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 rooftop gardens, green walls and green facades |
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| Application | This unit of competency describes the skills and knowledge required to research and gather green infrastructure and construction information for application in designing rooftop gardens, green walls and facades.  The unit applies to individuals who use specialised knowledge and researched information to design roof top gardens, green walls 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.  Rooftop garden, green wall and green facade design must meet all the requirements of 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 Read and interpret construction plans, specifications and local government planning and building permits to determine any restrictions or limitations relating to green infrastructure design  1.2 Identify project location, aspect and climate zone to assist with the design details and the selection of suitable plants, irrigation systems and drainage requirements  1.3 Interpret and follow relevant organisational design policies and procedures  1.4 Identify purposes, benefits and functions of green infrastructure, and risks associated with rooftop gardens, green walls and facades  1.5 Ascertain environmental, biodiversity, energy efficiency and maintenance impacts of green infrastructure design  1.6 Consider green infrastructure and nearby vegetation that may contribute to fire risk  1.7 Consult with client to clarify type and purpose of rooftop garden and or wall or facade design preferences, features and requirements  1.8 Consider building regulations, standards and codes  1.9 Identify and interpret building structural principles  1.10 Calculate cost of completed project |
| 2. Design green walls | 2.1 Locate position of green wall from plans and site visit to determine aspect, dimensions and building structure type  2.2 Research local climate and weather conditions  2.3 Determine type of green wall best suited for the conditions and building type and required outcomes  2.4 Select and pair plants based on the conditions and system design  2.5 Source or develop a lighting, irrigation and drainage system  2.6 Calculate total weight of green wall materials, fixings and fastening system and refer to building regulation, standards and codes and manufacturer specifications for compliance  2.7 Prepare a design sketch of proposed green wall and confirm with client  2.8 Prepare design plans, specification and estimated costs for green wall |
| 3. Design rooftop gardens | 3.1 Determine location, aspect, climatic features and urban environment of roof space  3.2 Consult with clients to determine purpose, inclusions and requirements of proposed rooftop garden construction  3.3 Accurately measure overall size of proposed green roof space  3.4 Evaluate access and egress to rooftop garden area  3.5 Design rooftop garden to utilise spatial availability, enable future access, comply with building regulations, standards and codes and meet client requirements  3.6 Consider and incorporate a design that encourages biodiversity  3.7 Select and pair plants based on the conditions and system design  3.8 Calculate mass weight of materials and components  3.9 Check structural capabilities of the building from plans and specifications and consultation with engineers  3.10 Prepare a design sketch of proposed rooftop garden and confirm with client  3.11 Prepare design plans, specification and estimated costs for rooftop garden |
| 4. Design green facades | 4.1 Establish the intended purpose and objective of the facade  4.2 Identify and select suitable types of plants and determine depth of growing media for installed container or garden bed planting  4.3 Examine the integrity of the structure and confer with structural professional to ascertain suitability  4.4 Consider fixing requirements that comply with building codes and standards  4.5 Design facade considering wind and weather conditions, irrigation and drainage requirements and factors relating to ongoing maintenance  4.6 Prepare a design sketch of proposed green facade and confirm with client  4.7 Prepare design plans, specifications 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 |
| Learning | * Apply various approaches to identify and apply complex building regulation, standards and codes to inform the green infrastructure design |
| Reading | * Gather researched environmental and biodiversity data to select materials for green infrastructure |
| Oral Communication | * Determine stakeholder requirements through open-ended questioning, active listening, paraphrasing and summarising |
| Numeracy | * Apply decimals and percentages to estimate project cost * Use measurements and formulas to calculate length, area, volume and weight |
| 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 rooftop gardens, green walls and green facades |  |  | No equivalent unit |

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| Links | Companion Volumes, including Implementation Guides, are available at VETNet:  [Agriculture Horticulture and Conservation and Land Management Training Package](https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=c6399549-9c62-4a5e-bf1a-524b2322cf72) |

| TITLE | Assessment requirements for AHCGRIXX2 Design rooftop gardens, green walls 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 green wall with a minimum of 20 square metres, one external green facade with a minimum of 20 square metres and one rooftop garden project with a minimum of 100 square metres for construction or installation on an existing building and has:   * designed a practical, functional and sustainable green infrastructure that meets the client requirements * complied with all building regulations, standards and codes * calculated and applied wind, live and dead loads to the design * included practical and operational access and egress * used measurements and formulas to calculate material quantities and project costs * incorporated provisions for ongoing maintenance. | |

| 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:   * functional requirements and structural capabilities of green infrastructure * green infrastructure design for existing and new buildings * closed versus open systems * ecosystems and habitat restoration in urban areas * site analysis: * climatic factors – wind, temperature, solar radiation, rainfall and irrigation * weight loading – live load, dead load and transient load * drainage * new and existing structures – capabilities and access * ease of construction – equipment required * assessment of risks and mitigation plans * construction of green infrastructure terminology * reasons for creating green walls and roofs: * lack of space * improve aesthetics * improve physical environment – reduce glare, modify temperature, filter air pollutants, reduce water runoff and mitigate flood problems * create urban farming – grow crops * features/benefits of green infrastructure: * improved stormwater management * increase sound insulation * regulate building temperatures * run-off water filtration * food production * aesthetic value * improving air quality * energy efficiency * reduction in energy consumption and saving * sustainability * protecting building from the elements and increasing roof life span * thermal insulation * reduction in risk of fire * reducing the urban heat island effect * creation and preservation of habitat and ecological biodiversity * characteristics, properties and limitations of materials and plants used for green infrastructure: * water proofing material * substrate * root barrier * drainage and irrigation systems * storing and recycling water systems * lighting systems * types of green wall construction: * geo-fabric system * steel framed system * types of green roofs: * extensive green roof – shallow rooted plants requiring little maintenance - comprises of waterproof membrane, root protection layer, a drainage layer, filter mat, growing medium and vegetation * intensive - feature a wide variety of vegetation including trees (requiring higher level of maintenance) - maximise environment benefits, provide public amenities and production of food * semi extensive – hybrid of extensive and intensive, might have limited access and structural capacity to support an intensive green roof * types of green facades * current and relevant work health and safety and environmental requirements * organisational policies, procedures and quality systems. |

| 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 * resources, equipment and materials: * digitally based hardware and software design systems * specifications: * specific organisational policies, procedures and processes * manufacturer’s fixing and fastening specifications for green wall 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 to determine 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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