

## **BSA Manual Support Document**

### **Contractors Competency Matrix Guidance**

#### **Roofing & Solar**

## Overview

The purpose of this framework is to define the current standards and qualifications for roofers installing solar collectors, ensuring that training methods and assessment processes are aligned with industry requirements. It highlights the skills, knowledge, experience, and behaviour (SKEB) statements necessary for the role, supporting the development of a competent workforce. The framework combines the National Occupational Standards (NOS) for retrofit roofing, industry best practices, and construction competencies. It identifies the core trade and specific competencies required for solar collector installation and proposes an interactive training program to improve workforce competency. While the current apprenticeship standard does not yet include solar collector installation, this gap is addressed in the framework, which will be updated continually to reflect industry standards, legislation, and consultation.

## Functional Map Activities

Core Construction Competencies	Labourer	New Entrant	Installer (mate/ second person)	Installer Supervisor	Supervisor	Training
Conform to general workplace health, safety and welfare	X	X	X	X	X	
Conform to productive work practices	X	X	X	X	X	
Move, handle or store resources	X	X	X	X	X	
Fire safety in Buildings	X	X	X	X	X	e-learning
Core Trade Competencies						
Interpretation of information	X	X	X	X	X	
Safe working practices	X	X	X	X	X	
Selection of resources	X	X	X	X	X	
Minimise the risk of damage	X	X	X	X	X	
Meet the contract specification	X	X	X	X	X	
Allocated Time	X	X	X	X	X	
Understand and apply the Building Regulations and Industry best practice in relation to structural stability				Best Practice	X	
Understand and apply the Building Regulations and Industry best practice in relation to ventilation				Best Practice	X	
Understand and apply the Building Regulations and Industry best practice in relation to fire safety				Best Practice	X	
Understand and apply the Building Regulations and Industry best practice in relation to conservation of fuel and power				Best Practice	X	
Understand and apply the Building Regulations and Industry best practice in relation to materials and workmanship				Best Practice	X	
Understand and apply the Building Regulations and Industry best practice in relation to drainage and rainwater				Best Practice	X	
Understand and apply the Building Regulations and Industry best practice in relation to moisture				Best Practice	X	
Understand and apply the Building Regulations and Industry best practice in relation to combustion appliances and fuel storage systems				Best Practice	X	
Understand and apply the Building Regulations and Industry best practice in relation to protection from falling, collision and impact				Best Practice	X	
Specialist Trade Competencies						
Maintain slate and tile roofing All routes		working towards	working towards/ best practice	X	Best Practice	
Install Solar collectors to roofs All routes		working towards	working towards/ best practice	X	Best Practice	
Use access equipment up to six metres Access route		working towards	working towards/ best practice	X	Best Practice	
Utilise provision of protection systems Access route		working towards	working towards/ best practice	X	Best Practice	
Install, maintain and remove work area protection and safety equipment Protection/ Handover route		working towards	working towards/ best practice	X	Best Practice	
Clear site and hand over on completion Protection/ Handover route		working towards	working towards/ best practice	X	Best Practice	

