Chapter 20: Dune Management

1. Introduction

Cape Town's coast line consists of a mix of rocky shores, interspersed with pocket beaches and long sandy shores. The coastal system is primarily a wind driven system affected by seasonal sand deposition and erosion, and alternating seasonally dominant winds from the south-east and north-west. These dynamics are further affected by high energy winter coastal storms and associated swells.

Historically, prior to urban development, Cape Town's coastline consisted of extensive mobile coastal sand dune systems operating over extensive spatial scales. However as a result of urban development over centuries but particularly within the last 80 years, the historical expansive sand dune systems have been severely compromised and transformed.

2. Importance of Sand Dunes

All remaining sand dunes in Cape Town, including those that are functional and healthy as well as those that are cut-off and in a poor and often destabilised state, are of critical importance to the City's coastline as:

- Functional sand dunes provide the most effective and efficient buffers against storm surge events along sandy coastlines and as such, must be considered as critical green municipal infrastructure that protects coastal property and infrastructure from storm surge events
- Functional and healthy sand dunes provide the best means of regulating and controlling wind-blown sand which, when uncontrolled, creates substantial burden and damage to City infrastructure
- Functional and healthy sand dunes are a habitat for biodiversity
- Functional sand dunes regulate localised environmental and weather conditions

The appropriate and on-going management of remaining dune systems along Cape Town's coastline is of critical importance. This area of coastal management has historically been neglected and under resourced often to the cost of the City and its ratepayers. **Dune management in the City must become a priority activity that is well resourced as an on-going management imperative.**

3. Problem Identification

Fewer and fewer coastal dune systems along Cape Town's coastline remain functional without any need for active management intervention. As the urban development footprint has expanded over the last few decades, most dune systems have become cut-off, damaged and are no longer naturally functional and consequently require on-going intervention. At the core of the issue is the fact that the marine and climatic component of the coastal dynamic system remains functional and dynamic irrespective of the development footprint. As a result sand is still naturally deposited on our beaches, and seasonal wind patterns still move that sand in a manner that historically created the dunes. However, with the development and built infrastructure, these naturally functioning systems are now operating within an altered environment often leading to:

- Excessive sand build-up altering the normal expected profile of fore-dunes
- Excessive build-up of sand against or on hard infrastructure such as buildings and roads
- Inappropriate dune and coastal beach profiles that exacerbate erosion of the dunes
- Inability of natural dune vegetation to become established
- Loss of dunes, particularly frontal hummock dunes

- The loss of sand transport corridors with the result being more permanent dunes where these did not previously exist

These challenges are further exacerbated by:

- Multiple informal access points across the dunes which creates blow-outs and erosion points
- Uncontrolled and unregulated sand removal and manipulation by City line departments
- Illegal small scale sand mining in areas
- Little to no active management of remaining dune belts

4. Dune Management Principles

The following overarching principles will be applied in the City's dune management approach:

- Where systems remain relatively functional, regulate and avoid human interference and protect the dunes from any and all destructive activities to optimise natural self-functioning systems
- Recognise that where systems have been altered to the extent that natural functioning is no longer practical or realistic, implement specific dune management interventions to manage the remaining system in an optimal way as part of an altered system
- Utilisation of exotic species such as Marram Grass as well as the mechanical shaping of dunes as a necessary component to managing dunes in an altered system
- Where dune systems are currently stabilised as a result of established alien plant species, leave those non-natural systems in place until such time that a slow but managed replacement of aliens by indigenous plants occurs through a structured process
- Mechanical removal of excess sand build-up will be applied as needed in managing altered systems.

5. Dune Management Plans

In Chapter 2, the City has defined Coastal Roles and Responsibilities for all aspects of coastal management. The development and implementation of appropriate long-term dune management plans will occur in alignment and as per those defined Roles and Responsibilities in the following way:

5.1. Beach Recreational Nodal Points

At all Beach Recreational Nodal Points where dune management plans are required, the development and implementation as well as long-term on-going management will take place in the following ways:

- Dune Management Plans to be developed by the Environmental Resource Management Department
- Dune Management Plans will be implemented in accordance with those plans by the Sport, Recreation and Amenities Department
- On-going management in the long term resides with the Sport, Recreation and Amenities Department in accordance with Management Plans
- Budget allocation will be provided in accordance with the listed responsibilities above

