hydraulic calculations</b> for sprinkler system	
	5.4 Determine <b>full hydraulic calculations</b> for complex sprinkler systems using recognised <b>sprinkler design software</b>	

6. Be able to determine water supply for residential sprinkler systems	6.1 Identify options for <b>water supplies</b>	<p><b>Water supplies:</b> Legislation requirements, water regulations, design requirements, codes of practice, manufacturer's guidance, guidance documents, best practice. Fire strategy, occupancy, vulnerable persons, compensatory features, special circumstances, fire loading, site specific requirements, customer requirements. deviations, areas of non-compliance. Mains water supply, water meters, backflow prevention devices, connections. Fluctuations in supply, dedicated, shared and communal supplies. Tanks options: Tanks linked as common supply, underground, roof mounted, outdoor, frost protection. Fill, refill and overflow options. Air gap, backflow prevention and overflow requirements. Contents monitoring. Booster pumps, pumps for tanks, pump selection, pump curves, location, access, fire and frost protection, testing rationale, component performance. Hydraulic losses between; tank and pump, pump and valve set test point. Stored water supplies, hydraulically most favourable requirements, pump selection, pump curve, Q max; effective water capacity, air gap, unusable water, reduced capacity, proven infill. Water tank calculations regulations, overflow arrangements, tank location and available space, component performance.</p> <p><b>Electrical system:</b> Pumps, wiring arrangements, alarms, sensors, pump control panel, automatic testing facility, component performance.</p>
	6.2 Confirm <b>water supply</b> requirements for sprinkler systems	
	6.3 Determine <b>water supply</b> for sprinkler systems	
	6.4 Identify <b>electrical system</b> requirements for water supplies	

7. Be able to determine alarm requirements for residential sprinkler systems	7.1 Identify options for <b>alarm arrangements</b>	<p><b>Alarm arrangements:</b> Legislation requirements, electrical regulations, design requirements, codes of practice, manufacturer's guidance, guidance documents, best practice. Monitored systems, remote monitors systems.</p> <p>Fire strategy, stakeholder requirements, evacuation policy, interface with other systems, electrical codes of practice, alarms control panels, alarms and associated fittings, battery backup, component performance.</p>
	7.2 Determine <b>alarm requirements</b>	
8. Be able to determine protection from frost for residential sprinkler systems	8.1 Identify options for frost <b>protection</b>	<p><b>Protection:</b> Water regulations, heating envelope of building, anti-freeze and its disposal, insulation options, trace heating, control equipment, component performance.</p>
	8.2 Determine <b>protection</b> from frost arrangements	
9. Be able to complete residential sprinkler system proposal documentation	9.1 Compile documentation for a sprinkler system design <b>proposal</b>	<p><b>Proposal:</b> Installation drawing, design specification, component inventory, quality management process.</p> <p><b>Customer:</b> Sprinkler system requirements, fire strategy, occupancy and use of building.</p> <p><b>Stakeholders:</b> AHJ; Building Control, Fire Authority, Local authority departments, Planning and conservation bodies, Water Undertaker, Insurance Companies, HSE, Third party certification bodies.</p> <p><b>Confirm:</b> Communication skills, advice, impartial, cost effective, professionalism, limitations, scope, advantages and disadvantages of specification, customer responsibilities, data protection, commercial confidentiality.</p>
	9.2 Complete a sprinkler system design <b>proposal</b>	
	9.3 <b>Confirm to customer and stakeholders</b> their understanding of sprinkler system design <b>proposal</b>	
10. Be able to amend design specifications of residential	10.1 Identify areas where <b>variations</b> to a design specification are required	<p><b>Variations:</b> Changes to: Stakeholder, building control and water undertaker requirements, fire strategy, category of system,</p>

