Australian Government

UEENEEG186A Design effective and efficient lighting for residential and commercial buildings

Release 2

INDUSTRY SKILLS COUNCILS
Creating Australia's Future

UEENEEG186A Design effective and efficient lighting for residential and commercial buildings

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This unit covers lighting design for residential and commercial buildings to provide sufficient illumination with minimal energy use. It encompasses an understanding of safety principles and photometrics, the application of design calculations, compliance standards, energy management, lighting control and available lighting products appropriate to the illumination design and fully documenting completed design.

Application of the Unit

Application of the Unit

2)

This unit is intended to focus the competencies obtained as prerequisites to the specific application of lighting design in various situations in terms of effectiveness and efficiency.

Licensing/Regulatory Information

License to practice

3)

The skills and knowledge described in this unit do not require a license to practice in the workplace. However other conditions may apply in some jurisdictions subject to regulations related to electrical work. Practice in the workplace and during training is also subject to regulations directly related to occupational health and

License to practice **3)**

safety and where applicable contracts of training such as apprenticeships.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEG184A	Provide photometric data for illumination system design
UEENEG185A	Select effective and efficient light sources and luminaries for given locations and designs.

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 5 Writing 5 Numeracy 5

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT		PERFORMANCE CRITERIA	
1	Prepare to design lighting	1.1	OHS processes and procedures for a given work area are identified, obtained and understood.
		1.2	The extent and nature of the lighting requirements is determined from design brief.
		1.3	Safety and other regulatory requirements to which the lighting design shall comply are identified, obtained and understood. Note. Requirements include performance standards set down by the BCA for various types of building classifications
		1.4	Design development work is planned to meet scheduled timelines in consultation with others persons involved in the lighting installation or associated work.
2	Develop lighting design.	2.1	Knowledge of lighting performance standards, compliance methods and lighting equipment is applied to designing the lighting.
		2.2	Alternative arrangements for the lighting design are considered based on the requirements outlined in the design brief.
		2.3	Safety, functional and budgetary considerations are incorporated in the lighting design.

ELEMENT	PERFORMANCE CRITERIA	
	2.4	Lighting design draft is checked for compliance with the design brief and regulatory requirements.
	2.5	Lighting design is documented for submission to appropriate person(s) for acceptance and approval.
	2.6	Solutions to unplanned situation are provided consistent with organisation's policy.
3 Obtain approval for lighting design.	3.1	Lighting design is presented and explained to client representative and/or other relevant person(s).
	3.2	Requests for alterations to the design are negotiated with relevant person(s) within the constraints of organisation's policy.
	3.3	Final design is documented and approval obtained from appropriate person(s).
	3.4	Quality of work is monitored against personal performance agreement and/or established organizational or professional standards.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of designing effective and efficient lighting for residential and commercial buildings.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EG186A Lighting design

Evidence shall show an understanding of lighting design to an extent indicated by the following aspects:

T1 Detailed knowledge of lighting principles

T2 Lighting applications

T3 Safety aspects of lighting

T4 Energy efficiency

T5 Integrating various lighting types into one application

T6 Control and energy management

T7 Interpreting and applying manufacturers' technical data

T8 Architectural considerations

T9 Utilising natural lighting

T10 Use of computer programs for lighting design

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit. It must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of performance criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Designing effective and efficient lighting for residential and commercial buildings as described in 8) and including:

A Determining the extent and nature of the lighting requirements from a design brief.

B Identifying and understanding safety and other requirements to which the lighting design shall comply.

C Planning to meet scheduled timelines

D Applying appropriate knowledge of lighting performance

compliance and lighting equipment in designing the lighting.

E Considering alternative arrangements for the lighting design

F Including safety, functional, maintenance and budgetary factors in the lighting design

G Documenting and presenting the lighting design

H Responding appropriately to requests to alter the design.

I Documenting and obtaining approval of the lighting design.

J Dealing appropriately with unplanned events

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

OHS policy and work procedures and instructions.

Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions for assessment must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to designing effective and efficient lighting for residential and commercial buildings.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is

expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to at least three of the following:

- Large residential lighting design
- Indoor area shop lighting
- Stairway or stairwell lighting
- Flood lighting
- Amenities lighting
- Lighting for specific commercial processes and tasks
- Lighting for ambient and aesthetic effect
- Display lighting
- Security lighting
- Using computer program for lighting design

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Electrical