5.2. Natural Coastal Areas

In all areas defined as Natural Coastal Areas where dune management plans are required, the development and implementation as well as long-term on-going management will take place in the following ways:

- Dune Management Plans to be developed by the Environmental Resource Management Department
- Dune Management Plans will be implemented in accordance with those plans by the Environmental Resource Management Department
- On-going management in the long term resides with the Environmental Resource Management Department
- Budget allocation will be provided in accordance with the listed responsibilities above

6. Defined Areas Requiring Dune Management: Beach Recreational Nodes

Area	Dune Status and Priority	Dune Management Plan Status	Risks	Date to be compiled by
Duynefontein to Melkbosstrand	Impacted by local residents encroachment into dunes, numerous informal access points, but relatively stable	No plan exists	Medium risk of slow deterioration, encroachments must be resolved	December 2014
Big Bay Beach Front	Dunes irrigated and vegetated, stable, requires onging management	Plan in place and attached to this chapter	None at this time	N/A
Table View Beach Front	Irrigation system faulty, blow outs and sand cover shifting, storm water outlets undermining dunes	Historical plan in place, requires updating and review	Pockets of erosion, loss of vegetation and wind blown sand onto infrastructure	June 2014
Cape Town Harbour to West Beach	High risk area, especially in the southern end, exacerbated by erosion of the Bay, installation of illegal defence structures, high priority for integrated intervention	No plan exists	Extremely high risk of ongoing illegal activity as well as high risk to private property as well as risk to quality of coastal environment.	December 2014 due to the fact that it is a substantial piece of work that will require integration across many property owners as well as government agencies
Hout Bay Beach	Massive sand build up, complete collapse of dune systems as functional, high priority	Plan has been developed and implementation began in August 2013. Plan attached to this chapter	Significant risks remain if plan not implemented	EIA for full implementation must be completed by April 2014
Glencairn Beach	Dune system failure placing railway line at risk. High priority intervention area	Detailed study commissioned in January 2013. Study completion will inform way forward	Significant risk to transport corridor as well as coastal quality	Proposed plan expected December 2013
Fish Hoek Beach	Highly cut off dune cordon, managed informally, regular blow-outs and risk of undercutting by Silvermine River Mouth	Formal management plan needed	Low risk, but quality of coastline deteriorating	April 2014
Sunrise Beach	Highly mobile sand system, minimal intervention recommended, small pockets of stabilisation will be beneficial, formalisation of access points would be	No plan exists	Low risk	December 2014

	beneficial.			
Strandfontein Pavilion	Mobile sand threatens infrastructure, limited stabilisation at key points recommended, formalisation of access points recommended. Key risk area along Fishermans Lane where sea wall collapsing, substantial intervention needed	No Plan exists	Priority as a core recreational node and Fisherman Lane seawall collapse poses significant public safety risk and poor quality coastal environment	February 2014
Blue Waters to Mnandi	Dune systems relatively high quality, minimal intervention required, formalisation of access points would be beneficial	No Plan exists	Low priority as minimal risk and well managed as Blue Flag Beach area	December 2014
Monwabisi	Highly wind driven system, massive implications for infrastructure, substantial plan required as part of an overall Resort Development Plan	No Plan exists	High priority due to level of risk as well as a key recreational point	April 2014
Strand beach front western end	Dunes covered in alien invasive species. Noted area for criminal activity. Recommended that alien invasive species be left in-situ until long term sustainable plan developed	No Plan exists	Risk of criminal activity best resolved through management interventions.	December 2014

7. Defined Areas Requiring Dune Management: Natural Coastal Areas

Area	Dune Status and Priority	Dune Management Plan Status	Risks	Date to be compiled by
Blaauwberg Nature Reserve	High quality dunes	Implemented	Trampling	Completed
Dolphin Beach	Dune build up encroaching on private property, requires long term plan	No plan exists	Ongoing encroachment onto private property	February 2014
Kommetjie Beach	Dunes cordon variable in quality but overall functional and self-regulating	Detailed plan developed in 2002. Action required is the formalisation of access points	Unregulated public access across dunes	Access point control plan to be developed and implemented by June 2014

Witsands Beach	Highly mobile dune field actively managed to ensure integrity of historic landfill site	Implemented in 2005	Only if current management strategies cease	Ongoing

8. Compliance Monitoring

This will be done through reporting via the Coastal Risk Register