sprinkler systems to reflect installed systems	10.2 Identify suitable <b>components</b> and associated services to address <b>variations</b> to a design specification	<p>building use; construction, design, layout and aesthetics. Installation issues and conflicts e.g. construction, integration, electrical supply, HVAC systems, gas, drainage, location issues (e.g. heads, tanks and pumps) availability and suitability of components and water supplies.</p> <p><b>Components:</b> Sprinkler heads, valves, pipework, brackets, tanks, pumps, alarm integration.</p> <p><b>Design specification:</b> As per outcomes 1-9.</p>
	10.3 Amend a <b>design specification</b> and re-calculate to take account of variations	
<b>Additional information about the unit</b>		
Delivery guidance	<p>This unit is about designing residential sprinkler systems and producing a specification for the design. It includes confirming customer and stakeholder requirements, options available, determining suitable components and completing full hydraulic calculations. It also includes making adjustments to the design specification to ensure the installed system reflects the installed system.</p> <p>The unit is recommended for practitioners, i.e. anyone who is employed or contracted to work with others in an organisation – specifiers, designers, installers, commissioners, service and maintenance engineers, regulators, specifiers, owners, facility and building managers - to ensure that, within the scope of their responsibility, suitable and sufficient residential sprinkler systems are specified, designed, installed, commissioned, serviced and maintained.</p> <p>The unit has been designed to meet the needs of individuals who work, or intend to work, in a position where they are involved in the design of residential sprinkler systems.</p> <p>It is also appropriate for those involved in regulating and advising on residential sprinkler systems, i.e. anyone who has the responsibility for ensuring the requirements of residential sprinkler systems and associated regulation are being met through cooperation or enforcement.</p>	
Assessment guidance	For the knowledge and understanding component of the unit, assessment from a learning and development environment is allowed.	

	<p>For the practical components, assessment can take place either in the workplace or in a realistic working environment (RWE).</p> <p>Further guidance can be found in Section 5: Assessment.</p>
Links	<p>This unit is based on National Occupational Standards: SFS MFP 3: Design systems for mechanical fire protection.</p>

<b>Title</b>	Produce quotations for residential sprinkler systems	
<b>Level</b>	3	
<b>Unit Number</b>	4	
<b>TQT</b>	30	
<b>GLH</b>	15	
<b>Learning Outcomes</b> <i>The learner will:</i>	<b>Assessment Criteria</b> <i>The learner can:</i>	<b>Guidance and/or Indicative Content</b>
1. Be able to identify information required to provide quotes for residential sprinkler systems	1.1 Gather information on <b>building construction</b> relevant to a quote	<p><b>Building construction:</b> Width, length and heights, construction materials, hazards.</p> <p><b>Confirm:</b> Communication skills, scope, information required, limitations, information gaps, information provided, areas of confusion and misunderstanding, site access, advice, impartial, cost effective, recording methods, professionalism, data protection, commercial confidentiality.</p> <p><b>Customer:</b> Sprinkler system requirements, fire strategy, occupancy and use of building.</p> <p><b>Stakeholders:</b> AHJ; building control, fire authority, local authority departments, planning and conservation bodies, water undertaker, insurance companies, HSE, third party certification bodies.</p> <p><b>Building control:</b> Local authority building control, approved inspectors.</p> <p><b>Water undertaker:</b> Legislation requirements, water regulations, water undertaker consultations, water supply consultations, water main connections, backflow prevention, booster pumps, tank air</p>
	1.2 <b>Confirm customer, stakeholder, building control and water undertaker</b> requirements	
	1.3 <b>Confirm</b> sprinkler system <b>specification</b> with <b>customer</b> and <b>stakeholders</b>	
	1.4 Identify <b>accessibility</b> issues to the building	



		<p>gaps, vortex and overflow requirements. Ofwat requirements. See Appendix 1.</p> <p><b>Specification:</b> Legislation requirements, standards, codes of practice, manufacturer’s guidance, guidance documents, best practice. Fire strategy, category of system, vulnerable persons, compensatory features, special circumstances, occupancy, fire loading, deviations, areas of non-compliance, aesthetics, site specific requirements, integration with other services. Type and location of sprinkler heads, pipework, valves, water supplies, pumps, frost protection, alarm arrangements and their associated equipment. Methodology for installation, commissioning, servicing and maintenance, recording methods, data protection, timescales, commercial confidentiality.</p> <p><b>Accessibility:</b> Site access, vehicular access, storage, occupied premises, restricted hours.</p>
2. Be able to identify suitable components for residential sprinkler systems	2.1 Identify <b>components</b> suitable for sprinkler systems	<p><b>Components:</b> Legislation requirements, standards, codes of practice, manufacturer’s guidance, guidance documents, best practice, performance, new developments, advice, impartial, cost effective. Fire strategy, category of system, vulnerable persons, compensatory features, special circumstances, occupancy, fire loading, aesthetics.</p>
	2.2 Identify suitable <b>components</b> to fulfil a specification	
3. Be able to estimate water supply requirements for residential sprinkler systems	3.1 Identify <b>water supplies</b> suitable for sprinkler systems	<p><b>Water supplies:</b> Water supply options, water mains and tank feed supplies, fluctuations in towns mains, dynamic flow and pressure, pump, booster pumps, pump controller location and options, tank options and location. Existing water supplies, hydraulic calculations, estimation.</p>
	3.2 Select a suitable <b>water supply</b> to fulfil a specification	

