

Occupation Profile

Modern Apprenticeship in Engineering - Manufacturing & Fabrication Apprenticeship SCQF Level 7

Approved by: Engineering Technical Expert Group

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Purpose:

This occupation profile consists of 17 work situations routinely carried out in Manufacturing and Fabrication roles. Collectively these describe all the performance requirements and knowledge and understanding requirements apprentices need to demonstrate competence in the occupation. Each work situation has a unique reference number and is set out as follows:

- Work situation title, goal, brief outline, performance requirements and knowledge and understanding requirements



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Mandatory work situations

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Goal of work situation:

To safely perform core engineering activities.

Brief outline:

This involves carrying out core engineering activities in accordance with technical specifications, instructions and organisational requirements.

Performance requirements

1. Obtaining clear and detailed information from drawings and other technical documentation to carry out specified engineering activities
2. Confirming programmes of work with relevant people in accordance with organisational procedures
3. Contributing to developing risk assessments and method statements of risks for specific engineering activities
4. Coordinating site services and activities of other trades affected by engineering activities in compliance with industry practices and organisational procedures
5. Identifying and using correct PPE in accordance with manufacturers guidance
6. Calibrating engineering tools and equipment in accordance with manufacturer's instructions.
7. Communicating engineering information to relevant others in accordance with organisational procedures
8. Carrying out relevant engineering activities in line with quality requirements
9. Checking engineering activities and outputs meet quality requirements
10. Carrying out relevant handover procedures in accordance with organisational requirements
11. Leaving work sites in appropriate condition in accordance with organisational requirements
12. Completing and securely storing relevant engineering documentation in accordance with organisational requirements

Knowledge and understanding requirements

1. How to access and interpret engineering information from drawings and other technical documentation
2. Current legislation, guidelines, policies, procedures, Safe Systems of Work (SSOW) and protocols which are relevant to your working practice and to which you must adhere
3. How to contribute to developing risk assessments and method statements for engineering activities
4. Importance and correct use of any equipment and PPE required
5. Duty to report any acts and omissions that could have a negative impact on yourself, relevant others and your organisation
6. How to interpret first and third angle drawings, imperial and metric systems of measurement, workpiece reference points and system of tolerancing
7. Principles and practice of communicating in engineering environments
8. Organisational procedures for checking resources are fit for purpose
9. Principles and practice of metrology and calibration
10. What is meant by 'engineering assets'
11. Operation, applications, advantages and limitations of different engineering assets
12. Principles and practice of handover
13. Principles and practice of Management of Change (MOC)
14. Importance of Quality requirements associated with engineering operations
15. Organisational requirements for completing and securely storing documentation

13. Dealing effectively with engineering problems within the scope and limitations of your own competence, responsibilities, and accountability
14. Reporting engineering problems which cannot be solved and escalating, where necessary in accordance with organisational requirements
15. Disposing of waste materials, substances, and fluids in accordance with legislative and organisational procedures
16. Scope and limitations of your own competence, responsibilities and accountability
17. Organisational procedures for reporting and escalating problems which cannot be solved
18. Organisational procedures for disposing of waste materials, substances and fluids
19. Business and commercial considerations associated with engineering activities
20. How to keep up to date on technical advances, emerging technologies, and new products in engineering
21. Use and importance of digital equipment and data in engineering activities

Developing meta-skills and personal practice

Goal of work situation:

To develop meta-skills and personal practice through self-evaluation, agreeing objectives, reflecting on practice, and actively learning to improve own performance in line with organisational requirements.

Brief outline:

This is about developing meta-skills and personal practice. This involves reflecting on and learning from practice; acting on feedback; agreeing and working towards own objectives for continuous personal and professional development. Individuals will be supported in their development, usually by their line manager.

Performance requirements

1. Identifying meta-skills and role specific skills regularly used in own work to assess strengths and improvement needs for personal and professional development
2. Discussing and agreeing SMART objectives for personal and professional development and to achieve business objectives
3. Discussing and agreeing appropriate development activities to improve own performance and to achieve business objectives
4. Completing development activities within agreed timescales to support and progress own performance
5. Acting on feedback to improve own performance and development
6. Reflecting on performance, meta-skills and specific skills developed in your role to identify and agree future development needs
7. Completing mandatory training in line with organisational requirements
8. Completing documentation required for personal and professional development in line with organisation policy and procedures

Knowledge and understanding requirements

1. The purpose and importance of meta-skills including their definitions and how they relate to own work
2. The importance of personal and professional development within own organisation and role
3. How to use reflective practice to identify gaps in role specific knowledge, skills and meta-skills
4. How to participate effectively in performance reviews
5. How to discuss and agree SMART objectives – Specific, Measurable, Achievable, Realistic, Time-bound
6. The importance of business and personal objectives in own development
7. Sources of up-to-date and appropriate information to support own development
8. The importance of maintaining well-being in own role and where to get support
9. How to use feedback to develop own skills and knowledge
10. Different learning models and styles and how to use these for own development

Knowledge & Understanding Requirements

URN: SDS 0081

Understanding the importance of environmental good practice and sustainability

Goal of work situation:

To understand good environmental practices, the importance of sustainability and how to apply this within your area of responsibility

Brief outline:

This is about individuals understanding the negative impact of their work on the environment and the steps that can be taken to reduce this impact and promote sustainability. This could be local or global impact.

