Green Walls and Roof Gardens Project

Summary of Feedback, Responses and Actions

7 February 2020

Draft units of competency and skill sets for the Green Walls and Roof Gardens project were made available on the Skills Impact website for stakeholder review from 30 October – 1 December 2019. Please visit the website to view a full list of the documents that were submitted for consultation during this time.

Feedback was received from a variety of stakeholders around the country via email, the Skills Impact Feedback Hub, at face-to-face workshops and webinar, via phone and email, as follows:

	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	National
Industry (employer / employee)									
Industry association			*						
Union									
Registered Training Organisation (RTO)									
Government department	*					*			

** Note: Feedback received from a national industry association and Government departments indicated no relevant stakeholders in the Northern Territory, Australian Capital Territory and Tasmania.*

Feedback received during the 'drafts available' period for the units of competency and skill sets that have been developed for the design, construction and maintenance of roof gardens, vertical gardens and green facades has been positive, with minor changes and updates suggested by stakeholders.

Below is a summary of the feedback raised for the draft units of competency and skill sets developed and reviewed for the Green Walls and Roof Gardens project, and how these have been dealt with. This involves a consideration of the information provided, views of industry stakeholders and from people who are part of the Subject Matter Expert Working Group (SMEWG) process. Resolutions are constructed to consider the needs and views of stakeholders to the extent possible, and to comply with the *Standards for Training Package 2012*. The resolutions may represent a compromise on one or more stakeholder views with the aim of a workable outcome for industry, State and Territory Training Authorities (STAs) and training providers.

Acronyms - PC – Performance Criteria, PE – Performance Evidence, KE – Knowledge Evidence, AC – Assessment Conditions, SMEs – Subject Matter Experts

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Summary of feedback on draft Skill Sets

AHCSSXXXX1 Design Roof Gardens, Vertical Gardens and Green Facades Skill Set

Stakeholder Comments and Identified Issues		Consideration and Proposed Resolution
Industry, VIC	Re: Pathways Information: [Designing] Generally requires a degree in Landscape Architecture due to regulations based upon weight-loading, interfacing with architecture, etc. Engineering inputs can be vital and of a significantly large scale to warrant designers to have qualifications of degree level and/or highly specialised supplementary training. Re: Inclusion of unit AHCPCM503 Vertical garden and roof garden species selection is most certainly not part of general landscape species services. These technologies require highly specific expertise to specify species accurately. Few terrestrial/landscape species are tolerant of roof garden or vertical garden conditions, therefore highly detailed knowledge of appropriate species is required to achieve sustainable outcomes. Vertical gardens are ecological niches not existent in terrestrial scenarios, requiring species specifically adapted to life on the vertical plane, i.e. epiphytic, lithophytic, certain rheophytic species. The array of these species also greatly impacts survivability. Living architecture technologies should not be associated with or confused with terrestrial horticulture or general landscape design or its associated education. highly specialised education in these fields is required -see Melbourne Universities courses led by Dr. Claire Farrell and Dr. John Rayner. Applying general landscape design methodologies to vertical garden or roof garden applications generally has devastating impacts. Re Target Group: Having worked in the industry for over 10 years, completing circa 600 living architecture installations form small residential to significantly large commercial (largest in the southern hemisphere) installations, I have mostly worked with Landscape Architects, Architects and tier 1 builders. less than 1% of projects have involved general	Comments**:** Thank you for your detailed feedback. Wording has been included in the Skill Set Description and Target Group to clarify that design of green infrastructure is required to be undertaken '*in association with'* building professionals. Comments**:** Unit *AHCPCM503 Specify plants for landscapes* has been replaced with unit *AHCPCM504 Design specialised landscape* which was a unit identified in the consultation process to be more appropriate. Comments**:** Thank you for this information. As noted above, wording has been included in the Skill Set Description and Target Group to clarify that design of green infrastructure is required to be undertaken *in association with building professionals*.

Stakeholder Comments and Identified Issues		Consideration and Proposed Resolution
	landscape designers. I have a diploma in landscape design, degree in botany and environmental studies and a second degree though most of the works I conduct are still done in conjunction with landscape architects and architects. Design documentation is rarely covered by landscape design qualifications as the degree of engineering inputs, council approval requirements and often budgets are frequently (unfortunately) well beyond the scope of general landscape designers. Small DIY installations are frequently covered by landscape designers, though most design is handed over to myself once rudimentary briefing on design requirements is provided to such clients. Small DIY installations, utilising basic off-the-shelf products constitute a notably small portion of the industry. The vast majority of installations (which are growing at a rapid pace) are those requiring higher skill-sets than general landscape design.	
RTO, NSW	Re: Pathways Information The Landscape Designer would need to engage an engineer to cover structural loading issues. The same process as swimming pool and other structural engineering certification. Liaison with architects to cover interface and connection solutions is most likely. Covering professional practice in this area will be beneficial for students designing green walls and green roofs. AHCPCM503 *AHCPCM504 Design specialized landscape* might be a better option than 'Specify' so the specialized plant groups can be analysed/learned and students assessed on the application of plant knowledge in a variety of green infrastructure scenarios.	Comment**:** Thank you for your feedback. Wording has been included in the Skill Set Description and Target Group to clarify that design of green infrastructure is required to be undertaken in association with specialists and building professions. Adopted: Unit *AHCPCM503 Specify plants for landscapes* has been replaced with unit *AHCPCM504 Design specialised landscape.*
Government Department, NSW	Understanding each of the skills set requires an overriding sustainability focus	Feedback from SMEWG confirmed that sustainability is a key factor in green infrastructure design which is communicated through to the construction and maintenance via the design scope, and the group have confirmed that sustainability is included in the design unit.