4. Be able to estimate costs of residential sprinkler system components	4.1 Identify <b>costs</b> of individual sprinkler system components	<p><b>Costs:</b> Advise, impartial, cost effective, manufactures, suppliers of sprinkler heads, pipework, fittings, valves, pressure gauges, tanks, pumps, control panels, alarms and associated fittings.</p> <p><b>Estimate:</b> Legislation requirements, standards, codes of practice, manufacturer's guidance, guidance documents, best practice. Fire strategy, category of system, vulnerable persons, compensatory features, special circumstances, occupancy, fire loading, aesthetics.</p>
	4.2 <b>Estimate costs</b> of components to fulfil a specification	
5. Be able to prepare and issue quotations for residential sprinkler systems	5.1 Identify any <b>limitations</b> to a <b>quote</b>	<p><b>Limitations:</b> Quote criteria, scope, principles, specifications, qualifications, constraints, exclusions.</p> <p><b>Prepare:</b> Documentation, plans, design specification, component inventory, recipients.</p> <p><b>Quote:</b> Labour charges, overheads, profit margin, logistics, customer requirements, sprinkler system specification, deviations, areas of non-compliance, communication methods, estimating, contracts, exclusions, terms and conditions, programme of work, installation, commissioning, servicing and maintenance equipment and staff requirements, timescales. Contractual requirements, customer responsibilities, areas of confusion and misunderstanding, quote recipients.</p> <p><b>Stakeholders:</b> Customer (including architect, owner, facilities management company, occupier), AHJ; building control, fire authority, local authority departments, planning and conservation bodies, water undertaker, insurance companies, HSE, third party certification bodies.</p> <p><b>Confirm:</b> Communication skills, advice, impartial, cost effective, professionalism, limitations, scope, customer responsibilities, data protection, commercial confidentiality</p>
	5.2 <b>Prepare</b> information to issue <b>quotes</b>	
	5.3 Provide <b>quotes</b> for providing a sprinkler system	
	5.4 <b>Confirm quote</b> complies with legislation, technical and sprinkler system specification requirements	
	5.5 <b>Confirm stakeholders'</b> understanding of quote for a sprinkler system	

Additional information about the unit	
Delivery guidance	<p>This unit is about establishing the cost of sprinkler systems, preparing and issuing quotations for its design, installation, commissioning, servicing and maintenance. It includes discussing customer and stakeholder requirements, advising on options available and requirements of residential sprinkler systems.</p> <p>The unit is recommended for practitioners, i.e. anyone who is employed or contracted to work with others in an organisation – specifiers, designers, installers, commissioners, service and maintenance engineers, regulators, specifiers, owners, facility and building managers - to ensure that, within the scope of their responsibility, suitable and sufficient residential sprinkler systems are specified, designed, installed, commissioned, serviced and maintained.</p> <p>The unit has been designed to meet the needs of individuals who work, or intend to work, in the provision of quotations for residential sprinkler systems.</p> <p>It is also appropriate for those involved in regulating and advising on residential sprinkler systems, i.e. anyone who has the responsibility for ensuring the requirements of residential sprinkler systems and associated regulation are being met through cooperation or enforcement.</p>
Assessment guidance	<p>For the knowledge and understanding component of the unit, assessment from a learning and development environment is allowed.</p> <p>For the practical components, assessment can take place either in the workplace or in a realistic working environment (RWE).</p> <p>Further guidance can be found in Section 5: Assessment.</p>
Links	<p>This unit is based on National Occupational Standards: SFS MFP 2: Prepare and produce quotations for mechanical fire protection systems.</p>

## 4 Centre Requirements

Centres must be approved by SFJ Awards and also have approval to deliver the qualifications they wish to offer. This is to ensure centres have the processes and resources in place to deliver the qualifications. Approved centres must adhere to the requirements detailed in the SFJ Awards Centre Handbook, which includes information for centres on assessment and internal quality assurance (IQA) processes and procedures and is available in the centres' area of the SFJ Awards website <http://sfjawards.com/approved-centres>.

Centres are responsible for ensuring that their assessor and internal quality assurance staff:

- are occupationally competent and/or knowledgeable as appropriate to the assessor or IQA role they are carrying out
- have current experience of assessing/internal quality assuring as appropriate to the assessor or IQA role they are carrying out, and
- have access to appropriate training and support.

