

# Title: **DECANALISATION OF THE SAND AND LANGEVLEI RIVERS CONFLUENCE**

## Project Statement:

The decanalisation of the Sand and Langevlei Rivers confluence is an ambitious project that aims to not only rehabilitate a stretch of river but also fundamentally shift how the City of Cape Town views its rivers. As the pilot for the city's Liveable Urban Waterways Programme, the project is a proof of concept for a new approach to using, managing, and valuing our water resources. The design is the product of a highly collaborative process, including input from a team of specialists and the local communities, resulting in site-specific interventions informed by the context. The design proposes the complete removal of the canals at the confluence of the two rivers and, in their place, create a system of wetlands to treat the contaminated water and establish wetland habitat. Skirting the edges of the wetlands are high-flow bypass channels that accommodate peak flows during heavy rainfall events. The whole project site is floodable and aims to slow the flow of the rivers, allowing infiltration into the aquifer below. A portion of the site is designated for restoring the endangered Cape Flats Dune Strandveld Habitat. Pedestrian and NMT routes run through the site, connecting neighbourhoods, places of worship, commercial centres, and public transport stops. Recreational nodes within the site encourage the use and activation of the site. This project acknowledges that space is at a premium due to rapid urbanisation, and every urban green space needs to be multifunctional. It, therefore, aims to reinstate a river with a more natural form and function while creating a safe and attractive urban green space for local communities. The project harnesses the urban and ecological tensions through design and materiality to create a uniquely beautiful space that celebrates the systems and forces that shape the urban river landscape.

## Project Narrative and Content:

In the South of Cape Town is a piece of land where two rivers come together. The environment is extremely harsh - exposed to the salt-laden, desiccating southeaster winds in the dry summer months and the stormy South Atlantic Ocean frontal systems in winter. The rivers are contained and contaminated – canalised systems subject to sewage spills, dumping, and contaminated stormwater. Here, the City of Cape Town has chosen to pilot its ambitious Liveable Urban Waterways (LUW) Programme. This project intends to revitalise this complex site and de-canalise the confluence of the Sand and Langevlei Rivers.

The LUW Programme endeavours to fundamentally change how the city's urban waterways are managed in an attempt to reach the goal of becoming a water-sensitive city by 2040. The programme aims to demonstrate how water-sensitive design, waterway rehabilitation, nature-based solutions and

investment in green infrastructure can benefit society, the environment, and the economy. The LUW programme developed six “elements of liveability” that guide this project’s design principles. These elements are as follows:

- Has acceptable water quality
- Makes space for the water
- Has a functioning ecology
- Connects the waterway to the water table and the floodplain
- Connects communities and is used and enjoyed by communities
- Provide a range of ecosystem services, economic and social benefits

The Sand River catchment is one of Cape Town’s major catchments that discharges into False Bay. The site is situated in the flat lower reaches of this catchment, a few kilometres from the coastline and 1km from the Zandvlei Estuary inlet. The 96500m<sup>2</sup> site is circumscribed by a busy main road to the north, low-middle income residential neighbourhoods to the east and west and a nature reserve to the south. Currently, the site is a homogenous grassy area trisected by deep concrete canals that create a Y-shape as they confluence in the middle of the site. For most of the year, the canals contain a trickle of highly contaminated water, but after rainfall events in winter, the water levels increase significantly, creating dangerous, fast-flowing torrents. The land surrounding the canals is underutilised by the surrounding communities and is subject to the dumping of solid waste and building rubble.

The design process has been intensely collaborative from the start, with an interdisciplinary professional team comprising Landscape Architects, Civil & Hydraulic Engineers, Freshwater Ecologists, Botanists, Geohydrologists and Town Planners. Additionally, there have been public participation events, including a full-day co-design workshop where community members engaged in activities like storytelling, collage, and model building, which allowed them to share their knowledge of the site and voice their wishes and concerns for the project. A walking workshop was held on site with representatives from all the relevant city departments, including Biodiversity, Water and Sanitation, Recreation and Parks, and Catchment, Stormwater and River management. These engagements and collaborations have developed a deeper understanding of the site and the opportunities and constraints we are working with.

