
OUDE MOLEN LANDSCAPE DESIGN GUIDELINES

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1. INTRODUCTION

Oude Molen is situated next to the Two Rivers Urban Park (on the western side, bordered by Perseverance Road to the north adjacent to Maitland Garden Village, and Alexandra Road on the eastern side next to Pinelands). The entire area of Oude Molen offers views over the Two Rivers Urban Park towards Observatory, with Devil's Peak and Table Mountain in the background.

The Oude Molen Landscape Guidelines document outlines principles for the future development of the landscape environment at Oude Molen. This environment encompasses both Soft Landscape elements, for example vegetation material and landform, and Hard Landscape elements, including hardened surfaces and urban elements.

The Guidelines and Precinct Landscape Plan serve as a framework for the strategic planning and design of exterior space to be shown on Landscape Plans as part of the City of Cape Town's Site Development Plan process. This Guidelines delineates core principles to advance broader urban design considerations.

The Guidelines will play a role in cultivating a unified vision by fostering harmonious relationships between architectural structures and outdoor spaces, interspersed with public zones for observation and social interaction, it imbues a distinct sense of place and inclusivity. The landscape's transformative influence extends to shaping the initial impressions individuals upon entering Oude Molen, thereby elevating the overall human experience of these outdoor spaces. Furthermore, it fosters a connection between the public users and the environment, reinforcing the symbiotic relationship that enriches the experience of Oude Molen.

2. VISION

The Vision for Oude Molen is to create a People Focused development with the following objectives:



- Creating a safe, liveable neighbourhood;
- Promoting walkable high density mixed-use developments;
- Integrating inclusionary housing;
- Weaving public facilities and open spaces into the landscape;
- Providing equitable access to cultural heritage, productive landscapes and natural reserves; and
- Embracing the principles of sustainability into the design, construction and operational phases.

3. LANDSCAPE PRINCIPLES

The landscape principles are aligned with the overarching urban design objectives, this intervention fosters the creation of compact, walkable, and liveable mixed-use neighbourhoods with sustainable access to resources and experiences.

3.1. Outdoor Space Creation

- a) Articulate Outdoor Spaces:
Utilize vertical elements (trees and shrubs) and horizontal planes (lawns, groundcovers, and low-lying shrubs) to define and create distinct "rooms" within the landscape.
- b) Humanize Urban Scale:
Integrate urban building scale and form with landscape elements to visually reduce the perceived scale of development, creating a more pedestrian-friendly environment.
- c) Curate Views:
Employ landscape elements to frame or screen views within the urban context. This allows for the creation of visually engaging vistas while also providing privacy or blocking undesirable views as needed.

3.2. Landscape Diversity

- a) Promote Biodiversity for Sustainable Urban Ecosystems:
Incorporating a diverse range of plant species within landscapes fosters the development of more resilient and productive human-urban ecosystems.

- b) Avoid Monocultures:
Monoculture landscapes, with their limited plant varieties, are highly susceptible to disease, pest outbreaks, and struggle to adapt to extreme weather events like droughts or floods.
- c) Harness Local Biodiversity for Ecosystem Protection:
Given Oude Molen location within the threatened Cape Floral Kingdom, incorporating a diversity of indigenous plant species can serve as a mitigation strategy against the negative impacts of urban and agricultural development.

3.3. Landscape Preservation

- a) Prioritize Mature Tree Preservation:
Retaining existing mature trees conserves the significant resources invested in their growth, contributing to a more sustainable and resilient landscape.
- b) Protect Culturally Significant Trees:
Trees holding specific cultural value to the site or surrounding community should be preserved to maintain the historical and symbolic significance of the landscape.
- c) Safeguard Aquatic Systems:
Protecting existing aquatic features on the site contributes to maintaining essential environmental services to the benefit of Oude Molen.

3.4. Landscape Time

- a) Dynamic Landscapes:
Urban landscapes are living environments that evolve over time.
- b) Planned Maturation:
Landscape design should account for the growth and development of plant materials, ensuring spaces adapt and mature gracefully over time.
- c) Embracing Seasonality:
Seasonal variations in foliage, colour, and structure add dynamism and visual interest to urban spaces.

3.5. Microclimate

- a) Landscapes Moderate Microclimates:
Through biological processes like evapotranspiration, landscapes actively regulate the microclimate of spaces, influencing temperature and humidity.
- b) Strategic Landscape Placement:
The thoughtful placement of landscape elements can influence wind flow patterns, either directing or diverting breezes. Additionally, shade provided by trees directly impacts the local temperature within a space.

3.6. Environmental Services

- a) Harnessing Landscape for Environmental Services:
Utilize landscape elements to provide essential environmental services, such as reducing pollution and minimizing resource consumption.
- b) Enhancing Ecological Services:
Implement stormwater management and infiltration practices through landscape design. This will not only benefit the health of the local landscape but also contribute to the ecological services provided by the two adjacent rivers.

3.7. Water Conservation

- a) Explore Water-Wise Irrigation:
Consider utilizing alternative water sources, such as rainwater harvesting or greywater systems, to reduce reliance on potable water for landscape irrigation.
- b) Embrace Drought-Tolerant Plants:
Incorporate indigenous or well-adapted plant species within the landscape design. These species require minimal irrigation to thrive, promoting water sustainability.
- c) Employ Water-Retention Techniques:
Landscape specifications should include the use of mulching materials, such as stone chips or compost. This creates a surface seal that helps retain moisture in the soil for extended periods, reducing irrigation needs.

3.8. Hardscape Robustness

- a) Durable Materials:
Utilise high-quality, weather-resistant materials like stone, concrete, clay, galvanized steel or treated timber for long-lasting performance.
- b) Minimal Maintenance Needs:
Select materials and design elements that require minimal ongoing maintenance to reduce long-term costs and ensure functionality.
- c) Vandal-Resistant Design:
Incorporate design features that deter vandalism, such as rounded edges, tamper-proof fasteners, and robust construction methods.
- d) Universal Accessibility:
Ensure hardscape elements comply with accessibility standards, allowing for comfortable and safe use by everyone.
- e) Sustainable Sourcing:
Where possible, prioritize sustainably sourced materials with low environmental impact for a more responsible approach.
- f) Reusability and Adaptability:
Consider the potential for future reuse or adaptation of hard landscape elements to accommodate changing needs.

3.9. Softscape Robustness

- a) Selection for Climate and Conditions:
Choose plants and materials that thrive in the local climate, soil type, and sun exposure.
- b) Durability and Longevity:
Prioritize materials and plants known for their hardiness and resistance to pests, diseases, and harsh weather conditions.
- c) Low Maintenance Needs:
Select plant species that require minimal ongoing maintenance, such as watering and pruning.
- d) Functional Design:
Design landscape elements to serve intended purposes effectively, considering factors like pedestrian flow, drainage needs, and plant growth patterns.
- e) Species Diversity:
Incorporate a variety of indigenous species to create a more resilient ecosystem less susceptible to disease or pest outbreaks.
- f) Sustainable Practices:
Implement practices like mulching, rainwater harvesting, and integrated pest management to support plant health and minimize resource consumption.

4. LANDSCAPE COMPONENTS

Landscape Components in the framework create the basis of the landscape intervention as defined by the Urban Design. The typical component is a combination of soft and hard landscape that create functional and aesthetical environment.

4.1. Mature Trees Preservation

Tree preservation is the critical practice of protecting and maintaining existing trees within the urban environment. Prioritizing the retention of mature, healthy specimens and trees with cultural significance is essential for maintaining a healthy city and mitigating visual impacts. These majestic elements of the urban landscape provide a multitude of benefits, making their preservation a cornerstone of sustainable development.

4.2. Mobility Infrastructure

- a) Avenues, Streets and Roads:
Avenues, Streets and Roads are the essential elements of any village, serving as both transportation corridors and vibrant public spaces. They enable movement, foster social interaction, and contribute to Oude Molen's sustainability.
- b) Shared Streets and Lanes:
Shared streets represent a shift in urban design, moving away from car-centric environments and towards a more collaborative and people-oriented approach. They create a shared space where pedestrians, cyclists, and low-speed vehicles coexist harmoniously prioritizing safety.
- c) On-Street Parking:
On-street parking offers a readily available solution for short-term parking needs. It acts as a convenient for

residents, visitors, and businesses in a densely developed area. On-street parking offers immediate access, making it ideal for quick errands, short appointments, deliveries, or spontaneous visits to shops and restaurants.