## Generic Skills & Knowledge

Interpret Information	Safe work practices	Selection of resources	Minimise the risk of damage	Approach to work
<p>To effectively interpret oral or written working instructions, drawings, specifications, method statements, risk assessments, and manufacturers' information, it's essential to understand the types of information provided, their sources, and how to interpret them accurately. These documents guide the work to be carried out, ensuring compliance with safety, quality, and operational standards.</p> <p>Organisational procedures must be followed when reporting and rectifying inappropriate information or unsuitable resources. These procedures are in place to ensure that any discrepancies or issues with the information are addressed promptly, minimizing risks to the project and ensuring work continues without delay. It's crucial to follow these procedures to maintain consistency, safety, and quality in the work.</p> <p>Understanding these procedures is vital for identifying problems with information and solving them effectively. Correctly addressing issues with information and resources ensures that the work meets the required standards and specifications. Following organisational protocols also ensures compliance with legal and safety regulations, protecting both workers and the project.</p>	<p>To comply with relevant legislation and official guidance, it is crucial to follow safe practices when carrying out work, including using health and safety control equipment, access equipment, and working platforms. Safe handling, storage, and use of materials, tools, and equipment are essential to prevent accidents and injuries. Being aware of specific health risks and addressing them in a timely manner is also vital to maintaining a safe work environment.</p> <p>It is important not to commence or continue work if unsure or unclear about any task or instruction. Operatives must have a clear understanding of current legislation and official guidance to ensure work is carried out safely and in compliance with legal requirements. Emergencies should be addressed promptly, with specific individuals designated to respond according to the emergency procedures.</p> <p>Organisational security procedures must be followed to ensure the safety of tools, equipment, and personal belongings on-site. Accident reporting procedures should be understood, and the responsible person should promptly report any incidents to maintain safety records. Health and safety control equipment should be used appropriately and in accordance with manufacturer instructions, ensuring that all safety protocols are met.</p> <p>Furthermore, environmentally responsible work practices must be adhered to, aligning with current legislation and official guidance. Operatives should also be knowledgeable about the different types of fire extinguishers and their proper usage, ensuring they are used correctly in case of a fire emergency.</p>	<p>When selecting resources for your work, it is essential to consider materials, components, and fixings, as well as tools and equipment. Understanding the characteristics, quality, uses, sustainability, limitations, and potential defects of these resources is crucial. If defects are identified, it is important to know how to address and rectify them.</p> <p>Resources should be used according to their intended purpose, and any issues related to the resources should be reported according to established procedures. Organisational procedures for resource selection must be followed, as these are designed to ensure the right materials and equipment are chosen for the task. These procedures are in place to maintain safety, efficiency, and compliance with standards.</p> <p>Additionally, awareness of the hazards associated with both the resources and methods of work is essential. These hazards must be managed and mitigated to ensure a safe working environment. It's important to understand that a construction product's choice, substitution, or recommendation should not be made without proper authority. Any information communicated about construction products must be passed on accurately and without alteration, as per the relevant authority's specifications.</p>	<p>To ensure a safe and efficient work environment, it's crucial to protect the work and surrounding area from damage. This includes minimizing the risk of damage to the existing building fabric by using protective measures, such as barriers or covers, to prevent any unintended harm. The purpose of this protection is to maintain the integrity of the structure and avoid costly repairs or delays.</p> <p>A clean and tidy workspace should be maintained at all times, as this not only ensures a safer environment but also improves efficiency. It reduces the likelihood of accidents and helps in keeping tools and materials organized.</p> <p>Disposing of waste safely and in accordance with current legislation is essential to avoid environmental damage and comply with legal requirements. This can be achieved by following proper waste management procedures, using designated disposal methods for different types of waste, and ensuring that all materials are disposed of in a way that minimizes harm to the environment.</p>	<p>To meet the required specifications, it's essential to follow the methods of work precisely and report any problems promptly to avoid delays or quality issues. Understanding the process thoroughly ensures that the work aligns with the planned outcomes.</p> <p>Regular maintenance of tools and equipment is crucial for their effective use and longevity. This involves cleaning, checking for faults, and ensuring everything is in good working condition before use.</p> <p>Completing your work within the allocated time is vital to ensure the project progresses as planned. Keeping deadlines is important not only for meeting client expectations but also to ensure coordination with other occupations involved in the project.</p> <p>Understanding the work program and how your tasks fit into the overall schedule is key. Adhering to deadlines helps maintain workflow continuity, avoid delays, and meet the client's expectations.</p>

## Best Practice

- Structural Stability: Materials, re-covering, roof structure, loadings. Identification of defects: decay, infestation
- Ventilation: Performance, purpose, types, and control. Installation and effectiveness of systems
- Fire Safety: Fire resistance over roof coverings. Fire stopping between premises
- Conservation of Fuel and Power: U-Values for thermal efficiency
- Materials and Workmanship: Part 4: Waterproofing. Part 6: Roof slating, tiling, and cladding
- Drainage and Rainwater: Gutters, rainwater pipes, siphonic systems. Eaves drop, rainwater recovery systems Materials for pipes, joints, gutters
- Moisture: Resistance to external moisture and interstitial condensation Surface condensation and mould prevention
- Combustion Appliances and Fuel Storage: Flue outlet positioning for solid fuel. Protection from hot flues. Protection from Falling, Collision, and Impact: Pedestrian guarding and maintenance area safeguarding

## Behavioural Competencies

- Demonstrate visible commitment to safety at all levels.
- Collaborate effectively with others and work as part of a team.
- Communicate clearly within teams and organizations, adapting for different audiences.
- Use various communication formats (oral, written, digital, graphic) to ensure accessibility.
- Work within your competence and seek advice, when necessary, especially regarding building safety.
- Maintain and develop personal competence through self-assessment and personal development.
- Ensure competence in others, fulfilling duty holder obligations when delegating tasks.
- Record and monitor performance to improve outcomes as part of a learning culture.
- Take responsibility for your own actions and those under your supervision.
- Communicate boundaries and responsibilities effectively within teams.
- Identify and challenge unsafe behaviours, escalating concerns when necessary.
- Provide feedback on unsafe processes, equipment, or practices.
- Protect the safety of yourself, colleagues, and the public during work.
- Be aware of your duty of care to building occupants, including vulnerable individuals.
- Engage and consult with occupants or those affected by work, responding to their concerns.
- Work safely and challenge unsafe behaviours.
- Communicate effectively using various methods (oral, written, listening, body language).
- Apply equality, diversity, and inclusion when working with others.
- Work effectively with others and demonstrate independent working when needed.
- Use logical thinking to make safe and valid decisions.
- Manage your time effectively to ensure safety while completing tasks.
- Adapt to changes and prioritize safety, especially in dynamic work environments.