AHCSSXXXX2 Construct Roof Gardens, Vertical Gardens and Green Facades Skill Set

Stakeholder Comments and Identified Issues		Consideration and Proposed Resolution
Government Department, NSW	Need to ensure that sustainable focus especially for water/drainage is and run off is covered	Feedback from SMEWG confirmed that sustainability is a key factor in green infrastructure design which is communicated through to the construction and maintenance via the design scope, and the group have confirmed that sustainability is included in the design unit.
Industry, VIC	Is there a need to include a reference to 'safely build under supervision'? Is this skill set intended more for construction managers or entry-level personnel?	Comment**:** Thank you for your feedback. Whilst the skill set target group is not limited to 'construction managers', the wording of the Target Group has been amended to reflect the skill set is intended for *experienced horticulture and landscape construction workers and/or builders who construct green infrastructure systems for roof gardens, vertical gardens and green facades in new and or existing buildings.* The units of competency within the skill set are predominately for 'individuals who take responsibility for their own work and for the quality of the work of others. They use discretion and judgement in the selection, allocation and use of available resources'

AHCSSXXXX3 Maintain Roof Gardens, Vertical Gardens and Green Facades Skill Set

Stakeholder Comments and Identified Issues		Consideration and Proposed Resolution
Government Department, NSW	Urban agriculture - surely this could be part of Cert II (sic) Agriculture not just Horticulture	Comment**:** Thank you for your feedback. Pathways information added to include Certificate III in Agriculture.
Industry, VIC	There doesn't appear to be a reference to producing maintenance plans or manuals in any of the skill set descriptions. The ability to read/interpret a maintenance manual is an important skill set, as is the ability to produce a maintenance plan/manual. Design unit – edit the PC or PE to design a maintenance program.	Adopted: Consideration of maintenance program requirements has been included in the AHCSSXXX1 Plan and Design Roof Gardens, Vertical Gardens and Green Facades Skill Set Description, in relation to the selection of media and plants and their maintenance requirements as part of the design process and project costing. Also the need to consider maintenance requirements in selection of media in AHCGR1XX1 Design roof gardens, vertical gardens and green facades has been included in PCs: 3.*3 Consult with growing media specialist and select plants based on the location conditions and system design, and maintenance requirements*, and 3.7 *Prepare design plans, specifications, maintenance plan and estimated costs for vertical garden.*

General Feedback on Skill Set and Draft Units

Stakeholder Comments and Identified Issues		Consideration and Proposed Resolution
Industry & RTO, Workshop NSW	Another qual option for the new units is Cert IV and Dip of Parks and Gardens, Cert III in Urban Irrigation.	Comment: Thank you for your feedback. The SMEWG considered this feedback and after consultation agreed that AHCGRIXX3 Maintain roof gardens, vertical gardens and green facades unit should be added to the elective group of AHC31016 Certificate III in Parks and Gardens. It should also be noted that the packaging rules of this qualification permits another unit to be imported into the qualification, if necessary.
	Design unit - strengthen plant selection in this unit rather than add other AHCPCM units to the Skill Set.	Feedback from consultation with SMEWG has confirmed that plant selection for roof gardens, vertical gardens and green facades is integral to design. After consideration, the group decided that AHCPCM503 Specify plants for landscapes is replaced with AHCPCM504 Design specialised landscape.
Industry, RTO & Government, Workshop VIC	White card, include this in the construct skill set.	Comment: Thank you for your feedback. Wording regarding the requirement of a 'White Card' as a requirement to undertake construction work has been included in the Licencing/Regulatory Information of the Skill Set.
	Maintain Skill Set - AHCPCM303 Control pests and diseases	The SMEWG considered this feedback and after deliberation decided that AHCPCM202 Treat plant pests, diseases and disorders should be replaced with the more appropriate AHCPCM302 Control plants, pests and diseases in the maintenance skill set. They did not feel that AHCPCM202 Treat plant pests, diseases and disorders was the most appropriate unit to be included in the skill set as it requires supervised maintenance rather than self-directed.

	Budgets (cost the build) and site access in the design unit (explicit).	Adopted: added costing and quoting of materials/labour and build costs more explicitly into KE as seen below:
		• *project costing and quoting, including:*
		  • *materials and labour*
		  • *build costs including transporting and storing materials and equipment and provision of safety equipment*
		  • *ongoing maintenance*

Stakeholder Comments and Identified Issues		Consideration and Proposed Resolution
Government, National	Waterproofing is particularly (sic) on the building compliance radar. You have touched on this in the building unit. Could this be better reflected in the design and maintain units? Also, may be able to strengthen (sic) the reference to NCC, Aust Standards, and council regulations and guidelines. To ensure compliance (sic) may require engagement of engineers or specialists such as building designers, graduates should know when and who to engage.	Comment**:** Thank you for the feedback. KE of design unit includes reference to waterproofing materials as well as professional practice of consultation/confirmation with specialist professionals. Building regulations, standards and codes and local government policy, procedures and permits are sufficiently covered within the units. For instance, the design unit has the following PCs covering this issue: PC 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* PC 2.3 *Confirm building structural principles relating to green infrastructure in consultation with architect, engineer and/or other relevant specialists* PC 3.2 *Design roof garden to utilise spatial availability, enable access and egress, and comply with building regulations, standards and codes* PC 3.4 *Document specifications for irrigation and drainage systems, lighting and waterproofing, including recommended suppliers.* Individuals must also have Knowledge Evidence of relevant legislation, standards and codes including the National Construction Code (NCC)
Industry Association, QLD	New training units developed have the ability to be incorporated into existing recognised qualifications. The new Green Infrastructure construction units should have the ability to be incorporated into a revised Cert IV Landscaping qualification. There needs to be experience or prerequisite requirements to undertake the proposed skill sets/units.	Comment**:** Thank you for your feedback confirming the proposed placement of the new units which includes placement of the 'Construct roof gardens, vertical gardens and green facades' unit within the Certificate IV in Landscaping. The SMEWG has considered the issue of prerequisites for the individual units as well as entry requirements for the skill sets. Feedback from the group is that 'People will undertake the training for a variety of reasons and come from a variety of backgrounds. Entry requirements will present an unhelpful and unnecessary barrier to access training in this area'. The units are proposed to be added as elective units to a range of existing qualifications, none of which currently have entry requirements, meaning a person could undertake the units (and RTOs could package the individual units into a short course) from existing qualifications without entry requirements. Wording has been incorporated into the components to indicate a level of experience may be necessary, and RTOs prior to enrolment or the commencement of training and assessment, whichever comes first, must provide advice to the prospective learner about the

