

National Occupational Standards

Sector: Building and Construction

Occupation: Marine Civil Works Supervisor

MQF Level: 4

Units:

- MCWS401: Identification of marine civil engineering projects
- MCWS402: Tasks in marine civil engineering projects
- MCWS403: Materials and technical requirements in marine civil engineering projects
- MCWS404: Health and safety, and security during work practices
- MCWS405: The role of the Marine Civil Works Supervisor

MCWS 401: Identification of different marine civil engineering projects

This unit is about distinguishing between different types of marine civil engineering works, based on their use, function, and structural typology. Different functional requirements bring different challenges, based on the location and environmental context of the project.

Upon completion of this unit the candidate should have enough knowledge and skills to distinguish between project characteristics, challenges, and requirements that are affected by the scope of the project, size, and its location.

Performance Criteria

The candidate must have the necessary knowledge and skills to supervise and ensure that:

1. He or she can identify characteristics particular to land-sea environment locations where marine civil engineering projects are carried out.
2. He or she can identify and interpret characteristics of different marine projects in terms of function, structural typology, size, location, topography, and bathymetry.
3. He or she can identify and interpret what constitutes different structural typologies in terms of structural components.
4. He or she can distinguish between short term maintenance works, repair, restoration (renovation) projects, additions to existing infrastructure, and new projects.
5. He or she can read and interpret the weather conditions, and how this could affect progress, and having basic knowledge of direct operations and related risks.

Required Knowledge

The Level 4 Marine Civil Works Supervisor must know, demonstrate, and explain:

1. Climatic, and coastal geographical aspects that characterize and influence projects in land-sea environments.
2. General differences of marine engineering projects in terms of use and function.
3. The structural typology and mechanism used for different types of projects.
4. General requirements for projects of different magnitude and sizes.
5. Transport mechanisms to and around the site location, and associated limitations characterized by land-sea environment.
6. Characteristics of maintenance works in marine civil engineering projects.
7. Characteristics of restoration and repair works of different structural typologies.
8. Characteristics of existing structures for which additions are to be made.
9. Characteristics of new constructions in marine civil engineering projects.

Marine Civil Works Supervisor – MQF Level 4

Required Skills

The Level 4 Marine Civil Works Supervisor must be able to:

1. Determine challenges that are particular to land-sea environment for different project typologies.
2. Understand general requirements of the ecological system to be affected.
3. Read and interpret the characteristics of the bathymetry and topography of the site, how these affect the project, and associated challenges that need to be addressed.
4. Identify the structural components in different types of marine engineering projects.
5. Identify the relevance and importance of the components in a structure or project.
6. Identify what materials are used in different components.

MCWS 402: Tasks in marine civil engineering projects

This unit is about knowledge and skills required to identify characteristics of different tasks involved in different types of marine civil engineering projects, and the identification of associate requirements and activities. This also includes civil engineering tasks for utility service infrastructure found in land- sea environments.

Performance Criteria

The candidate must have the necessary knowledge and skills to supervise and ensure that:

1. They can evaluate identified project tasks and identify corresponding activities required to carry them out.
2. They can read and interpret instructions and supervise works according to method statements, giving relevant feedback, for different types of marine civil engineering projects
3. They can determine and interpret the sequence of events required to carry out the tasks.
4. They can distinguish different requirements to carry out tasks on land, from sea, and underwater.
5. They can select and allocate the required resources to carry out the tasks.
6. They can co-ordinate determination of position of services and substructures on site, and monitor workactivities for new services and substructures.
7. They can organize and co-ordinate geomatics work requirements and carry secondary surveying work.
8. They can observe and monitor work in terms of rules and laws relevant with the conduction of the tasks other than health and safety, including police, civil, environmental protection, and planning rules.

Required Knowledge

The Level 4 Marine Civil Works Supervisor must know, demonstrate, and explain:

1. Organizational information, method statements and procedures.
2. The tasks and associated activities that need to be carried out.
3. Limitations of the works method statement to carry out relevant tasks.
4. The effects and limitations on the procedures by a land-sea environment.
5. Protocols of repair and maintenance works.
6. Data and information from technical drawings and sketches, and risk assessments.
7. Additional information and data requirements to carry out the task.
8. Permission of works required to carry out tasks.
9. The skills and knowledge required by personnel under supervision to carry out the activities.
10. The knowledge and requirements of personnel carrying complimentary tasks, other than those under his supervision.
11. The procedure and reporting required to determine the position of utility services.
12. The procedure and reporting required in laying utility services.
13. Methods to calculate, determine or obtain information on heights dips, angles, lengths, areas, and bathymetry.
14. Calibration requirements of equipment and machinery.
15. The polluting effects on the marine and coastal ecosystem due to activities, tasks, and procedures.
16. Laws and rules on works, tasks and activities that effect the coastal environment and its eco-

system.

