Landscape Performance, Procedures and Style Manual for Development Applications

2007
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1 General

1.1 Purpose

The purpose of this document is to:

- Encourage the development of quality landscapes associated with new developments.
- Identify Council’s policy and aims regarding municipal planting theme and design principals that are important for a quality outcome.
- Assist in the documentation and submission of landscape plans so as to ensure efficient and quick processing of planning applications.
- To encourage the retention of any existing vegetation and enhance the Mackay aesthetic character.

1.2 Planning Applications

Processing times for planning applications depends on the adequacy and accuracy of the documentation. Council encourages submissions to be checked that applications include all required documentation and thoroughly describe the proposed works. Council has the right to re-charge for inadequate applications that need re-submitting.

Plans may come in the form of Operational Works applications or Minor Works applications.

1.3 General Landscape Design Requirements

1.3.1 Access, Safety and Security

This section relates to any landscape works involving access, safety and security generally.

Equitable Access

Equitable access to, across and through a site is accommodated in the landscape design.

- Pathways are designed to provide non-discriminatory access to people with varying levels of mobility and special needs in accordance with AS1428.1.
- Tactile ground surface indicators are to be provided to aid users with vision impaired; and integrated within pavement treatments to ensure visibility and surface texture are accommodated.

1.3.2 User Safety and Security

Landscape works are designed and constructed to maximise the safety of users by accommodating drivers, pedestrians and cyclist sightlines; accommodating maintenance practises and requirements; highlighting and providing barriers to possible hazard zones; directing pedestrian and cycle movement and alerting users to changing conditions.

The mature unpruned height of under plantings on road verges or in roundabouts, medians and splitter islands is not to exceed 600 mm above road surfaces. This height, however, may be reduced at the discretion of Council’s traffic engineers and may vary from site to site.

- Street trees are to have a minimum of 2.4 metre canopy clearance from ground level at time of maturity. At the discretion of the traffic engineer, advanced stock may be required to provide a minimum 1.5 metre canopy clearance from ground level at the time of installation.

Photo 1: Clear sight lines beneath street tree.
At shared vehicle and pedestrian access points appropriate shared zones finishes will be constructed in accordance with Council specification.

Lighting must be provided in accordance with relevant design codes and Australian Standard AS 1158 to provide safe access for night activities and to promote user safety and security including lighting to popular parks, which may be on a timer to discourage anti-social behaviour. Turtle friendly lighting should be adhered to when designing along coastal areas.

1.3.3 Crime Prevention through Environmental Design

Landscape design must address the principles of Crime Prevention Through Environmental Design (CPTED) Principles to the extent appropriate to the context.

Landscape design must address CPTED’S three (3) overlapping strategies:

1. **Passive Surveillance** – is concerned with the creation of environments that maximise visibility and the potential for casual surveillance. Natural surveillance in landscape designs can be maximised through the appropriate design and placement of physical features.

2. **Passive Access Control** – is used to guide pedestrians, cyclists and vehicles leaving or entering a space. It is also used to prevent and/or discourage access and decrease to define and outline property and ownership and to deter potential offenders.

3. **Territorial Reinforcement** – is concerned with territorial influence. Environments can be designed to define and outline property and ownership and to deter potential offenders.

CPTED strategies in Open Space

4. It is important when designing parks that the principles of crime prevention through environmental design are considered, in particular:

- Dense stands of vegetation should be confined to park peripheries, and should not be located alongside paths and play equipment. Vegetation should not block passive surveillance of picnic and play areas from adjacent residences.

- Landscaping should not restrict sightlines and opportunities for natural surveillance within and of a site therefore all new vegetation around centres of activity should be single clean trunked trees with shrubs which do not grow beyond 600 mm height. This will avoid the problem of concealment and allow a greater area of surveillance from the road.

- Lighting where required should be sufficient to deter loitering and vandalism.

- Large shrubs and trees should be planted in such a way as to prevent or reduce illicit access to buildings and neighboring properties.

- Safety in large parks or areas of vegetation within a development may be enhanced by planting trees in thin strips which maximises the number of trees planted but which also restricts the ability of offenders to hide within a “mass” of vegetation.

1.3.4 Shade Structures

The provision for shade is to be designed in a way that provides shade and maximises user health and safety.

- Shade is to be provided by built elements such as awnings and free
standing structures, vegetation, or a combination of these.
- Shade structures must be in accordance with Council specification and certified by a Structural Engineer.
- Where playgrounds are to be installed adequate shade must be provided.

1.3.5 **Entry Statements**

This relates to any landscape works involving entry statements. Entry Statements are established in a manner that allows for appropriate management and maintenance.

- Entry statements must be located wholly within private property.
- Entry statements are to be treated with an appropriate anti-graffiti product.

1.3.6 **Landform**

This section relates to any landform, such as mounding, that involve reconstructing the surface of the land for aesthetic or functional purposes. Land reconstruction may be undertaken as a component of engineering earthworks.

**Mounding**

Mounding is designed and constructed to minimise impacts on downstream properties or vegetation and minimise impacts to site drainage and important surveillance sight lines.

- Mounding for amenity purposes should be designed to have little impact on designated drainage corridors and have no potential to impact on stormwater flow.
- Mounding for amenity purposes is designed to minimise or avoid the redirection of major stormwater runoff.
- The position of mounding has regard for the possible impact of diversion of water flow away from existing vegetation, intended for retention.
- Maximum slope requirements must comply with the following:
  
  1. Battered Turfed areas – 1:4 maximum
  2. Garden areas – 1:3 maximum.

**Batters, Steep Rock Slopes and Retaining Walls**

Reference should be made to M.C.C. Engineering Design Guidelines D6 – Site Regrading.