Stakeholder Comments and Identified Issues		Consideration and Proposed Resolution
		training product appropriate to meeting the learner's needs, taking into account the individual's existing skills and competencies.
Industry, VIC	Really like the content of the whole training package. Please ensure in designing green infrastructure we highlight under sustainability that we design for environmental, economic and social. I think we really need to highlight the social responsibility, benefits and value that green infrastructure can bring to individuals, communities, workspaces.	Thanks! Comment**:** KE of AHCGRIXX1 Design roof gardens, vertical gardens and green facades has been amended to require knowledge of environmental, economic and social reasons for creating green infrastructure.
Industry Association, National	We do care about this issue because it impacts on the structural performance of the building. Vertical gardens: • as a form of cladding it is obviously combustible and poses a safety risk. Drainage is an issue and pooling water can impact on the structural integrity (one issue for the opal tower in Sydney) Roof gardens: • need to be engineered in early in the design process to cater for the additional weight • drainage is an issue • damage to waterproofing membranes during installation. general site management during construction: • materials handling • storing of materials.	Comment**:** Thank you for your feedback. Features, benefits and risks of green infrastructure is included in the KE of AHCGRIXX1 Design roof gardens, vertical gardens and green facades, as well as the need to design in association with building professionals such as architects and engineers in relation to structural requirements. Unit AHCGRIXX2 Construct roof gardens, vertical gardens and green facades KE wording has been strengthened to include knowledge of the construction requirements for maintaining the integrity of waterproofing. Additional weight calculations are identified in AHCGRIXX1 Design roof gardens, vertical gardens and green facades, see PC 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.* Materials handling and storage of materials on site have been added to KE in AHCGRIXX2 Construct roof gardens, vertical gardens and green facades.
RTO, Industry Association & Industry, Workshop WA	• Roof gardens, living facades, vertical gardens (industry awards use this language in categories) • Living infrastructure • SS maintain needs rope unit? Or elevated work platforms	The SMEWG considered this feedback but all members indicated support and continuation of the following terminology: Green infrastructure, roof gardens, vertical gardens and green facades. The issue of ropes and elevated work platform (EWP) units in the maintenance skill set was considered; however, as skill sets do not have

Stakeholder Comments and Identified Issues		Consideration and Proposed Resolution
	• Plants and soil selection for VG, LF and RG – new unit • Build SS prepare growing media	the option for elective units and not all maintenance work would require ropes (roof gardens) or EWPs, the SMEWG decided not to include these units at this time. Feedback indicated specific units and skill sets for plants and growing media were not required as they are covered in existing units within the AHC Agriculture, Horticulture and Conservation and Land Management Training Package.
	• Review of the design by external consultants – last step of the design and first build.	Adopted: Element in each design strengthened to include confirming the design concept with specialists and/or building professional (engineer/architect) before presenting to client or developing final plans and specifications. Construct unit amended to more explicitly include within the PC resolution of any discrepancies with the designer and associated specialists. PC 1.1 *Read and interpret design plans and specifications, check permits and resolve any discrepancies with designer and/or associated specialists.*
	• PE change to 10-60 square metres for residential.	Adopted: PE in all units changed to 50 square metres as per other feedback.
	• Support for the skill sets, and the 3 areas of coverage (well written units).	Thank you!
	• Agreement where the units are placed in quals.	Thank you for this feedback.
RTO, Industry Association & Industry, Workshop QLD	Should there be entry requirements?	Comment: The SMEWG has considered the issue of prerequisites for the individual units as well as entry requirements for the skill sets. Feedback from the group is that 'People will undertake the training for a variety of reasons and come from a variety of backgrounds. Entry requirements will present an unhelpful and unnecessary barrier to access training in this area'. The units are proposed to be added as elective units to a range of existing qualifications, none of which currently have entry requirements, meaning a person could undertake the units (and RTOs could package the individual units into a short course) from existing qualifications without entry requirements. Wording has been incorporated into the components to indicate a level of experience may be necessary, and RTOs prior to enrolment or the commencement of training and assessment, whichever comes first, must provide advice to the prospective learner about the

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	Design skill set - agree that AHCPCM504 is a better unit. Parks and Gardens qual, add maintain unit as an elective	training product appropriate to meeting the learner's needs, taking into account the individual's existing skills and competencies. Adopted. Adopted. Thanks for this feedback. Agree this is a good idea and has been added to the proposals for validation.

Summary of feedback on new Units of Competency

AHCGRIXX1 Design roof gardens, vertical gardens and green facades

Stakeholder Comments and Identified Issues		Consideration and Proposed Resolution
RTO, NSW	New unit include or the learning outcomes be strengthened (sic) to include “Suitable plant species to be chosen for green wall/roof top applications” or to that effect. That way you can drop both the suggested plant units AHCPCM503 – Specify plants and AHCPCM504 – Design specialised landscapes. This way the Skill set will become shorter, it will be more specialised, there will be no CT’s because it is a new unit and the price point will be less. (Note: above feedback in unit 2, but relates to unit 1)	Comment**:** Feedback from the SMEWG has confirmed that plant selection for roof gardens, vertical gardens and green facades is integral to design. Unit AHCPCM503 Specify plants for landscapes has been replaced with unit AHCPCM504 Design specialised landscape.
Government, WA	APP: Need stronger wording in here to indicate that this is advanced competency for people that have considerable horticultural or landscaping experience. **Elements** - Elements 2, 3 and 4 have much the same PCs and can be combined: Design vertical gardens, roof top gardens and facades. PC's: 1.2 identify project location, aspect and **climate zone...** change to climate conditions. 1.3 Interpret and follow **relevant organisational design policies and procedures -** Not sure what this means - does organisation mean building owner/manager? 1.4 **Identify purposes, benefits and functions of**	Adopted: Application wording amended to include: *The unit applies to individuals with existing horticultural or landscaping experience, who use specialised knowledge and researched information to design roof top gardens, vertical gardens and green facades for existing and or new buildings.* Comment: SMEWG advice in the development of the units was the need to maintain separate elements due to variations in requirements. Comment: Based on other consultation received and confirmation by the SMEWG members, PC 2.2 wording has been amended to ‘*Identify project location and complete site analysis’.* Removed. Adopted: PC 1.1.