- d) Courtyard Parking:
Courtyard parking offers a designated parking area within the interior space of a complex. While prioritizing functionality, well-designed courtyard parking can also contribute to the overall aesthetic and liveability of the space. Additionally, courtyards can provide opportunities for passive recreation or social interaction.
- e) Pedestrian Path Network:
Pedestrian path networks are the interconnected systems of walkways, trails, and sidewalks that form the arteries of active non-vehicular movement within a community. These networks enable residents to walk, jog, or cycle for daily commutes, reaching workplaces, retail destinations, and leisure activities.

4.3. Urban Infrastructure

- a) Gateways & Entrances:
Gateways and road entrances fulfil a twofold function: providing essential access to a location while simultaneously serving as symbolic markers of arrival or transition. These gateways can manifest in various forms, ranging from prominent landmark structures and landscaped areas to strategically placed curb extensions, traffic circles, and signage with enhanced lighting. Each element contributes to a cohesive design that guides visitors, establishes a sense of arrival, and reflects the character of the destination.



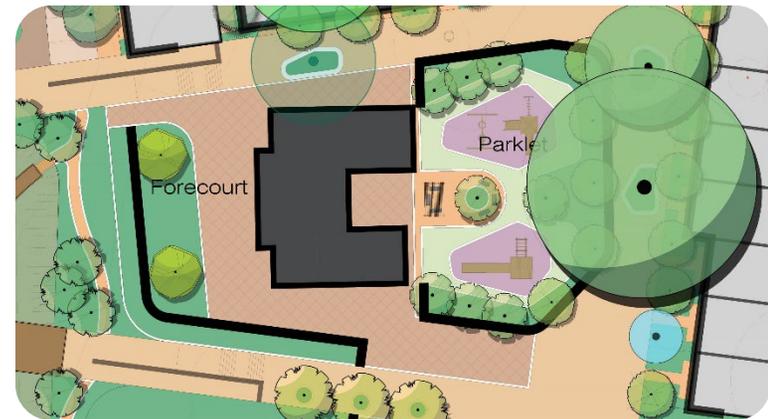
4.4. Public Green Infrastructure

a) Neighbourhood Parks:

Neighbourhood parks are the cornerstones of a community, offering residents a vital green respite within walking distance. The park serves as an escape from the built environment and create space that could foster a sense of community. A variety of recreational functions could be included into the park including playgrounds, sport courts, open space for picnics or informal sports.

b) Public Plazas & Squares:

Public squares and plazas are vital components of a city's fabric, functioning as centralized open spaces that foster community gathering. Strategically located, they are often found in the heart of a town, surrounded by significant buildings with cultural importance. These spaces serve as vibrant marketplaces or venues for public events. Public squares and plazas offer a multitude of functionalities, catering to a range of activities, including socializing, relaxation, and hosting various events.



b) Pocket and Linear Parks:

Pocket and Linear parks are miniature oases strategically integrated within the urban fabric. These compact public open spaces provide a visual green relief in densely populated areas.



c) Pool Park:

Public pool parks are multi-functional recreational spaces that combine the appeal of a swimming pool with the diverse functionalities of a park. These facilities offer residents with a convenient and affordable option for aquatic recreation and relaxation.



d) Food Gardens:

Food gardens are intentional plantings, typically on a smaller scale, cultivated to produce fruits, vegetables, herbs, or even flowers for edible purposes. Food gardens offer a multitude of benefits, promoting healthy eating habits, and providing access to fresh, local produce.



e) Integrated Stormwater Parks:

Leveraging sustainable park infrastructure, specifically bioswales and bio-ponds, to provide effective, natural filtration and polishing of stormwater. The integrated approach that ensures aesthetically and functional green spaces that can serve both active and passive public use.



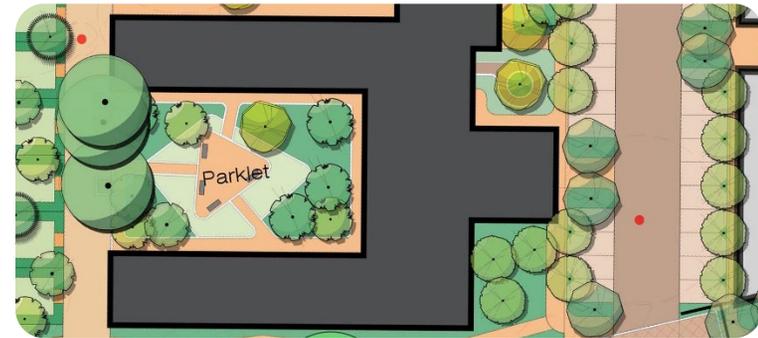
f) Two Rivers Urban Park Interface:

The interface along the common boundary with the Two Rivers Urban Park (TRUP) must seamlessly integrate the external grassland landscape into the proposed development via a linear park. This linear park is mandated to include a landscaped bio-swale designed to pre-treat and manage stormwater runoff before it discharges into the TRUP. The planting scheme within the linear park must transition from the existing grassland species into indigenous fynbos, effectively integrating the visual edge of the new development. Furthermore, trees should be planted in an informal pattern throughout the linear park to mitigate any potential visual impacts of the development. The park itself must be designed to accommodate both active and passive public uses.



g) Courtyard Parks:

Courtyard parks are intimate green spaces nestled within the confines of buildings. These enclosed private parks areas offer a tranquil escape for relaxation and connection with nature.



h) Residence Gardens:

Residence gardens are a personalized outdoor space. These spaces, typically adjacent to a residence, offer an opportunity to cultivate beauty, fresh produce, and a tranquil environment, all within the comfort of your own home.

i) Roof & Balcony Gardens:

Roof and balcony gardens should be considered as additional soft landscape element where appropriate, sustainable and affordable. These urban spaces offer a multitude of benefits, extending beyond aesthetics.

5. LANDSCAPE GUIDELINES

5.1. Hierarchy of Landscape Components

The establishment of a clear hierarchy of landscape components serves as a guiding framework for Landscape Guidelines of both Hardscape and Softscape.

a) Primary Components:

Gateways & Entrances, Plazas & Squares.

These spaces serve as major connectors, gathering areas, or prominent landmarks within the urban fabric. Durability,

high traffic volume capacity, and aesthetics are all key considerations.

- b) Secondary Components:
Streets with On-Street Parking, Streets and Sidewalks.
These elements prioritize efficient movement and accommodate vehicular traffic alongside pedestrian use. Balancing functionality, safety, and aesthetics is important.
- c) Tertiary Components:
Shared Streets, Large Parks and Courtyard Parking.
These spaces prioritize shared use and a balance between functionality and user experience.
- d) Quaternary Components:
Pocket & Linear Parks, Courtyard Parks, Food Gardens.
These spaces prioritize recreation, relaxation, and a connection to nature.

5.2. Tree Preservation

Tree preservation strategy for the development of Oude Molen prioritise the retention of trees with cultural, ecological, and aesthetic value.

5.2.1 TREE EVALUATION CRITERIA:

The following criteria were used to assess trees for preservation during the Tree Quality Survey. Please refer to 5.12 for Tree Quality Survey Plans read in conjunction with Trees Catalogue Report:

- a) Tree Conditions: Trees were visually inspected, photographed, numbered, identified, girth of trunk and canopy estimated. Overall appearance of the tree was

judge based on each species age, growth shape, state of foliage, trunk and branches structural stability, and any sign of disease or pest on the trees. Based this overall assessment the Trees Quality was described if the tree is in a Good Condition for retention or not.