Performance requirements

There are no performance requirements for this work situation. This work situation provides knowledge and understanding requirements only.

Knowledge and understanding requirements

1. Why it is important to consider and apply sustainability in everything you do
2. The importance of assessing the negative environmental impact that your work could have and what needs to be considered
3. Environmental legislation and industry codes of practice that apply to your area of work
4. Different ways of working that could be adopted to reduce negative environmental impact and promote sustainability in your area of work
5. How to make responsible and sustainable use of natural resources in ways which minimise negative impacts on nature and natural habitats and promotes biodiversity
6. How to make responsible use of water, energy and other resources
7. The importance of energy efficiency and the ways in which energy usage can be monitored, reduced and replaced with renewable sources
8. The importance of making informed decisions on purchases, considering the carbon footprint and adopting the principles of the circular economy
9. The ways in which waste can be reduced and the principles of the waste management hierarchy
10. How pollution can be avoided in your area of work
11. How your work impacts on climate and environmental change and the actions that could be taken to respond to and mitigate the effects of this
12. How carbon emissions can be calculated and reduced and mitigated
13. The use of targets for reducing carbon emissions and improving environmental performance

14. The importance of constantly reviewing environmental performance and taking action to make improvements
15. The purpose of environmental management systems and other environmental quality marks
16. Where to find information and advice on grants, subsidies or other forms of funding or assistance to implement low carbon solutions



Optional work situations

A minimum of 4 optional work situations must be achieved

Starting up engineering processes.....	10
Controlling engineering processes.....	11-12
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Fabricating engineering assets.....	15
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Goal of work situation:

To safely start up engineering processes for production of an engineering asset.

Brief outline:

This involves using appropriate work instructions and information to prepare the equipment and materials and safely start engineering processes for production of an engineering asset in accordance with technical specifications, instructions and organisational requirements.

Performance requirements

1. Selecting and obtaining resources required to start-up engineering processes
2. Confirming resources are fit for purpose to undertake start-up of engineering processes
3. Identifying areas of stored energy and isolating these in accordance with organisational requirements prior to commencing start-up of engineering processes
4. Checking operating parameters are established in accordance with organisational requirements
5. Checking work area and equipment to be used are in a safe and functional condition
6. Checking materials to be used are of correct identity, quality, and quantity to begin processing
7. Starting operation and operating equipment safely in accordance with organisational requirements
8. Dealing with deviations from specified parameters promptly, minimising loss and damage in accordance with organisational requirements
9. Returning resources upon completion of work in accordance with organisational requirements
10. Checking all starting up the engineering processes work meets quality requirements

Knowledge and understanding requirements

1. Principles and practice of engineering processes
2. Resources (equipment, tools and consumables) associated with start-up of engineering processes and how and when to use them
3. Terms used in start-up of engineering processes
4. Others you need to communicate with regarding starting up
5. How to interpret and check operating parameters
6. Functions and uses of different types of equipment, accessories and components used during operation
7. Importance of confirming status of equipment
8. Importance of checking materials against specification
9. How to deal with unexpected results and deviations from specification
10. Importance of minimising loss and damage
11. Quality requirements associated with start-up of engineering processes

Goal of work situation:

To safely control engineering processes during production of engineering assets.

Brief outline:

This involves using appropriate work instructions and information to ensure engineering processes are controlled during production of engineering assets in accordance with technical specifications, instructions and organisational requirements.

Performance requirements

1. Selecting and obtaining resources required to control engineering processes
2. Confirming resources are fit for purpose to undertake control of engineering processes
3. Identifying areas of stored energy and isolating these in accordance with organisational requirements prior to commencing control of engineering processes
4. Checking and setting necessary specifications and operating parameters in accordance with operating instructions
5. Checking equipment and materials are ready for processing operations in accordance with organisational requirements
6. Checking operational data and analysing using appropriate methods and techniques in accordance with organisational requirements
7. Adjusting controls to produce engineering assets to specified quantity, quality and minimise waste
8. Identifying deviations from operating parameters specifications in accordance with operating instructions
9. Identifying possible faults and causes of deviations from operating parameters in accordance with organisation requirements
10. Taking relevant corrective action to restore process to within required operating parameters
11. Checking processes are operating according to specifications and within operating parameters
12. Returning resources upon completion of work in accordance with organisational requirements

Knowledge and understanding requirements

1. Principles and practice of engineering processes
2. Resources (equipment, tools and consumables) associated with control of engineering processes and how and when to use them
3. Terms used to control engineering processes
4. Others you need to communicate with regarding controlling engineering processes
5. How to interpret and check operating parameters
6. Importance of checking materials to meet specifications
7. Importance of checking controls meet operating instructions
8. Methods of obtaining, analysing and interpreting process data
9. How to adjust engineering processes to meet specified quality and quantity whilst minimising waste
10. How to deal with unexpected results and deviations from specifications
11. What deviations may occur from norm, and how to recognise them and any consequences
12. Importance of remedial action and how to deal with this
13. Methods of investigating engineering process faults and causes
14. Corrective action options to take regarding engineering process control
15. Quality requirements associated with controlling engineering processes

13. Checking all controlling engineering processes work meets quality requirements

Goal of work situation:

To safely close down engineering processes on production of engineering assets.