## Retrofit Competencies

- Engage with stakeholders, adapting communication methods to their needs and understanding.
- Ensure clear, accurate, and consistent record-keeping throughout the project.
- Recognize how accurate work records support future maintenance and replacement.
- Understand and work within personal limits of competence.
- Take responsibility for maintaining competence through regular training on technology, regulations, and standards.
- Be aware of Continuous Professional Development (CPD) requirements and the revalidation process for specific trades or roles.
- Ensure work is carried out by qualified and competent professionals.
- Understand typical client needs and motivations for retrofit work.
- Recognize the impact of retrofit options on clients, such as access requirements and installation time.
- Tailor content and advice to meet the client's needs and understanding.

## Maintain slate and tile roofing

Skills	Knowledge
Comply with the contract information to efficiently maintain slate and tile roofing to the required specification by demonstrating the skills to measure, mark out, remove, fit, position, and secure materials. Repair specified roof areas according to working instructions for at least four of the following: slate roofs (using local materials and styles), tiled roofs (using local materials and styles), flashings, roof ventilation, and rainwater goods.	<p>Know how to use resources effectively and report any associated problems, including materials, components, and equipment such as slates, tiles, battens, underlays, sand, cement, limes, vents, lead, additives, guttering, downpipes, and fixings. Understand the correct use of hand and powered tools and equipment, as well as the reporting process for issues.</p> <p>Know how to meet the contract specification by removing existing battens, underlay, slates, and tiles, replacing battens and underlay, and removing, replacing, and treating lead work/flashings with patination oil. Understand how to re-point, position and secure roof ventilation, and remove/replace guttering and downpipes. Know how to mix mortar, work with plant and machinery, use hand tools, power tools, and equipment, work safely at height, and use access equipment.</p>

## Install solar collectors to roofs

Skills	Knowledge
Comply with the contract information to efficiently install solar collectors to roofs as per the required specification by demonstrating work skills to measure, mark out, cut, fit, fix, position, secure, and replace components. Use and maintain hand and power tools and equipment properly. Prepare for and install solar collectors on roofs according to given working instructions, including integrated photovoltaic, mounted photovoltaic, integrated solar thermal, and mounted solar thermal systems. Reinstate roof coverings following installation.	<p>Understand how to use resources effectively and report any issues associated with them, including solar collector installation kits, hand and powered tools, associated equipment, and digital equipment.</p> <p>Know how to meet the contract specifications in relation to:</p> <ul style="list-style-type: none"> <li>Assessing the installation area</li> <li>Checking the roof's direction</li> <li>Removing or leaving waterproofing elements</li> <li>Marking out for installation using templates or dimensions</li> <li>Preparing and weatherproofing penetrations</li> <li>Fixing additional supports</li> <li>Securing fixtures, fittings, and collectors</li> <li>Reinstate roof coverings, including flashings</li> <li>Installing solar panels during construction or retrofitting to existing buildings</li> <li>Conducting an assessment of significance</li> <li>Recognising specific requirements for structures of special interest, traditional construction, hard-to-treat buildings, and buildings of historical significance</li> <li>Working with and around plant and machinery</li> <li>Working at height using access equipment, platforms, and fall prevention methods</li> <li>Using all hand and power tools and equipment</li> <li>Performing care and maintenance of all hand and power tools and ancillary equipment.</li> </ul>

## Use of access equipment up to six metres

Skills	Knowledge
To comply with the contract information and carry out the work efficiently to the required specification, it is essential to demonstrate the skills necessary to move, position, erect, secure, check, and remove access equipment in line with the project requirements. Additionally, hand tools and ancillary equipment must be used and maintained according to the manufacturer's instructions. The use of access equipment must adhere to safety regulations, and at least two types of access equipment, such as ladders, stepladders/platform steps, proprietary towers, podiums, or mobile scaffold towers, should be erected, used, removed, and stored in compliance with these regulations.	It is essential to understand how to properly use and report any issues associated with various resources such as ladders, stepladders, podiums, proprietary towers, mobile scaffold towers, protection equipment, and hand or power tools. The correct calculation of the quantity of equipment required for specific tasks, particularly when using access equipment up to 6 meters, is crucial. To meet contract specifications, it's important to know how to protect the work area, establish a stable base for equipment, and correctly erect both proprietary and non-proprietary access equipment according to manufacturer instructions. This includes placing protective screens, checking and monitoring the equipment during use, and ensuring its safe removal and storage. Furthermore, working with plant and machinery, using tools and equipment, and working at height requires attention to safety, following protocols for the safe and effective use of access equipment throughout the project.

