

3.5 Landscaping

3.5.1 Landscape Design Principles

• Landscape design principles are referenced in *Landscape Design Requirements for DETE Facilities* for context, character, and design elements of inclusiveness, function, biodiversity and sustainability. General principles include:

- Use of existing and native vegetation where possible
- Protection and re-use of topsoil
- Water conservation
- Overland flow and stormwater management
- Provision of natural shading
- Landscape design must consider on-site and local protected native fauna habitats.
- Retention of existing vegetation requires minimal clearing in conjunction with replacement of vegetation with endemic species, where possible. Vegetation corridors that are used by native fauna are to be preserved and enhanced. This may require consultation with adjacent land holders and community environmental groups to ensure that such corridors can remain (or are made) continuous over boundaries.
- Where site constraints limit the preservation of natural vegetation, native endemic species of appropriate dimensions are to be used in preference to exotic species.
- Existing vegetation shall be enhanced by complementary new planting that is native and endemic to the local area to assist natural native plant regeneration.
- Landscape work shall include restoration of barren or degraded areas to prevent soil erosion.
- All plants shall be of minimal maintenance type, and not require large quantities of water to maintain good form.
- Landscaping design shall take into account efficient maintenance and vandal resistance.
- External surfaces, fixtures and furniture shall be of high durability and be vandal resistant.
- Landscaping design shall not conflict with the functional requirements of student movement and access.
- Hard and soft landscaping shall not conflict with fire access requirements.
- All materials imported to site are to be certified free of fire ants and asbestos.
- **The use of copper chromium arsenic (CCA) treated timber for landscaping elements is not permitted** (walls, fences, decks, rails) (in accordance with Australian Pesticides and Veterinary Medicines Authority (APVMA) review March 2005).
- Mulch material including soil additives shall not contain peanut shell or other irritant materials.
- Poisonous plants shall not be used including those identified by the Queensland Poisons Information Centre that could cause serious illness in children who may eat them. Plants that must be avoided are listed on the Queensland Poisons Information Centre website. Refer also to *Section 2.1*.
- Plants that have the following characteristics shall be avoided:
 - Dangerous fruiting bodies and sap
 - Sharp spines or projections
 - Tendency to shed limbs or hazardous material
 - Tendency to drop flower causing a slip hazard on pathways
 - Likely to cause allergic reaction, irritability or cause health disorders (such as asthma)
 - Wind pollinated plant material
 - Likely to be highly flammable and create a fire hazard particularly when planted close to buildings
- Support stakes and star pickets shall have protective caps.
- Provide universal access to external areas in building zones with transition level differences in accordance with current Australian Standards and Codes.

- Reduce the risk of fire spreading by avoiding planting of trees (particularly natives) close to buildings.
- Provide adequate firebreaks (minimum 4 to 5 metres wide) in bushfire susceptible areas, particularly around the perimeter of the site.
- In cyclone-prone areas, retention of existing or planting of new large trees close to the building zone shall be avoided due to the potential damage that can occur from falling branches and trees.
- Trees shall be located so as not to encroach upon pathways or road access required for fire appliances.
- To avoid damage to building structures, trees should not be closer to the buildings than 1.5 times their mature height (excluding palm trees). For example, a 5 metre high tree should be planted no closer than 7.5 metres from any building.
- Cleared vegetation and disturbed ground shall be stabilised either by planting, turfing or mulching.
- Landscaping shall be maintained after construction (i.e. plant material, turfing) for a period of 13 weeks, unless briefed otherwise.
- Landscaping is not to impede good surveillance around paths, and is to maintain visual access between 700 and 2200mm above ground level.
- Planting design shall conform to CPTED principles (i.e. ensure visual access between 700mm and 2200mm above ground level). Refer also to the DETE *Security Design Requirements* (see *Section 2.1*).

3.5.2 Hard Landscaping & Fixtures

- Pavements other than to pathways, covered links and building aprons shall be anti-slip coloured concrete, or an appropriate alternative.
- Do not use exposed aggregate concrete around school buildings.
- Unit paving shall not be used to large areas due to problems in maintaining an even level over time. Unit paving should only be used as banding or edging to give a feature to concrete paving. Any unit paving shall be securely fixed.
- Loose gravel or loose rocks shall not be used as a surface treatment. Any pebble or stones shall be securely adhered to the surface.
- Large solar reflectors, such as hard paved areas, shall be located away from positions where their reflected sunlight could impose a heat load or a glare problem into school buildings or into neighbouring buildings.
- External fixtures and furniture shall have a high durability and be vandal resistant.
- Exposed edges of seats and walls shall be designed to reduce the likelihood of skateboard damage and, where required, provide skateboard deterrents.
- Capping blocks on retaining walls or seating shall be securely fixed with epoxy adhesive grout. Where capping blocks are unavailable, consider the use of domed concrete.

3.5.3 Soft Landscaping

- Plant species shall be selected that:
 - Require minimal maintenance
 - Require minimal water (drought tolerant species preferred)
- Plant species shall be chosen that will have a suitable lifespan (e.g. annuals, biannuals or herbaceous perennial species are not suitable for DETE facilities except where specifically requested).
- Plant species shall be selected to suit their location (light/ shade tolerances) and complement existing local vegetation. Preference is for Australian native plant material, where suitable.
- Plant species shall be selected to meet the general design intent and be in scale with the context when mature, in particular, tree and shrub species.
- Plant material is to be selected on the principle of value for money and be commonly available from the nursery industry.