Brief outline:

This involves using appropriate work instructions and information to close down engineering processes in accordance with technical specifications, instructions and organisational requirements.

Performance requirements

1. Selecting and obtaining resources required to close-down engineering processes
2. Confirming resources are fit for purpose to undertake close-down of engineering processes
3. Identifying areas of stored energy and isolating these in accordance with organisational requirements prior to commencing close-down of engineering processes
4. Checking close-down operation instructions to confirm they are clear and complete
5. Checking equipment meets conditions for close-down to commence
6. Confirming services are isolated in accordance with organisational requirements
7. Identifying and closing down services not required in accordance with organisational procedures
8. Closure of the engineering processes in accordance with organisational procedures
9. Returning resources upon completion of work in accordance with organisational requirements
10. Checking all closing down engineering processes work meets quality requirements

Knowledge and understanding requirements

1. Principles and practice of engineering processes
2. Resources (equipment, tools and consumables) associated with closing down an engineering processes and how and when to use them
3. Terms used in closing down engineering processes
4. Others you need to communicate with regarding close down
5. How to interpret and check operating parameters
6. How to deal with unexpected results and deviations from specifications
7. How to check equipment is ready for close-down to commence
8. Methods used to close-down engineering processes
9. How to identify and close-down those services not required
10. Importance of minimising any loss and damage during close down
11. How to undertake material reconciliation
12. Problems that may occur in operations and how to deal with them
13. Issues of security and confidentiality and how to deal with them
14. Quality requirements associated with closing down engineering processes

Manufacturing engineering assets by hand

Goal of work situation:

To safely produce engineering assets using hand tools to meet a specified requirement.

Brief outline:

This involves using appropriate work instructions and information to manufacture engineering assets using only hand tools in accordance with technical specifications, instructions and organisational requirements.

Performance requirements

1. Selecting and obtaining resources required to undertake manufacture of engineering assets by hand
2. Confirming resources are fit for purpose to undertake manufacture of engineering assets by hand
3. Identifying areas of stored energy and isolating these in accordance with organisational requirements prior to commencing manufacture of engineering assets by hand
4. Using hand tools in line with operational procedures and specification
5. Producing components to required quality and within specified dimensional accuracy
6. Carrying out quality sampling checks at suitable intervals in accordance with organisational requirements
7. Returning resources upon completion of work in accordance with organisational requirements
8. Checking all manufacturing engineering assets by hand work meets quality requirements

Knowledge and understanding requirements

1. Principles and practice of using hand tools
2. Resources (equipment, tools and consumables) associated with the manufacture of engineering assets by hand and how and when to use them
3. Terms used in manufacturing engineering assets by hand
4. Others you need to communicate with regarding manufacturing engineering assets by hand
5. Methods and techniques for manufacturing engineering assets by hand
6. Quality requirements associated with manufacturing engineering assets by hand

Goal of work situation:

To safely fabricate engineering assets to meet specified requirements.

Brief outline:

This involves application of a range of processes (e.g., cutting, thermal-cutting, forming, bending, stamping, finishing etc) to produce engineering assets in accordance with technical specifications, instructions and organisational requirements.

Performance requirements

1. Selecting and obtaining resources required to undertake fabrication of engineering assets
2. Confirming resources are fit for purpose to undertake fabrication of engineering assets
3. Identifying areas of stored energy and isolating these in accordance with organisational requirements prior to commencing fabrication of engineering assets
4. Carrying out fabrication activities on engineering assets in accordance with industry recognised methods and practices
5. Checking fabricated parts and components are in accordance with the specification
6. Returning resources upon completion of work in accordance with organisational requirements
7. Checking all fabricating engineering assets work meets quality requirements

Knowledge and understanding requirements

1. Principles and practice of fabrication
2. Resources (equipment, tools and consumables) associated with fabrication of engineering assets and how and when to use them
3. Terms used in fabrication of engineering assets
4. Others you need to communicate with regarding fabrication
5. Range of processes and methods used in fabrication and how and when to apply them
6. Materials used in fabrication, their properties and how and when to use them
7. How to measure and mark out
8. Certification schemes relevant to fabrication
9. Quality requirements associated with the fabrication of engineering assets

Goal of work situation:

To safely produce engineering components and parts using machine tools to meet a specified requirement.

Brief outline:

This involves using appropriate work instructions and information to produce engineering components and parts using machine tools in accordance with technical specifications, instructions and organisational requirements.