Stakeholder Comments and Identified Issues		Consideration and Proposed Resolution
	green infrastructure, and risks associated with roof gardens, green walls and facades - Suggest: Establish purpose, functions, benefits and risks associated with roof gardens, vertical gardens and facades.	Agreed – PC 1.7 removed.
	1.7 Consult with client to clarify type and **purpose**...repetition of 1.4?	Due to other changes resulting from feedback, this PC has been moved to 1.2.
	1.8 **Consider building regulations, standards and codes** - logically should be before 1.1.	Has been reworded, PC 2.3 to *Confirm building structural principles relating to green infrastructure with architect, engineer and/or other relevant specialists.*
	1.9 **Identify and interpret building structural principles** - It is not clear what this is trying to say. Is it trying to say: establish the impact of the proposed green infrastructure on the building's integrity and structure?	PC 2.2 reworded to *Identify project location and complete site analysis.*
	2.2 **Research local climate and weather conditions** - Hasn't this already been covered in Element 2? Also weather is a short-term concept which is not applicable at this stage?	Reworded and moved to PC 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.*
	2.4 Select **and pair plants -** not sure what this means or whether it is necessary.	Adopted other feedback which suggested wording: *Document specifications for irrigation and drainage systems, lighting and waterproofing, including recommended suppliers.*
	2.5 Source or develop a lighting, irrigation and drainage **system** - systems. presumably they may be separate.	Adopted other feedback to retain as two PCs. *Prepare a design concept of proposed [ ], confirm with specialists and/or building professionals and present to client.* *Prepare design plans, specifications, maintenance plan and estimated costs for [ ].*
	2.7 + 2.8 - couldn't these be combined into one PC?	Now PC 2.2 *Identify project location and complete site analysis.*
	3.1 Hasn't this already been done in Element 1? Although this wording is better.	Reworded PC 2.1 to *Consult with client to clarify type and purpose of green infrastructure, design preferences, features and requirements.*

Stakeholder Comments and Identified Issues		Consideration and Proposed Resolution
	3.2 Again, wasn't this done in Element 1? 3.6 Biodiversity may not be an objective of the client or even run counter to their objectives. 3.8 calculate mass weight of **materials and components** – and water (from irrigation and drainage). 3.10 + 3.11 amalgamate. 4.4 **Consider**…??? What? Just consider. No, use fixing requirements.	PC 3.6 Removed. Adopted, as well as other feedback: PC 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.* As per comment in PC 2.7 + 2.8 above. Adopted other feedback to retain as two PCs. *Prepare a design concept of proposed [ ], confirm with specialists and/or building professionals and present to client.* *Prepare design plans, specifications, maintenance plan and estimated costs for [ ].* PC 5.3 Amended wording to *Specify fixing requirements that comply with building codes and standards.*
Government, VIC	General Comments: Too many PC (37) needs to be broken down Unit reads more like a compliance document, as PE and KE read like checklists. Element 1: Refine element to cover the three components - of green infrastructure in general, differences and factors to consider - location, climate etc. PCs 1.1 and 1.8 the same outcome. PC 1.2 Too wordy identify project location and complete site analysis. PC 1.4 Should be PC 1.1. PC 1.5 How do you assess ascertain? Needs to be reworded – identify. PC 1.5 Too many parts, maintenance is a separate area. PC 1.7 Move to PC 1.2. PC 1.8 How do you assess consider? Needs to be	Comment: The number of PCs have been streamlined where PCs were duplicated. This now sees number of PCs reduced to 27. Adopted. Adopted. Adopted. Adopted and reworded PC 1.3 to *Identify environmental and energy efficiency impacts of green infrastructure design.* PC moved to 2.1.

Stakeholder Comments and Identified Issues		Consideration and Proposed Resolution
	reworded – identify. PC 1.9 Does not make sense – reword. PC 1.10 Remove not part of research brief. PC 2.1 No mention of media critical part of design. PC 2.4 Why pair, just select. PC 2.5 What is needed for this to be built not source. PC 2.8 Completed in PC 1.10. PC 3.2 Consult with clients to determine proposed requirements of roof garden. PC 3.6 How do you assess consider? No need to have biodiversity client may not want it and covered in element 1 during research. PC 3.7 Why pair just select. PE: Why on existing building, not mentioned in PCs. PE: "• incorporated provisions for ongoing maintenance " Not mentioned in PCs and large amount of content to complete. KE "• 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" Why? Not needed.	Reworded to *Confirm building structural principles relating to green infrastructure with architect, engineer and/or other relevant specialists* and moved to PC 2.3. Agreed. Costing of designs included PCs 3.7, 4.7 and 5.7. Selection of growing media and plant selection included in elements 3, 4 and 5. Wording amended on recommendation from feedback PC 4.4 to '*Document specifications for irrigation and drainage systems, lighting and waterproofing, including recommended suppliers'.* Removed. Included in PC 2.1 *Consult with client to clarify type and purpose of green infrastructure, design preferences, features and requirements.* Removed. Adopted. Removed. SMEWG advice and feedback received in consultation process that consideration of maintenance requirements of green infrastructure a critical component of project design. Wording amended in PC and PE for clarity. KE streamlined to include environmental, economic and social reasons. SME advice of importance of knowing distinctions.

