

## PIL308A Establish an urban permaculture system

This competency standard covers the establishment of an urban permaculture system from a previously prepared permaculture design for a site.

The work requires the application of permaculture knowledge with depth in some areas and a broad range of permaculture skills. Establishing an urban permaculture system is normally done where some discretion and judgement are required in the selection of equipment and materials, organisation of work and the achievement of outcomes within time and budgetary constraints.

Element		Performance Criteria	
1	Prepare to establish an urban permaculture system	1.1	The site, <b>planting methods</b> and <b>plant species and cultivars, integrated animal systems</b> are identified according to the site plan and <b>enterprise work procedures</b>
		1.2	<b>Materials, tools, equipment and machinery</b> are selected according to planted area design requirements and enterprise work procedures
		1.3	<b>OHS hazards</b> are identified, risks assessed, controls implemented and reported to the supervisor
		1.4	Suitable <b>safety</b> and <b>personal protective equipment (PPE)</b> is selected, used, maintained and stored
2	Coordinate establishment of the urban permaculture system	2.1	Work tasks are coordinated in a sequential, timely and effective manner in consultation with the supervisor
		2.2	Establishment of the urban permaculture system is undertaken according to <b>OHS requirements</b> and with due consideration of the <b>environmental implications</b>
		2.3	A <b>clean and safe work area</b> is maintained throughout and on completion of work
3	Prepare the area	3.1	<b>Earthworks</b> are undertaken according to enterprise work procedures

		3.2	<b>Additives</b> are selected and applied as required according to <b>site conditions</b> and enterprise work procedures
		3.3	Patterns or positions of elements such as plants are marked out on site according to the plant establishment program
		3.4	Surplus debris may be removed from the site and reused elsewhere or disposed of in an environmentally aware and safe manner according to enterprise work procedures and OHS requirements
4	Undertake positioning of elements in the system	4.1	Plant elements are inspected prior to being planted/or otherwise installed and plants with <b>major defects</b> are discarded according to enterprise work procedures
		4.2	Plants with <b>minor defects</b> are trimmed or treated to maintain health and vigour according to enterprise work procedures
		4.3	Elements are at a spacing sufficient to enable them to develop their full potential according to zone and sector analysis, pattern understanding and enterprise work procedures and the plant establishment program
		4.4	Newly installed plants elements are provided with <b>post-planting installation care</b> according to enterprise work procedures
		4.5	<b>Pruning</b> or other adjustments are is undertaken where necessary according to the needs of the species and cultivar or system to ensure a sound framework for their growth and habit according to enterprise work procedures
5	Monitor the plant establishment program	5.1	The establishment program is monitored according to enterprise work procedures
		5.2	Elements in situations which will prevent them from reaching their full potential are identified, recorded and reported according to enterprise work procedures

		5.3	Remedial action is undertaken to ensure all requirements of the plant establishment program are implemented
6	Complete program of works	6.1	Earthworks are completed to plan specifications and enterprise work procedures
		6.2	<b>Waste material</b> or material not for immediate use is cleared away in an environmentally aware and safe manner according to enterprise work procedures and OHS requirements
		6.3	Tools, equipment and machinery are cleaned, maintained and stored according to OHS and enterprise work procedures
		6.4	Work outcomes are recorded or reported to the supervisor.

### Range of Variables

The Range of Variables explains the contexts within which the performance and knowledge requirements of this standard may be assessed. The scope of variables chosen in particular training and assessment requirements may depend on the work situations available.

What **planting methods** may be used to establish a planted area?

Planting methods may include tube planting, hand or machine assisted planting of seedlings, direct seeding planting of divisions, transplanting, laying, rolling, chaffing and sprigging.

What **plant species and cultivars** may be relevant to this standard?

Species and cultivars may include exotic, native, endemic, evergreen, deciduous, conifer and palm trees and shrubs, turf, grasses, ground cover plants, climbers, herbaceous and aquatic plants.

What **integrated animal systems** may be relevant to this standard?

Chicken tractor systems, continuous worm-farm systems, chicken dome pattern systems, tyre pond and mandala aquaculture systems and other integrated systems appropriate to an urban permaculture system which utilise animals, fish or bird species to generate yield in association with plant species.

What **enterprise work procedures** may apply to this standard?