- b) Heritage Significance: Trees identified as heritage trees are those of cultural significance. This includes species historically used in agricultural settings or during Cape Town's early development. Additionally, trees older than 60 years located near Heritage Buildings are considered culturally significant. Removal of heritage significant trees will require motivation to and approval from Heritage Western Cape and the City of Cape Town.
- c) Listed Protected Trees: Species listed under the National Forest Act (Act No.84 of 1998) are considered protected trees. A removal permit from the National Department of Forestry is necessary for any pruning or removal of these protected species. The Tree Quality Survey identifies all listed protected trees species on Oude Molen.
- d) Placing-Making Trees: Large, mature trees in good condition are categorized as placing-making trees. Every effort should be made to retain these trees through pruning or adjustments to architectural or engineering plans. Removal of placing-making trees will require motivation to and approval from the City of Cape Town.
- e) Transplantable Trees:
Trees and Palms in good condition and identified as transplantable species should consider for relocation on-site. Species include all Ficus Tree species, Pheonix Palm species and Washingtonia Palm species.

- f) Invasive Trees:
The National Environmental Management: Biodiversity Act (2004) NEMA Regulations classify invasive plant species into categories based on their level of invasiveness. Trees listed as Class 1, 2, and 3 Invasive Species was shown to be removed with only two exceptions noted in the Guidelines.
- g) Trees in Good Condition or Transplantable: Trees in good condition or identified as transplantable species should consider for retention or relocation on-site. However, removal may be considered if necessary for development purposes.

5.2.2 PLANNING AND DEVELOPMENT:

- a) Minimize Tree Removal: During the planning stages of any development project, prioritize minimizing the number of trees that need to be removed. Explore alternative site layouts and designs that can incorporate existing trees.
- b) Identify and Protect Valued Trees: Develop a tree protection plan that identifies all trees within the development area. Categorize them based on size, species, health, and cultural significance. Focus on protecting mature, healthy trees and those with cultural importance.
- c) Set Clear Tree Protection Zones: Establish tree protection zones (TPZ) around the base of each tree to be preserved. The size of the TPZ will depend on the tree's canopy diameter. The TPZ designate the critical root zone falls that must be protected from disturbance during construction activities.

5.2.3 CONSTRUCTION PRACTICES:

- a) Fencing and Signage: Erect fencing around the perimeter of all TPZ to prevent encroachment by construction equipment and workers. Clearly mark these zones with signage to raise awareness of their importance.
- b) Soil Compaction Mitigation: Minimize soil compaction within TPZ. Avoid storing building materials or parking vehicles in these areas.
- c) Careful Excavation: If excavation is necessary within a TPZ, perform it carefully by hand or with specialized equipment that minimizes root damage. Prune roots only as a last resort and ensure proper cuts using clean, sharp tools. Root pruning to be performed by a professional Arborist.

5.2.3 TREE MAINTENANCE:

- a) Proper Pruning: If pruning is necessary, ensure it is done by a professional Arborist who understands proper pruning techniques. Improper pruning can weaken trees and make them more susceptible to disease and insect infestation.
- b) Monitoring and Care: Monitor the health of preserved trees throughout the construction process and beyond. Address any concerns about tree health promptly by consulting with a professional Arborist.

5.3. Invasive Vegetation Control

The National Environmental Management: Biodiversity Act (2004) NEMA Regulations classify invasive plant species into categories based on their level of invasiveness. Class 1, 2, and 3 Invasive Species: Prohibited for Planting in landscape areas and must be removed in accordance with NEMA Regulations from the Oude Molen.

5.3.1 HERITAGE TREE AND NEMA CLASS 3 EXCEPTIONS:

a) *Phytolacca dioica*:

An exception is granted for two specimens of the Heritage Tree species, *Phytolacca dioica*, located within the designated Manor House forecourt. Due to its heritage significance, these two specimens will be retained.

b) *Eriobotrya japonica*:

An exception is granted for *Eriobotrya japonica*, located in various location at Oude Molen and be retained as food trees in the landscape.

c) Management of Retained Invasive Heritage Trees:

- A strict management plan must be implemented for the two retained *Phytolacca dioica* specimens and *Eriobotrya japonica*.
- Regular monitoring and preventing seed dispersal to other areas of Oude Molen or adjacent properties.
- Removal of seedling that germinate across the Oude Molen and adjacent properties.

5.3.2 IDENTIFICATION AND PRIORITIZATION:

- a) Accurate Identification: The first step is accurately identifying invasive plant species present on the site. This information will guide control strategies and resource allocation.
- b) Prioritization: Species with the highest potential for negative ecological impacts should be targeted first. This includes invasive species that readily spread, displace indigenous vegetation, or disrupt ecosystem functions.

5.3.3 CONTROL METHODS:

- a) Mechanical Removal: This method involves manually removing invasive plants by hand-pulling or using tools. It is most effective for small infestations or controlling seedlings and saplings.
- b) Herbicide Application: Herbicides can be a valuable tool, but their use should be carefully considered due to potential environmental risks. Selective herbicides with minimal impact on indigenous plants should be chosen, and application should be conducted by trained professionals following all safety regulations.

5.3.4 INTEGRATED APPROACH:

- a) The most effective control strategies often combine multiple methods. For example, initial mechanical removal of larger plants could be followed by herbicide application to control regrowth and prevent seed dispersal.

5.3.5 POST-CONTROL MANAGEMENT:

- a) Monitoring: Regular monitoring is essential to detect new infestations or re-emergence of controlled invasive plants. Early detection allows for prompt action and prevents re-establishment.
- b) Rehabilitation: Following control efforts, restoring the disturbed area with indigenous plants is crucial. This discourages re-invasion by invasive species and promotes the recovery of the landscape.

5.4. Western Leopard Toad Protection

5.4.1 HABITAT PROTECTION AND MIGRATION PATTERNS

The endangered Western Leopard Toad (WLT) is known to inhabit the wetland areas of the Two Rivers Urban Park, where breeding occurs. Outside of the breeding season, WLTs forage widely, commonly utilizing urban green infrastructure such as gardens, parks, and open spaces. The primary threat to this species is habitat loss, compounded by the deterioration of wetland quality due to high concentrations of nutrients, chemicals, and poisons. WLT mobility is also critically affected by artificial barriers to foraging movement and by high rates of mortality caused by vehicular traffic on roads that intersect their seasonal migration paths to and from breeding sites.

5.4.2 WLT VULNERABLE PERIODS

- a) Breeding and Migration Period:
 - Period: July to September
 - Threat: Vehicular Road Traffic

- b) Hatching Period:
 - Period: August to September
 - Threats: Tadpoles are vulnerable to alien fish & ducks. Additionally, the wetland habitat quality.
- c) Toadlet Migration Period:
 - Period: October to December
 - Threats: Toadlets leave breeding ponds in migration to forage areas. Artificial barriers block migration. Vehicular road traffic, pools and lawnmower kill toadlets.

5.4.3 MITIGATION OF URBAN IMPACT ON WLT

- a) Fencing and Boundary Wall Migration Access: Perimeter fencing and boundary walls must incorporate design features to permit toad movement. A minimum ground-level gap of 50 mm wide and 40 mm high must be maintained along the entire extent of the barrier.
- b) Fencing and Boundary Wall Barriers: In select, limited situations adjacent to high-volume roads, solid vertical exclusion barriers are required. These barriers must be a minimum of 600 mm high to prevent WLT migration onto busy roadways and minimize road mortality.
- c) Toad Tunnels for Road Crossing: The installation of toad tunnels beneath busy roads is highly encouraged to enable safe migration and significantly reduce road fatalities. Tunnels should have a minimum internal diameter of 800 mm and can be either square or cylindrical.
 - Lighting: Natural light is recommended, especially for longer tunnels, and can be achieved by integrating open "sky-lights" into the tunnel design.

- Placement: Tunnel locations must be determined based on localized WLT migration patterns.
- d) Road Speeds Limitations: Appropriate road speed limits must be established and enforced to reduce speeding. Lower speeds enhance driver reaction times, allowing vehicles to avoid toads on the road surface.
- e) Toad-Friendly Gardens and Landscape Design: Landscape and garden design must incorporate elements that minimize adverse effects on WLTs. Key considerations include:
- Utilizing indigenous plant species.
 - Avoiding the use of insecticides and pesticides whenever possible.
 - Prioritizing planted areas over impervious paved surfaces.
 - Designing earth slopes with a gradient of at least 1:3 (or gentler) to facilitate WLT movement.
 - Installing "Toad Savers" (escape ramps) in ponds and pools with steep edges to prevent drowning.
 - Incorporating landscape features such as rocks, stones, and wood piles to provide vital cover and refuge from predators.
- f) Sustainable Urban Drainage Systems SUDS: Stormwater runoff must be treated using Sustainable Urban Drainage Systems (SUDS), specifically bio-swales and bio-ponds, prior to discharge into the natural environment. This measure is critical to minimize the impact of pollutants on WLT breeding wetlands.