Performance requirements

1. Selecting and obtaining resources required to undertake machining of engineering assets
2. Confirming resources are fit for purpose to undertake machining of engineering assets
3. Identifying areas of stored energy and isolating these in accordance with organisational requirements prior to commencing machining of engineering assets
4. Checking a machine is set up and ready for machining activities to be carried out in accordance with specification
5. Manipulating machine tool controls safely and correctly in line with operational procedures
6. Producing components to required quality and within specified dimensional accuracy
7. Carrying out quality sampling checks at suitable intervals in accordance with organisational requirements
8. Returning resources upon completion of work in accordance with organisational requirements
9. Checking all machining engineering assets work meets quality requirements

Knowledge and understanding requirements

1. Principles and practice of material removal using machines
2. Resources (equipment, tools and consumables) associated with machining of engineering assets and how and when to use them
3. Terms used in machining of engineering assets
4. Others you need to communicate with regarding machining engineering assets
5. Range of programming packages (including CNC) and how and when to use them
6. Safety mechanisms on a machine, and procedure for checking they are operating correctly
7. Factors which effect selection of cutting feeds and speeds
8. How various types of materials will affect feeds and speeds that can be used
9. Effects of clamping the workpiece
10. How material removal can cause warping and distortion in finished workpiece
11. Inspection checks to be carried out
12. How to check inspection equipment is within current calibration requirements
13. Quality requirements associated with machining of engineering assets

Goal of work situation:

To safely produce engineering assets in form of assemblies and sub-assemblies to meet a specified requirement.

Brief outline:

This involves using appropriate work instructions and information to produce engineering assets in form of assemblies and sub-assemblies in accordance with technical specifications, instructions and organisational requirements.

Performance requirements

1. Selecting and obtaining resources required to undertake production of assemblies and sub-assemblies
2. Confirming resources are fit for purpose to undertake production of assemblies and sub-assemblies
3. Identifying areas of stored energy and isolating these in accordance with organisational requirements prior to commencing production of assemblies and sub-assemblies
4. Assembling required product in accordance with organisational requirements
5. Manipulating tools, parts and components in line with operational procedures
6. Producing assemblies and sub-assemblies to required quality and within specified dimensional accuracy
7. Carrying out quality sampling checks at suitable intervals in accordance with organisational requirements
8. Returning resources upon completion of work accordance with organisational requirements
9. Checking all producing assemblies and sub-assemblies work meets quality requirements

Knowledge and understanding requirements

1. Principles and practice of assemblies and sub-assemblies
2. Resources (equipment, tools and consumables) associated with production of assemblies and sub-assemblies and how and when to use them
3. Terms used in production of assemblies and sub-assemblies
4. Others you need to communicate with regarding producing assemblies and sub-assemblies
5. Purpose of production of assemblies and sub-assemblies.
6. What assemblies and sub-assemblies will be used for
7. Jigs and how and when to use them
8. Methods and techniques for producing assemblies and sub-assemblies and when to use them
9. Quality requirements associated with production of assemblies and sub-assemblies

Goal of work situation:

To safely join materials using mechanical and chemical methods to meet a specified requirement.

Brief outline:

This involves joining materials by application of a range of mechanical methods including mechanical fastening (e.g., bolting, compression fittings, riveting, caulking, shrink fitting, folding etc) and chemical methods (using glue, epoxy, plastic agents) in accordance with technical specifications, instructions and organisational requirements.

Performance requirements

1. Selecting and obtaining resources required to undertake joining of materials
2. Confirming resources are fit for purpose to undertake joining of materials
3. Identifying areas of stored energy and isolating these in accordance with organisational requirements prior to commencing joining of materials
4. Selecting appropriate joining method in accordance with technical requirements
5. Preparing and supporting a joint in accordance with organisational requirements
6. Checking a joint for condition and accuracy before joining
7. Joining materials using appropriate methods in accordance with industry practices and organisational procedures
8. Returning resources upon completion of work in accordance with organisational requirements
9. Checking all joining materials work meets quality requirements

Knowledge and understanding requirements

1. Principles and practice of joining materials
2. Resources (equipment, tools and consumables) associated with joining of materials and how and when to use them
3. Terms used in joining of materials
4. Materials suitable for joining and how to do this
5. Others you need to communicate with regarding joining materials
6. Range of processes and methods used in joining materials and when to use them
7. Quality requirements associated with the joining of materials

Goal of work situation:

To safely join materials using heat, pressure, or both to meet a specified requirement.

Brief outline:

This involves joining materials (typically metals and/or thermoplastics) by the application of a range of welding techniques in accordance with technical specifications, instructions and organisational requirements.

Performance requirement

1. Selecting and obtaining resources required to undertake welding of materials
2. Confirming resources are fit for purpose to undertake welding of materials
3. Identifying areas of stored energy and isolating these in accordance with organisational requirements prior to commencing welding of materials
4. Preparing and supporting a joint in accordance with organisational requirements
5. Checking a joint for condition and accuracy before welding
6. Welding a joint to specified quality, dimensions and profile using appropriate methods in accordance with industry practices and organisational procedures
7. Returning resources upon completion of work in accordance with organisational requirements
8. Checking all welding materials work meets quality requirements

Knowledge and understanding requirements

1. Principles and practice of welding
2. Resources (equipment, tools and consumables) associated with welding of materials and how and when to use them
3. Terms used in welding of materials
4. Materials suitable for welding and how to do this
5. Others you need to communicate with regarding welding
6. Range of welding techniques and when to use them
7. Coding and certification schemes relevant to welding
8. Quality requirements associated with welding of materials

Goal of work situation:

To safely move loads to meet a specified requirement.