Work procedures will be based on sound permaculture principles and practices and may include supervisor's oral or written instructions, the plant establishment program, enterprise standard operating procedures (SOPs), specifications, routine maintenance schedules, work notes; product labels

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	and Material Safety Data Sheets (MSDSs); manufacturers' service specifications and operator's manuals; waste disposal, recycling and re-use guidelines; and OHS procedures.
What <b>tools, equipment and machinery</b> may be required?	Tools, equipment and machinery may include hand tools; trailed, 3-point linkage and motorised machinery for excavation, planting and post-planting care operations; and irrigation and drainage systems and components.
What <b>OHS hazards</b> may be associated with the establishment of permaculture systems?	Hazards may include disturbance or interruption of services, solar radiation, dust, noise, soil-, water- and air-borne micro-organisms, treatments hazardous to animal or human health, sharp hand tools and equipment, manual handling, moving vehicles, machinery and machinery parts, spider and insect bites, uneven surfaces and flying objects.
What <b>safety equipment</b> may be required?	Safety equipment may include first aid kit, high visibility vests, reversing alarms on mobile equipment, signage and barriers.
What <b>personal protective equipment (PPE)</b> may be required to establish permaculture systems?	PPE may include hat, boots, overalls, gloves, goggles, respirator or face mask, face guard, spray jacket or suit, hearing protection, sunscreen lotion and hard hat.
What <b>OHS requirements</b> may be relevant to this standard?	OHS requirements may include identifying hazards; assessing risks and implementing controls; cleaning, maintaining and storing tools, equipment and machinery; appropriate use, maintenance and storage of PPE including sun protection; safe operation of tools, equipment and machinery; safe handling, use and storage of materials which may be hazardous to human or animal health; correct manual handling; basic first aid; personal hygiene and reporting problems to supervisors.

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<p>What <b>environmental implications</b> may be associated with the establishment of permaculture systems?</p>	<p>The establishment of permaculture system may have beneficial environmental impacts where actively growing young trees and shrubs help to fix carbon dioxide from the atmosphere, lower the watertable and associated likelihood of seepage and salinisation in linked catchment areas, and reduce water, nutrient and chemical flow into the external environment including natural waterways.</p> <p>Detrimental environmental impacts may arise where establishment activities produce excess noise, dust or water run-off, or the implementation of post-planting care activities such as fertilisation, irrigation and pest control apply inappropriate levels of chemical, nutrients and water, resulting in escape to the external environment.</p>
<p>What tasks may be undertaken to maintain a <b>clean and safe work area</b>?</p>	<p>Tasks may include disabling unused tools, equipment and machinery and storing neatly out of the way of establishment activities; safely storing materials on site; using signage and safety barriers during and removing after establishment activities are completed; and swiftly and efficiently removing and processing debris and waste material not for immediate use from the work area.</p>
<p>What <b>services</b> may need to be located?</p>	<p>Services may include water supply, gas, power (electricity), telecommunications, irrigation, stormwater water and drainage.</p>
<p>What <b>earthworks</b> may be required when establishing a permaculture system?</p>	<p>Earthworks may include ripping and cultivating the area to be planted, constructing soil profiles for sports turf playing surfaces and installation of irrigation and drainage systems including swales, ponds and other land-modification systems for collection or storage of nutrients or water for forage or irrigation.</p>
<p>What <b>additives</b> may be required for the successful establishment of plants?</p>	<p>Additives may include lime, gypsum, emollients, fertilisers, organic materials and fungal and disease control agents, treatments or systems.</p>
<p>What <b>site conditions</b> may affect the permaculture system establishment program?</p>	<p>The establishment program may be affected by soil, moisture content, pH levels, salinity, texture, compaction, aspect, pollutants, toxicity, climate, buildings, roadworks and shade. Such conditions should be turned to advantage in the design of the</p>

	permaculture system.
What <b>major defects</b> may require the rejection of plants?	Major defects include any condition that will prevent the plant from reaching its full potential, including wilt, stunted growth, root damage and severely root-bound seedlings.
What <b>minor defects</b> may be repairable in required plants?	Minor defects that may be repaired may include damage or breaks sustained by plants that can be trimmed or treated so that the plants can still reach their desired potential.
What <b>growing requirements</b> may affect the planting method?	Growing requirements may include seasonal aspects, the growth stage at planting, and pruning, depth and drainage required for successful establishment.
What aspects of <b>post- planting installation care</b> are required?	Post-planting, installation care may include watering, fertilisation, controlling pests and diseases, weeding, rolling, mowing, renovating, mulching, pruning, protecting, staking, trellising and monitoring plant health. It may also include checking predator protection, nutrient run-offs, and water quality factors for integrated animal systems.
What <b>waste material</b> may be relevant to this standard?	<p>Waste material may include specified noxious or toxic materials (such as weed seed heads, noxious weeds and chemicals), treatments which may affect human or animal health, recyclable materials (such as paper, plastic and metal-based litter), composting waste (such as soft plant materials), reusable materials (such as cloths and containers for washing, woody waste) and returnable materials (such as oils and chemical containers).</p> <p>Waste may be removed to designated areas for recycling, reuse, return to the manufacturer or disposal.</p>