5.5. Hardscape Elements

5.4.4 PEDESTRIAN NETWORK

- a) The pedestrian network serves as the lifeblood of a well-designed urban environment. It prioritizes the movement and experience of pedestrians and encouraging active lifestyles.
- b) Network Components
- Sidewalks: These dedicated pathways alongside streets provide a safe and convenient space for pedestrians to navigate. Design considerations for sidewalks include width, surface material, accessibility and integration with street furniture.
 - Shared Streets: These spaces prioritize shared use between pedestrians, cyclists, and slow-moving vehicles. Careful design is crucial to ensure the safety and comfort of all users, often achieved through designated lanes, signage, and traffic calming measures.
 - Paths: Found in parks and other recreational areas, paths offer a more leisurely experience for pedestrians. Material selection and aesthetics can vary depending on the specific context, with a focus on creating a comfortable and visually appealing environment.
- c) Optimizing Pedestrian Movement
- Directness and Connectivity: The network should provide clear and direct routes to destinations, minimizing unnecessary detours or dead ends.

- Accessibility: The network should be accessible to all users, regardless of age or physical ability. This includes incorporating ramps, tactile paving, and sufficient space for wheelchairs and strollers.
- Comfort and Safety: The network should prioritize pedestrian safety with adequate lighting, clear sight lines, and comfortable walking surfaces. Pleasant aesthetics and integration with nature can further enhance the user experience.

d) Network Hierarchy

- Sidewalk and path specifications are directly linked to the hierarchical level of the landscape component they serve. These specifications act as guidelines and should be interpreted in conjunction with engineering requirements and architectural imperatives.
- Primary Components
Gateway & Entrance:
Sidewalks – 2.5 Metres minimum width.
- Secondary Components
Streets with on-street parking & Streets:
Sidewalks – 1.8 Metres minimum width.
- Tertiary Components
Shared Streets:
Minimum Lane widths can overlap in a Shared Street.
Pedestrian Lane – 1.5 Metres minimum width.
Cycle Lane – 2 Metres minimum width.
Vehicular Lane – 3.5 Metres minimum width.

- Neighbourhood & Pool Parks:
Major Park Paths – 1.5 Metres minimum width.
Minor Park Paths – 1.2 Metres minimum width.
- Courtyard Parking:
Parking Sidewalk – 1.2 Metres minimum width.
- Quaternary Components
Pocket & Linear Parks:
Major Park Paths – 1.2 Metres minimum width.
Minor Park Paths – 1 Metres minimum width.
Informal Paths – 1 Metres minimum width.
- Courtyard Parks:
Park Paths – 1 Metres minimum width.
Informal Paths – 1 Metres minimum width.
- Food Gardens:
Garden Paths – 1 Metres minimum width.
Informal Paths – 1 Metres minimum width.

5.4.5 PAVING

Surface treatments in urban design are directly linked to the component's hierarchical level and its primary function. Paving is a common treatment for various landscape components, including streets, shared streets, sidewalks, paths, and plazas.

- a) Requirements
Hard surface selection necessitates a multidisciplinary approach. Architects, Landscape Architects, and various Engineering disciplines (e.g Civil, Traffic, etc.) must collaborate to determine the optimal surface based on:
- b) Functional Requirements: The chosen surface material should prioritize the primary function of the space. For

example, high-traffic areas like streets require durable materials like asphalt or concrete pavers, while pedestrian paths might benefit from more textured or aesthetically pleasing surfaces like clay or concrete pavers.

- c) Hierarchical Level: Surfaces in higher-order component, like major streets or plazas, often prioritize functionality and durability. Lower-order components, like garden paths, can incorporate aesthetics considerations and user experience.
- d) Context and Aesthetics: The overall design vision and surrounding environment should be considered. Material selection can influence the visual character and user experience of a space.
- e) Material Selection
In Oude Molen, prioritizing pedestrian use and walkability can be achieved through the selection of paving materials based on the hierarchical framework of landscape components.
 - Primary Components:
Paving Materials: Natural Stone Paving; Architectural In-situ Concrete; Clay Pavers; Coloured or Exposed Aggregate Concrete Pavers.
 - Secondary Components:
Paving Materials: Vehicular surfaces – Exposed Aggregate Concrete Pavers; Textured Concrete Pavers; Asphalt. Pedestrian surfaces – Clay Pavers; Coloured Concrete Pavers.
 - Tertiary Components:
Paving Materials: Shared surfaces – Clay Pavers; Coloured Concrete Pavers.

- Quaternary Components:
Paving Material: Pedestrian surfaces – Clay Pavers; Coloured Concrete Pavers; Laterite with concrete edging; Stone Chip with concrete edging.

- f) Permeable Paving
Permeable paving offers a sustainable and functional alternative to traditional hard surfaces. This innovative system allows rainwater to infiltrate the ground directly through the paving, rather than running off into storm system. This infiltration process reduces stormwater runoff, and the infiltrated water replenishes groundwater aquifers. The use of permeable paving must be encouraged in all landscape components.
The benefits of permeable paving can be further amplified by integrating it with other Sustainable Urban Drainage Systems (SUDS). These systems, such as infiltration trenches, can work together to collect, filter, store, and utilize stormwater for various purposes.

5.4.6 UNIVERSAL ACCESSIBILITY

Universal Accessibility is a fundamental principle in creating inclusive environments. It prioritizes the design of spaces that are usable by individuals of all abilities, regardless of sensory, cognitive, or age-related limitations. This approach ensures comfortable, safe, and independent access and utilisation of spaces for everyone.

- a) Physical Accessibility: Ensuring barrier-free access
- b) Ramps: Provide alternative access to stairs for wheelchairs and other mobility aids.
- c) Handrails: Offer support for people with balance issues.

- d) Sensory Accessibility: Ensuring visual or auditory impairment access
- e) Tactile Paving: Provide detectable warning surfaces providing information of changes in the walking surface or circumstances. Used at road crossings, Kerb level changes, bus stops and entrance to buildings.
- f) Audio descriptions: Verbal descriptions of visual content for visually impaired audiences.
- g) Visual alarms: Flashing lights alongside audible alarms for people with hearing impairments.
- h) Braille signage: Provides tactile information for visually impaired people.
- i) Information Accessibility: Ensures information is communicated clearly
- j) Clear and concise signage: Easy-to-read fonts with consistent symbols and pictograms.
- k) Multiple language: Cater to multilingual populations including Braille.

5.4.7 WAYFINDING SIGNAGE

Effective wayfinding signage plays a critical role in creating a user-friendly and navigable environment.

- a) User Focus:

- Target Audience: Consider the needs of all potential users, including visitors, residents, and those with disabilities.
- Simplicity and Clarity: Prioritize clear messaging, concise wording, and easy-to-understand symbols.
- Multilingual Considerations: Consider incorporating multilingual elements or pictograms.

- b) Information Hierarchy:

- Prioritize Information: Focus on the most essential wayfinding information, such as building names, key destinations, and directional cues.
- Visual Hierarchy: Use font size, colour, and placement to guide users' attention to the most important information.

- c) Design and Placement:

- Visibility and Readability: Signage should be prominently displayed, well-lit, and visible from appropriate viewing distances.
- Placement and Consistency: Strategically place signs at decision points and ensure consistency in design and placement throughout the area.
- Durability and Material Selection: Choose materials that are weatherproof, vandal-resistant, UV-resistant and appropriate for the environment.