1.3.7 **Public Open Space**

At the time of development, the developer shall landscape all public open spaces at stated in the Operational Works Application. Reference should be made to M.C.C. Engineering Design Guidelines D8 – Landscaping.
2 Soft Landscapes and Plant Selection

2.1 Plant Selection and Planting

This section relates to planting works involving new planting and/ or the preparation of growing media or planting beds. This section should be read in conjunction with:
- Construction Specification C273 – Landscaping
- M.C.C. Engineering Design Guidelines – D8 - Landscaping

2.1.1 Species Selection and Plant Design for Ecological Sustainability

Species selection and plant design respects as far as practicable the indigenous flora of the area, minimizes the selection of non-indigenous species and consists of plants suited and able to flourish in the site conditions whilst balancing amenity appeal with environmental benefits, durability and sustainability.

Where required, information or flora indigenous to the area may be found in the following:

1. ‘One Hundred and One Trees of Mackay’ available from The Society of Growing Australian Plants.

- Street trees within Mackay’s CBD will use the relevant species as identified in the ‘Street Tree Masterplan’ For Mackay’s CBD.
- Outside of the CBD a preferred Street Tree planting schedule has been compiled (Reference should be made to M.C.C. Engineering Design Guidelines D8 – Landscaping)
- Harsh microclimates such as car parks and plantings close to high volume traffic lanes will require particular attention not only to species selection but also to growing media volume, moisture supply, bottom drainage and maintenance access.
- Species will provide habitat and food source for local fauna as far as practicable.

Species selection must have regard for:

1. The mature size of the species;
2. The growing media volume and depth available to sustain mature growth;
3. The susceptibility of the species to poor drainage;
4. Flower, fruit and leaf litter issues;
5. The pest and disease management requirements of the species in their proposed location;
6. Landscape character and amenity;
7. Shade considerations; and
8. Other ongoing maintenance requirements.

Species selected must be well established, disease free, container or field grown stock, that have been propagated for the specific site conditions i.e. sun hardened, shade tolerant or salt tolerant.

2.1.2 Plant Siting

Plants are sited to maximize community benefit whilst recognizing maintenance and sustainability requirements.

- Spatial constraints of the site will be recognized in the spacing of plant material with regard to both canopy and root zone/ growing media requirements of the selected species.
- The density of planting at the time of installation is to promote rapid coverage of garden beds so as to provide physical barriers to potential desire lines through planted areas.
Species which are known to exhibit sharp foliage, thorns or heavy fruiting characteristics are to be avoided in high traffic areas or where primary contact by visitors and maintenance staff is likely to be frequent.

### 2.1.3 Pot Sizing

Pot sizes reflect the function and location for which the planting is proposed. Tube stock is only to be used in revegetation areas/Buffer Planting. Generally 140mm pot size for groundcovers and strappy plants and 200mm pot size for shrubs. In areas of high visual impact, pedestrian use and activity, larger and more advanced stock may be conditional upon the quality of stock selected. All Street Trees outside of the CBD are to be a minimum 45 Lt. Within the CBD, a minimum 100 Lt pot size is required, with Preference to 200 Lt and ex-ground, space permitting. Plant to Mackay City Council Detail A4-177

### 2.1.4 Staking

All tree specification and sourcing aims for successful establishment without the need for staking, however in areas prone to high winds staking may be used to protect trees during the establishment phase. Plants displaying weakness or failure in root system are to be replaced at developers cost, including inappropriate tree staking that interferes with a tree canopy. Throughout the ‘on maintenance’ period, it is the developer’s responsibility to check tree stakes and ties and tighten/loosen as necessary. Tree stakes must not interfere with the trees branching system. Refer to Mackay City Council Standard Tree Planting Detail A4-49D.

### 2.1.5 Topsoiling - Media and Sub-Grade Preparation

Adequate media volume and depth is required by the intended planting to overcome periods of critical thermal and water stress and allow for adequate root growth. All planting beds are to be cultivated including sub soil cultivation and decompaction measures, with drainage being provided to all garden beds particularly in centre medians and road verges and connected to a Storm Water System.

### 2.1.6 Organic Mulch

Mulch is used to suppress weed growth, retain moisture, improve soil texture, reduce maintenance requirements and provide a visually consistent surface area not intended for mowing. All exposed soil surfaces not intended or suitable for grassed mowing areas are to be mulched. Mulched areas are to have minimum 100 mm settled depth cover. Hardwood chips are the preferred mulch in Mackay due to the lack of pine mulch supplies.

### 2.1.7 Turf

Turfing is used in circumstances where immediate cover is required for erosion or to offset the high establishment and maintenance requirements of seeding. Where new works occur with Council controlled land turf is to be laid from the back of kerb to the property boundary.

### 2.1.8 Hydro-Mulching

Hydro-mulching is used for erosion control on batters and slopes unable to be grassed and where regeneration of indigenous vegetation is desired. Additives of local native tree, shrub and ground cover species are to be used in seed mixes on steep gradients to assist in preventing erosion.
2.1.9 **Grass Seeding**

Grass seeding is used where the turfing option is excluded due to cost constraints. Established and weed control costs will be a consideration in option selection. All seeded areas are to be prepared to achieve significant germination without the required timeframe. Grass cover of less than 90% over the entire area at the off maintenance inspection will cause the maintenance period to be extended until cover is achieved.

2.2 **Street Tree Planting**

The ultimate aim of street tree planting is to provide an attractive streetscape with character and charm whilst providing shade, and aiding in the reduction of heat and glare from the road pavement. An individual character may be obtained by using one tree species per street. Where a development is occurring in an established street setting, an assessment of the existing trees should be made, and the most prevalent, appropriate and healthy species chosen for verge planting.

1. Tree species shall be selected for their suitability to the site conditions (e.g., small trees under power lines, drought resistance, soil suitability) and shall be in accordance with Mackay City Council’s Preferred Street Tree List.

