Australian Government

Assessment Requirements for UEECD0030 Prepare electrotechnology/utilities drawings using manual drafting and CAD equipment and software

Release: 1

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Modification History

Release 1. This is the first release of this unit of competency in the UEE Electrotechnology Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and include:

- applying modifications to original drawings and resubmitting for approval
- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements, including implementing risk control measures
- checking drawings for accuracy and compliance with job specifications
- completing electrotechnology/utilities drawings using manual drafting and computer-aided design (CAD) equipment and software
- determining job specifications from designs, drawings and layouts
- filing completed drawings
- obtaining specifications from design information, customer requirements, sketches, preliminary layouts and/or field investigations
- planning and preparing electrotechnology/utilities drawings using manual drafting and CAD equipment and software
- preparing and modifying preliminary electrotechnology/utilities drawings and diagrams using CAD equipment and software
- responding to unplanned situations
- submitting completed drawings
- using CAD equipment and related computer commands
- working with relevant person/s.

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions and include knowledge of:

- architectural and site plan drawings for electrotechnology/utilities applications, including:
  - principles, purpose, terms and conventions usage in basic architectural drawings
  - typical scales

- base plan symbols and labels
- electrotechnology/utilities site plan symbols and labels
- signing and markings site plan symbols and labels
- architectural design and planning principles
- elevation drawings
- architectural symbols and abbreviations usage
- floor plans layout and production
- basic construction terminology and materials
- perspectives and pictorials
- typical wall and building sections with necessary details
- applicable building codes
- as-built floor plan measurement, sketching and drafting
- usage of schedules in freehand architectural style lettering
- styles of architecture
- fundamentals and design function in residential design
- site plans production
- foundation plan production

- AutoCAD basics for electrotechnology utilities applications, including:
  - operating system fundamentals encompassing principals, concepts and applications of CAD hardware; terms, conventions and codes related to CAD hardware; CAD hardware type and variation; system specifications interpretation and usage; input/output (I/O) devices identification; computer components installation and configuration arrangements and applications
  - CAD filing and naming conventions
  - opening program, closing and saving drawings
  - basic drafting commands encompassing line, circle, spline and rectangle
  - basic modification commands encompassing erasing, copy, mirror, block, trim and extend
  - layout and plotting
  - design centre encompassing electrical symbols and electronic symbols
  - AutoCAD and lists
  - components and symbols in CAD
  - mass storage and file compression
  - network operating systems, protocols, and cabling systems
  - researching hardware and software
  - installation and configuration of operating systems
  - plotting solutions
  - security issues
  - system maintenance
  - user interface
  - object creation and modification

- editing
- layers
- properties
- paper space and model space concepts
- dimensioning and dimensioning variables
- blocks
- attributes
- three-dimensional construction
- solid modelling and scripts
- library construction
- database manipulation
- data extraction
- circuit simulation
- wiring symbols - motor and generator; alternating current (a.c.) and direct current (d.c.) ; wiring junctions; grounds; distinguishing power and control conductors; normally open and normally closed contacts; series and shunt coils; circuit protection devices - overload relay w/thermal element; fuse and circuit breakers; push button - disconnect switches; momentary contact; maintained contact; meters; resistors; transformers - power, current, potential and auto-transformers

- auxiliary views and revolutions, including:
  - principles, concepts and purpose of auxiliary views and revolutions
  - terms, conventions and codes related to auxiliary views and revolutions
  - rules of revolutions
  - types and usage techniques of auxiliary views, auxiliary reference planes and revolutions
  - techniques and applications in finding the true size of an oblique surface
  - secondary auxiliary view drawing techniques and applications
  - applications of revolutions
  - usage of the axis of revolution to draw the true shape of an oblique view
- civil/geographic information systems (GIS) drawings fundamentals, including:
  - principles, terms and conventions usage in civil GIS drawings
  - land surveying techniques (e.g. property line, corners, symbols, coordinates, base line and typical sections)
  - GIS and global positioning systems (GPS) uses and applications
  - land survey plot production from a written description
  - manual and computer methods calculation of area
  - contour plans
  - profile drawings
- drawing, numbering, file names and digital file storage, including:
  - drawing series and version control
  - drawing sheet numbering
  - drawing file names

    - drawing storage
    - drawing file
- electrotechnology/utilities drafting fundamentals, including:
    - principles, concepts and purpose of electrotechnology/utilities drafting
    - terms, conventions and codes related to electrotechnology/utilities drafting
    - rules and symbols used in electrotechnology/utilities drafting
    - types and usage techniques of electrotechnology/utilities drawings
    - techniques and applications for creating graphic symbols charts
    - techniques and applications in composing block diagram drawings
- electrotechnology/utilities drawings and diagrams
- electrotechnology/utilities drawings line work, symbols, lettering and techniques production to Australian/New Zealand industry standards, including:
    - principles of correct drafting technique
    - principles, concepts and purpose of electrotechnology/utilities drawings
    - terms, symbols (including sectional symbols), conventions and codes related to electrotechnology/utilities drawings
    - rules for drafting electrotechnology/utilities drawings
    - types and usage techniques of electrotechnology/utilities drawings
    - relationship between components and symbols used in drafting applications
    - techniques and applications for production of electrotechnology/utilities drawings
- map drafting, including:
    - types and usage techniques of map drafting and illustrated maps
    - techniques and applications of plat surveys and set plans
    - techniques and applications of contour maps using profile coordinates
    - map reading techniques and applications
    - map drawing techniques and applications
- pole and structure elevations, including:
    - elevation sheet layout
    - elevation labelling
    - concrete bases
    - luminaire pole elevations
    - signal pole elevations
    - service pole elevations
    - sign pole elevations
    - sign bridge and cantilever elevations
    - breakaway sign structures
    - wood post/sign structures
- relevant manufacturer specifications
- relevant WHS/OHS legislated requirements
- relevant workplace documentation

- relevant workplace policies and procedures
- risk control measures
- sketching techniques for electrotechnology/utilities applications, including:
  - lines and letters
  - shapes
  - solids
  - axonometric views
  - building sketch
  - isometric views
  - object sketch
  - perspective: building interior perspective sketch
  - detail labelled sketch
- standard drawing sheets and drawing sheet layout, including:
  - standard drawing sheet borders
  - standard drawing sheet scale
  - standard drawing sheet editing - routine
  - standard drawing sheet editing - title block
  - standard drawing sheet editing - revision blocks
  - drawing sheet layout for small electrotechnology/utilities projects
  - drawing sheet layout for large electrotechnology/utilities projects
  - drawing sheet layout for signing and markings projects
  - key plan sheets
  - drawing layers
  - line types
- survey base plan drawings, including:
  - survey base plan scale
  - survey base plan
  - survey base plan contents
  - model space and paper space
  - external reference (xref) drawings
  - viewports.

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must occur in workplace operational situations where it is appropriate to do so;

where this is not appropriate, assessment must occur in simulated workplace operational situations that replicate workplace conditions.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment (PPE) currently used in industry
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6