



Australian Government

CPPSIS5046 Set out stormwater systems

Release: 1

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Modification History

Release 1.

Replaces superseded non-equivalent CPPSIS5046A Design a stormwater system.

This version first released with CPP Property Services Training Package Version 3.

Application

This unit of competency specifies the outcomes required to set out stormwater systems and associated engineering structures using surveying methods and equipment. The unit covers using horizontal and vertical control techniques to set out marks and lines to define the position and level of design points on site. It also covers interpreting plans, maps and specifications to conduct measurements and calculations that ensure stormwater components and related engineering structures are in the correct plan position and at the correct reduced level. The unit requires the ability to measure, calculate and reduce surveying data, including fall of land and volume relating to contours, spot heights and cross-sections. It also requires the ability to check and validate measurements against specifications and complete set-out documentation.

The unit supports those who work under limited supervision in a surveying team.

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

Pre-requisite Unit

Nil

Unit Sector

Surveying and spatial information services

Elements and Performance Criteria

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range of conditions.
1. Prepare for stormwater system set-out.	1.1. Project and client requirements for stormwater system are identified and interpreted. 1.2. Relevant plans, maps and stormwater specifications are accessed and analysed to identify principal work

- activities.
- 1.3. Equipment is selected and prepared according to manufacturer specifications and organisational requirements.
 - 1.4. Work is planned in consultation with ***appropriate persons*** to meet survey specifications and timeframes.
2. Use control techniques for set-out.
- 2.1. Horizontal control points are located throughout the work area and coordinates are set out according to plans and specifications.
 - 2.2. Design points are set out from base lines by offsetting, and positions are checked to ensure correct tolerances according to specifications.
 - 2.3. Primary and secondary controls are used and accuracy is checked according to plans and specifications.
 - 2.4. Set-out pegs or markers are used to indicate base lines and offsets relative to the work area.
 - 2.5. Vertical control points are established to ensure design points are positioned at correct levels according to plans and specifications.
 - 2.6. Offsets and profiles are put in place to define the main lines of stormwater works and provide vertical controls.
 - 2.7. Measured surveying data is reduced and calculations, including fall of land and volume, are conducted according to industry-accepted standards and organisational requirements.
3. Finalise stormwater system set-out.
- 3.1. Measurements are checked according to plans and specifications to ensure correct plan position and reduced level of set-out.
 - 3.2. Discrepancies between specifications and actual activities are identified and addressed or reported according to organisational requirements.
 - 3.3. Stormwater system set-out is finalised and documentation completed according to organisational requirements.

Foundation Skills

This section describes the language, literacy, numeracy and employment skills essential to performance in this unit but not explicit in the performance criteria.

Skill	Performance feature
Numeracy skills to:	- perform surveying calculations relating to height, distances, slope, angles and coordinates - use datum and contours to calculate fall of land and volume.
Oral communication skills to:	- ask questions to clarify task requirements - report and discuss project information.
Reading skills to:	interpret graphical information in plans, drawings and contour maps.
Writing skills to:	record field notes in a format that can be interpreted by a third party.
Technology skills to:	- connect observations to coordinate systems - set up, calibrate and operate surveying equipment.
Problem-solving skills to:	identify and use primary and secondary controls to improve accuracy of measurements.

Range of Conditions

This section specifies work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included. Bold italicised wording, if used in the performance criteria, is detailed below.

Appropriate persons must include at least one of the following:

- client
- colleague
- engineer

- manager
- registered or qualified surveyor.

Unit Mapping Information

No equivalent unit.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=6f3f9672-30e8-4835-b348-205dfcf13d9b>

Assessment Requirements for CPPSIS5046 Set out stormwater systems

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Performance Evidence

A person demonstrating competency in this unit must satisfy the requirements of the elements, performance criteria, foundation skills and range of conditions of this unit. The person must also set out stormwater systems and associated engineering structures for two different projects.

While setting out the above stormwater systems and associated engineering structures, the person must:

- plan work tasks by checking plans, drawings, maps, specifications and control marks
- set out marks and lines to define position and level of design points on site using two of the following pieces of equipment:
 - hand-held laser measuring device
 - global navigation satellite system (GNSS)
 - level
 - tape
 - total station
- use horizontal and vertical control techniques to position design points and markers
- measure and calculate data within industry-accepted tolerances for accuracy
- comply with manufacturer specifications when using equipment
- check measurements to ensure accuracy of plan position and reduced level of set-out and address identified discrepancies
- reduce and manipulate surveying data
- communicate clearly with others to clarify and report project information
- comply with organisational and legislative requirements for:
 - identifying hazards, using personal protective equipment (PPE), and working safely
 - recording, storing and filing data
 - setting up and using surveying equipment.

Knowledge Evidence

A person demonstrating competency in this unit must demonstrate knowledge of:

- mathematical concepts relating to algebra, trigonometry and geometry and their use in calculating spatial measurements
- methods for calculating fall of land and volume relating to:
 - contours and spot heights
 - cross-sections: mean area and end area using trapezoidal, prismoidal and Simpson's rules
 - regular objects, including cone, cylinder, pyramid, wedge, frustum and sphere
- methods for calculating surveying data and verifying its accuracy using primary and secondary controls
- methods for establishing a control network that meets specified tolerances
- methods for recording spatial data relating to set-out
- methods for setting up, levelling and calibrating equipment used to set out stormwater systems
- purpose of primary and secondary controls for set-out
- reference and coordinate systems for surveying data, including Australian Height Datum and Map Grid of Australia
- types of pegs and markers used during set-out and methods for ensuring their optimal placement on site
- types of stormwater systems and their purposes.

Assessment Conditions

The following must be present and available to learners during assessment activities:

- equipment:
 - as specified in the performance evidence, including PPE
- specifications:
 - task specifications, drawings, maps and plans
 - organisational policies, procedures and documentation relating to work health and safety
- relationships with team members and supervisor:
 - working in a team.

Timeframe:

- as specified by project requirements.

Assessor requirements

As a minimum, assessors must satisfy the assessor requirements in the Standards for Registered Training Organisations (RTOs) current at the time of assessment.

Links

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