Stakeholder Comments and Identified Issues		Consideration and Proposed Resolution
	KE "• types of green roofs: " Too much information and another unit of competency (too large in content). AC: "• digitally based hardware and software design systems " Not necessary disadvantage those not using digital can hand draw - do students complete CAD unit first. AC "• manufacturer's fixing and fastening specifications for green wall and green facade systems " Is this information readily available via research? May not want to supply.	Removed. Thank you for your feedback. Removed this reference in the AC.
Industry, VIC	It would be helpful if the Design component included references to checking the status of any permit or other legislative requirements as part of the design process. KE "reasons for creating green walls and roofs:" Another reason for creating green roofs is to achieve appropriate compliance with relevant building performance rating tools. KE "characteristics, properties and limitations of materials and plants used for green infrastructure:" An additional characteristic which should be added is sensor equipment and integration with Building Information Management (BIM) systems.	Adopted. PC 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.* Comment**:** Thanks for the information. KE streamlined to include environmental, economic and social reasons. Adopted and added to KE.
RTO, VIC	General: Concerned that the unit is too big. There are 36 PCs, double most diploma level units. Learner would have to design for all three situations.	Comment**:** The number of PCs have been streamlined and reduced where PC were duplicated. SMEWG advice in development was to include design for the three different infrastructures. The SMEWG confirmed that whilst the unit is 'big' *it needs to be kept as one unit. If someone is interested in entering the green infrastructure industry, they need to know these different building styles and techniques. Some development sites may have all three different building styles incorporated into a design*.' '*Business and industry professionals have already set this precedent as those who specialise in one of these niche areas specialise in them all'.*

Stakeholder Comments and Identified Issues		Consideration and Proposed Resolution
	APP: "information for application in designing roof gardens, green walls and facades." This wording makes it unclear that the objective of the unit is to design (as suggested in the elements). Wouldn't they research green infrastructure and construction information in preparation to design (element 1). Suggest simplifying the Application statement to make clear that the unit is for designing roof gardens, green walls and facades.	Thank you for the feedback. Wording has been amended to : 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.
	Element 1, 2, 3, 4 - This element is too big. Suggest breaking this element up into two. Perhaps the first focussed on building regulations, standards, codes, structural principle, interpreting construction plans, planning procedures, organisational procedures. Non-site specific PCs. The second can relate to the client brief and the site. This could include 1.2, 1.4, 1.5, 1.6 and 1.7. Reading through elements 2, 3, and 4 they all repeat PCs from this first one. PCs 2, 3 and 4 could almost be units in their own right.	Comment**:** The separation of element 1 into 2 elements and streamlining PCs from other elements where duplicated has been adopted.
	PC1.8 Already done in 1.1?	Agreed, and PC 1.1 now 1.2 reworded in response to consolidated feedback.
	PC1.10 A bit soon to do that?	Agreed, calculating costs of designed projects has been incorporated into elements 3, 4 and 5.
	PC 2.2 Was this partly done in 1.2?	Agree. Amended PC 2.2 to *Identify project location and complete site analysis*.
	PC 2.4 Wouldn't you need to have come up with a preliminary or draft design prior to 2.4, 2.5 and 2.6.	Wording amended to: *Prepare a design concept of proposed [ ], confirm with specialists and/or building professionals and present to client.*
	PC 2.4 "and pair" delete.	Wording amended to: *Consult growing media specialist to determine media characteristics and functionality, and select plants based on the location conditions, system design and maintenance requirements.*
	PC 2.5 This is an open ended PC.	*Wording amended to: Document specifications for irrigation and drainage systems, lighting and waterproofing, including recommended suppliers.*
	PC2.7 Put before 2.4.	

Stakeholder Comments and Identified Issues		Consideration and Proposed Resolution
	Foundation Skill - Reading "infrastructure" Reading and interpreting plans. Foundation Skill - Numeracy "weight" What about interpreting graphs, charts etc.	Wording amended to: *Prepare a design concept of proposed [ ], confirm with specialists and/or building professionals and present to client.* Adopted. Amendment to foundation skills to include as suggested.
	PE: "100" Is a balcony garden similar to a roof? 100 metres may be too big. PE dot point 1 "practical" Reword. Hard to provide evidence that something is practical. Was not mentioned in the PCs. PE dot point 1 "functional" Ultimately won't know what is functional unless it is built. PE dot point 1 "sustainable" First time this word appears. Biodiversity, energy (1.5) are aspects of sustainability but it has issues of interpretation similar to the word (sic) green. PE dot point 4 "practical" How do you determine this?	Comment: Based on consolidated feedback received and confirmation by the SMEWG, PE volume for roof garden has been reduced to 50 square metres. Comment: PE reworded to accommodate consolidated feedback from consultation. PE dot points have been rewritten to state the following: • *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.*
	KE dot point 1 "• functional requirements and structural capabilities of green infrastructure " How do you determine this? KE dot point 4 "• ecosystems and habitat restoration in urban areas " Remove this as it is too vague a statement. Need to be more specific e.g. the ecosystem services that can be provided by roof gardens, green walls and facades. Some of these elements are listed under features and benefits. KE dot point 9 "plants" Perhaps include the selection of plants separately.	Removed. KEs reworded to: • *professional practice requirements in green infrastructure design* • *factors influencing green infrastructure design for existing and new buildings.* Comment: as above the KE has been amended to accommodate consolidated feedback. This dot point has been removed. Thank you. Plants have been listed as separate KE to materials.