5.6. INFRASTRUCTURE

Infrastructure is the invisible backbone of a society. It encompasses the physical structures and networks that provide essential services, such as transportation systems, energy grids, water systems, sanitation systems, stormwater systems and communication networks. These guidelines in relation to the landscape should be interpreted in conjunction with engineering requirements and architectural imperatives.

a) Underground Services

Balancing the needs of healthy urban trees with the integrity of underground services requires careful planning of streets and shared streets.

b) Service Corridors: To ensure healthy urban tree growth alongside essential underground utilities, dedicated service corridors within road reserves are recommended. This facilitates the allocation of designated root ball zones for street trees. A minimum width of 1.5 meters per row of street trees is required for root ball zones.

- Primary Components

- Gateway & Entrance:

- Multiple rows of Sidewalk trees, Median trees and Traffic Island trees will require wider root ball zones at the ratio of 1.5metres zone per row of trees.

- Secondary Components

- Streets with on-street parking & Streets:

- Streets will have a row of trees on either side. A root ball zone of 1.5metres wide must be allowed for on both sides of the road.

- Tertiary Components

- Shared Streets:

- Shared Streets are limited in space and should only have one row trees on one side. A root ball zone of 1.5metres wide should be allowed for on the applicable side.

- Preserving Mature Trees: Priority is given to the preservation of mature trees over the placement of service corridors. These corridors must be designed to completely avoid the root ball of the tree that extends outwards to the drip line of the tree canopy.

c) Street Kerbs & Edging

Street kerbs and edging play a vital role in defining the separation between sidewalks and roadways, while edging creates a clean and defined edge between the pavement and surrounding landscaping.

- Primary Components

- Gateway & Entrance:

- Kerbs & Gutters: Non-Mountable.

- Pedestrian Crossings: Kerb ramp.

- Sidewalks: Small Flush Kerb.

- Secondary Components

- Streets with on-street parking & Streets:

- Kerbs & Gutters: Non-Mountable.

- Pedestrian Crossings: Kerb ramp.

- Sidewalks: Small Flush Kerb.

- Tertiary Components

- Shared Streets:

- Kerbs & Gutters: Flush Kerb.

- Neighbourhood & Pool Parks:
Formal Paths: Small Flush Kerbs.
- Courtyard Parking:
Kerbs & Gutters: Mountable.
Pedestrian Access: Kerb ramp.
Sidewalks: Small Flush Kerb.
- Quaternary Components
Pocket & Linear Parks:
Formal Paths: Small Flush Kerbs.
Informal Paths: Small Flush Kerbs.
- Courtyard Parks:
Formal Paths: Small Flush Kerbs.
Informal Paths: Small Flush Kerbs.
- Food Gardens:
Formal Paths: Small Flush Kerbs.
Informal Paths: Small Flush Kerbs.
- Preserving Mature Trees: In prioritizing the environment, mature tree preservation takes precedence over the design of streets, paths, and curbs. Ideally, if possible, these elements should be constructed at the same finished level or within a maximum 100mm variance of the existing tree bases. Additionally, box-cut excavations for streets and paths should maintain a minimum 2-meter distance from the trunk of any retained mature tree.

5.5.1 SUSTAINABLE URBAN DRAINAGE SYSTEMS

Sustainable Urban Drainage Systems (SUDS) are a range of techniques for managing rainwater runoff in urban environments. Unlike traditional drainage systems that simply

channel rainwater away, SUDS aim to mimic natural drainage processes by slowing down, storing, and filtering rainwater runoff. SUDS can be broadly categorized into three main types based on their primary function:

- a) Source Control: These techniques aim to manage rainwater at the source where it falls, reducing the volume and flow rate entering the drainage system.
 - Permeable paving: Surfaces that allow rainwater to infiltrate the ground.
 - Rainwater gardens: Shallow, landscaped depressions that collect and filter rainwater.
 - Green roofs: Vegetated roofs that absorb, retain, and evaporate rainwater.
- b) Conveyance: These techniques safely transport excess rainwater runoff to a suitable discharge point.
 - Bio Swales: Shallow, vegetated channels that convey and filter stormwater runoff.
 - Filter drains: Subsoil drains lined with a filter media to remove pollutants from runoff.
- c) Attenuation: These techniques store excess rainwater runoff and release it slowly over time, reducing the peak flow entering the drainage system.
 - Detention basins: Temporary storage areas for rainwater runoff.
 - Wet ponds: Permanent ponds that provide storage, filtration, and habitat for wildlife.

5.5.2 HARVESTING STORMWATER FOR IRRIGATION:

Sustainable Urban Drainage Systems can be leveraged to create a closed-loop irrigation system. By capturing and filtering stormwater runoff through SUDS components, the harvested water can be stored in surface ponds, tanks, or underground storage for later irrigation use. This approach reduces reliance on potable water for landscape maintenance, promoting a sustainable solution.

5.5.3 TREE WELLS / CUT-OUTS IN PARKING AND PAVED AREAS

In areas with hardened surfaces like parking lots, plazas, sidewalks, and other paved areas, incorporating tree well cut-outs are essential. These designated tree spaces allow for correct tree installation and promote the long-term health of the tree and the robustness of surrounding paving.

- a) Tree Well Cut-out in paved areas: The minimum size of the cut-out is depended on the size of tree to be installed or retained.
- New Trees: Minimum 1.2metre diameter of internal space.
 - Mature Trees: Minimum 4x diameter of the trunk at the base.
 - Paving Edge: Small Flush Kerb or Concrete Beam under paving header edge.
 - Root Barrier: Tree species with an aggressive root system will require root barrier to a depth of 1metre to contain the root ball and protect infrastructure.

- Irrigation: Irrigation sleeve to be installed off centre to allow for the tree installation.
- b) Tree Well Cut-out in parking areas: Vehicle clearance is the main consideration in parking areas and the size of a tree well cut-out will be limited to a minimum size.
- New Trees: Minimum triangle shape with two sides being 1metre long into the parking located on the bay demarcation line and 1.44metres along parking kerb for the inertial space.
 - Mature Trees: Minimum 4x diameter of the trunk at the base. Bays should be omitted to retain mature trees.
 - Paving Edge: Small Flush Kerb, on level with parking surface or Kerb Extension on level with parking kerb.
 - Root Barrier: Tree species with an aggressive root system will require root barrier to a depth of 1metre to contain the root ball and protect infrastructure.
 - Irrigation: Irrigation sleeve to be installed off centre to allow for the tree installation.

5.5.4 FURNITURE, LIGHTING & ELEMENTS

Streetscape elements encompass the various furniture and elements that enhance the functionality, aesthetics, and user experience of public spaces.

- a) Streetscape Elements:
- Seating: Benches, chairs, seating walls, providing areas for rest, socializing, and people-watching.

- Lighting: Streetlights, light bollards, decorative fixtures, illuminating pathways and creating a sense of safety.
- Waste Receptacles: Bins for litter disposal, maintaining cleanliness and preventing visual clutter.
- Signage: Directional signs, informational plaques, promoting wayfinding and communication.
- Pedestrian Amenities: Bike racks, bollards, bus Shelters, public art installations, enriching the user experience.
- Planting Elements: Tree grates, tree guards, constructed planters, providing greenery and mitigating the urban heat island effect.

5.5.5 GUIDELINES:

- a) Functionality: Furniture should meet the intended purpose, considering factors like user needs, traffic flow, and accessibility.
- b) Durability: Materials should be weather-resistant, vandal-resistant, and require minimal maintenance.
- c) Aesthetics: The design should complement the surrounding environment and contribute to the overall streetscape character.
- d) Safety: Furniture should be properly anchored, stable, and avoid creating trip hazards.

- e) Context: Furniture selection should be tailored to the specific type of street (e.g., commercial, residential, pedestrian zones).
- f) Universal Access: Ensuring accessibility for people of all abilities promotes inclusivity.
- g) Spacing: Furniture should be placed strategically to avoid congestion while maintaining adequate pedestrian flow.
- h) Maintenance: Easy access for cleaning, repairs, or waste collection is crucial.

5.5.6 PARKSCAPE ELEMENTS

Parkscape elements plays a vital role in enhancing the functionality, aesthetics, and user experience of public parks and green spaces.

a) Parkscape Elements:

- Seating: Benches, chairs, seating walls, and picnic tables provide resting areas for visitors, encouraging social interaction and enjoyment of the park.
- Lighting: Pole and Bollard lighting enhances safety and usability during evening hours, while decorative lighting can add ambiance.
- Waste Receptacles: Strategically placed bins promote cleanliness and proper waste disposal.