Required Skills

The Level 4 Marine Civil Works Supervisor must be able to:

1. Read and interpret schedule of works and distribute (allocate) the activities to the personnel.
2. Identify the personnel, machinery, equipment, and materials required to carry out the tasks.
3. Give feedback to improve the works method statement.
4. Give feedback to improve the schedule of works.
5. Carry out and monitor work activities and tasks as described in technical drawings, data sheets.
6. Evaluate the necessary technical specifications, and drawings and pass on and give the necessary instructions or information to the relevant personnel.
7. Report and advice on changes requirements to different tasks.
8. Organize work for site clearance.
9. Co-ordinate work to minimize wastage of materials.
10. Supervise the operation of specific tools and machinery to carry out the tasks; the sequence they should be used, and limits on how and when they should be used.
11. Supervise civil engineering tasks associated with the repair, replacement and laying of new utility services equipment in land-sea environment.
12. Maintain the security and safety of existing and new services, substructures and existing structures including third party property.
13. Identify requirements for geomatics such as take-offs and setting out and organize tasks to determine such information.
14. Understand and co-ordinate tasks such as to mitigate adverse effects on the marine and coastal ecological systems and mitigate pollution on land and at sea as required.

MCWS 403: Materials and technical requirements in marine civil engineering projects

This unit is about understanding the general properties of materials used in coastal marine environments and identifying the important and relevant specification requirements of materials and procedures that are required to carry out tasks.

A candidate should have enough knowledge and skills to search for information and technical specifications, and read, understand, and communicate knowledge about specific technical requirements to carry out tasks.

Performance Criteria

The candidate must have the necessary knowledge and skills to supervise and ensure that:

1. They can read and interpret general properties of materials used in marine civil engineering projects.
2. They can read and interpret general geotechnical properties of materials.
3. They can research and understand technical specifications about materials and tasks.
4. They can understand general specifications on the use of tools, machinery, and auxiliary components, and liaise on corresponding requirements with relevant personnel.
5. They can define accurate and approximate techniques of geomatics and specifications when required.
6. They can evaluate the direct and indirect impacts of the use of materials on the land-sea environment and the ecological system.
7. They can keep records of equipment certification, testing, calibration and expiry dates and coordinate to follow procedures to keep such items up to standard.

Required Knowledge

The Level 4 Marine Civil Works Supervisor must know, demonstrate, and explain:

1. Architectural and technical drawings such as site drawings, setting out drawings, steel reinforcement drawings, services drawings, system schematic diagrams, structural steel drawings and specifications.
2. General properties of materials that are used in land-sea environment.
3. General geotechnical properties of the coastal ground.
4. Different uses of materials in different climates, environmental requirements, and for different marine civil engineering components.
5. Testing requirements on materials to determine their quality and properties.
6. Sampling requirements of materials for testing.
7. Co-ordinate checks on the quality of material according to specifications defining the expected service life.
8. The type of finishing required for different tasks, considering the size and function of a project.
9. The requirements of finishes that are influenced or depend on marine civil engineering works.
10. The significance of geomatics reference markings such as datums, surveying control points and alignments.
11. Certification requirements of tools, machinery, and PPE (Personal Protective Equipment) and

Marine Civil Works Supervisor – MQF Level 4

RPE equipment.

12. Maintenance requirements of tools, machinery, and PPE and PPR equipment.
13. Limitations and certification of PPE (Personal Protective Equipment) and RPE equipment (Respiratory Protective Equipment).
14. The effect of materials on the land-sea environment.
15. Pollution and human interference effects on the ecological system.
16. Laws and rules on the use of materials that harm the environment.
17. Mitigation measures on the use materials that harm the land-sea environment.

Required Skills

The Level 4 Marine Civil Works Supervisor must be able to:

1. Research, interpret and instruct on technical standards, for the preparation, handling and use of materials and products
2. Research, interpret and instruct on specification requirements of different materials and products
3. Give feedback on testing requirements to determine properties of construction materials and geotechnical properties
4. Evaluate and instruct on the performance of materials under different and changing climatic and environmental conditions in the short and long term
5. Research, interpret and instruct on specifications of finishes that are influenced or depend on marine civil engineering works
6. Co-ordinate work within tolerance, accuracy and level of detailing required
7. Organize and carry out quality assurance (assurance or control) checks
8. Organize sampling regimes for testing and quality control according to specifications and technical requirements
9. Report identified defective components and materials giving suggestions for remedial works
10. Recommend upgrade of quality assurance methodology and frequency on inspection depending on evolving situations on site
11. Co-ordinate and carry out secondary dimensional measurements, including checks of levels and alignments
12. Carry out conversion of units, and carry the necessary computations in secondary dimensional measurements
13. Co-ordinate and organize work within specification requirements and according to standard procedures
14. Organize and coordinate work mitigating the adverse effects of materials and products on the environment and eco-system

MCWS 404: Health and safety, and security during work practices

This unit is about the knowledge and skills required by a supervisor to observe and supervise work which is compliant with health and safety requirements. Following this unit, the candidate should have the required knowledge about health and safety requirements and have skills to carry out tasks and supervise personnel to work on relevant tasks within these health and safety procedures, and without imposing additional risk on them and third parties.