## Evidence Guide

### What evidence is required to demonstrate competence for this standard as a whole?

Competence in establishing an urban permaculture system requires evidence that a person is able to prepare for establishment activities, coordinate work groups, prepare the site, install plants and introduce animals and monitor the establishment program including post-planting installation care of the area.

The skills and knowledge required to establish an urban permaculture system must be **transferable** to a different work environment. For example, this could include different plant species, environments, and planting techniques as well as different animal, fish, bird species, animal to plant, animal to fish, fish to plant relationships, integrated systems to maximise yield, and establishment requirements (such as suitability to climate, terrain, locality).

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**What specific knowledge is needed to achieve the performance criteria?**

Knowledge and understanding are essential to apply this standard in the workplace, to transfer the skills to other contexts and to deal with unplanned events. The knowledge requirements for this competency standard are listed below:

- Permaculture principles and practices
- The objectives of the plant system establishment program, including finished plant system forms, site appearance, end use and time constraints
- The physiology of required plant, animal, fish, bird species and cultivars, culture and planting procedures, including growth rates, main nutrient and water requirements, deficiency symptoms, recommended treatments and associated environmental implications, predator issues, habitat requirements and inter-relationships
- The identification of pests and diseases, plant symptoms of infections, treatment threshold levels, recommended treatments, methods of application and environmental implications
- Soils and soil amelioration techniques
- OHS legislative requirements and codes of practice, OHS procedures, OHS employee and employer responsibilities and hazard identification, assessment and control.

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**What specific skills are needed to achieve the performance criteria?**

To achieve the performance criteria, appropriate literacy and numeracy levels as well as some complementary skills are required. These include the ability to:

- Communicate orally and in writing with work team members, supervisors, contractors and consultants
- Utilise proforma recording, reporting, analysis and work procedure documents.

- Read maps and plans
- Interpret site plans, plant system establishment specifications and test results
- Measure quantities, calculate material requirements, area, volume, ratios and application rates
- Coordinate work group, contractors and own work activities.

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### What processes should be applied to this competency standard?

There are a number of processes that are learnt throughout work and life which are required in all jobs. They are fundamental processes and generally transferable to other work functions. Some of these are covered by the **key competencies**, although others may be added. The questions below highlight how these processes are applied in this competency standard. Following each question a number in brackets indicates the level to which the key competency needs to be demonstrated where 0 = not required, 1 = perform the process, 2 = perform and administer the process and 3 = perform, administer and design the process.

1. How can <b>communication of ideas and information (1)</b> be applied?	Written, oral and tele-communication of ideas and information relating to plant system establishment activities and problems encountered will be required with the work group, supervisor, contractors and consultants.
2. How can <b>information be collected, analysed and organised (1)</b> ?	Enterprise work procedures and site and plant permaculture system establishment plans should be consulted, interpreted and applied to coordinate plant system establishment activities with further clarification sought from the supervisor when necessary.
3. How are <b>activities planned and organised (1)</b> ?	Work activities for the work group, contractors and self will be planned prior to and adjusted during the plant system establishment program.
4. How can <b>team work (2)</b> be applied?	The plant system establishment program will involve facilitating and leading members of a team to complete the establishment program on time and budget.
5. How can the use of <b>mathematical ideas and techniques (1)</b> be applied?	Mathematical application will be required to calculate the spatial and logistical requirements of the plant system establishment program.

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| 6. How can <b>problem solving skills (1)</b> be applied? | Site contingencies, personnel difficulties and timeline failures may require problem solving techniques.  |
| 7. How can the <b>use of technology (1)</b> be applied?  | Technological understanding will be required to access and apply program specifications, undertake plant system establishment activities, water storage and movement, energy creation and saving, communicate and keep records. |
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**Are there other competency standards that could be assessed with this one?**

This competency standard could be assessed on its own or in combination with other competencies relevant to the job function.

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For information about assessing this competency standard for consistent performance and where and how it may be assessed, refer to the **Permaculture International Ltd Course Documentation**.

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