Modification history

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| Release | Comments |
| Release 1 | This version released with AHC Agriculture, Horticulture and Conservation and Land Management Training Package Version 6.0. |

| AHCGRIXX1 | Design roof gardens, vertical gardens and green facades |
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| Application | This unit of competency describes the skills and knowledge required to design roof gardens, vertical gardens and green facades, in consultation with system/component suppliers, building professionals and other specialists. It includes incorporating the principles, benefits and risks associated with green infrastructure into designs which comply with applicable building and local government regulations and guidelines and meet client requirements.  The unit applies to individuals with existing horticultural and or landscaping experience, who use specialised knowledge and researched information to design roof gardens, vertical gardens and green facades for existing and or new buildings.  This unit of competency is suitable for individuals using their own judgment to deal with predictable and unpredictable problems and decide on solutions to a range of complex problems during the design process.  Roof garden, vertical garden and green facade design must meet all the requirements of local government and construction regulations, standards and codes.  No licensing, legislative or certification requirements apply to this unit at the time of publication. |
| Prerequisite Unit | Nil |
| Unit Sector | Green Infrastructure (GRI) |

| Elements | Performance Criteria |
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| Elements describe the essential outcomes. | Performance criteria describe the performance needed to demonstrate achievement of the element. |
| 1. Research green infrastructure design information | 1.1 Establish purpose, functions, benefits and risks associated with roof gardens, vertical gardens and green facades  1.2 Access and interpret building regulations, standards and codes and local government policy, procedures and permits to determine applicable restrictions or limitations relating to green infrastructure  1.3 Identify environmental and energy efficiency impacts of green infrastructure design  1.4 Identify factors which will impact green infrastructure designs |
| 2. Scope project requirements | 2.1 Consult with client to clarify type and purpose of green infrastructure, design preferences, features and requirements  2.2 Identify project location and complete site analysis  2.3 Confirm building structural principles relating to green infrastructure with architect, engineer and/or other relevant specialists |
| 3. Design roof gardens | 3.1 Accurately measure and record overall size of proposed green roof space  3.2 Design roof garden to utilise spatial availability, enable access and egress, and comply with building regulations, standards and codes  3.3 Consult growing media specialist and select media and plants based on the location conditions, system design and maintenance requirements  3.4 Document specifications for irrigation and drainage systems, lighting and waterproofing, including recommended suppliers  3.5 Calculate total weight of materials, components and water in consultation with suppliers, to ensure the total weight complies with parameters set by an engineer  3.6 Prepare a design concept of proposed roof garden, confirm with specialists and/or building professionals and present to client  3.7 Prepare design plans, specifications, maintenance program and estimated costs for roof garden |
| 4. Design vertical garden | 4.1 Determine the location of vertical garden, aspect, and dimensions  4.2 Identify type of vertical garden best suited for the conditions, building type and required outcomes  4.3 Consult growing media specialist to determine media characteristics and functionality, and select plants based on the location conditions, system design and maintenance requirements  4.4 Document specifications for irrigation and drainage systems, lighting and waterproofing, including recommended suppliers  4.5 Calculate the total weight of vertical garden materials and fixing fastening system in consultation with suppliers, to ensure the total weight complies with parameters set by an engineer  4.6 Prepare a design concept of proposed vertical garden, confirm with specialists and/or building professionals and present to client  4.7 Prepare design plans, specifications, maintenance plan and estimated costs for vertical garden |
| 5. Design green facades | 5.1 Identify and select suitable types of plants and determine depth of growing media for installed container or garden bed planting  5.2 Confirm the integrity and suitability of the support structure with engineer  5.3 Specify fixing requirements that comply with building codes and standards  5.4 Design facade considering wind and climate conditions, irrigation and drainage requirements and factors relating to ongoing maintenance  5.5 Prepare a design concept of proposed green façade, confirm with specialists and /or building professionals and present to client  5.6 Prepare design plans, specifications, maintenance program and estimated costs for green facade |

| 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. | |
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| Skill | Description |
| Reading | * Reading and interpreting legislation, standards, codes, and regulations to identify and synthesise information that is critical for compliant green infrastructure design * Gather and analyse researched information to select materials and components for green infrastructure |
| Oral Communication | * Determine stakeholder requirements through open-ended questioning, active listening, paraphrasing and summarising * Consult with architects, engineers and suppliers to ensure compliance of designs |
| Numeracy | * Apply decimals and percentages to estimate and calculate project costs * Use measurements and formulas to calculate length, area, volume and weight * Interpreting data and numerical data displayed in graphs, charts and/or tables |
| Writing | * Develop relevant documentation using digital technology |

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| Unit Mapping Information | | | |
| Code and title current version | Code and title previous version | Comments | Equivalence status |
| AHCGRIXX1 Design roof gardens, vertical gardens and green facades | Not applicable | New unit | No equivalent unit |

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

| TITLE | Assessment requirements for AHCGRIXX1 Design roof gardens, vertical gardens and green facades |
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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 designed one roof garden project with a minimum of 50 square metres, one vertical garden with a minimum of 20 square metres and one green facade with a minimum of 20 square metres and has:   * designed compliant green infrastructure that meets the client requirements * complied with local government policy and procedures, building regulations, standards and codes * complied with the project design parameters set by an engineer * used measurements and formulas to calculate material quantities and project costs * incorporated provision of access and egress for construction and maintenance * developed a maintenance program to ensure sustainability of the green infrastructure. | |

| Knowledge Evidence |
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| 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:   * professional practice requirements in green infrastructure design * factors influencing green infrastructure design for existing and new buildings * relevant legislation, standards and codes including the National Construction Code (NCC) * recirculating and flood-drain vertical garden systems * site analysis, including: * climatic factors – wind, temperature, solar radiation, rainfall and irrigation * drainage * installation and ongoing maintenance access * ease of construction and equipment required * green infrastructure terminology * reasons for creating vertical gardens and roofs, including: * environmental * economic * social * features, benefits and risks of green infrastructure * characteristics, properties and limitations of materials used for green infrastructure, including: * water proofing material * substrate * root barrier * drainage and irrigation systems * storing and recycling water systems * lighting systems * sensor equipment and integration with Building Information Management (BIM) systems * characteristics, properties and limitations of plants used for green infrastructure * types and properties of vertical garden construction, including: * panel system * modular system * properties of green roofs, including: * extensive * intensive * properties of green facades * project costing and quoting, including: * materials and labour * build costs including transporting and storing materials and equipment and provision of safety equipment * ongoing maintenance * current and relevant work health and safety and environmental requirements * organisational policies and procedures. |

| Assessment Conditions |
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| Assessment of skills must take place under the following conditions:   * physical conditions: * skills must be demonstrated in design workplace or an environment that accurately represents workplace conditions * specifications: * specific organisational policies, procedures and processes * manufacturer’s fixing and fastening specifications for vertical garden and green facade systems * work health and safety and environmental documentations * building regulations, standards and codes * relationships: * clients to discuss green infrastructure design requirements * building professional (engineer) to advise on building structural integrity.   Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards. |

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