Information on the induction and continuing professional development of those carrying out assessment and internal quality assurance must be made available by centres to SFJ Awards through the external quality assurance process.

This qualification handbook should be used in conjunction with the SFJ Awards Centre Handbook, the SFJ Awards Assessment Guidance and the SFJ Awards Quality Assurance (Internal and External) Guidance, available in the centres' area of the SFJ Awards website <http://sfjawards.com/approved-centres>.

# 5 Assessment

The Qualification Assessment Strategy has been developed in collaboration with organisations involved in the sprinkler sector such as third party certification bodies, professional bodies, designers, installers, service engineers and training providers. It has been designed to support the delivery and assessment of the SFJ Awards Level 3 Certificate in Residential Sprinkler System Design.

## 5.1 Qualification assessment methods

The SFJ Awards Level 3 Certificate in Residential Sprinkler System Design is assessed by a portfolio of evidence, which can include:

- Assignments
- Case studies
- Course work
- Direct observation
- Expert witness testimony
- Records of professional discussions, question and answer sessions
- Reflective accounts
- Reports
- Reviews of systems
- Workplace assessments

Evidence generated by learners will be internally set, marked and verified and externally quality assured by SFJ Awards.

Learners must demonstrate that they have met all assessment criteria of all units.

The qualification is not graded and learners who achieve the qualification will receive a Pass.

## 5.2 Trainer requirements

Trainers must be trained and qualified as teachers and occupationally competent. Trainers are not required to be occupationally competent in all areas of the qualification, but they must be for the assessment criteria they are teaching.

Trainers must meet all the following requirements:

- **Teaching competence:** this includes holding a suitable teaching qualification or evidence they are working towards it, and equivalent teaching experience; they must be able to use a range of teaching methods to facilitate learning and manage learners with reasonable adjustments. They must adhere to all procedures as set out

by the centre and recognise the importance of maintaining communication with learners and assessors.

- **Technical competence:** this could include holding a suitable qualification, membership of a relevant professional body and/or experience in the sprinkler industry evidenced by a curriculum vitae which must be supported by references.
- **Operational experience:** at least 2 years but preferably 5 years' experience of the sprinkler industry, providing them with in-depth knowledge and understanding at a level higher than that which they are teaching; they must be familiar with the underpinning national occupational standards.
- **Evidence of how they have maintained their competence:** this could include evidence of attending continuous professional development events and/or other means of maintaining currency in the industry which can be evidenced. Their level of competence must be sufficient to be able to teach learners. They will need to be familiar with the latest developments in legislation relating to sprinkler systems and up to date technology used in the industry including software tools.

### 5.3 Assessor and internal quality assurer quality assurer requirements

#### 5.3.1 Assessor requirements

Assessors must be trained and qualified as assessors and occupationally competent. Assessors are not required to be occupationally competent in all areas of the qualification, but they must be for the assessment criteria they are assessing.

Assessors must meet all the following requirements:

- **Assessor competence:** this includes holding a suitable assessor qualification or evidence they are working towards it, and equivalent assessing experience; they must be able to distinguish permitted forms of evidence, record evidence of learner performance, adhere to all procedures as set out by the centre and recognise the importance of maintaining communication with learners and internal quality assurers.
- **Technical competence:** this could include holding a suitable qualification, membership of a relevant professional body and/or experience in the sprinkler industry evidenced by a curriculum vitae which must be supported by references.
- **Operational experience:** at least 2 years but preferably 5 years' experience of the sprinkler industry, providing them with in-depth knowledge and understanding at a level higher than that which they are assessing; they must be familiar with the underpinning national occupational standards.
- **Evidence of how they have maintained their competence:** this could include evidence of attending continuous professional development events and/or other means of maintaining currency in the industry which can be evidenced. Their level of competence must be sufficient to be able to assess learners. They will need to be familiar with the latest developments in legislation relating to sprinkler systems and up to date technology used in the industry including software tools.

Approved centres will be required to provide SFJ Awards with current evidence of how each assessor meets these requirements, for example certificates of achievement or references.

### 5.3.2 Internal quality assurer (IQA) requirements

Internal quality assures (IQAs) must be trained and qualified as IQAs and occupationally competent. IQAs are not required to be occupationally competent in all areas of the qualification, but they must be for the assessment criteria and corresponding evidence of assessment they are quality assuring.