2. To ensure consistency in growth rate and form all trees shall be no less than two (2) metres in height and shall be well established in their root and branch formation. A minimum 45 litre container is required.

3. The alignment and placement of street trees measured from the tree at the estimated ultimate size shall be in accordance with the Engineering Design Guidelines – D8 - *Landscaping*

2.3 **Roundabout and Median Strip Design**

- Roundabout and median strip design must have regard for plant siting and potential maintenance requirements. Planting in roundabouts and medians are to be set back from the inside of the roundabout kerb edge as is described in the M.C.C. Engineering Design Guidelines – D8 – *Landscaping*. Irrigation is to be placed in medians with subsoil drainage installed to adequately stop the ingress of water into the roadway. Irrigation shall be of such a design and quality of material and workmanship that the ingress of water into the pavement due to failure or damage is avoided.

**NOTE:** Specific Guidelines must be adhered to when landscaping within State Controlled Roads. (DMR Median & Roundabout Landscaping)

2.4 **Park and Reserve Access**

Parks and Reserves must be designed to optimize public access; prevent the entry of unauthorized or inappropriate users; facilitate the access of maintenance vehicles, emergency vehicles, and other vehicles authorized by Council; and minimize adverse impacts on the cultural, ecological and landscape values of the site.

- Parks and Reserves are designed to have due consideration for the movement of maintenance vehicles through the locality by providing access for vehicles to all parts of the park. Links across drainage and waterway corridors must be designed for access during wet periods. Where practicable and where loss to park or reserve amenity is minimized formal corridors for maintenance vehicles must be provided.

- Parks and Reserves must be designed to provide access for emergency vehicles. In Bushland Reserve design, emergency access must comply with an approved Fire Management Plan (FMP)
Clear zones must be provided for along park and reserve boundaries to accommodate maintenance vehicles and activities in accordance with Council specification. Areas of high ecological value, as directed by Council, will be protected from public access. Full width galvanized vehicular gates or bollards with lock and chain must be provided at vehicle access points.

2.5 Treatment to Park Boundaries

Vehicles should be prevented from driving into parks, drainage reserves and public open spaces by the provision of barriers along the road frontages and the installation of vertical barrier kerb and channel (not roll over). The barriers may be log barriers, bollards or natural features such as existing vegetation or newly planted and staked trees. Log barriers and bollards shall be in accordance with Standard Drawings A4-160B Post and Rail and A4-46D Round Timber Bollard.

2.6 Landscape Buffer (Screening)

Mounds and buffers adjacent to major roads controlled by the Department of Main Roads must comply with the requirements as specified by the Department of Main Roads and as detailed herein. Council's requirement for mounding buffering is specified within the Integrated Planning Act under Image Corridors and will be set out within the Operational Works approval. Generally, these buffers are between 2 and 10m wide along the full frontage of the property. Where a development is proposed that has a visual impact upon the landscape, vegetative screen buffering is required to remedy the situation. Situations may include car parks, large sheds, industrial sites, acoustic fencing etc.

Maintenance for these buffers is of great concern to Council. The need for fast spreading, low maintenance species is recommended with large bands of single species for continuity. Authorised vehicular access to these buffers is paramount for all future maintenance.

- Drainage swales may be incorporated into the buffer design where no alternative control method is achieved.
- Plant selection has regard for plant maturity with particular attention given to issues relating to shade and access to sunlight for adjacent land uses.
- Plant selection and planting reflects the required screening function.
- Unless otherwise stipulated by conditions of development approval landscaped buffers may comprise of planting only or a combination of earth mounding, planting and fencing in accordance with Engineers specifications.
- Allow for a 1000mm clear maintenance access path to rear of buffer planting.
- The location of the buffer does not compromise traffic visibility and safety requirements.
- Unauthorized vehicle access to planting strips is prevented by appropriate devices and structures for example slip rails, wheelstops, bollards or kerb. Maintenance access must be designed into the buffer.
- Areas adjacent to landscape buffers that are intended to be mowed must not exceed a cross fall gradient of 1:4.
- A mixture of 70% native and 30% exotic is to be achieved when plant choices are made.
- Refer to Mackay City Council Standard Buffer Planting Image Corridor. A3-841 and A3-842.

2.7 Landscaping Within Carparks

Landscaped areas and buffer strips associated with car parks enhance visual amenity and are designed for long term sustainability and durability. Generally planting beds located along road frontages are a minimum width of 2 meters, but reference should be made to the Operational Works Approval. All trees that are to be planted within car parks are at least 45L stock.

Photo 9: Tiered screen planting offers visual relief from unsightly structures.
Trees within car park areas are to have a minimum 600 mm clear trunk height for a 1.5 m high tree at planting and be able to attain a clear trunk height of 2.4 meters at maturity. The mature height of under plantings does not exceed 900 mm. All trees and shrubs maintain adequate sight lines in accordance with traffic visibility, engineering safety requirements and CPTED recommendations. A ratio of 1:6 (1 tree per 6 Car Parking Bays) is to be aimed for throughout the Car Park within Council controlled land.

### 2.8 Fire Management

Fire management is provided for in Bushland Reserves.

- Fire management must comply with the site specific Fire Management Plan (FMP) accepted by Council.
- Fire management should have regard for the principles of ecological fire and fire ecology (of wildlife and vegetation) as specified by the SEQ Fire and Biodiversity Consortium and the latest information available and approved by the EPA. Consideration should be given to the State Planning Policy: Mitigating the adverse impacts of Flood, Bushfire and Landslide SPP1/03, AS3959 and SEQ Fire and Biodiversity Consortium produced publications including but not limited to clear access ways must be provided and allow for fire management.

1. Fire Management Operation manual: Guidelines fire planning and conducting fuel reduction and ecological burns on your property; and
2. ‘Fire Management Strategic Manual: Guidelines for planning and implementing a Council or Shire wide fire management strategy’.

