

1. Module details**Module name****Towers - Basic Construction****Module duration**

It is expected that students with the appropriate entry knowledge and skills will successfully complete this module in 36 – 40 hours.

Module code

NUE239

Discipline code

0703130

2. Module purpose

This module is designed to supply the knowledge and skills required by electricity supply industry workers to construct transmission towers and associated accessories.

The experience gained is in the correct procedures and practices involved in preparing for and carrying out the total construction of a transmission tower by interpreting plans and drawings, partlists and resources required.

Installation of footings and foundations, assembly and erection of steel tower components for the type of tower required, and assembly of all transmission tower components and hardware.

All procedures and practices comply in accordance with electricity supply industry standards, Supply Authority regulations, relevant Australian Standards, enterprise requirements and OH&S regulations.

3. Prerequisites

NUE207 Powerline Safety Practices.

NE175 Workshop Practice.

NUE236 Rigging (Basic).

4. Relationship to competency standards

This module addresses Unit 2.8 of the E.S.I. National Competency Standards for Overhead Line Work and Cable Jointing.

5. Content**Enterprise works and assembly manuals**

parts lists

drawings

Footings and foundations

soil types

concrete (hydraulic cements, aggregates, properties of concrete, water cement ratios)

caisson or pile based foundation

special bored types

soil stabilisation processes &

erosion control

Tower types and assembly techniques

pyramid
 delta
 pi
 tower components
 construction & assembly techniques (by parts, by sections)
 anti-climbing devices
 tower nameplate

Hardware

insulator types
 accessories
 earthing requirements

Resource requirements

personnel
 plant
 equipment
 tools
 transport

6. Assessment strategy

Assessment methods

Short answer questions (written, oral or graphic or computer based), multiple choice questions, oral questions, observations, assignments, other recognised methods.
 Suitable practical exercises which assess the skills required of each learning outcome.

Conditions of assessment

Theory room for written tests together with practical field observation.

7. Learning outcome details

Learning outcome 1

Install transmission footings and foundations to the required specifications.

Assessment criteria

- 1.1 Identify and interpret all technical drawings required for the installation of transmission footings and foundations.
- 1.2 Identify various types of footings and foundations and the influence of soil type.
- 1.3 Explain the importance of accurate mixing ratios and additives used in mixing concrete when preparing to install footings.

Learning outcome 2

Assessment criteria

- 1.4 Identify the installation methods and the resources required, including personnel, plant, equipment, tools and transport to ensure the task can be completed.
- 1.5 Identify soil stabilisation and erosion control techniques as appropriate for the installation of transmission tower footings/foundations.
- 1.6 Identify and install the appropriate earthing system.
- 1.7 Install transmission footings and foundations to the required specifications.

Assemble and erect steel transmission tower components.

- 2.1 Identify and interpret all technical drawings required for the erection of steel transmission tower components.
- 2.2 Identify types of towers used for electrical transmission lines.
- 2.3 Identify construction methods used to assemble transmission towers.
- 2.4 Identify resources including specialist tools and equipment required for the assembly of towers.
- 2.5 Assemble components and erect a steel transmission tower in accordance with nominated specifications.

Learning outcome 3

Assessment criteria

Assemble transmission tower components and hardware.

- 3.1 Identify and interpret all technical drawings required for the installation of transmission line hardware and components.
- 3.2 Identify work methods for installation of transmission line hardware and components.
- 3.3 Rig and install transmission line hardware and components.

8. Delivery of the module

Delivery strategy

Delivery strategies must be suitable for both theoretical and/or practical learning and module purpose. It is recommended that learning and assessment be facilitated in a holistic manner which may require a learning sequence other than indicated in the body of this module descriptor.

Resource requirements

Relevant Australian standards.
Enterprise work manuals and standing instructions, diagrams and layouts.
Relevant manufacturers' equipment manuals.
Tower construction facility.

Occupational health and safety requirements

Students should be made aware of Occupational Health and Safety issues in all situations and be expected to demonstrate safe working practices at all times. Electrical safety must be emphasised.