Brief outline:

This involves selecting relevant equipment, checking working area is safe for use of equipment, and process of safely moving, transferring and setting down loads in accordance with technical specifications, instructions and organisational requirements.

Performance requirements

1. Contributing to developing risk assessments and method statements including identification and use of personal protective equipment to enable health and safety hazards identification and evaluation of risks for moving of loads
2. Communicating information to relevant others
3. Selecting and obtaining resources required to undertake moving of loads in accordance with organisational requirements
4. Confirming resources are fit for purpose to undertake moving of loads
5. Identifying and confirming lifting point and attaching lifting equipment to load to be moved in accordance with organisational requirements
6. Identifying areas of stored energy and isolating these in accordance with organisational requirements prior to commencing moving of loads
7. Using equipment to move and transfer loads securely and without loss, damage or contamination in accordance with organisational requirements
8. Setting down goods in a suitable position in a designated location in accordance with organisational requirements
9. Undertaking movement and transfer of goods in a way that minimises any possible damage to surrounding environment
10. Returning resources upon completion of work in accordance with organisational requirements
11. Checking all using equipment to move loads work meets quality requirements

Knowledge and understanding requirements

1. Principles and practice of moving loads
2. Resources (equipment, tools and consumables) associated with moving of loads and how and when to use them
3. Terms used in moving of loads
4. Range of considerations associated with load destination
5. Hazards and conditions that affect lifting activity
6. Safe working loads
7. Load stability, security and weight distribution factors
8. Load characteristics
9. Others you need to communicate with regarding use of equipment to move loads
10. Manual handling techniques and how to apply them
11. How to identify and confirm lifting point
12. Methods and techniques for attaching lifting equipment to a load to be moved
13. Training and relevant licences required to operate specific equipment
14. Equipment capabilities
15. Methods used for communication
16. Quality requirements associated with moving of loads

Goal of work situation:

To safely apply approved industry quality control processes and methods to support product and service delivery.

Brief outline:

This involves applying approved quality control processes for products and services to ensure they conform to quality standards and meet stakeholder requirements. It also involves making recommendations for improvement and communicating outcomes to stakeholders in accordance with technical specifications, instructions and organisational requirements.

Performance requirements

1. Selecting and obtaining resources required to undertake quality control
2. Confirming resources are fit for purpose to undertake quality control
3. Identifying areas of stored energy and isolating these in accordance with organisational requirements prior to commencing quality control
4. Carrying out quality control activities on engineering assets in accordance with industry recognised methods and practices
5. Organising sample taking with relevant others in accordance with organisational requirements
6. Taking representative samples in accordance with organisational requirements
7. Testing samples in accordance with organisational procedures
8. Interpreting sample results to take any necessary action in accordance with organisational procedures
9. Making recommendations for improvements in accordance with organisational requirements
10. Returning resources upon completion of work in accordance with organisational requirements
11. Checking conducting quality control work meets quality requirements

Knowledge and understanding requirements

1. Principles and practice of quality assurance and control
2. Resources (equipment, tools and consumables) associated with quality control and how and when to use them
3. Terms used in quality control
4. Others you need to communicate with regarding quality
5. How to contribute to asset recall processes
6. How to obtain representative samples and why this is important
7. How to label samples correctly and why this is important
8. Correct methods and procedures for testing samples
9. How to interpret sample results
10. How and when to make recommendations for improvements in accordance with organisational requirements
11. Differences between quality assurance and quality control and when to apply them
12. Quality requirements associated with quality control

Goal of work situation:

To safely apply industrial coating and surface finishes to engineering assets.

Brief outline:

This involves preparing and applying a range of industrial coatings and surface finishes using processes and techniques in accordance with technical specifications, instructions and organisational requirements.

Performance requirements

1. Selecting and obtaining required resources to undertake application of industrial coatings and surface finishes
2. Confirming resources are fit for purpose to undertake application of industrial coatings and surface finishes
3. Identifying areas of stored energy and isolating these in accordance with organisational requirements prior to commencing application of industrial coatings and surface finishes
4. Carrying out appropriate masking in accordance with organisational requirements
5. Blowing, cleaning and sanding down areas for coating in accordance with organisational requirements
6. Mixing industrial coatings to defined specifications
7. Spraying (or manually applying) surface coating to relevant area in accordance with specification
8. Testing coating finish and coverage using relevant methods
9. Applying touch-ups, external markings and fine stencilling in accordance with organisational requirements
10. Disconnecting coating equipment in accordance with organisational requirements
11. Inspecting and cleaning coating equipment in accordance with organisational requirements
12. Checking applying industrial coatings work meets quality requirements
13. Monitor temperature and humidity in surface finishing areas and booths in accordance with organisational requirements