IQAs must meet the following requirements:

- **IQA competence:** this includes holding a suitable IQA qualification or evidence they are working towards it, and equivalent IQA experience; they must be able to distinguish permitted forms of evidence, know how to record evidence of learner performance, adhere to all procedures as set out by the centre, implement quality assurance and administration processes as specified by SFJ Awards and recognise the importance of maintaining communication with learners and assessors; they must have the authority and resources to be able to advise and organise the work of assessors. It is also recommended that they hold the same or an equivalent assessor qualification to the assessors whose judgements they are internally quality assuring. They must understand the nature and context of the assessors' work and that of their learners. This means that they must have worked closely with staff who carry out the functions covered by the qualifications, possibly by training or supervising them, and have sufficient knowledge of these functions to be able to offer credible advice on the interpretation of the units. They must understand the content, structure and assessment requirements for the qualification(s) they are internal quality assuring\*.
- **Technical competence:** this could include holding a suitable qualification, membership of a relevant professional body and/or experience in the sprinkler industry evidenced by a curriculum vitae which must be supported by references.
- **Operational experience:** at least 2 years but preferably 5 years' experience of the sprinkler industry, providing them with in-depth knowledge and understanding at a level higher than that which they are internally quality assuring; they must be familiar with the underpinning national occupational standards.
- **Evidence of how they have maintained their competence:** this could include evidence of attending continuous professional development events and/or other means of maintaining currency in the industry which can be evidenced. Their level of competence must be sufficient to be able to quality assure assessment decisions made by assessors. They will need to be familiar with the latest developments in legislation relating to sprinkler systems and up to date technology used in the industry including software tools.

*\*Centres should provide IQAs with an induction to the qualifications that they are responsible for quality assuring. IQAs should also have access to ongoing training and updates on current issues relevant to this qualification.*

Approved centres will be required to provide SFJ Awards with current evidence of how each member of their team meets these requirements, for example certificates of achievement or references.

## 5.4 Expert witnesses

Expert witnesses, for example line managers and supervisors, can provide evidence that a learner has demonstrated competence in an activity. Their evidence contributes to performance evidence and has parity with assessor observation. Expert witnesses do not however perform the role of assessor.

### 5.4.1 Occupational competence

Expert witnesses must, according to current sector practice, be competent in the functions covered by the units for which they are providing evidence.

They must be able to demonstrate consistent application of the skills and the current supporting knowledge and understanding in the context of a recent role directly related to the qualification unit that they are witnessing as a practitioner, trainer or manager.

### 5.4.2 Qualification knowledge

Expert witnesses must be familiar with the qualification unit(s) and must be able to interpret current working practices and technologies within the area of work.

## 5.5 Assessing competence

The purpose of assessing competence is to make sure that an individual is competent to carry out the activities required in their work. Assessors gather and judge evidence during normal work activities to determine whether the learner demonstrates their competence against the standards in the qualification unit(s). Competence should be demonstrated at a level appropriate to the qualification. The skills required at the different qualification levels are defined in Ofqual's level descriptors.<sup>2</sup> Further information on qualification levels is included in the SFJ Awards Assessment Guidance.

Evidence must be:

- Valid
- Authentic
- Sufficient
- Current
- Reliable.

Evidence of learner attainment must be generated through real work activities either in the workplace or in a realistic working environment (RWE), reflecting as far as possible the typical conditions and constraints experienced in relation to sprinkler system design and be as naturally occurring as possible.

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<sup>2</sup> Qualification and Component Levels, Ofqual November 2018, <https://www.gov.uk/guidance/ofqual-handbook/section-e-design-and-development-of-qualifications>



## **5.6 Methods for assessing competence**

Qualifications may be assessed using any method, or combination of methods in Section 5.1, which clearly demonstrate that the learning outcomes and assessment criteria have been met.

Assessors need to be able to select the right assessment methods for the competences that are being assessed, without overburdening the learner or the assessment process, or interfering with everyday work activities. SFJ Awards expects assessors to use a combination of different assessment methods to make decisions about an individual's occupational competence. Further information on assessment methods is provided below and in the SFJ Awards Assessment Guidance.

### **5.6.1 Observation**

SFJ Awards believes that direct observation in the workplace by an assessor or testimony from an expert witness is preferable for the competence-based assessment criteria as it allows for authenticated, valid and reliable evidence. Where learners demonstrate their competence in a real work situation, this must be done without the intervention from a tutor, supervisor or colleague.

However, SFJ Awards recognises that alternative sources of evidence and assessment methods including reflective accounts, professional discussion or witness testimony, may have to be used where direct observation not possible or practical.