## Utilise provision of protection systems

Skills	Knowledge
To comply with the contract information and carry out the work efficiently to the required specification, it is essential to demonstrate the skills needed to wear, attach, set out, position, secure, check, and remove fall protection systems and equipment. Hand tools and fall protection systems must be used and maintained according to safety guidelines. Additionally, fall protection systems and equipment should be employed and utilised according to working instructions, ensuring the use of recognised anchor points for at least two of the following: scaffold and/or rigging, secured steelwork structures, wire and rope systems, permanently installed anchorage points, temporary anchorage points, track systems, and proprietary systems.	To ensure safety and efficiency, it is crucial to understand the proper use and reporting of issues related to fall protection systems and equipment, such as collective protective equipment, full-body harnesses, lanyards, and associated components. When working at height, it is important to correctly locate and position fall protection systems, securely wear and attach safety harnesses, and distinguish between different types of fall protection measures, such as fall arrest, restraint, and rope access systems. Regular visual inspections of the fall protection equipment, including inertia reels, eyebolts, and anchor points, are essential to ensure security and functionality. Workers must also be familiar with the criteria for thorough examinations, adhere to a hierarchy of control measures, and comply with a rescue plan. Furthermore, safe use of hand tools, access equipment, and working in proximity to plant and machinery are critical to maintaining a safe working environment.

## Install, maintain and remove work area protection and safety equipment

Skills	Knowledge
To meet the required specification, it is essential to demonstrate the necessary work skills to measure, set out, position, assemble, construct, secure, dismantle, and remove equipment in accordance with the contract. This includes using and maintaining hand and power tools properly. Temporary protection and safety arrangements must be installed, maintained, and removed as specified, which involves setting up protection equipment, barriers, and fences, along with safety measures such as protection and safety notices and safety lighting. Additionally, it is important to report the work undertaken, ensuring accurate documentation and communication.	To effectively carry out the work, it is essential to know how to properly use resources, such as materials, components, and equipment, while addressing any issues that may arise. This includes the use of safety and security equipment like cones, tapes, fences, barriers, hoarding, doors, gates, as well as protection and safety notices, signs, and safety lighting. It is also important to understand how to meet contract specifications by planning for the protection and safety of the work and surrounding environment. This involves confirming the location of utility services and ensuring their protection, preparing and setting out area protection equipment, and ensuring it is installed, checked, and maintained. Additionally, the ability to monitor and check accuracy during work progress and completion, as well as recognizing when specialist skills and knowledge are required, is crucial. Other key tasks include installing and dismantling protection and safety equipment, ensuring proper use of hand and power tools, and working safely at height with access equipment. All work should be accurately reported, with safety and protective measures maintained throughout the process.

## Clear site and hand over on completion

Skills	Knowledge
<p>To successfully complete the task, it is necessary to demonstrate work skills to finish, position, clear, clean, tidy, and secure the work area. This includes using and maintaining hand tools, portable power tools, and ancillary equipment as per the given instructions. Upon task completion, the site should be handed over according to specified requirements. This includes removing excess materials, ensuring the quality of the finished work meets the given specification, providing the client or their representative with relevant information and advice, and confirming their acceptance of the completed task and site condition. Additionally, all records, reports, and documentation must be completed and properly registered.</p>	<p>To meet the contract specification, it is essential to know how to use resources effectively, including materials, components, equipment, fittings, and fixings, as well as hand and portable powered tools. The task should be carried out by identifying the required finish quality, safely removing and disposing of both hazardous and non-hazardous waste, and ensuring all relevant information is provided to the client, customer, or their representative. This includes removing excess materials, cleaning and clearing the area, securing the work site, and determining when specific skills and knowledge are required. Additionally, making recommendations for specialist intervention, working on buildings of historical significance, and completing and registering records, reports, documentation, and customer service information are key responsibilities. All work must comply with health and safety regulations, including using hand tools, power tools, working at height, and using appropriate access equipment.</p>