- Signage: Informational signs guide visitors, identify park features, and educate them about park or heritage of the areas.
- Play Equipment: Playgrounds with slides, swings, and climbing structures provide recreational opportunities for children.
- Shelters: Covered areas, Pergolas offer protection from sun and rain, creating comfortable gathering spaces.
- Bicycle Racks: Designated parking for bicycles encourages eco-friendly transportation and park accessibility.
- Drinking Fountains: Easily accessible fountains provide clean drinking water for park users.
- Dog Waste Stations: Stations with bags and disposal bins promote responsible pet ownership.

b) Guidelines:

- Functionality: Choose furniture that caters to the intended uses of the park space and the needs of its users.
- Durability: Select furniture built with weather-resistant materials that can withstand frequent use and vandalism.
- Accessibility: Ensure furniture is accessible to people with disabilities, incorporating ramps, wider walkways, and inclusive seating options.

- Safety: Prioritize furniture with rounded edges, smooth surfaces, and secure installation to minimize injury risks.
- Aesthetics: Consider the overall design theme of the park and choose furniture that complements the surrounding landscape.
- Placement: Strategically locate furniture to maximize usability, minimize congestion, and create visually pleasing arrangements.

5.7. Softscape Elements

These guidelines establish a framework for creating visually appealing, functional, and sustainable soft landscapes. Soft landscapes encompass all the living elements of a designed space, including plants, trees, shrubs, and groundcovers.

5.6.1 SOFT LANDSCAPING

a) Overall Objectives

- Aesthetics and Ambiance: Enhance the visual appeal of the space by creating a harmonious composition of plants, textures, and colours.
- Functionality and Purpose: Consider the intended use of the space and select plant materials that complement the function. For example, shade trees for patios or low-maintenance plants for high-traffic areas.
- Sustainability and Environmental Benefits: Employ sustainable practices by selecting indigenous and water-wise plants that require minimal maintenance.

This promotes biodiversity and reduces the environmental impact of the landscape.

- Climate and Site Conditions: Choose plant materials that thrive in the local climate and soil conditions. Consider factors like sunlight exposure, drainage, and wind patterns when selecting plants.

b) Design Considerations:

- Plant Selection: Choose a variety of plants with different heights, textures, and bloom times to create visual interest throughout the year. Consider incorporating evergreen plants for year-round structure.
- Planting Design Principles: Utilise design principles like mass planting, layering, and focal points to create a cohesive and visually pleasing landscape.
- Hardscape Integration: Ensure a seamless integration between the softscape elements (plants) and the hardscape elements (paving, walls, etc.) of the design.
- Drainage and Irrigation: Design a proper drainage system to prevent waterlogging and ensure plant health. Implement an efficient irrigation system that minimizes water waste.
- Low-Maintenance Plants: Prioritize low-maintenance plants that require minimal pruning, watering, and fertilization to reduce long-term costs and maintenance needs.
- Pollinator-Friendly Plants: Consider incorporating plants that attract butterflies, bees, and other pollinators to promote a healthy ecosystem.

- Seasonal Colour: Select plants with various bloom times to ensure the landscape offers visual interest throughout the seasons.
- Focal Points: Create focal points within the landscape using unique specimen trees, bold foliage colours, or hardscape elements.

5.6.2 STREET SOFTSCAPE

Street landscaping plays a vital role in shaping attractive, functional, and environmentally sustainable linear public spaces. Careful consideration is given to tree and understory planting, including selection of species with appropriate root systems, optimal spacing for pedestrian and vehicular flow, clear sightlines for traffic safety, and avoidance of conflicts with underground services. A holistic approach is encouraged to ensure the creation of a cohesive and aesthetically pleasing streetscape that enhances the urban environment. These guidelines in relation to the landscape should be interpreted in conjunction with engineering requirements and architectural imperatives.

a) Verge Planting Guidelines

b) Primary Components – Gateway & Entrance:

- Trees
 - Species: Large to Medium sized trees.
 - Spacing: 7.5-15metres apart.
 - Parking: Perpendicular & diagonal parking:
One Tree for every second parking bay
Parallel parking: One tree for every bay
- Placement: Could be multiple rows.
In traffic island and medians.
Framing the gateway & entrances

- Understorey Planting
 Species: Low shrubs & majority groundcovers
 Placement: Interface between sidewalks & buildings.
 In traffic island and medians.
 Framing building entrances

c) Secondary Components – Streets and parking:

- Trees
 Species: Medium sized trees.
 Spacing: 5-10metres apart.
 Parking: Perpendicular & diagonal parking:
 One Tree for every second parking bay
 Parallel parking: One tree for every bay

Placement: Trees on both sides of the street.
 Could align with common boundary between properties to allow space for entrance and driveways.

- Understorey Planting
 Species: Low shrubs & majority groundcovers
 Placement: Interface between sidewalks and buildings.

d) Tertiary Components – Shared Streets:

- Trees
 Species: Medium to Small sized trees.
 Spacing: 5metres minimum apart.
- Parking: Perpendicular parking courtyard:
 One Tree for every second parking bay
 Or One Tree for very four parking bays, if bays are placed nose to nose.

Placement: Trees on one side of the shared street.
 Could align with common boundary between properties to allow space for entrance and driveways.

e) Understorey Planting

- Species: Low shrubs & majority groundcovers
 Placement: Interface between shared street and buildings.

f) Preserving Mature Trees: Priority is given to the preservation of mature trees and must be incorporated into the streetscape. Pruning of mature trees should be considered before removal.

5.6.3 PARK SOFTSCAPE

Parks serve as vital green spaces within communities, fostering recreation, relaxation, social interaction, and a connection with nature.

a) Tertiary Components – Neighbourhood Parks:

- Trees
 Species: Large to Medium sized trees.
 Placement: Could be random or structured to create outdoor rooms.
 Consider framing views.
 Create shaded seating areas.
 Depending on wind direction, consider windbreak to create protected areas.

- Lawns
Species: Select Indigenous water-wise grass.
Placement: Structured or informal shapes to create activity areas for informal sports.
- Planting Beds
Species: Shrubs & Groundcovers.
Placement: Planting beds assist with creating outdoor rooms.
Planting to be layered considering hardscape element e.g. paths.
Hedges to screen areas for contemplative spaces.
Security & safety to be considered in using shrubs.
- Elements
Paths: Path network to take desire lines into account.
Structures: Consider incorporating park furniture, seating areas, pergolas, lighting, drinking fountains, play & sport equipment, mowing edges, walls, fences, self-closing gates.

b) Quaternary Components – Pocket Parks, Courtyard Parks, Food Gardens:

- Trees
Species: Medium to Small sized trees.
Placement: Could be random or structured to create outdoor space and windbreaks.
Consider framing views.
- Lawns
Species: Select Indigenous water-wise grass.

Placement: Limited areas with structured or informal shapes to create foreground to planting beds.

c) Planting Beds

- Species: Shrubs & Groundcovers.
Placement: Planting beds assist with screening of adjacent properties.
Planting to be layered considering hardscape element e.g. paths.
Security & safety to be considered in using shrubs.

- Elements

Paths: Path network to take desire lines into account.

Structures: Consider incorporating park furniture, seating areas, lighting, play equipment, mowing edges.

- d) Preserving Mature Trees: Priority is given to the preservation of mature trees and must be incorporated into the parkscape.

5.8. Best Horticultural Practices

5.7.1 PLANT SPECIES NOT PERMITTED

- a) Any declared invasive species as listed in National
- b) Environmental Management: Biodiversity Act (2004)
NEMA Regulations: Class 1, 2, & 3
- c) *Pennisetum clandestinum* – Kikuyu.
- d) *Typha capensis* - Bulrush.

5.7.2 PLANTING CHARACTER

It is the intention to encourage the design and cultivation of largely "Water-Wise" indigenous landscapes and gardens.