### **5.6.2 Testimony of witnesses and expert witnesses**

Witness testimonies are an accepted form of evidence by learners when compiling portfolios. Witness testimonies can be generated by peers, line managers and other individuals working closely with the learner. Witnesses are defined as being those people who are occupationally expert in their role.

Testimony can also be provided by expert witnesses who are occupationally competent and familiar with the qualification/unit(s)/criteria. Expert witnesses are the preferred witness type recommended by SFJ Awards as they provide a stronger form of evidence which is more easily authenticated and verified.

The assessor should consider witness testimonies of either type as a typical form of evidence. Assessors are therefore responsible for making the final judgement in terms of the learner meeting the evidence requirements of the qualification/unit(s)/criteria.

### **5.6.3 Work outputs (product evidence)**

Examples of work outputs include plans, reports, budgets, photographs, videos or notes of an event. Assessors can use work outputs in conjunction with other assessment methods, such as observation and discussion, to confirm competence and assure authenticity of the evidence presented.

#### **5.6.4 Professional discussion**

Professional discussions are a free-flowing two-way dialogue between the assessor and learner. It should not be confused with questioning where the assessor asks specific questions and the learner provides answers. Discussions allow the learner to describe and reflect on their performance and knowledge in relation to the standards. Assessors can use discussions to test the authenticity, validity and reliability of a learner's evidence. Written/audio/electronic records of discussions must be maintained.

#### **5.6.5 Questioning the learner**

Questioning can be carried out orally or in written form and used to cover any gaps in assessment or corroborate other forms of evidence. Written/audio/electronic records of all questioning must be maintained.

#### **5.6.6 Simulations**

Assessment in a simulated environment is permitted for some competence-based assessment criteria where it may be impractical, hazardous and dependent on the occurrence of rare/emergency circumstances or requiring a time frame inappropriate to be undertaken in a real work situation.

In all cases, the simulated evidence must be gathered from a realistic working environment (RWE). The RWE should feature, as far as possible, the same conditions and limitations as would be experienced undertaking the same activity in a real work situation, including equipment, facilities and interpersonal factors.

Simulations may take place either in an operational or non-operational environment, for example a training centre, or in the learner's workplace. Proposed simulations must be reviewed to ensure they are fit for purpose as part of the IQA's pre-delivery activity. All simulations must be planned, developed and documented by centres with the involvement of both the assessor and IQA. Advice and agreement must be sought in advance with the SFJ Awards EQA and all subsequent simulation must adhere to these plans.

SFJ Awards will ensure that any use of simulated activity by an approved centre meets the requirements detailed in the Qualification Handbook, including comparability with conducting the same activity in a real work situation and that the evidence gathered is valid and demonstrates the competence of learners to undertake those same tasks in their workplace.

Simulations can be used when:

- the employer or assessor consider that evidence in the workplace will not be demonstrated within a reasonable timeframe
- there are limited opportunities to demonstrate competence in the workplace against all the assessment criteria
- there are health and safety implications due to the high risk nature of the work activity
- the work activity is non-routine and assessment cannot easily be planned for
- assessment is required in more difficult circumstances than is likely to happen day to day.

Simulations must follow the principles below:

1. The nature of the contingency and the physical environment for the simulation must be realistic
2. Learners should be given no indication as to exactly what contingencies they may come across in the simulation
3. The demands on the learner during the simulation should be no more or less than they would be in a real work situation
4. Simulations must be planned, developed and documented by the centre in a way that ensures the simulation correctly reflects what the specific qualification unit seeks to assess and all simulations should follow these documented plans
5. There should be a range of simulations to cover the same aspect of a unit and they should be rotated regularly.

### **5.6.7 Competency-based assessments**

Assessment of the competence-based assessment criteria of this qualification will be by the following approaches:

#### **Communication skills**

Using realistic role play communicate with customers and stakeholders:

Assessment criteria:

- Unit 2: 1.9, 1.10, 2.3, 2.6, 2.7, 2.8, 2.9, 4.1, 4.2
- Unit 3: 1.1, 1.2, 1.3, 9.3
- Unit 4: 1.3, 5.5

#### **Survey of premises and installations**

Using a RWE to conduct surveys of premises and installations:

Assessment criteria:

- Unit 2: 2.10

#### **Plan based exercises**

Using plan-based exercises of RWE residential premises to design sprinkler systems:

Assessment criteria:

- Using calculators: Unit 3: 5.3
- Using software: Unit 3: 5.4

#### **Documentation**

Using RWE documentation:

Assessment criteria:

