



**Australian Government**

# **AHCARB512 Generate tree plans using computer-aided design software**

**Release: 1**

# AHCARB512 Generate tree plans using computer-aided design software

## Modification History

| Release   | Comments                                                                                                                    |
|-----------|-----------------------------------------------------------------------------------------------------------------------------|
| Release 1 | This version released with AHC Agriculture, Horticulture and Conservation and Land Management Training Package Version 5.0. |

## Application

This unit of competency describes the skills and knowledge required to generate tree plans using computer-aided design software.

The unit applies to individuals who work in arboriculture and analyse information and exercise judgement to complete a range of advanced skilled activities and demonstrate deep knowledge in a specific technical area. They have accountability for the work of others and analyse, design and communicate solutions to a range of complex problems.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

## Pre-requisite Unit

Nil

## Unit Sector

Arboriculture (ARB)

## Elements and Performance Criteria

| Elements                                         | Performance Criteria                                                                                                                                      |
|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Elements describe the essential outcomes.</i> | <i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>                                                    |
| 1. Confirm project and drawing requirements      | 1.1 Confirm project requirements for computer-aided design (CAD) drawings<br>1.2 Identify drawing requirements, purpose and scope and confirm with client |
| 2. Create drawing                                | 2.1 Prepare CAD desktop layout and user interface according to                                                                                            |

| Elements                                             | Performance Criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Elements describe the essential outcomes.</i>     | <i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| template files to meet standard drawing requirements | software instructions and working environment<br>2.2 Determine layering strategy for plan components<br>2.3 Identify and select CAD libraries containing blocks, symbols and components according to software application<br>2.4 Select text and dimensioning styles according to workplace style guide<br>2.5 Select line types and weights to provide visual differentiation of plan elements<br>2.6 Select hatch and infill patterns and styles according to planned components, elements and purpose<br>2.7 Set up title blocks for planned drawings and sizes<br>2.8 Set up reference schedules according to project outcomes |
| 3. Create 2D drawings                                | 3.1 Use CAD software and functions to produce two-dimensional (2D) drawings according to industry drawing standards<br>3.2 Scan documents and save as digital files compatible for importing into 2D CAD programs<br>3.3 Import digital drawing components from software applications into 2D CAD drawings                                                                                                                                                                                                                                                                                                                         |
| 4. Edit, measure and inspect drawing components      | 4.1 Review, edit and remove incongruous elements in drawings<br>4.2 Record explanatory notes in drawings according to project purpose<br>4.3 Identify and apply dimensions and scale to drawings<br>4.4 Identify and apply tree symbols appropriate for purpose<br>4.5 Plot tree symbols with precision on drawing according to drawing scale and dimensions<br>4.6 Perform calculations to determine tree protection zones (TPZ), structural root zone (SRZ) and encroachments, and plot on drawing according to project purpose<br>4.7 Check accuracy and quality of drawing and amend drawings where below standard             |
| 5. Print CAD drawings                                | 5.1 Input page setup parameters to suit printing and project requirements<br>5.2 Input printer setup parameters for quality and quantity of pages<br>5.3 Print drawings according to printer instructions, workplace and                                                                                                                                                                                                                                                                                                                                                                                                           |

| Elements                                          | Performance Criteria                                                                                                                                                                                                                                                                                                                          |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Elements describe the essential outcomes.</i>  | <i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>                                                                                                                                                                                                                                        |
|                                                   | environmental procedures                                                                                                                                                                                                                                                                                                                      |
| 6. Save and back up files                         | 6.1 Create file directories for drawing project on storage media according to workplace file management procedures<br>6.2 Identify and create file names according to workplace style guide, software instructions and project naming convention<br>6.3 Save drawing files to file directories according to software and workplace procedures |
| 7. Export files to CAD program or document reader | 7.1 Select and open drawing files to be exported and save in file format specified by external drawing software application<br>7.2 Select and open drawing files to be exported and save in file format specified by external document reader software                                                                                        |

## Foundation Skills

*This section describes those language, literacy, numeracy and employment skills that are essential for performance in this unit of competency but are not explicit in the performance criteria.*

| Skill             | Description                                                                                                                                                                                   |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Writing           | <ul style="list-style-type: none"> <li>Document plan annotations according to plan requirements using terminology and style appropriate for arboriculture plans and drawings</li> </ul>       |
| Numeracy          | <ul style="list-style-type: none"> <li>Identify and interpret embedded mathematical information from site plans and information, and transition into two-dimensional (2D) drawings</li> </ul> |
| Get the work done | <ul style="list-style-type: none"> <li>Use the main features and functions of computer-aided design software and digital tools to generate 2D drawings</li> </ul>                             |

## Unit Mapping Information

| Code and title current version | Code and title previous version | Comments             | Equivalence status |
|--------------------------------|---------------------------------|----------------------|--------------------|
| AHCARB512                      | AHCARB507                       | Performance criteria | Equivalent         |

|                                                          |                                                          |                                                                         |  |
|----------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------|--|
| Generate tree plans using computer-aided design software | Generate tree plans using computer-aided design software | clarified<br>Foundation skills added<br>Assessment requirements updated |  |
|----------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------|--|

## Links

Companion Volumes, including Implementation Guides, are available at VETNet: -  
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=c6399549-9c62-4a5e-bf1a-524b2322cf72>

# Assessment Requirements for AHCARB512 Generate tree plans using computer-aided design software

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## Performance Evidence

An individual demonstrating competency must satisfy all of the elements and performance criteria in this unit.