- Fuel free zones and management trails must be provided within reserves. Where possible, a ten (10) meter clear zone along reserve boundaries should be provided. This zone must be clear of shrubs and trees such that it is capable of being mown with a tractor/ slasher and should be designed to have a maximum 10% grade. Clear zone widths may vary depending on the requirements identified in the FMP.
- Landscaping is designed to reduce fire hazard and risk to personal safety. Design should include as far as practicable the use of plants or vegetation of least flammable characteristics, while having regard for the protection and enhancement of prominent visual features and ecological features or processes.

### 2.9 Revegetation

Revegetation is to be provided for long ecological corridors, waterways, riparian areas, wetlands, gullies, around habitat trees, or as otherwise specified by Council.

- Revegetation areas will be prepared by clearing and treating all weed species.
- Slow release fertilizer suitable for native plants and water saving devices, such as water crystals, will be required for all plantings.
- Unless otherwise approved re-vegetation areas will be blanket mulched with a weed free organic mulch with a minimum settled depth cover of 100 mm.
- Tubestock is the minimum acceptable size of plant stock for revegetation areas. Unless otherwise approved plants are to be randomly spaced (not in rows), with plant densities detailed on a Landscape Planting Plan prepared by a suitably qualified Landscape Architect or Environmentalist.
- Where requested by Council, erosion prone areas will be required to be treated with a Jutemat and planted.
- Grow tubes/tree bags will be required on site. Each plant will be bagged and staked with three (3) stakes. All stakes and bags shall be removed prior to the ‘off maintenance’ inspection.
3 Landscape Works

3.1 *Community Artwork*

This section relates to the design and construction of community art within public and private open spaces.

Community art must be designed, constructed and sited to enhance the visual amenity of the space, create a sense of place, add a social and cultural dimension and maximize community benefit whilst being functional and durable.

Community art should be designed to have one or more of the following characteristics:

1. *Convey* meaning by providing legibility and identity through landscape design;
2. *Exhibit* freedom of expression
3. *Reflect* the cultural, historical and environmental values of local areas, communities and wildlife; and/or
4. *Be* interpretive.

Community art must be designed to:

1. achieve a *scale* that reflects the setting to enable all users groups to successfully appreciate the piece/s;
2. *provide* for the safety of users, particularly in regards to the provision of appropriate circulation space and setbacks from road edges;
3. *minimize* vandalism (including graffiti);
4. be of low maintenance and durability; and
5. Comply with the provisions of the relevant Australian Standards where it is integrated within a play space and is intended to be used as a play element.

Community art should have the ability to attract users, evoke the senses and maximize the quality, experience and understanding of the space.

Community art is to be located along pedestrian/cycle thoroughfares, within identifiable community spaces and within areas where visibility is increased.

For all Art Works within the CBD reference should be made to the 'Mackay Riverfront Artistic Infrastructure' available from Mackay City Council.

3.2 *Edging*

Edging is designed to provide adequate separation between turf and gardens and to provide safety for maintenance staff and other user groups. Built edges must be installed at grass mulch interfaces in local, district and regional parks and in commercial and retail centre development. Appropriate edging for these areas may includes reinforced concrete edging, recycled plastic and bricks laid on a mortar bed. Timber edges within Council controlled land is not acceptable. Refer to M.C.C. Engineering Guidelines – D8 – *Landscaping*

3.3 *Paving Finishes*

Within the Central Business District (CBD) of Mackay, a standard paving pattern has been introduced to prevent an uncoordinated look and feel to the city as new developments take place. This layout often includes the installation of street trees within the pathway. Refer to standard drawing A3-989B for standard footpath treatment.

Outside of the CBD standard drawing A2-500 is to be referred to detailing standard concrete pathways.

Photo 10: Continuous concrete edges provide for ease of maintenance.
All hard surfacing in open space areas and areas external to building envelopes must be designed to provide safety and functionality, enhance visual amenity, and have regard for ongoing maintenance requirements and stormwater management.

3.4 **Infrastructure and Facility Provisions**

Standard infrastructure items, such as bollards, seating, bins and bubblers, will be provided in accordance with Council Specifications, as previously mentioned. Other infrastructure and facilities that are to be located in State controlled land will require prior approval from the appropriate authority with which jurisdiction lies e.g. State controlled roads – Department of Main Roads – and Council for all Council Managed reserves.

- The design and construction of playground equipment is to comply with Council requirements and relevant Australian Standards both in supply and installation of softfall.
- Infrastructure items, such as shelters, are to comply with the Building Code and have building approval prior to installation and be certified by a Structural Engineer on completion.
- Where appropriate, mains powered stainless steel BBQs are to be provided. Where mains power is not available the use of solar powered stainless steel BBQs will be considered. Gas is not accepted.
- All fixtures and fittings are to be of grade 316 stainless steel due to Mackay’s harsh, salty environment.

3.4.1 **Furniture**

Furniture should reflect the intended function, whether it be for the CBD or Council parks and compliment any distinguishing features present eg seating situated to maximise a viewscape. Some preferred features of furniture include:

- Park benches located under a natural or built shade structure to allow day long use. If the shade is built, it should have an impervious roof eg colorbond to provide shelter during rain.
- Shade structures should maximise protection from the sun during the hours of 11 am - 2 pm.
- Refuse bins should be located for ease of use and pickup by refuse trucks eg adjacent to playgrounds or picnic areas, at park exits.
- All Fixtures and Fittings are to be grade 316 stainless steel due to Mackay’s harsh, salty environment.
- Designers are encouraged to consult with Council and thoroughly read this manual in the preparation of the landscaping plans.