- Unit 3: 9.1, 9.2
- Unit 4: 5.2, 5.3

## **Problem resolution**

Using RWE problems:

Assessment criteria:

- Unit 2: 3.1, 3.2
- Unit 3: 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 6.2, 6.3, 6.4, 7.1, 7.2, 8.1, 8.2, 10.1, 10.2, 10.3
- Unit 4: 1.1, 1.2, 1.4, 2.1, 2.2, 3.1, 3.2, 4.1, 4.2, 5.1, 5.4

## **5.7 Assessing knowledge and understanding**

Knowledge-based assessment involves establishing what the learner knows or understands at a level appropriate to the qualification. The depth and breadth of knowledge required at the different qualification levels are defined in Ofqual's level descriptors.<sup>3</sup> Further information on qualification levels is included in the SFJ Awards Assessment Guidance.

Assessments must be:

- Fair
- Robust
- Rigorous
- Authentic
- Sufficient
- Transparent
- Appropriate.

Good practice when assessing knowledge includes use of a combination of assessment methods to ensure that as well as being able to recall information, the learner has a broader understanding of its application in the workplace. This ensures that qualifications are a valid measure of a learner's knowledge and understanding.

A proportion of any summative assessment may be conducted in controlled environments to ensure conditions are the same for all learners. This could include use of:

- Closed book conditions, where learners are not allowed access to reference materials
- Time bound conditions
- Invigilation.

## **5.8 Methods for assessing knowledge and understanding**

Qualifications may be assessed using any method, or combination of methods in Section 5.1, which clearly demonstrate that knowledge-based learning outcomes and assessment

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<sup>3</sup> Qualification and Component Level, Ofqual November 2018

<https://www.gov.uk/guidance/ofqual-handbook/section-e-design-and-development-of-qualifications>

criteria have been met. Knowledge-based assessment criteria may be assessed in a training and development or classroom environment. Evidence of assessment, examples listed below, can be included in a portfolio of evidence.

- Assignments
- Case studies
- Course work
- Expert witness testimony
- Evidenced professional discussions
- Records
- Reflective accounts
- Reviews of systems

Where written assessments are used centres must maintain a bank of assessments that are sufficient to be changed regularly.

Knowledge-based assessment criteria of this qualification are:

- Unit 1: 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 3.2
- Unit 2: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 2.1, 2.2, 2.4, 2.5

## **5.9 Assessment planning**

Planning assessment allows a holistic approach to be taken. Holistic assessments are those which focus on assessment of the learner's work activity as a whole. This means that the assessment:

- reflects the skills requirements of the workplace
- saves time and streamlines processes
- makes the most of naturally occurring evidence opportunities.

Planning assessment enables assessors to track learners' progress and incorporate feedback into the learning process. By effectively planning assessors can therefore be sure that learners have had sufficient opportunity to acquire the skills and knowledge to perform competently and consistently to the standards before being assessed. As a consequence the assessment is a more efficient, cost effective process which minimises the burden on learners, assessors and employers.

## **5.10 Standardisation**

Internal and external standardisation is required to ensure the consistency of evidence, assessment decisions and qualifications awarded over time. Written/audio/electronic records of all standardisation must be maintained, including records of all involved parties.

IQAs should facilitate internal standardisation events for assessors to attend and participate to review evidence used, make judgments, compare quality and come to a common understanding of what is sufficient. In addition, it is also good practice to participate in

external standardisation activities. SFJ Awards will facilitate external standardisation events which are open to centres and their teams.

Further information on standardisation is available in the SFJ Awards Quality Assurance (Internal and External) Guidance and the SFJ Awards Standardisation Policy.

### **5.11 Recognition of Prior Learning (RPL)**

Recognition of prior learning (RPL) is the process of recognising previous formal, informal or experiential learning so that the learner avoids having to repeat learning/assessment within a new qualification. RPL is a broad concept and covers a range of possible approaches and outcomes to the recognition of prior learning (including credit transfer where an awarding organisation has decided to attribute credit to a qualification).

The use of RPL encourages transferability of qualifications and/or units, which benefits both learners and employers. SFJ Awards supports the use of RPL and centres must work to the principles included in Section 6 Assessment and Quality Assurance of the SFJ Awards Centre Handbook and outlined in SFJ Awards Recognition of Prior Learning Policy.