Knowledge and understanding requirements

1. Principles and practice of industrial coatings and surface finishes
2. The range of purposes of applying industrial coatings and surface finishes
3. Principles and practice of inspection techniques
4. Resources (equipment, tools and consumables) associated with industrial coating applications and surface finishes and how and when to use them
5. Terms used in the application of industrial coatings and surface finishes
6. Others you need to communicate with regarding applying industrial coatings
7. Chemical and physical properties of industrial coatings and paints
8. Principles and practice of inspection techniques
9. Differences, advantages and disadvantages of different application techniques
10. Quality requirements associated with fault diagnosis and resolution
11. Different types of surface defects
12. Properties and relationship between substrate, materials and complex shapes

14. Returning resources upon completion of work in accordance with organisational requirements
15. Dispose of waste in accordance with approved environmental practice and procedures

Applying methods and principles in project management

Goal of work situation:

This work situation involves using project management tools to plan, organise and monitor the progress of activities to achieve production quality performance indicators.

Brief outline:

This is about applying methods and principles of project management in line with organisational requirements. This includes ensuring activities are delivered in accordance with the business case and safe systems of work, and involves liaising with and reporting progress to stakeholders, ensuring activities contribute to key milestones and deliverables.

Performance requirements

1. Providing support to prepare business cases for approval of activities
2. Identifying roles, responsibilities and skill sets needed for project activities and resources
3. Planning and scheduling projects in line with agreed objectives, timescales, and organisational requirements
4. Managing activities in line with plans and to achieve milestones
5. Managing change in line with organisational procedures
6. Escalating to relevant personnel where there are deviations from plans
7. Identifying, agreeing, and implementing contingencies to mitigate problems
8. Communicating plan progress in formats to meet the needs of all relevant stakeholders
9. Reporting on progress in line with organisational reporting procedures
10. Collating and evaluating lessons learned to contribute to the continuous improvement of activities

Knowledge and understanding requirements

1. Relevant legislation and codes of practice, safe systems of work, risk and impact assessments for activities
2. The principles and approaches to developing good business cases
3. Different methodologies to plan and deliver activities and how to apply these
4. The tools and processes for identifying and analysing risks and opportunities and how to use them
5. Techniques and tools for monitoring and reviewing risks including when and how to escalate to management
6. Quantitative and qualitative measures of risk analysis and how to apply these
7. The importance of monitoring and controlling project performance including accountability
8. Industry specific tools and software for monitoring performance
9. The importance of establishing an agreed change control process, and the impact and consequences that changes can have on schedule, resources, and budget
10. The type of changes that may affect key performance criteria including time, cost, quality, and business case
11. The importance of contingency plans

12. The importance of evaluating and monitoring the benefits and challenges of activities and how to do this

Goal of work situation:

To provide positive and effective leadership to teams to enable, objectives, goals, and targets to meet organisational requirements

Brief outline:

This involves leading a team to achieve defined outcomes and targets required by the organisation. This includes identifying team members roles and responsibilities, setting individual and collective objectives, and monitoring and reviewing performance.

Performance requirements

1. Prioritising and setting realistic and achievable goals and objectives for your team, in accordance with targets set for yourself or for the work area/activity
2. Determining and agreeing individual roles and responsibilities
3. Empowering team members to work autonomously within agreed boundaries
4. Leading your team successfully to meet agreed objectives and goals
5. Monitoring the performance of your team against goals and targets set
6. Communicating performance and outcomes to relevant people in ways that suit their needs
7. Requesting feedback from others and acting on this to improve your leadership practice
8. Agreeing and recording actions from meetings in line with organisational requirements

Knowledge and understanding requirements

1. Leadership models, styles, qualities, and self-awareness and how to select and apply these to different situations and team members
2. How team dynamics impact on organisational behaviours, including cultural and values and differences
3. How to work cost effectively and efficiently
4. How to conduct a team performance review and how to support the team in problem solving/creative thinking activities and taking their own decisions.
5. Organisational policies and procedures on fairness and inclusion and the importance of complying with these
6. The ways communication may need to be adapted for team members and others
7. Listening, questioning and coaching techniques to achieve team outcomes.
8. The business targets set for your area of responsibility, and how to prioritise, set personal, individual and team targets to achieve them including action planning
9. How to monitor and check that your team is working to identified quality and safety standards
10. How to get and make use of feedback from team members and other colleagues on your leadership performance,
11. The types of difficulties and challenges that may arise when leading teams and ways of identifying and addressing them
12. How to escalate problems with team members performance and relationships in line with organisational processes