**Styles**

Mackay City Council currently has a standard furniture suite that it is implementing as new parks, sub-divisions or upgraded works are undertaken. The ‘Park’ range includes, seats, benches and tables (A similar equivalent to be approved prior to installation). All materials are to be extruded aluminum (timber will not be approved). The powder coat finishes can be part of the subdivision or park theme but must be specified prior to approval. Within the CBD a specific furniture suite, precinct colour coordinated, has been developed. Consult with the City Centre Manager for further specifications. Within the Botanic Gardens Town and Country is the style used. Consult with the gardens beforehand.

**Tree Grates and Guards**

Integrated T6 and GR2 (Square) 1200 x 1200, standard height (1400 mm)

- **Colour**: Dulux “Berry Grey” 81973 (Within the CBD)
- **Supplier**: Street Furniture Australia

Photo 11: Tree grate and guard to Mackay C.B.D.
Seats within the CBD
- Edge seats with arm rests EDG01
- Colour: Galvanised legs and arm to be powdercoated Dulux ‘Precious silver Pearl’
- Timber battens to be painted precinct colours.
- Supplier: Urban Art Projects.

Bins within the CBD
- Mackay City Centre series
- Finish: Stainless Steel Grade 4 Finish. Body powdercoat galvanized
- Supplier: Combined Metal Fabrication (Refer to City Centre Manager for details)

Bollards
- Timber Bollards refer to Mackay City Council detail A4-46D
- Post and rail refer to Mackay City Council detail A4-160B
- Slim Series Flat B5F (115 dia)
- Colour: Dulux ‘Precious Silver Pearl’
- Fixing: Sub-Surface Mounted
- Supplier: Street Furniture Australia

Bicycle Stand
- BST02 (Narrow hoop) or BST03 (Semi Hoop)
  - Fixing: Surface mounted
  - Colour: Stainless Steel finish.
  - Supplier: Street Furniture Australia

Seats and Tables – Outside of the CBD
- PS7, seat, aluminium battens, 1800 mm with arm rest AM7
  - Fixing: Surface mounted
  - Colour: To be specified
- PB5, Bench, aluminium battens, 1800 mm
  - Fixing: Surface mounted
  - Colour: To be specified
- PT7, Picnic table, aluminium battens, 1800 mm
  - Fixing: Surface mounted
  - Colour: To be specified
  - Supplier: Street Furniture Australia

Recycled plastic seats will be considered on a case by case basis.

Bin Enclosures- Outside of the CBD
- Non perforated aluminum sheet WBE (MJ) 240 liter, curved roof, aluminum tube and angle.
  - Fixing: Surface mounted
  - Colour: To be specified
  - Supplier: Street Furniture Australia

Drinking Fountain
- FL001, drinking fountain
  - Fixing: Surface mounted
  - Colour: To be specified
  - Supplier: Street and garden furniture

Barbeque
- Christie ‘Cooper’, marine grade stainless unit, high energy cooking plate, hard wired to mains electricity. (Gas BBQ’s are not accepted by M.C.C.)
  - Colour: Stainless steel
  - Supplier: All Park Products, ph: 1300 135 227

Shelters
- Landmark Series with hardwood up-grades and marine grade stainless steel fittings. Steel posts series are to be substituted for aluminum and power coated.
  - Size: Various, to suit application
Playgrounds
- No specified supplier, but all fixtures and fittings to be marine grade stainless steel. Plans, specifications and suppliers to be submitted for approval before installation.

Bus Shelters
- Standard Bus Shelter for Mackay City Council by Noosa Engineering and Crane Hire, (07) 5449 7477

Banana Bars (Deflector Bars) (Refer to Photo 36)
- As per Mackay City Council detail A4-175

3.5 Signage
Where a new park has been created a park name sign is to be provided. Refer to M.C.C. policy on ‘Park Signs’ The park name is to be submitted to Council for approval with the landscaping drawings. The proposed name is to preferably have the same theme as the subdivision’s street names. The name is to be creative and imaginative in order to appeal to children for local parks and to adults for district and regional parks.
- If the park has any historic, cultural or natural value the provision of interpretive signage will provide further interest to local users. Council can provide assistance in developing interpretive concepts.
- All park sign designs and names must be approved prior to installation.

3.6 Playgrounds
To ensure play equipment is as safe as possible and appropriate for the intended users, it should conform to the current and relevant Australian Standards for playgrounds and play areas and additional standards as may be established by Council.
- AS 4685 General Safety requirements and test methods
- AS 4422 Playground Surfacing
- AS 4486 Playground and Playground Equipment
Where playground equipment is required by Council as a condition of the development permit of the subdivision, or proposed to be installed by the developer, reference must be made to M.C.C. Engineering Guidelines - D8 – Landscaping.

3.7 Park Lighting
Pathways
Type: Avenue Virtual Lantern
Gear tray: HIT-CE 150W in-column gear tray
Column: Aluminium 90mm shaft, 4.5 m above ground, Flanged
Colour: Powder coat “Silver” RAL 9006
Breaker & Timer: A breaker must be installed to each pole to isolate that pole for future maintenance. A timer is also to be installed at the main control to operate from 5.30 – 9.30 pm.

Shelter Lighting
Type: Rexel lighting Lite Guard (Rexel)
Fittings: Vandal resistant fluorescent fitting to shelter roof.
P3 / P4 lighting to Australian Standards 1158

Photo 14: Installation of age appropriate play is critical for a child’s interaction.
3.8 **Site works**

The site works section applies to any landscape works that involve vegetation protection, clearing, stock piling and managing impacts during construction, through the following strategies.

3.8.1 **Retention and Protection of Significant Vegetation**

The canopy, trunk and root system of vegetation located within Preservation Areas must be retained and protected from disturbance.