The primary intervention of the project is the removal of the concrete canals at the confluence of the rivers. Removing the canals allows us to consider the river as a river rather than a stormwater drain with the sole purpose of conveying stormwater as fast as possible out to sea. Stormwater pipes that discharge into the river will be daylighted as early as possible, and stormwater swales will allow for pre-treatment before the water reaches the river.

At the point at which each river is fully de-canalised, the design diverts the highly contaminated low flows into a series of wetlands. The first wetland is a designated treatment wetland designed to be periodically maintained to remove excess reed growth, sediment build-up and any solid waste that has negotiated past the upstream waste interceptors. The water then trickles through a permeable berm into a second wetland that continues phytoremediation as the water flows through the high and

low marsh areas of a more diverse wetland habitat. This wetland will serve as a breeding ground for the endangered Western Leopard Toad (*Sclerophrys pantherina*). The water then filters out of this wetland back into the river.

To accommodate the winter high flows, wide unlined channels run along the outer edges of the wetlands. These channels will see very little flow during the summer months but will be the preferential path of the water after winter rainfall events. The channels have a natural river profile and are rehabilitated with locally indigenous riparian zone plant species.

Adjacent to the river, approximately 7000 m<sup>2</sup> of the site is designated for the restoration of the historically present and now endangered Cape Flats Dune Strandveld habitat. This area will be shaped with low berms and shallow depressions referencing the typical topographic features of this habitat type - undulating dunes separated by dune slacks. In the dune slacks, ephemeral wetlands develop, becoming saturated in winter and drying out completely in summer. These pockets of dynamic habitat are essential for the survival of a critically endangered butterfly species – the Barber's Cape Flats Ranger (*Kedestes barberae bunta*).

Encircling this ecological core of the project is a 2m wide pedestrian pathway with low seating walls, widened pause areas and educational signage along the route. This pathway encourages recreational use of the area and an appreciation and understanding of the river and its associated ecologies. It also acts as a physical delineator between the ecologically sensitive elements of the site and the park-like, more human-centric peripheral grassed areas. These grassed areas, maintained as a cue to care, are for recreational use and improve the safety and security of the site.

Other pathways connect neighbourhoods, commercial centres, places of worship, and public transport stops. Low seating walls and tree planting define pedestrian entry points into the site. These pathways run along the rivers wherever possible, maintaining a visual connection to the water. The permeable berm between the wetlands has a pathway that runs along the top of it, creating a shortcut through the site informed by an existing desire line.

At main nodal points, interventions have been included to increase public engagement with the site. The largest of these nodal point interventions is on the Langevlei River before it is fully de-canalised, where a long section of the canal wall is replaced with seating steps. These seating steps extend from the pathway to the water, and in the centre of them is a set of steps that lead to a low-flow crossing made of concrete stepping stones that connect the pathway on the river's eastern bank to the one on the western bank.

Though the heart of this project is ecological, it is still an urban site that needs robust, weather- and vandal-proof materials. The material palette is, therefore, fairly brutalist - concrete of varied textures and finishes is the dominant material. All the concrete from the demolition of the canals will be reused on-site. Most of it will be extracted in large chunks and used to construct the permeable berm that separates the two wetlands. The remaining large chunks of reclaimed concrete will be used at pathway intersections - widening the pathway and referencing the pre-rehabilitation condition. All the concrete

that is too small to be used for these applications will be crushed and used as aggregate in the polished concrete copings on the low seating walls and in the pathways. To interrupt the stark greyness of the concrete, the sides of the low walls will be inlaid with mosaic murals created by local artists.

The project aims to reinstate a river with a more natural form and function while creating safe and attractive urban green spaces for local communities. Through design and materiality, the project harnesses the tensions of the urban and the ecological to create a uniquely beautiful space that celebrates the systems and forces that shape the urban river landscape