There must be evidence that the individual has produced plans using computer-aided design software and calculated and plotted tree protection zones (TPZ) for at least 20 trees and 10 encroachments across two different sites.

There must also be evidence that the individual has:

- confirmed project requirements for drawings
- identified drawing requirements, purpose and scope, and confirmed with client
- prepared computer-aided design (CAD) software ready for drawing, including:
  - prepared the computer desktop user interface
  - determined the layering strategy for components
  - identified and selected component libraries
  - selected text and dimension styles according to workplace style guide
  - selected line types and weights
  - selected hatch patterns and types
  - set up title blocks for drawing sizes
  - set up reference schedules
- used two-dimensional (2D) CAD software program and functions to produce drawings using layers for different components. The tree protection CAD plan must contain:
  - TPZ
  - structural root zone (SRZ)
  - encroachments
  - imported digital text and drawing files from other software applications
- scanned and saved documents in digital format for import into 2D CAD drawings
- reviewed, edited and deleted incongruous elements
- recorded notes to drawings
- identified and applied dimensioning and scale to drawings

- identified and applied tree symbols with precision. Drawing must provide the following differentiations:
  - trees to be retained
  - trees to be removed
  - trees to be transplanted
- calculated areas of TPZ, SRZ and encroachments
- checked the drawing for accuracy and quality
- set page layout on printer, including:
  - scale
  - line weights
- set print parameters for the printer, including:
  - page size and paper quality
  - output print quality (fast, draft, best)
- created file storage directories according to workplace file management procedures
- named and saved drawing files to file directories according to workplace file management procedures and naming convention
- created drawing files and sent to external personnel for use in different software applications
- created exportable files for CAD software and document readers.

## Knowledge Evidence

An individual must be able to demonstrate the knowledge required to perform the tasks outlined in the elements and performance criteria of this unit. This includes knowledge of:

- interpretations and planning of drawing needs for arboriculture projects, including:
  - types of drawings used in arboriculture
  - content and purpose of drawings
  - use of drawings and importance of accuracy
  - planning the design and drawing project
- sources of information for drawing development, including:
  - project personnel
  - site visits and survey plans
  - digital images and aerial photography
- basic principles of 2D CAD drawing, including:
  - 2D CAD software programs available
  - CAD drawing tools
  - principles of layers and a layering strategy
  - CAD libraries and standard detail and components
  - selecting and using fonts and styles in business and drawings
  - selecting and setting dimension size and styles

- line types, thickness and colour as a means to communicate and differentiate design elements
- entering text and notations into CAD drawings
- setting and maintaining accuracy in CAD drawings
- basic tools and setup of a CAD drawing program, including:
  - preparing the CAD desktop and user interface
  - CAD drawing tools, their use and menu options
  - preparing page layout for drawing size
  - selecting hatch patterns, fill and colour
  - creating and using title blocks
  - use of style guides in maintaining quality and standards for organisations
- adding, editing and changing CAD components in drawings, including:
  - drawing lines, shapes and polygons
  - editing and deleting lines, text and shapes
  - joining and breaking lines and shapes
  - adding and editing text
  - plotting and positioning trees and other symbols
  - entering and positioning dimensions
- quality control check and document control
- page layout and standard size paper, including:
  - International Organization for Standardization (ISO) and American National Standards Institute (ANSI) paper sizes and use in Australia
- standard file formats for drawings and file exchange between CAD software
- standard file formats for conversion of drawings for document sharing
- saving computer files, file directories and storage media, including:
  - methods of saving files
  - file retrieval and backup
  - importing and exporting files
  - organisational standards for naming, filing and file security
- scanning and importing documents and graphics into CAD software
- plan printers, plan plotters and printing requirements, including:
  - print page size
  - media type
  - print quality
- calculating and plotting TPZ, SRZ and encroachments.

## Assessment Conditions

Assessment of the skills in this unit of competency must take place under the following conditions:

- physical conditions:

- two arboriculture work sites with trees as stipulated in the performance evidence, or an environment that accurately represents workplace conditions
- resources, equipment and materials:
  - computer with 2D CAD software, symbols libraries for architecture and arboriculture
  - digital scanner
  - plan printers and/or plotters
- specifications:
  - workplace safety policies and procedures for CAD drawing standards and file conventions
  - current drawing standards for page sizes and drawing conventions
- relationships:
  - client.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards. In particular, assessors must have:

- arboriculture vocational competencies at least to the level being assessed
- current arboriculture industry skills directly relevant to the unit of competency being assessed.

## Links

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