5.7.3 PLANTING SIZES

a) Trees:

- "1000L", "400L" and "200L" Containerised tree material should be used where possible.
- "100L" Containerised tree material or larger should be used for street and parking trees.
- "100L" Containerised tree material or larger should be a minimum of 50% of Park trees.
- "50L" Containerised tree material should be a minimum of 20% of Park trees.
- "20L" Containerised tree material may not exceed 10% of Park trees.
- "20L", "10L" and "5L" Containerised agricultural fruit producing trees may be used in orchards.
- Trees must be positioned to be at minimum one (1) metre away from any structures or services.

b) Shrubs & Climbers:

- "10kg" and "20kg" Large shrubs may not exceed 10% of planting bed areas.
- "4kg" Shrubs may not exceed 30% of planting bed areas.
- "6-pack" and "cuttings" Material may not be used for shrub species.

c) Groundcovers & Creepers:

- "4kg" Material may be 100% of planting bed areas.
- "6-pack" Material may not exceed 50% of planting bed areas.
- "Cuttings" Material may not exceed 20% of planting bed areas.

5.7.4 PLANT SPACING

The horticultural spacing in planting beds should be considered in terms of species growth form, sizes of planting material at the time of installation, eventual size when fully grown, and position in the landscape.

a) Minimum Planting Ratios:

- Groundcovers – "cutting" material – 8 rooted cuttings /m² minimum.
- Groundcovers – "6 pack" material – 6 Plantlets /m² minimum.
- Groundcovers – "4kg" material – 4 Plants /m² minimum.

- Groundcovers – “10kg” material – 3 Plants /m² minimum.
- Shrubs – “4kg” material – 2 Plants /m² minimum.
- Shrubs – “10kg” material – 1 Plant /m² minimum.
- Shrubs – “20kg” material – 1 Plant /m² minimum.
- Bulbous Plants – “4kg” material – 6 Plants /m² minimum

5.7.5 TREE STAKING & GUARDS

Newly planted trees shall be supported with Single or Double Tree stakes depended on bag size of tree to be installed.

- Single Tree Stakes:** Single tanalith treated stakes: 55 – 75 mm Ø, 2400 mm long. Tree stake must be driven a minimum of 500 mm into the ground, leaving a uniform 1900 mm above ground. Tree to be tied to single tree stake with a tree-tie that allows for further growth in the girth of the tree while keeping the tree upright. Care must be taken not to damage tree root ball with the installation of the tree stake.
- Double Tree Stakes:** Double tanalith treated stakes: 55 – 75 mm Ø, 2400 mm long with double a cross brace to stabilise the stakes. Each stake will be driven a minimum of 500 mm into the ground, leaving a uniform 1900 mm above ground. Tree to be tied to double tree stake braces with tree-ties that allows for further growth in the girth of the tree while keeping the tree upright. To prevent chafing, a 60 mm diameter PVC pipe or a strip of tire rubber will be wrapped around the middle section of the cross braces. Care must be taken not to damage tree root ball with the installation of the tree stake.
- Tree Guy Wires:** Guy wires, when necessary, should be employed to provide temporary support for newly planted transplanted trees or those with compromised stability. Sling shot points on the trees and anchor stakes to be

padded with a protective material to prevent damage to the tree trunk

- Tree Guards:** Tree guards are aesthetic tool for protecting new trees from physical damage caused by vehicles and vandalism. Selecting the appropriate size and robust material for the specific setting of the use of the guard.

5.9. Irrigation

Effective irrigation design goes beyond simply delivering water. It considers factors like plant water needs, soil type, precipitation patterns, and water conservation. By strategically placing sprinklers or drip emitters, and utilizing controllers, a well-designed irrigation system delivers the right amount of water at the right time, promoting healthy plant growth while minimizing water.

5.8.1 SYSTEM DESIGN

- Water source:** Identify the water source and assess its capacity to meet landscape irrigation needs.
- Site evaluation:** Analyse soil type, drainage patterns, sun exposure, and wind conditions to determine irrigation requirements for different landscape zones.
- Plant selection:** Choose indigenous and water-wise plants whenever possible to minimize irrigation needs.
- Irrigation system selection:** Select an efficient irrigation system type based on plant types, landscape layout, and water pressure.
- Zone creation:** Group plants with similar water needs into hydrozones for targeted irrigation.

5.8.2 SYSTEM COMPONENTS

- a) Controllers: Utilise programmable irrigation controllers for efficient water use, considering weather conditions and evapotranspiration (ET) rates.
- b) Emitters/Sprinklers: Choose emitters or sprinklers that provide uniform water distribution across each hydrozone, minimizing overspray and water waste.
- c) Rain sensors: Integrate rain sensors to automatically shut off irrigation during rainfall events.
- d) Drainage: Designate proper drainage areas to prevent waterlogging and potential damage to plants and infrastructure.

5.8.3 MAINTENANCE

- a) Irrigation scheduling: Develop a watering schedule based on plant needs, ET data, and weather conditions, adjusting frequency and duration as needed.
- b) Night irrigation: Schedule irrigation during cooler night hours to minimize evaporation losses.
- c) Mulching: Apply mulch around plants to retain moisture and suppress weed growth, reducing irrigation needs.

5.10. Recommended Plant List

The Plants lists is by no means complete, and other indigenous species could be added onto the planting palette. The plant lists include some fast-growing plants and other intermediate or climax plants to create practical habitats for the enjoyment of residents, screening distractions where necessary and framing views where possible.

RECOMMENDED PLANT LIST			
<u>TREES</u>	<u>SHRUBS</u>	<u>GROUNDCOVERS</u>	<u>CULINARY</u>
<i>Afrocarpus latifolius</i>	<i>Leonotis leonurus</i>	<i>Gazania rigens</i>	<i>Prunus persica</i> (Peach)
<i>Aloe barberae</i>	<i>Metalasia muricata</i>	<i>Gazania rigens var rigens</i> GREEN	<i>Punica granatum</i> (Pomegranate)
<i>Apodytes dimidiata</i>	<i>Pelargonium betulinum</i>	<i>Geranium incanum</i>	<i>Laurus nobilis</i> (Bay)
<i>Brachylaena discolor</i>	<i>Pelargonium capitatum</i>	<i>Pelargonium capitatum</i>	<i>Olea sp</i> (various edibles)
<i>Buddleja saligna</i>	<i>Pelargonium crispum</i>	<i>Plectranthus ciliatus</i>	<i>Cydonia oblonga</i> (Quince)
<i>Curtisia dentata</i>	<i>Pelargonium cucullatum</i>	<i>Plectranthus madagascariensis</i>	<i>Ficus carica</i> (Fig)
<i>Dais cotinifolia</i>	<i>Pelargonium graveolens</i>	<i>Plectranthus neochilus</i>	<i>Citrus medica</i> (various cultivars)
<i>Ficus elastica</i>	<i>Pelargonium ionidifolium</i>	<i>Plectranthus verticillatus</i>	<i>Citrus sp.</i> (various cultivars)
<i>Ficus microcarpa</i>	<i>Pelargonium peltatum</i>	<i>Portulacaria afra prostrata</i> (dwarf)	<i>Passiflora ligularis</i>
<i>Ficus rubiginosa</i>	<i>Pelargonium tomentosa</i>	<i>Scabiosa africana</i>	<i>Allium fistulosum</i> (Spring onion)
<i>Ficus sp</i>	<i>Portulacaria afra</i>	<i>Scabiosa incisa</i>	<i>Anethum graveolens</i>
<i>Ficus sur</i>	<i>Salvia Africana</i>		<i>Beta vulgaris</i> (Beetroot)
<i>Halleria lucida</i>	<i>Salvia chamelaeagnea</i>	BULBS, TUBERS & CORMS	<i>Brassica oleracea</i> (Broccoli)
<i>Phoenix canariensis</i>	<i>Searsia crenata</i>	<i>Agapanthus praecox 'Blue'</i>	Chives
<i>Prunus africana</i>	<i>Selago canescens</i>	<i>Aristea ecklonii</i>	Coriander
<i>Syzygium cordatum</i>	<i>Strelitzia reginae</i>	<i>Aristida junciformis</i>	<i>Cucurbita maxima</i> (Pumpkin)
<i>Syzygium guineense</i>	<i>Tecoma capensis</i>	<i>Crocoshmia aurea</i>	<i>Cucurbita moschata</i> (Butternut)
<i>Tarchonanthus camphoratus</i>		<i>Chasmanthe aethiopica</i>	<i>Cucurbita pepo</i> (Marrow)
<i>Trichilia emetica</i>	GROUNDCOVERS	<i>Clivia miniata</i>	<i>Daucus carota</i> (Carrots)
<i>Vachellia xanthophloea</i>	<i>Aristida junciformis</i>	<i>Kniphofia praecox</i>	<i>Fragaria × ananassa</i> (Strawberry)
<i>Washingtonia robusta</i>	<i>Arctotis acaulis</i> Pink, Cream, Red	<i>Kniphofia uvaria</i>	<i>Lactuca sativa</i> (Lettuce)
	<i>Arctotis stoechadifolia</i>	<i>Dietes bicolor</i>	<i>Lavender dentata</i> 'Royal Crown'
SHRUBS	<i>Asparagus densiflorus</i>	<i>Dietes grandiflora</i>	<i>Lavender stoechas</i>
<i>Agathosma capensis</i>	<i>Aystasia gangetica</i>	<i>Tulbaghia silver lace</i>	<i>Lycopersicon esculentum</i> (Tomato)
<i>Agathosma ovata</i>	<i>Barleria repens</i> 'Purple Prince'	<i>Tulbaghia violaceae</i>	<i>Mentha sp</i>
<i>Carissa macrocarpa</i>	<i>Bulbine frutescens</i>	<i>Zantedeschia aethiopica</i>	<i>Nepeta cataria</i>
<i>Carissa macrocarpa</i> 'Green Carpet'	<i>Crassula multicava</i>		<i>Origanum sp</i>
<i>Chlorophytum saundersiae</i>	<i>Crassula spatulate</i>	CULINARY	<i>Parsley sp</i>
<i>Coleonema album</i>	<i>Dimorphotheca fruticosum</i>	<i>Malus domestica</i> (Apple)	<i>Rocket sp</i>
<i>Coleonema pulchellum</i>	<i>Dimorphotheca jucundum</i>	<i>Prunus amygdalus</i> (Almond)	<i>Rosemary Majorca Pink</i>