Stakeholder Comments and Identified Issues		Consideration and Proposed Resolution
	AC "• digitally based hardware and software design systems " Not in PCs, PE or KE.	Thank you, removed in conjunction with other feedback received.
RTO, WA	General comment: As a subject matter expert, a TAFE educator and assessor, I am adamant that the unit is undeliverable in its current form. As such, I would advise that SMTAFE does not incorporate the current version of the unit into either our Certificate IV of Landscape Design, Diploma of Landscape Design or horticulture qualifications. This is a very high-level unit. Even when amended it would require at least 80-120 teaching hours to deliver. ELEMENT 1: Research green infrastructure designs. 1.1 Change to – Read and interpret construction plans, local government policy, procedures and permits to determine applicable restrictions or limitations relating to green infrastructure. 1.3 Change to – Follow relevant organisational design policies and procedures. 1.5 Change to – Ascertain environmental, energy efficiency and maintenance impacts of green infrastructure design. Note: remove biodiversity - whilst this is a benefit it is not applicable to all green wall infrastructure e.g. indoor green walls. 1.9 Change to – Consider building structural principles relating to green infrastructure as identified by an engineer.	Comment**:** Thank you for participating in the consultation and for providing detailed feedback. With the amendments made to the unit following first draft consultation, including your suggestions, the size of the unit has been reduced which should make the unit more attractive to your organisation to put onto scope once it has been endorsed and available on the National Register. Comment**:** As the feedback was consolidated, there have been a considerable number of amendments across the elements and PCs. Adopted: PC 1.2 amended to '*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'.* Removed based on the consolidated feedback gathered during the first draft consultation phase. Biodiversity removed. Move to PC 1.3 and Amended wording '*Identify environmental and energy efficiency impacts of green infrastructure'.* Adopted with variation. PC 2.3 *Confirm building structural principles relating to green infrastructure with architect, engineer and/or other relevant specialists.*

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	ELEMENT 2: Design green walls 2.1 Change to – Undertake a site assessment to determine the location of green infrastructure, aspect and dimensions. Note: Green wall locations are not usually specified on plans – this is the role of the designer.	Previous information in PC 2.1 has been incorporated into PC 2.2 *Identify project location and complete site analysis.*
	2.5 Change to – Document specifications for green wall lighting, irrigation and drainage systems, including recommended suppliers.	Thank you. Wording amended, now PC 4.4 *Document specifications for irrigation and drainage systems, lighting and waterproofing, including recommended suppliers.*
	2.6 Calculate total weight of green wall materials and fixing fastening system in consultation with suppliers, to ensure the total weight complies with parameters set by an engineer.	Suggested wording adopted.
	2.7 Change to – Prepare a design concept of proposed green wall and present to client.	Suggested wording adopted, with inclusion of confirming the design draft with specialists and/or building professionals prior to presenting to client.
	ELEMENT 3: Design roof gardens	
	3.3 Change to - Conduct a site assessment, accurately measuring and recording overall size of proposed green roof space.	As comment above, PC 2.2 is identifying project location. PC 3.1 amended to *Accurately measure and record overall size of proposed green roof space*. PC 3.3 now reads Consult growing media specialist and select media and plants based on the location conditions, system design and maintenance requirements
	3.6 Change to - Consider and incorporate plant species that encourage local biodiversity.	The original content for PC 3.6 has been removed based on consolidated feedback received during the First Draft consultation phase.
	3.8 Calculate total weight of materials and components in consultation with suppliers, to ensure the total weight complies with parameters set by an engineer.	Suggested wording adopted. Other feedback advised need to include water weight in calculations, as well as the materials and components. PC 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.*
	3.9 Remove altogether – this must only be done by a qualified and registered engineer. Note: 3.8 above covers the designers' responsibilities.	Removed. PC 2.3 amended to include 'confirming' structural principles with architect, engineer or other relevant specialists as per your recommended wording in 1.9 above.
	3.10 Change to - Prepare a design concept of proposed green roof and present to client.	Suggested wording adopted, with inclusion of confirming the design draft with specialists and/or building professionals prior to presenting to client.

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	ELEMENT 4: Design green facades 4.1 Change to – Consult with the client to determine the intended purpose and objective of the façade. 4.3 Change to – Consider integrity of support structure and consult with engineer to confirm support structure suitability. 4.4 Change to – Specify fixing requirements that comply with building codes and standards. 4.6 Change to - Prepare a design concept of proposed green roof and present to client. PERFORMANCE EVIDENCE 1. Consider reducing minimum roof garden area to 50m2 – the average size of residential roof top gardens drafted by most landscape designers. a. Change to – Designed practical, functional green infrastructure, considering sustainable principles which meets the client's requirements. b. Change to - Considered local government policy and procedures, building regulations, standards and codes. c. Note: this must only be done by a registered and qualified engineer – not a designer. Change to – Complied with the project design parameters set by an engineer. d. Change to – Considered practical and operational access and egress. f. Change to – Considered provisions and access for ongoing maintenance.	Removed. Refer to PC 2.1 *Consult with client to clarify type and purpose of green infrastructure, design preferences, features and requirements.* PC 5.2 amended to *Confirm the integrity and suitability of the support structure with engineer.* Suggested wording adopted. Suggested wording adopted, with inclusion of confirming the design draft with specialists and/or building professionals prior to presenting to client. Comment: Minimum roof top garden area of 50m2 adopted. Amended to *designed compliant green infrastructure that meets the client requirements* to accommodate consolidated feedback. Amended to *complied with local government policy and procedures, building regulations, standards and codes.* Suggested wording adopted. Amended to *incorporated provision of access and egress for construction and maintenance.* See statement above.

Stakeholder Comments and Identified Issues		Consideration and Proposed Resolution

	KNOWLEDGE EVIDENCE
	1. Change to – Functional requirements of green infrastructure. Note: structural parameters must only be determined by a registered and qualified engineer.
	
	2. Change to - Factors influencing green infrastructure design for both new and existing building.
	
	3. Change to – Recirculating and flood-drain green wall systems.
	
	4. Remove – This is not applicable to all green infrastructure and should be removed (this is not a sustainability or CLM unit).
	
	5.b. Remove – this must only be done by a qualified and registered engineer.
	d. Change to – Installation access and ongoing maintenance access.
	f. Remove – Structural risk assessment and planning is done by a qualified engineer only.
	