The relationship between meta-skills and work situations

Work situation	Meta skills alignment											
	Adapting	Collaborating	Communicating	Creativity	Critical thinking	Curiosity	Feeling	Focussing	Initiative	Integrity	Leading	Sense making
Performing core engineering activities	✓	✓	✓		✓	✓			✓	✓		✓
Developing meta-skills and personal practice	✓	✓	✓			✓	✓		✓			
Understanding importance of environmental good practice and sustainability	✓		✓			✓	✓		✓			
Starting up engineering assets		✓	✓		✓					✓		✓
Controlling engineering assets		✓	✓		✓					✓		✓
Closing down engineering assets		✓	✓		✓				✓	✓		✓
Manufacturing engineering assets by hand	✓		✓	✓				✓	✓			✓
Fabricating engineering assets			✓	✓				✓				✓
Machining engineering assets			✓	✓	✓			✓				
Producing assemblies and sub-assemblies			✓	✓	✓				✓	✓		✓

The table above indicates where there are opportunities to develop and evidence meta-skills in each work situation within the occupation profile. Please note, this information is for guidance, and indicates where meta-skills are explicit rather than an exhaustive list. There may be opportunities for individuals to develop and evidence other meta-skills when carrying out their role.

The relationship between meta-skills and work situations

Work situation	Meta skills alignment											
	Adapting	Collaborating	Communicating	Creativity	Critical thinking	Curiosity	Feeling	Focussing	Initiative	Integrity	Leading	Sense making
Joining materials	✓		✓	✓		✓		✓		✓		✓
Welding materials			✓	✓		✓			✓	✓		✓
Using equipment to move loads	✓	✓	✓		✓			✓	✓			✓
Conducting quality control		✓	✓			✓		✓		✓		✓
Applying industrial coatings			✓	✓				✓				
Applying methods and principles in project management	✓	✓	✓		✓				✓		✓	✓
Providing effective leadership	✓	✓	✓				✓		✓	✓	✓	

The table above indicates where there are opportunities to develop and evidence meta-skills in each work situation within the occupation profile. Please note, this information is for guidance, and indicates where meta-skills are explicit rather than an exhaustive list. There may be opportunities for individuals to develop and evidence other meta-skills when carrying out their role.

The relationship between National Occupational Standards and work situations

The table below indicates where there are links between National Occupational Standards and each work situation within the occupation profile

Work situation	National Occupational Standards Alignment		
Performing core engineering activities	<ul style="list-style-type: none">Supporting Activities in Engineering Construction (ECITB) ECICM03Performing Engineering Operations Suite 2 (Enginuity) ECIOSM03	<ul style="list-style-type: none">Land-based Engineering Operations (Lantra) LANCS10Core Mandatory Suite (Engineering) (Enginuity) SEMEM386	<ul style="list-style-type: none">Common NOS (ECITB) ECIEXP03
Starting up engineering processes	<ul style="list-style-type: none">Advanced Manufacturing (Enginuity) SEMADM306	<ul style="list-style-type: none">Mechanical Manufacturing Engineering Suite 3 (Enginuity) SEMADM306	<ul style="list-style-type: none">Bulk Liquid Operations (Cogent) COGBLO8Project Management (ECITB) ECIDD03
Controlling engineering processes	<ul style="list-style-type: none">Aeronautical Engineering Suite 3 (Enginuity) SEMCOMP312Advanced Manufacturing (Enginuity) SEMADM306Mechanical Manufacturing Engineering Suite 3 (Enginuity) SEMADM306	<ul style="list-style-type: none">Bulk Liquid Operations (Cogent) COGBLO8Water Network Construction Operations (EU Skills) EUSWNC2Project Control, Estimating, Planning & Cost Engineering (ECITB) ECIPC68	<ul style="list-style-type: none">Engineering (ECITB) ECIPC68Project Management (ECITB) ECIDD03
Closing down engineering processes	<ul style="list-style-type: none">Advanced Manufacturing (Enginuity) SEMADM306	<ul style="list-style-type: none">Mechanical Manufacturing Engineering Suite 3 (Enginuity) SEMADM306	<ul style="list-style-type: none">Bulk Liquid Operations (Cogent) COGBLO8Project Management (ECITB) ECIDD03

The relationship between National Occupational Standards and work situations

The table below indicates where there are links between National Occupational Standards and each work situation within the occupation profile

Work situation	National Occupational Standards Alignment			
Manufacturing engineering assets by hand	<ul style="list-style-type: none">Supporting Activities in Engineering Construction (ECITB) ECICM03Installing Plant and Systems (ECITB) ECIICESE01	<ul style="list-style-type: none">Maintaining Plant and Systems (ECITB) ECIOSM02Composite Engineering Suite 3 (Enginuity) ECIIPSM01	<ul style="list-style-type: none">Mechanical Manufacturing Engineering Suite 3 (Enginuity) SEMADM306Land-Based Engineering Operations (Lantra) LANCS10	
Fabricating engineering assets	<ul style="list-style-type: none">Fabricating Steel Structures (plating) (ECITB) ECIIPSM06Fabricating and Welding Suite 3 (Enginuity) SEMAE3325Automotive Engineering Suite 3 (Enginuity) SEMMAN2303	<ul style="list-style-type: none">Land-based Engineering Operations (Lantra) LANCS10Installing Plant and Systems (ECITB) ECIICESE01Maintaing Plant and Systems (ECITB) ECIOSM02	<ul style="list-style-type: none">Aeronautical Engineering Suite 3 (Enginuity) SEMCOMP312Mechanical Manufactruing Engineering Suite 3 (Enginuity) SEMADM306	
Machining engineering assets	<ul style="list-style-type: none">Supporting Activities in Engineering Construction (ECITB) ECICM03Fabrication and Welding Engineering Suite 3 (Enginuity) SEMAE3225Mechanical Manufacturing Engineering Suite 3 (Enginuity) SEMADM306	<ul style="list-style-type: none">Composite Engineering Suite 3 (Enginuity) SEMCOMP312Maintaining Plant and Systems (ECITB) ECIOSM02Installing Plant and Systems (ECITB) ECIICESE01	<ul style="list-style-type: none">Mechanical Manufacturing Engineering Suite 3 (Enginuity) SEMADM306Onsite Machining (ECITB) ECIOSM07	