- Plant species selection shall minimise the risk of root systems penetrating drainage lines.
- Tree species shall not be prone to 'branch or limb drop'.
- Shrub and groundcover planting areas:
 - Locate planting areas where there is too much shade for turf and battered banks where slope exceeds maximum gradient for turf.
- Planting areas **shall not** be located in the following areas:
 - Under the rooflines or eaves of buildings
 - Under open stairs or ramps – provide hard paving in lieu
 - Against perimeter of buildings, to ensure visual termite inspection particularly of weepholes can be carried out
- Planting areas shall meet the following requirements:
 - Where planting areas are located near buildings they must be no closer than a minimum of 300mm from the building
 - Width of planting areas to be 1200mm minimum and 3600mm maximum
 - Cultivation nominally 300mm deep to break up subsoil and remove surface debris over 25mm diameter
 - Topsoil depth of nominally 300mm
 - Mulch depth of 100mm, free from wood slivers
 - Concrete edging between planting beds and turf
 - Planting area finished level including mulch shall be min 200mm below finished floor level
- Shrubs, climbers and ground covers in planting areas shall be:
 - 140mm diameter pot size minimum
- Mass planting ground covers, or revegetation mix of ground covers, shrubs and trees, shall be:
 - Tube stock or 125mm diameter pots
- Small trees in planting areas in Building Zones and in grasses areas shall have:
 - Location so that eventual canopy (at maturity) shall be a minimum of 2000mm away from the eaves line of buildings, shade structures and play structures
 - Minimum container size 45 litre
 - Stake with ties and provide weed control mat
 - Vandal resistant protector guards
- Feature/ large trees or trees planted specifically for shade shall have:
 - No tall forest species
 - Location so that eventual canopy (at maturity) shall be a minimum of 2000mm away from the eaves line of buildings, shade structures and play structures
 - Minimum container size 100 litre
- Stake with ties and provide weed control mat
- Vandal resistant protector guards.
- All other trees planted in turfed areas or planting areas providing shade and/or screening shall have:
 - Minimum size 200mm diameter pots
 - Size and shape of holes to encourage root spread
 - Stakes
 - Weed control mats
- Turf:
 - All turfed areas with clay subgrade shall be designed and constructed to reduce the development of uneven surfaces through swelling and shrinkages

- Species of turf used shall be suitable for application and able to withstand wear in a student environment. A minimum B grade of turf is to be used.
- Grade of turf to sports fields shall to be as recommended by the Landscape Consultant in consultation with client
- Cultivation depth min 150mm to break up subsoil and remove surface debris over 25mm diameter
- Imported topsoil depth 100mm after settlement to grassed areas
- Upgraded site stripped topsoil or imported topsoil of depth min 200mm (preferably 300mm) to sports fields and the planting of appropriate turf species for everyday use by students
- Topdressing to maximum depth of 10mm
- Slope to suit surface drainage (overland flow paths) and away from hard paving and buildings
- Maximum slope of 1:4 (preferably 1:5) to cut/ fill batters, swales and berms
- The finished surface level between turf and adjacent paths, walkways or hard paving shall be flush
- Provide nominally 300mm concrete slab mowing strips immediately adjacent to the perimeter of buildings
- Soil and drainage profile for ovals and other turfed sporting surfaces shall be appropriate to maintaining a health and resilient grass cover and shall be appropriate to site conditions.

3.5.4 Irrigation

- Extent and type of irrigation system will be determined by availability of water supply and local water restrictions.
- Consideration shall be given to irrigation systems that cover large shade trees in cyclone prone areas where irrigation may encourage shallow rooting of the tree's roots.
- Allow for future stages of construction in the design of the irrigation system.
- The irrigation design shall incorporate the following:
 - Use of stored rainwater (tanks) for irrigation purposes particularly in areas where water restriction may apply
 - Turfed and planted areas to be irrigated separately in watering zones
 - Automatic control valves shall be located in pits in planting areas, not turfed areas or close to paths or road edges
 - Valves for sports fields shall be located along the outside edge of the playing area
 - Overspray in normal weather conditions shall not affect buildings, car park surfaces or pedestrian paths and covered walkways
 - Provide protection of irrigation control equipment from damage by weather, vandalism, damage and theft
 - Backflow prevention
- Sprinklers systems to deter vandalism
- Irrigation inspection covers should be designed to deter theft and vandalism
- Hose cocks not attached to buildings shall be mounted on bollards, and to prevent trip hazards or obstructions shall not be located in any path of travel.
- In building zones, place hose cocks a maximum of 30m apart.
- Provide concrete slab or hard paving under hose cock, or locate over field gully.
- Hose cocks shall have removable handles.

3.5.5 Surface and Subsoil Drainage

- Refer also to *Section 3.2.5 Stormwater Drainage*.
- Surface drainage and overland flow shall include the following:

- Positive surface drainage away from buildings and the building zone
- Field gullies shall be located away from heavily trafficked areas and shall have adequate drainage to eliminate free standing water
- Provide flush grates field gullies within trafficked areas. Refer to *Section 3.2.5 Stormwater Drainage* for flush grate minimum requirements.
- Overflow relief gullies on sewer lines shall allow overflow away from buildings
- Where field gullies abut or are within garden beds, provide appropriate filter to ensure that mulch does not enter drainage system
 - Subsoil drainage pipes shall be slotted polyethylene, wrapped in a filter membrane.
 - Reduce low lying areas which cause free standing water to all areas of the grounds including oval and sports fields