### **5.12 Equality and diversity**

Centres must comply with legislation and the requirements of the RQF relating to equality and diversity. There should be no barriers to achieving a qualification based on:

- Age
- Disability
- Gender
- Gender reassignment
- Marriage and civil partnerships
- Pregnancy and maternity
- Race
- Religion and belief
- Sexual orientation

Reasonable adjustments are made to ensure that learners who have specific learning needs are not disadvantaged in any way. Learners must declare their needs prior to the assessment and all necessary reasonable adjustment arrangements must have been approved by SFJ Awards and implemented before the time of their assessment.

Further information is available in the SFJ Awards Reasonable Adjustments and Special Considerations Policy and the SFJ Awards Equality of Opportunity Policy.

### **5.13 Health and safety**

SFJ Awards is committed to safeguarding and promoting the welfare of learners, employees and volunteers and expect everyone to share this commitment.

SFJ Awards fosters an open and supportive culture to encourage the safety and well-being of employees, learners and partner organisations to enable:

- learners to thrive and achieve
- employees, volunteers and visitors to feel secure

- everyone to feel assured that their welfare is a high priority.

Assessment of competence-based qualifications in the justice sector can carry a high-risk level due to the nature of some roles. Centres must therefore ensure that due regard is taken to assess and manage risk and have procedures in place to ensure that:

- qualifications can be delivered safely with risks to learners and those involved in the assessment process minimised as far as possible
- working environments meet relevant health and safety requirements.

# Appendix 1

## Legislation, Regulations, Standards, Codes of Practice and Guidance

### Introduction

Terms used in the qualification are specific but also generic because acts, regulations, statutory instruments, codes of practice and guidance etc. are regularly updated and any reference to a specific item could render the qualification out-of-date rapidly. Use of the appropriate qualification term will thus encompass any updates.

### Legislation and Regulations

Key current legislation encompass Acts, Orders, Regulations and Statutory instruments. Examples include:

#### Building Legislation

England & Wales: Building Act 1984, The Building Regulations 2010  
Scotland: The Building (Scotland) Act 2003, The Building (Scotland) Regulations 2004  
Northern Ireland: The Building Regulations (Northern Ireland) 2012  
Ireland: Building Control Act 2007

#### Fire Safety Legislation

England & Wales; Regulatory Reform (Fire Safety) Order 2005  
Scotland: The Fire Safety (Scotland) Regulations 2006  
Northern Ireland: The Fire Safety Regulations (Northern Ireland) 2010  
Ireland: Fire Services Act 1981 & 2003

#### Water Regulations

S.I.1999 No. 1148. The Water Supply (Water Fittings) Regulations 1999  
S.I.1999 No.1506. The Water Supply (Water Fittings) (Amendment) Regulations 1999  
S.I.2005 No. 2035. The Water Act 2003 (Consequential and Supplementary Provisions) Regulations 2005  
S.I.2013 No.1387. The Construction Products Regulations 2013  
The Water Supply (Water Fittings) (Scotland) Byelaws 2014  
Water Industry (Scotland) Act 2002  
S.I. 2006 No. 3336. The Water and Sewerage Services (Northern Ireland) Order 2006  
S.R. 2009 No.255. The Water Supply (Water Fittings) Regulations (Northern Ireland) 2009



## Electrical Regulations

S.I. 1989 No. 635. Electricity at Work Regulations 1989

Note: There are reciprocal legislation for other areas of the British Isles e.g. Channel Islands, Isle of Man, Ireland.

## **Standards, Codes of Practice and Guidance**

Key current regulations, standards, codes of practice and guidance relevant to sprinkler systems include:

### Fire Safety Guidance

England & Wales: Approved Documents

Scotland: Technical Handbooks

Northern Ireland: Technical Booklets

Ireland: Technical Guidance Documents

BS 9991 Fire safety in the design, management and use of residential buildings

Fire safety in specialised housing (NFCC)

Fire safety in housing (CFOA)

Fire safety in purpose-built blocks of flats (LGA)

Housing – Fire Safety (LACORS)

Practical Fire Safety Guidance for Existing Premises with Sleeping Accommodation (Scottish Government)

### Sprinkler Standards

BS 9251, BS EN 16925, BS EN 12259, UL 1626, NFPA 13D, NFPA 13R, BS EN 12845,  
Sprinkler rules

### Associated Standards

BS 5839, BS 7671, BS 6920

Note 1: Much guidance is provided by manufacturers regarding their products on suitability, design, installation, commissioning, servicing and maintenance requirements.

Note 2: There are reciprocal legislation and technical standards applicable to building construction and fire safety for other areas of the British Isles e.g. Channel Islands, Isle of Man, Ireland.

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