The relationship between National Occupational Standards and work situations

The table below indicates where there are links between National Occupational Standards and each work situation within the occupation profile

Work situation	National Occupational Standards Alignment		
Producing assemblies and sub-assemblies	<ul style="list-style-type: none"> Composite Engineering Suite 3 (Enginuity) SEMCOMP312 Supporting Activities in Engineering Construction (ECITB) ECICM03 Installing Plant and Systems (ECITB) ECIICSE01 	<ul style="list-style-type: none"> Welding Plate & Pipework (ECITB) ECIW08 Constructing Capital Plant Steel Structures – Erecting (ECITB) ECICCPSS07 	<ul style="list-style-type: none"> Fabricate Steel Structures Plating (ECITB) COSVR687 Mechanical Manufacturing Engineering Suite 3 (Enginuity) SEMADM306
Joining materials	<ul style="list-style-type: none"> Supporting Activities in Engineering Construction (ECITB) ECICM03 Welding Plate & Pipework (ECITB) ECIW08 Fabrication and Welding Engineering Suite 3 (Enginuity) SEMAE3225 	<ul style="list-style-type: none"> Water Network Construction (EU Skills) EUSWNC2 Electricity Power Utilities (EU Skills) EUSPTD002 Gas Network Construction (EU Skills) EUSMUNC2 	<ul style="list-style-type: none"> Land-Based Engineering Operations (Lantra) LANCS10
Welding materials	<ul style="list-style-type: none"> Supporting Activities in Engineering Construction (ECITB) ECICM03 Welding Plate & Pipework (ECITB) ECIW08 Fabrication and Welding Engineering Suite 3 (Enginuity) SEMAE3225 Aeronautical Engineering Suite 3 (Enginuity) SEMCOMP312 	<ul style="list-style-type: none"> Automotive Engineering Suite 3 (Enginuity) SEMMAN2303 Marine Engineering Suite 3 (Enginuity) SEMMAN2303 Mechanical Manufacturing Engineering Suite 3 (Enginuity) SEMADM306 Water Network Construction (EU Skills) EUSWNC2 	<ul style="list-style-type: none"> Electricity Power Utilities (EU Skills) EUSPTD002 Gas Network Construction (EU Skills) EUSMUNC2 Land-Based Engineering Operations (Lantra) LANCS10

The relationship between National Occupational Standards and work situations

The table below indicates where there are links between National Occupational Standards and each work situation within the occupation profile

Work situation	National Occupational Standards Alignment			
Using equipment to move loads	<ul style="list-style-type: none">Supporting Activities in Engineering Construction (ECITB) ECIOSM07Electricity Power Utilities (EU Skills) EUSPTD002	<ul style="list-style-type: none">Constructing capital plant steel structures - erecting (ECITB) ECICCPSS07	<ul style="list-style-type: none">Moving Loads – Rigging (ECITB) ECISAEC04	
Conducting quality control	<ul style="list-style-type: none">Condition Monitoring (ECITB) ECICM05Aeronautical Engineering Suite 3 (Enginuity) SEMCOMP312	<ul style="list-style-type: none">Rail Engineering Signalling Suite 3 (Enginuity) SEMRES217Advanced Manufacturing (Enginuity) SEMADM306	<ul style="list-style-type: none">Maintaining Plant and Systems (ECITB) ECIOSM02	
Applying industrial coatings	<ul style="list-style-type: none">Materials Processing and Finishing Suite 3 (Enginuity) PROPF409Decorative Finishing and Industrail Painting	<ul style="list-style-type: none">Occupations (Construction) (Construction Skills) COSVR652	<ul style="list-style-type: none">Associated Industrial Services Occupations (Construction) (Construction Skills) COSVR86	
Applying methods and principles in project management	<ul style="list-style-type: none">Engineering and Manufacture Suite 4 (Enginuity)Project Management (ECITB)	<ul style="list-style-type: none">Engineering Leadership and Management Suite 4 (Enginuity)	<ul style="list-style-type: none">Industrial Design (Creative and Cultural Skills)	
Providing effective leadership	<ul style="list-style-type: none">Business Improvement Techniques Suite 2 (Enginuity)	<ul style="list-style-type: none">Management and Leadership (Instructus)		