<u>CULINARY</u>	<u>SUDS SPECIES</u>	<u>SUDS SPECIES</u>	<u>SUDS SPECIES</u>
<i>Rosemary prostratus</i> Tony	<u>SHALLOW MARSH (0-0.2m)</u>	<u>WETLAND MARGIN</u>	<u>EPIHEMERAL MARSH</u>
<i>Rosemary Tuscan Blue</i>	<i>Cyperus sphaerospermus</i>	<i>Ficinia indica</i>	<i>Nidorella foetida</i>
<i>Solanum melongena</i> (Aubergine)	<i>Cyperus textilis</i>	<i>Geranium incanum</i>	<i>Phragmites australis</i>
<i>Solanum tuberosum</i> (Potato)	<i>Ficinia hirsuta</i>	<i>Leonotis leonuris</i>	<i>Plecostachys serpyllifolia</i>
<i>Spinacia oleracea</i> (Spinach)	<i>Isolepis prolifer</i>	<i>Leucadendron levisanus</i>	<i>Psoralea aphylla</i>
<i>Thyme sp</i>	<i>Isolepis rubicunda</i>	<i>Monopsis lutea</i>	<i>Psoralea pinnata</i>
<i>Vigna unguiculata</i> (Beans)	<i>Juncus kraussii</i>	<i>Orpheum frutescens</i>	<i>Restio quadratus</i>
	<i>Juncus lomtophyllus</i>	<i>Passerina paludosa</i>	<i>Restio tetragonus</i>
	<i>Juncus punctorius</i>	<i>Psoralea repens</i>	<i>Zantedeschia aethiopica</i>
<u>SUDS SPECIES</u>			
<u>POOL (>0.4m)</u>	<i>Kniphofia uvaria</i>	<i>Pteridium aquilinum</i>	
<i>Aponogeton distachys</i>	<i>Mariscus congestus</i>	<i>Salix mucronata</i>	<u>Mostly DRY</u>
<i>Nymphaea nouchali</i>	<i>Mariscus tabularis</i>	<i>Searsia (Rhus) angustifolia</i>	<i>Ficinia bulbosa</i>
<i>Potamogeton pectinatus</i>	<i>Mariscus thunbergii</i>	<i>Senecio halimifolius</i>	<i>Ficinia capitella</i>
	<i>Mentha aquatica</i>	<i>Stenotaphrum secundatum</i>	<i>Ficinia dunensis</i>
<u>DEEP MARSH (0.2-0.4m)</u>	<i>Mentha longifolia</i>	<i>Virgilia oroboides</i>	<i>Ficinia lateralis</i>
<i>Berula erecta</i>	<i>Otholobium virgatum</i>		<i>Ficinia nigrescens</i>
<i>Bolboschoenus maritimus</i>	<i>Prionium serratum</i>	<u>EPIHEMERAL MARSH</u>	<i>Ficinia pygmaea</i>
<i>Cladium mariscus</i>	<i>Pennisetum macrourum</i>	<i>Berzelia lanuginosa</i>	<i>Muraltia mitior</i>
<i>Eleocharis limosa</i>	<i>Scirpoides nodosus</i>	<i>Cynodon dactylon</i>	<i>Monopsis unidentata</i>
<i>Gunnera perpensa</i>	<i>Wachendorfia thyrsoflora</i>	<i>Falkia repens</i>	<i>Plecostachys serpyllifolia</i>
<i>Schoenoplectus scirpoideus</i>	<i>Watsonia meriana</i>	<i>Grammatotheca bergiana</i>	
		<i>Halleria elliptica</i>	
		<i>Helictotrichon turgidulum</i>	
<u>SHALLOW MARSH (0-0.2m)</u>	<u>WETLAND MARGIN</u>		
<i>Calopsis paniculata</i>	<i>Cliffortia ericifolia</i>	<i>Imperata cylindrica</i>	
<i>Carex clavata</i>	<i>Cliffortia ferruginea</i>	<i>Isolepis ludwigii</i>	
<i>Carpha glomerata</i>	<i>Cliffortia strobilifera</i>	<i>Juncus capensis</i>	
<i>Cliffortia graminea</i>	<i>Elegia cuspidata</i>	<i>Juncus effusus</i>	
<i>Cliffortia odorata</i>	<i>Elegia nudum</i>	<i>Lobelia anceps (=L. alata)</i>	
<i>Cotula vulgaris</i>	<i>Elegia rectum</i>	<i>Merxmullera cincta</i>	
<i>Cyperus longus</i>	<i>Elegia tectorum</i>	<i>Morella serrata</i>	

5.11. Landscape Design Guidelines Matrix

LANDSCAPE DESIGN GUIDELINES MATRIX																
LANDSCAPE GUIDELINES	LANDSCAPE COMPONENTS															
	Mature Trees Preservation	Avenues, Streets & Roads	Shared Streets and Lanes	On-street Parking	Courtyard Parking	Pedestrian Path Network	Gateways & Entrance	Plazas & Squares	Neighbourhood Parks	Pocket an & Linear Parks	Pool Park	Food Gardens	Courtyard Parks	Residences Gardens	Roof Gardens	
Tree Preservation	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Invasive Vegetation Control	■	■	■				■	■	■	■	■	■	■	■	■	■
Pedestrian Network		■	■	■	■	■	■	■	■	■	■	■	■			
Paving	■	■	■	■	■	■	■	■								
Universal Accessibility		■	■	■	■	■	■	■	■	■	■	■	■			
Wayfinding Signage		■	■			■	■	■	■	■	■	■				
Infrastructure	■	■	■	■	■	■	■	■								
Furniture & Elements		■	■			■	■	■	■	■	■	■	■			
Soft Landscaping	■	■	■	■	■		■	■	■	■	■	■	■	■	■	■
Streets Softscape	■	■	■	■			■	■								
Parks Softscape									■	■	■	■	■			
Best Horticultural Practices	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Irrigation	■	■	■	■	■	■	■	■	■	■	■	■	■			
Recommended Plant List	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

5.13. Tree Quality Survey Plans – To be read in conjunction with the Tree Quality Survey and Catalogue