- The minimum Tree Preservation Area (TPA) is calculated as a radius for the tree equal to ten times the Diameter Breast Height (DBH).
- Prior to the commencement of site earthworks the TPA is to be delineated with temporary fencing comprised as a minimum of star pickets at 5 metre centres with barrier mesh secured firmly. Fencing is to remain in place for the duration of the construction period.
- Site sheds, buildings, driveways, stockpiling, car parking or the cleaning or servicing of machinery is prohibited within the TPA.
- The soil level is not to be altered within the TPA.
- Where operational clearance is required for machinery operating in close proximity to trees, branch removal is undertaken with appropriate equipment and to AS 4373-Pruning of Amenity Trees.
- Trunks of trees are protected from bark bruising or bark removal by the installation of close proximity fences or trunk wrapping with material capable of providing a protection barrier such as timber battens or corrugated iron secured externally by twirled wire.
- Root systems at risk of compaction by machinery will be covered by a blanket of organic mulch 300 mm deep.
- Where significant disturbance is unavoidable within the TPA and excavation of a trench exposes roots within the TPA an appropriate root curtain is to be constructed immediately using Hessian, hay bales or mulch is then dampened and kept moist.
- All incidents of significant structural or physiological damage to vegetation intended for retention will require the technical services of a qualified arborist who will assess the tree for rectification or removal.
- If installation of services or footings cannot be avoided within/ or through the appropriate zone, arboriculturally sound practices are to be used e.g. coring or tunnel boring. Methods and practices are to be approved by Council’s Parks, Reserves and Landscape Services Department prior to works commencing or continuing.

3.9 **Lighting**

Light fixtures and fittings within Council controlled land must:

1. Be sited to minimise loss of residential amenity through glare associated with night time use;
2. Be sited to deter unsociable behaviour as far as practicable;
3. Not be visually intrusive;
4. Be appropriate to the setting;
5. Be designed and constructed to minimise vandalism; and
6. Be provided appropriate to the park category or at the discretion of Council. In some cases the use of a timber can be used to control park lighting to deter anti-social behaviour.

Parks must be illuminated in accordance with current AS 1158, lighting requirements, and Council specified lights where applicable.

A separate lighting plan must be submitted for approval taking into account any future landscape works, tree locations, etc.
3.10 **Irrigation**

Irrigation works are designed and installed utilizing best management practices whilst taking into consideration future maintenance costs to the asset owner and the safety of the asset users.

All irrigation systems used to maintain landscape works within Council controlled land must be compatible with the ‘Master General Specification for Central Irrigation Control Systems’. Irrigation plans must be submitted for approval prior to works beginning.

Roundabouts, median strips and splitter islands intended for immediate or future landscaping of any form will be equipped with automatic hard wired irrigation systems. The only exception will be regions not connected to mains water supply. Where power is not available, solar power is to be installed. Council will not accept battery operated irrigation systems. In commercial and retail centre development. All planted finishes are to be equipped with permanent automatic irrigation infrastructure, turf does not need irrigation. Buffer screen planting for noise attenuation structures is to be provided with an irrigation system.

3.11 **Maintenance**

Any Landscape Works undertaken within Council controlled land as part of a development must be maintained by the developer for a minimum period of twelve months. At this time Council will inspect the landscape works before signing off and accepting any future maintenance. During the twelve month period horticultural best practices must be undertaken to ensure quality workmanship throughout the development before Council will accept the works.

Council has certain expectations of acceptable landscape quality. A detailed list can be found in the M.C.C. Engineering Design Guidelines –D8- **Landscaping**. This will ensure that once the twelve month period has been reached a quality, well maintained landscape is being given over to Mackay City Council. Failure to comply with the maintenance procedures may result in Council rejecting the landscape works and imposing an extension to the twelve month maintenance period until Council feels that the standard of landscape works has improved to one that is acceptable.
4 Stormwater Management

This section relates to works and maintenance undertaken as part of Stormwater Management. It is intended as a guide only. For more detail refer to:
M.C.C. Engineering Design Guidelines - Constructed Lakes
Stormwater Quality Management Plan for Mackay, 2006
Qld State Legislation
WSUD Engineering Guidelines, B.C.C.
WSUD Engineering Procedures, 2005 Melbourne Water

4.1 Design Intent for Stormwater Management

A design intent must be produced for the construction of any water body and should clearly articulate the objectives of the stormwater management method and consider the surrounding environment. It should be developed in consultation with relevant authorities and when completed will provide direction to the functional and detailed design.

The design intent should capture the expected recreation use, public safety, visual amenity and community expectations.

The design intent must be produced during feasibility discussion and communicated to all relevant stakeholders.

4.1.1 Lake Depth

A lake should be oriented to the dominant winds to facilitate mixing, particularly for summer and autumn, and edge treatments must be designed to minimise wave damage.

The lake depth should be no greater than 3 meters to ensure sufficient light penetration to maintain submerged plants and to minimise the likelihood of stratification. It is preferable that the lake is between 1.5 - 2.0m in depth to maintain the most productive biological system possible. The lake depth should vary to create an opportunity for the establishment of diverse ecological systems.

4.1.2 Vegetation

Submerged plants are important to maintain biological processes and water quality. They provide a surface for the absorption of dissolved nutrients and provide food and shelter for zooplankton that may graze on algal species. The oxygen released during photosynthesis is important in maintaining oxygen saturation in the water column, which is depleted by animal respiration and decomposing organic matter. Vegetation can also help stabilise sediments and reduce release of sediment-bound nutrients arising from resuspension process.

4.1.3 Edge Design

The batter slopes on approaches and immediately under the water line have to be configured with consideration of public safety. Both hard and soft edge treatments can be applied to complement the landscape of the surrounding area of the pond or lake. A soft edge treatment approach will involve a gentle slope to the water edge and extending below the water line be adopted before the batter slope steepen into deeper areas.
An alternative to the adoption of a flat batter slope beneath the water line is to provide a 3m “safety bench” that is less than 0.2m deep below the permanent pool level be built around the water body.