	7a. Remove – this is giving the answers to the knowledge question; students must determine themselves.
	b. As per 7a c. As per 7a d. As per 7a.
	
	8a. Remove – this is giving the answers to the knowledge question; students must determine themselves.
	b. As per 8a c. As per 8a d. As per 8a e. As per 8a f. As per 8a g. As per 8a h. As per 8a i. As per 8a j. As per 8a k. As per 8a l. As per 8a m. As per 8a n. As per 8a o. As per 8a.
	10. a. Change to – Panel system.
	b. Change to – Modular system.
		Removed. Replaced with *professional practice requirements in green infrastructure design* based on feedback to ensure knowledge of parameters of role.
		
		Suggested wording adopted.
		
		Suggested wording adopted.
		
		Removed as suggested.
		
		Removed as suggested.
		
		Amended to *installation and ongoing maintenance access.*
		
		Removed as suggested.
		
		KE streamlined to remove ‘answers’ whilst still ensuring parameters of KE to be covered for consistency of RTO delivery.
		• *reasons for creating vertical gardens amended to:*
		  • *environmental*
		  • *economic*
		  • *social.*
		
		As per comment above, amended to KE of *features, benefits and risks of green infrastructure.*
		
		Adopted.
		
		Suggested wording adopted.

Stakeholder Comments and Identified Issues		Consideration and Proposed Resolution
	11. a. Change to – properties of an extensive green roofs. Note: remove the specifics as this gives students the answers to the knowledge questions. b. Change to – properties of an intensive green roofs. Note: remove the specifics as this gives students the answers to the knowledge questions. c. Remove – this is not conventional. Most green roof can be categorised as either intensive or extensive, otherwise a combination of the principles is applied. 12. Change to – Properties of a green façade. 14. Change to – Organisational policies and procedures. Quality systems are procedures/policy. ASSESSMENT CONDITIONS: Not all design is completed using computer-aided drafting programs. This is also not a design requirement, with equally detailed designs able to be produced with 'hand drawing'. Remove this from the assessment conditions.	Suggested wording adopted. Suggested wording adopted. Removed.

AHCGRIXX2 Construct roof gardens, vertical gardens and green facades

Stakeholder Comments and Identified Issues		Consideration and Proposed Resolution
RTO/TAFE, WA	The unit is undeliverable in its current form within a TAFE or simulated work environment. I would advise that SMTAFE does not incorporate the current version of the unit into our course delivery. Some aspects of the unit are suitable for those already working for only the largest commercial roof garden and green wall companies, who wish to have their skills recognised/assessed.	Comment**:** Thank you for participating in the consultation and for providing detailed feedback. With the amendments made to the unit following first draft consultation, including your suggestions, the size of the unit has been reduced which should make the unit more attractive to your organisation to put onto scope once it has been endorsed and available on the National Register.

Stakeholder Comments and Identified Issues		Consideration and Proposed Resolution
Government, VIC	Title and in application: "build or install" change to construct (sic) PC 1.1 Wordy please refine. PC 1.2 What does this mean? Same as PC 1.1. PC 1.3 Combine Pc 1.3 and 1.6 - complete job safety analysis. PC 1.8 Not applicable at plan stage PC 1.9 Move to element 2,3,4, not completed at this stage PC 2.2 Why would you do at this stage (sic). Other parts come first waterproofing etc. PC 4.1 Why may not be in public spot. Element 5 "Clean up" Add after each project. PE "There must be evidence that the individual has, in an existing building: • built one roof garden with a minimum area of 100 square metres • installed one green wall with a minimum of 20 square metres and • installed a green facade with a minimum of 20 square metres" Could only be RPL and why existing building. KE "• characteristics, properties and limitations of materials and plants used for green infrastructure " Covered in design not required in this unit, not in	Adopted. Wording amended to make for succinct PC 1.1: *Read and interpret design plans and specifications, check permits and resolve any discrepancies with designer and/or associated specialists.* Removed. PC 1.2 amended to *Complete job safety and environmental analysis, identifying potential hazards and applying control measures* Element 1 is 'plan and prepare'. Selecting, fitting and using PPE and checking delivered materials is part of preparing. Sequence of PC has been amended. Good point. PC 4.1 removed, and subsequent PCs renumbered accordingly. Element 5 now incorporated as a PC in each project rather than having a separate element for 'Clean up'. Comment: Based on feedback received volume of roof garden has been reduced to 50m2. Reference to existing building has been removed. Removed.

Stakeholder Comments and Identified Issues		Consideration and Proposed Resolution

	PC's.
	
	KE "• lighting systems " Design or install?? This unit should on focus on construction.
	
	KE "• functional and operational features of plant, equipment, hand and power tools: " Know about these, many are (sic) licensed and not mentioned or relate to PCs.
		
		Wording amended to KE
		• *construction requirements for:*
		  • *maintaining integrity of waterproofing materials*
		  • *drainage systems*
		  • *irrigation systems*
		  • *storing and recycling water systems*
		  • *lighting and/or air flow systems*
		
		Specific list of plant, equipment and tools removed.

Industry, VIC	PC 2.3 "Ensure waterproofing" A leak detection inspector using specialist equipment is often required to 'ensure' waterproofing installed correctly. So perhaps this should be amended to 'Ensure waterproofing installation to specific area using approved materials and methods has been inspected and certified'. PC 3.4 "lighting" Consider adding 'lighting and/or air flow equipment'. Element 4 Consider adding 4.7 Install sensor equipment and ensure connection with Building Information Management (BIM) system. PE I agree with previous comment about reducing this to 50sqm.	Thank you. A variation of this wording has been adopted: *Ensure waterproofing installation to the specified area by specialist waterproofer using approved materials and methods, has been inspected and certified.* Suggested wording adopted in PC 3.4 and construction requirements of lighting and/or air flow systems included in KE. PC 4.6 added. *Install sensor equipment and ensure connection with Building Information Management (BIM) system, if applicable.* Thank you for your feedback. This amendment has been adopted based on the consolidated feedback received during the first draft consultation workshops and agreed by the SMEWG members.
Government, VIC	General Comment: Very big unit	Consultation with SME confirm that whilst the unit is 'big' the needs to be kept as one unit. '*it needs to be kept as one. If someone is interested in entering the green infrastructure industry, they need to know these different building styles and techniques. Some development sites may have all three different building styles incorporated into a design*.' '*Business and industry*

