

SEMMME3-002 - SQA unit Code HIVM 04

Using and interpreting engineering drawings and documents



Overview

This unit identifies the competences you need to make effective use of text, numeric and graphical information, for interpreting and using technical information extracted from engineering drawings, technical manuals, reference tables, specifications and charts, in accordance with approved procedures. You will be required to extract the necessary information from the various drawings and related documents, in order to establish and carry out the work requirements, and to make valid decisions about the quality and accuracy of the work produced.

Your responsibilities will require you to comply with organisational policy and procedures for obtaining and using the drawings and related specifications. You will be expected to report any problems with the use and interpretation of the drawings and specifications that you cannot personally resolve, or are outside your permitted authority, to the relevant people. You will be expected to work with a minimum of supervision, taking personal responsibility for your own actions and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will provide a good understanding of the types of drawings and documents used, and will provide an informed approach to applying instructions and procedures. You will be able to read and interpret the drawings and documents used and will know about the conventions, symbols and abbreviations, in adequate depth to provide a sound basis for carrying out the activities to the required specification.

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Performance criteria

- You must be able to:*
- P1 use the approved source to obtain the required drawings and specifications
 - P2 correctly interpret the drawings and specifications
 - P3 identify, extract and interpret the required information
 - P4 use the information obtained to ensure that work output meets the specification
 - P5 deal promptly and effectively with any problems within your control and report those which cannot be solved
 - P6 report any inaccuracies or discrepancies in drawings and specifications

Knowledge and understanding

You need to know and understand:

- K1 the information sources used for the drawings and specifications that you use in your work activities
- K2 how drawings and documents are obtained, and how to check that they are current and valid
- K3 how to use other sources of information to support the drawings (such as electronic component pin configuration specifications, standard reference charts for limits and fits, tapping drill reference charts, bend allowances required for material thickness, electrical conditions required for specific welding rods)
- K4 the procedures for reporting discrepancies in the drawings or documents, and for reporting lost or damaged drawings/documents
- K5 care and control procedures for the drawings and documents, and the importance of returning them to the designated location on completion of the work activities
- K6 the basic drawing conventions that are used, and why there needs to be different types of drawings
- K7 the types of drawings used and how they interrelate (such as isometric and orthographic, first and third angle, assembly drawings, circuit and wiring diagrams, block and schematic diagrams)
- K8 imperial and metric systems of measurement; tolerancing and fixed reference points
- K9 the meaning of the different symbols and abbreviations found on the drawings that you use (such as surface finish, electronic components, weld symbols, linear and geometric tolerances, pressure and flow characteristics)
- K10 care and control procedures for drawings and specifications, and how damage or graffiti on drawings can lead to scrapped work
- K11 the extent of your own responsibility, when to act on your own initiative to find, clarify and evaluate information, and to whom you should report if you have problems that you cannot resolve

Additional Information

Scope/range related to performance criteria

You must be able to:

1. Use approved sources to obtain the necessary drawings and related specifications, and carry out **all** of the following:
 - 1.1 check the currency and validity of the drawings and documents used
 - 1.2 exercise care and control over the documents at all times
 - 1.3 correctly extract all necessary data in order to carry out the required tasks
 - 1.4 seek out additional information where there are gaps or deficiencies in the information obtained
 - 1.5 deal with or report any problems found with the drawings/specifications
 - 1.6 make valid decisions based on the evaluation of the engineering information
 - 1.7 return all drawings and related specifications to the approved location on completion of the work
 - 1.8 complete all necessary production documentation

2. Use information extracted from mechanical and/or electrical/electronic drawings, to include **one** or more types from:
 - 2.1 detailed component drawings
 - 2.2 modification drawings
 - 2.3 general assembly drawings
 - 2.4 sub-assembly drawings
 - 2.5 repair drawings
 - 2.6 schematic diagrams
 - 2.7 fluid power drawings
 - 2.8 fabrication drawings
 - 2.9 wiring/circuit diagrams
 - 2.10 welding drawings
 - 2.11 installation drawings

3. Use information extracted from related documentation, to include **two** from the following:
 - 3.1 job instructions
 - 3.2 reference tables/charts
 - 3.3 drawing instructions
 - 3.4 national, international and organisational standards
 - 3.5 test schedules
 - 3.6 planning documentation
 - 3.7 Manufacturers' instructions

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- 3.8 quality control documents
- 3.9 weld procedure specifications

- 4. Extract information that includes **three** of the following:
 - 4.1 materials or components required
 - 4.2 surface texture requirements
 - 4.3 weld type and size
 - 4.4 dimensions
 - 4.5 location/orientation of parts
 - 4.6 operations required
 - 4.7 tolerances
 - 4.8 process or treatments required
 - 4.9 connections to be made
 - 4.10 build quality
 - 4.11 assembly sequence
 - 4.12 installation requirements
 - 4.13 circuit characteristics (such as pressure, flow, current, voltage, speed)

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