4.1.4 Centre Median Bio-retention Swales

Centre median bio-retention swales are swales integrated into the centre of the median of dual carriage roads to collect surface runoff from road reserve to facilitate filtration treatment through a prescribed soil filtration media that is densely vegetated for retention of pollutants. The bio-retention systems are to be landscaped to complement the streetscape design intent. The road pavement is to slope ‘inwards’ towards the centre median. Base width ~0.5m, top width ~2.5m, Depth 0.3-0.4m.

4.1.5 Bio-retention ‘Rain Gardens’

Bio-retention ‘Rain Gardens’ are landscape features located within the road reserve between the dual carriage road pavement and the access driveways. Piped stormwater flows from the development catchment to be ‘day lighted’ onto the surface of these systems and percolated through a prescribed soil filtration media that is densely vegetated for retention of pollutants. The bio-retention systems can be planted with vegetation (trees and ground cover species) endemic to the region. Considering the bio-retention system accepts all stormwater flows and piped flows are to be ‘day-lighted’ to the surface, it means the systems are large (i.e. typically 6m wide).

4.1.6 Bio-retention Pods

Runoff within the kerb will be delivered to bio-retention pods to facilitate filtration treatment through a prescribed soil filtration media that is densely vegetated for retention of pollutants. The treated stormwater (i.e. the water that passes through the bio-retention system) will be collected at the base of the filtration media and discharge system. Stormwater flows in excess of the filtration rate of the bio-retention pods up to the 5 year ARI design flow will either enter an overflow pit which is sized to preserve trafficability of the road.

4.2 Safety and Maintenance

Safety

As with any water body, safety should be at the forefront of any design. For retention and detention basins designed to hold a body of water secure fencing must be installed if alternative accessible safe edges have not been designed due to space restrictions or location. Open channels and overland swales must be designed to Mackay City Council detail A3-868 Typical Open Channels allowing adequate access for future maintenance.

Aluminium pool fencing is not acceptable due to its lack of resistance to vandalism. Mackay City Council has adopted a Pool compliant fence constructed from galvanised tubing and welded together. This style of fence also makes it less likely to be stolen. Refer to Mackay City Council detail A3-3895 – Fencing – tubular steel fence – Pool fence compliant style.

Other situations where a fence must be installed is around head walls of culverts. A post and rail is acceptable for fall heights of less than 900 mm.
**Maintenance**

Adequate access must be provided to allow for future maintenance. A minimum 3000mm wide, 150 mm thick concrete pathway is to be installed to a location that allows machinery to clean out debris from the trap as is design.

A gross pollution and trash rack is to be installed at the water outlet point and in a location that can be easily accessed for maintenance.

Grass swales must not exceed 1:4 for mowing.

4.3 **Wetlands**

For wetland areas to function, a number of ‘zones’ must be designed. They generally consist of:

4.3.1 **An Inlet Zone**

- Sediment basin to remove coarse sediments.
- Designed to retain 125um sediment for flows up to one-year ARI peak discharge.

4.3.2 **Macrophyte**

- A shallow, heavily vegetated area to remove fine particles and promote uptake of soluble pollutants.
- An important operating characteristic of macrophyte zones is even well distributed flows that pass through various bands of vegetation. Strong vegetation growth is required to perform the filtration process as well as withstand flows through the system. Vegetation selection is heavily dependant on the regional climate.
  - **Shape** – To optimise hydraulic efficiency (reduce short circuits and dead zones), the desired shape adopts a high length to width ratio. For landscape planning purposes assume a Length to Width ratio of 5-6 (L): 1 (W).
  - **Bathymetry** – The wetland bathymetry is an important consideration in the wetland design. Depending on the ‘hydrologic’ nature of the wetland the bathymetry is generally designed to create a range of different habitats including Deep Marsh (0.35-0.5m deep), Marsh (0.2-0.35m deep), Shallow Marsh (0-0.2m deep) and Ephemeral Marsh (0-0.3m deep WL).

4.3.3 **High Flow Bypass**

- A high flow bypass is required to safely convey high flows and protect the macrophyte zone (in this case, we can readily create the high flow bypass within the melaleuca re-veg zones).

4.3.4 **Outlet**

- An outlet that maintains discharge with a notional 48 hours detention is an important feature of wetlands.
- Generally, there are areas of open water surrounding the outlet of wetlands. These can be controlled with an appropriate outlet structure.
5 Landscape Plans

5.1 Guidelines and Philosophy Behind Landscape Design

Careful consideration of the following factors in the design of the site will add value to the development and surrounding area. The landscape design should be proportioned to relate to the architecture of the site, existing vegetation and the street.

The planning of the site should be designed to accommodate and design for the amenity of the proposed development, ensuring that the location, materials and scale of the landscape elements are appropriate for their intended use.

The basic functions of a landscape are served by the following components and should be shown in the landscape plan:

- Paved or other durable surfaces for vehicular and pedestrian access.
- Garden beds to provide scale, screening and setting
- Lawn or alternative for outdoor activities
- Trees to provide shade, scale and form.

Mackay City Council has a set of Drawing Standards that must be adhered to, refer to Engineering Design Guidelines – D20 -Drawings and Documentation Guidelines.

Landscape Character

The landscape character should be identified through observation of the planting types, fencing, setbacks, materials, colours and architectural design styles of the surrounding areas. The landscape design may respond through replication and interpretation of existing/past site conditions. All sites have a context, this must be taken into account at the site analysis stage of design.

Presentation to the street

The landscape design should be used to highlight architectural features, define entry points, indicate direction and frame/filter views into and out off the site. The design should recognise the impact the development will have on neighbouring properties and the street. Landscape can lessen adverse effects from the proposed development by reducing the effects of poor views and contribute to the landscape character of the area.