Performance Criteria

The candidate must have the necessary knowledge and skills to supervise and ensure that:

1. They can research and interpret knowledge on health and safety aspects.
2. They can co-ordinate, carry out and supervise work within a health and safety framework and following relevant regulations.
3. They can identify potential hazards within tasks and simultaneous activities, identify vulnerability aspects, and quantify the risk.
4. They can take the necessary actions to mitigate the risks.
5. In case of accident, injury, or ill health, they can take the necessary actions and follow procedures.
6. They can carry out, monitor, and supervise health and safety welfare and security within the operational work environment.
7. They can evaluate, interpret, and coordinate resources and activities required to maintain Health and Safety requirements effectively in place.

Required Knowledge

The Level 4 Marine Civil Works Supervisor must know, demonstrate, and explain:

1. The requirements, their roles and responsibilities under the Health and Safety Act XXXII of 2007 or as per current legislation.
2. Health concerns within the workplace and its immediate surrounding environment, when carrying work activities, and outside working hours.
3. Organizational policies and procedures regarding legislation, official guidance, instruction, and information which needs to be complied with.
4. Importance to liaise with employer on matters that relate with health and safety issues, to safeguard their own wellbeing, and that of all stakeholders which are in a way or other affected by the work tasks and activities.
5. The requirements for fulfilling the duties of appointed persons in terms of Workplace (First Aid) regulations LN 11/2002 or recent amendments.
6. Potential hazards in the workplace rising from: electricity and utility services, construction materials, chemicals and substances used in the workplace, waste materials, working at heights, work equipment and machinery, fire risks, occupational work activities, manual handling, proximity hazards, changing weather conditions and hazards from third parties and working in deep water.
7. Induced risk due to hazards particularly relevant to land-sea environment when working in and on the sea, working near the sea and working underwater.
8. Methods of allocating equipment and resources relating to protective clothing and equipment,

Marine Civil Works Supervisor – MQF Level 4

- welfare facilities, storage and security of materials, tools, and equipment.
9. Personal responsibility for behaviour of health, safety and welfare on site and the consideration of others.
 10. Importance in promoting a positive health and safety culture in the workplace.
 11. Importance of working around heavy machinery and equipment, and keeping safe distances, defining exclusion zones, and allocating right of ways and preference for access.
 12. The effect of toxic or hazardous materials detected on site, and associated precautions needed to be taken.
 13. The risks to health within a construction environment – substances hazardous to health – drugs and alcohol, chemicals, and solvents.
 14. How to use methods and techniques to identify and recommend opportunities to improve health and safety in the workplace.
 15. Procedures to deal with accidents and emergencies associated with the workplace relevant to a land-sea environment.
 16. Procedures to report accidents and near misses.
 17. Personal and supervision responsibility to maintain the health, safety, and welfare on site, including consideration of others as necessary.
 18. The arrangements to maintain security on site and in the workplace.
 19. Protection and adequate storage of equipment, materials, and machinery, from non-human induced damage, or damage due to other tasks that can result in additional potential hazards.
 20. Methods and importance of correct storage of combustibles and chemicals on site, when leaving or entering the site, and when being handled on-site.
 21. Methods and techniques to check the health and safety requirements, and the health and safety duties of other team members in the workplace (Example: storage of materials, components, tools, machinery, and equipment).
 22. Determining when health and safety checks should be carried out according to organizational requirements.
 23. Methods to improve health and safety, and welfare measures in the workplace.
 24. Methods to report and communicate any team performance health, safety, and welfare issues.
 25. The different arrangements for checking security and operational arrangements for workers, visitors, relevant stakeholders, unauthorized personnel, and the public.