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	APP: "or install a designed " delete a. Element 1: for…? Each project? This element is going to be repeated three times in carrying out elements 2, 3, and 4 PC 1.2 "principles" Is this the right word? Determine the requirements using the principles? PC1.6 Does this repeat 1.3 to some extent? PC 2.4 "Set out and install irrigation: Irrigation may go in after/with soil. PC 2.7 Might there be some type of mulch, gravel other put in after planting? Element 5 For the three different jobs? PE "100" too big. KE How to plant plants? Cultural requirements of plants used?	*professionals have already set this precedent as those who specialise in one of these niche areas specialise in them all'.* Thanks, changed to "required to construct designed…". Comment: The PC has been removed with the requirement to check the plans and 'resolve any discrepancies with the designer and/or associated professionals' including in PC 1.1. Removed. PC 1.2 amended to *Complete job safety and environmental analysis, identifying potential hazards and applying control measures.* Moved to PC 2.6 after draining system and soil profile installed. Comment: Following advice from SME during development, as there were so many variables (mulch, compost, fertiliser, etc) to 'follow designer and/or supplier establishment information'. Element 5 incorporated as PC in each project: *Clear the work area by disposing of, reusing or recycling materials, and cleaning, checking for serviceability and storing tools and equipment following workplace and environmental requirements.* Comment: This has been reduced to 50m2 based on the consolidated feedback received during the first draft consultation workshops and agreed by the SMEWG members. Thank you for noting this omission. The following KE has been added: • *planting methods that comply with the growing requirements of individual plant species and cultivars* • *initial establishment needs of plants.*

AHCGRIXX3 Maintain roof gardens, vertical gardens and green facades

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RTO, WA	Again, the unit is undeliverable in its current form within a TAFE or simulated work environment. I would advise that SMTAFE does not incorporate the current version of the unit into our course delivery. Some aspects of the unit are suitable for those already working for only the largest commercial roof garden and green wall companies, who wish to have their skills recognised/assessed.	Comment**:** Thank you for participating in the consultation and for providing detailed feedback. With the amendments made to the unit following first draft consultation, including your suggestions, the size of the unit has been reduced which should make the unit more attractive to your organisation to put onto scope once it has been endorsed and available on the National Register.
Government, VIC	PC 1.2 Remove Pc unnecessary. Swap PC do PC 1.4 before 1.3 PC 1.5 move up the order. PC 2.3 Identify and remove weeds. PC 2.6 Need to identify pests and diseases then eliminate. PC 2.9 Refine wording of PC. PC 3.1 "Observe and note" Record. PC 3.3 "Consider" Please remove. PC 3.4 Change to Schedule next maintenance period.	PC 1.2 removed. Sequence of PCs amended. Suggested wording adopted. PC 2.6 wording amended to *Identify pests and diseases and apply appropriate method of eliminating or controlling according to workplace and environmental requirements.* Now PC 2.8. Wording amended to *Evaluate condition of soil or growing media, top up and add ameliorates or additives, if required.* Amended to ‘record’. PC 3.3 removed. Now PC 3.3 Amended to *Record maintenance activity undertaken and schedule next required maintenance activity.*
Industry, VIC	Element 2: There should be an additional Item 2.10 for check sensors and review BIM data for any anomalies (sic).	The SMEWG confirmed that this should be carried out within Element 1 as part of ‘Plan maintenance’. Therefore PC 1.2 added and now reads c*heck sensors and review data for anomalies, if applicable.*

Stakeholder Comments and Identified Issues		Consideration and Proposed Resolution
Government, VIC	Element 1 Plan for maintenance?	
	PC 1.2 Would you have to read them? Need to follow them.	Now PC 1.3 and amended to 'follow'.
	PC 1.5 Should be before calculating costs.	Sequence of PC have been amended.
	PC 1.6 The reduction of fire risk should be in the maintenance plan (1.1) not a separate plan.	PC 1.6 removed.
	PC 2.6 "eliminating" May not be able to eliminate - can apply control methods	Amended to 'eliminating or controlling'.
	PC2.8 "top up" Top up growing media?	Wording amended to clarify. PC 2.8 *Evaluate condition of soil or growing media, top up and add ameliorates or additives, if required.*
	PC 3.2 "level" Could be condition and volume of growing media.	Suggested wording adopted.
	PE "100" too big.	Comment: This has been reduced to 50m2 based on the consolidated feedback received during the first draft consultation workshops and agreed by the SMEWG members.
	PE dot point 1 "irrigation system" Are there always irrigation systems in green roof gardens? Could it be visual inspection of the infrastructure, systems and plants?	Suggested wording adopted.
	PE dot point 2 "spring and autumn or" Delete as seasonal pruning covers it.	Deleted as suggested.
	PE dot point 4 "rubbish" And disposed of (weeds, infested or infected material may need special disposal).	Amended to *disposed of vegetation and waste according to workplace and environmental requirements.*
	KE dot point 3 "•ecosystems and habitat restoration in urban areas " Too vague. Make specific to this work.	Removed. Amended wording to clarify:

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	KE dot point 6 • processes and techniques of maintenance:
	• feeding and watering
	• weeding and trimming - Plant maintenance - cultural requirements of plants in the garden
	"•ameliorants and additives " - To soil or growing media?
	
	KE dot point 7 sub point "•sustainability " - Vague. Some elements of this already listed.
		• *plant maintenance and cultural requirements of plants:*
		  • *feeding and watering*
		  • *weeding and trimming*
		• *soil or growing media maintenance, including:*
		  • *ameliorants and additives.*
		
		Removed.