- Planting should be used to effectively screen service areas and block unwanted views that invade privacy.
- Planting should be used to reduce the visual impact of fencing along street frontages and along driveways.
- Planting should be used to screen unsightly structures including bins, gas bottles, air conditioners etc.
- Plantings are to be designed in a way so has not to conflict with services and over head power lines.
- One tree per lot is the minimum street tree planting along any road. Where space permits additional trees can be added but at centres no more than 7m.
- Planting should be provided that allows for ease of maintenance in the future.
5.2 **Landscape Concept Plan at Development Application Stage**

At the Landscape Concept Plan Stage the plan should at least show:

- Plans should display title block with a north symbol, detailed legend, plan numbers, designer information, street name and lot description.
- The recommended scale for a landscape plan is 1:100 or 1:200 with 1:500 for larger sites.
- Plans should detail boundaries, easements, fences, footpaths, gutter crossings, drainage and grassed areas. Services should be indicated on the plan and show at least, underground services (water, electricity, gas, telephone, sewer and stormwater).
- A Landscape Concept Plan should show any existing vegetation to be removed or to remain.
- The description and resolution of land use conflicts between the site and adjoining properties, e.g. screen/buffer planting with descriptive notes.
- Description of landscape works in general illustrating the proposed landscaping in a concept format.
- All proposed vegetation on the plan should be shown, including feature and shade tree locations etc. Plant species need only be indicative with a range of plants under such heading as groundcovers, clumping, shrubs, trees etc. No plant sizes or numbers need be submitted at this stage.
- Possible circulation routes, potential views out of the site, building to screen.
- Where possible it is encouraged at this early stage that any remnant vegetation try and be saved, this offers immediate shade and feature trees to a new site.

5.3 **Landscape Plan at Operational Works Stage - (Refer Typical Plan, page 21)**

For Landscape Design approval at the Operational Works Stage the consultant is to submit at least the following information. A failure to do so may result in a stand up application process due to Request for more information being returned. Plans should be designed in accordance with previous approval responses and other relevant Operational Works Plans.

- Three copies of the Landscape Plan including any Working Drawings and associated Landscape Specifications, at A3 size if legible, or A1 for more legibility.
- The recommended scale for a landscape plan is 1:100 or 1:200 with 1:500 for larger sites.
- Plans should detail boundaries, easements, fences, footpaths, gutter crossings, drainage and grassed areas. Services should be indicated on the plan and show at least, underground services (water, electricity, gas, telephone, sewer and stormwater).
- The location of overhead wires.
- The plan should demonstrate that the proposed development complies with the minimum ‘Landscaped Area’ specified by the Planning Scheme.
- Proposed surface materials including, turf, pathways, patios, mulched garden beds, etc.
- All structures including existing and proposed building footprints and building F.L’s are to be shown.
- Other landscape structures such as pergolas, gazebos, entry statements etc.
- Fencing and retaining walls details and specifications.
- A contour plan showing all existing levels and proposed new levels.
- Lighting.
- Site furniture and play equipment, including type, colour and supplier.
- Details of edging treatment.
- Irrigation systems, including the location of the RPZ valve and the proposed location of the control box.
- Where the irrigation is to become part of Council’s responsibility separate irrigation plans will need to be submitted for approvals by Council’s Parks Department.
- Site drainage including any subsoil drainage and drainage pit locations.
Any detailed dimensioning needed to achieve the finished landscape works. The need to scale of a drawing should not be necessary. There should be enough dimensioning information for the contractor to be able to build from the landscape drawings provided.

**Planting Details**

At the Operational Works Stage detailed Planting information must be provided. It should show the location and species name of the proposed plants in a key format that relates back to the Plant Schedule, the plant schedule should have at least the following information:

- Botanical and common name relating back to the key name given
- Number of plants to be used
- Size of plant container
- And most importantly the expected size of plant to be planted at the time of planting. This is to allow Council to make an informed decision on whether or not the plant is of an adequate size at the time of planting.

Refer below for a typical Planting Schedule set out.

**PLANT SCHEDULE**

<table>
<thead>
<tr>
<th>KEY</th>
<th>SPECIES</th>
<th>No.</th>
<th>POT</th>
<th>Ht.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARC ale</td>
<td>ARCHONTOPHENIX alexandra</td>
<td>6</td>
<td>100lt</td>
<td>1500 clear trunk</td>
</tr>
<tr>
<td>COR sp</td>
<td>CORDYLINE sp</td>
<td>24</td>
<td>200</td>
<td>500</td>
</tr>
<tr>
<td>CUP ana</td>
<td>CUPANIOPSIS anacardioides</td>
<td>5</td>
<td>45lt</td>
<td>1800</td>
</tr>
<tr>
<td>LIR 'EG'</td>
<td>LIRIOPE 'Evergreen Giant'</td>
<td>14</td>
<td>140</td>
<td>250</td>
</tr>
<tr>
<td>OPH 'Var'</td>
<td>OPHIOPOGON 'Variegata'</td>
<td>24</td>
<td>140</td>
<td>200</td>
</tr>
<tr>
<td>PHI 'Xan'</td>
<td>PHILODENDRON 'Xanadu'</td>
<td>13</td>
<td>200</td>
<td>450</td>
</tr>
</tbody>
</table>

Refer to Plan on Page 21 for a Typical Landscape Plan at Operational Works.

**Landscape Plans for the Central Business District (CBD)**

Any Landscape work undertaken within the CBD may impact on the existing street. At this stage a separate ‘Streetscape Plan’ is required detailing all proposed footpath finishes, set outs and levels, this is to be designed in accordance with Mackay City Council Standard footpath treatment A3-989B.

**Note**

Plans that are clear and detailed can be easily assessed and increase the efficiency of plan assessment by council. They also provide a tenderer with clear directions about the desired outcome. The designers name and contact details should be clearly marked on the landscape plan so the landscape assessment officer can make enquiries directly.