Required Skills

The Level 4 Marine Civil Works Supervisor must be able to:

1. Identify relevant health and safety procedures.
2. Comply with their individual duties and legal obligations under the health and Safety Act XXXVII of 2007, or a per current legislation or other complimentary laws.
3. Work and supervise work according to health and safety regulations, and other relevant regulations that apply to the work environment.
4. Comply with safe working practices in accordance with organizational procedures.
5. Comply with and carry out organizational procedures for safely working around mobile machinery and equipment.
6. Comply with and carry out organizational procedures for safely working on land near the sea, from or on the sea, and underwater.
7. Recognize hazards, hazardous materials, quantify risk and apply mitigation measures associated with workplace activities.
8. Quantify, report and act on hazards and risks related with changing circumstances, changing

Marine Civil Works Supervisor – MQF Level 4

- activities, activities done simultaneously and geographical aspects, in accordance with organizational procedures.
9. Report and address near misses and accidents in accordance with organizational and statutory requirements.
 10. Recognize, report and act on emergency situations, in accordance with organizational procedures.
 11. Arrange, allocate and make use of Personal Protective equipment (PPE) and RPE (where necessary) to carry out work duties.
 12. Refer to the relevant personnel and required guidance and get the necessary approval in terms of hazard and risk identification, mitigation and action, and allocation of PPE and RPE where the role of the team members falls outside his or her specialization (example: divers), or where tasks are carried out in locations not accessible to the candidate (example: underwater).
 13. Carry out work activities to protect work areas from damage.
 14. Report and upgrade risk mitigation measures required following accidents and near misses.
 15. Comply with and ensure that organizational behaviour for workplace health safety and welfare, are observed.
 16. Carry out the security arrangements and procedures that should be observed and followed when working on site, and outside working hours.

MCWS 405: The role of the Marine Civil Works Supervisor

This unit is about managerial aspects of the marine civil works supervisor that define him or her in his or her role within the project.

Performance Criteria

The candidate must have the necessary knowledge and skills to supervise and ensure that:

1. They can perform the role with minimum supervision and maximum attention to work-force safety requirements according to company procedures.
2. They can evaluate marine civil work projects and give feedback to produce work-breakdown structures during project preliminary studies and at acceptance phase.
3. They can evaluate the roles of other personnel and stakeholders involved in the project and liaise with them.
4. They can organize and manage the execution of tasks and co-ordinate with subcontractors.
5. They can monitor and keep records of the workforce assigned on project and resources utilization and allocation.
6. They can evaluate marine civil work tasks and identify HR skill requirements and possible skill gaps, tools and equipment and tasks that need to be subcontracted.

Required Knowledge

The Level 4 Marine Civil Works Supervisor must know, demonstrate, and explain:

1. The terms of reference as a supervisor, and those of other personnel.
2. Project management tools (Example: Gantt Charts) defining the tasks under his or her supervision or those which are complementary.
3. Which aspects need to be monitored and which aspects need to be controlled within his or her responsibility.
4. Which aspects need decision making and who should make them.
5. Different communication tools and methods which are effective in different situations of a project, and effective with different stakeholders.
6. The quality, competence, and skills of human resources required to carry out different tasks and activities.
7. How to organize and co-ordinate work and operations for maximum performance with others.
8. Methods to plan and monitor sequence of works; and plan, prepare and organize resources accordingly.
9. Methods to improve work processes and activities.
10. Organizational procedures, operational standards, and efficiency targets.
11. Requirements for data collection and information gathering.
12. Requirements for preparation of documents and reports.
13. Organizational requirements to report problems that affect the operation of works.

Required Skills

The Level 4 Marine Civil Works Supervisor must be able to:

1. Manage tasks and duties, and the limits in the role as a supervisor of marine civil engineering works.
2. Evaluate the roles of other personnel on the projects: roles under supervision, roles he or she must report to, and relevant stakeholders associated with tasks under supervision.
3. Comply with organizational procedures and instructions on communication methods and tools, when communicating with work personnel or other stakeholders.
4. Comply with organizational procedures for the selection between formal or informal communication.
5. Communicate the work programmes and sequence of work activities with relevant stakeholders and work personnel.
6. Co-ordinate and agree on work programmes with other supervisors, occupations and affected third parties where necessary.
7. Communicate the relevant procedures, data, instructions, alerts, warnings, procedures or other information with relevant stakeholders and work personnel.
8. Co-ordinate work activities within specified timeframes, complying with organizational procedures, policies and requirements described by project management tools.
9. Co-ordinate work activities within budget while keeping the required quality and standard.
10. Interpret work method statement and risk assessments in terms of budget and timescales.
11. Comply with financial resources allocated to carry out tasks.
12. Give feedback on timeframes and cost limitations to carry out tasks.
13. Co-ordinate work keeping site organized and tidy.
14. Give contribution in procurement of HR, machinery, and tools.
15. Assign tasks and activities to different human resources available depending on their knowledge and skill.
16. Record information related to work activities on resources, tools, machinery, and HR.
17. Give feedback on time, cost, quality, and resource management that are particularly affected by a land-sea environment, its climate, changing situations and operation period during the day or night.
18. Co-ordinate and prepare the necessary documents and management reports.
19. Communicate relevant information following handing-over of site when works are over.
20. Coordinate works to adhere to conditions issued by relevant authorities such as PA, ERA, and SCH.
21. Liaison with site monitors such as archaeological and environmental monitors and execute their instructions.