



**Western Cape
Government**

In partnership with the City of Cape Town

TWO RIVERS URBAN PARK

10 November 2016

ENGINEERING SERVICES MODEL

Water & Sewerage Infrastructure



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and Associates



Terms of reference - Deliverables

- ✓ Engineering Services Model - aim to test conceptual mixed-use development scenarios against infrastructure requirements
- ✓ Determination of bulk infrastructure requirements and gap-analysis between existing infrastructure capacity and development demands.
- ✓ Provision of **potable water supply** solutions including rainwater harvesting, recycling & potential water saving concepts if possible.
- ✓ Provision of **sewerage/wastewater** solutions including recycling, on-site treatment, waste-to-energy concepts if possible.
- ✓ Develop solutions in-line with City of Cape Town standards and requirements for mixed-use developments.
- ✓ Engineering Services Model developed towards functional, efficient use of existing infrastructure supported by efficient additional infrastructure or methods that are adaptable.

Basis of concept development

- Existing development

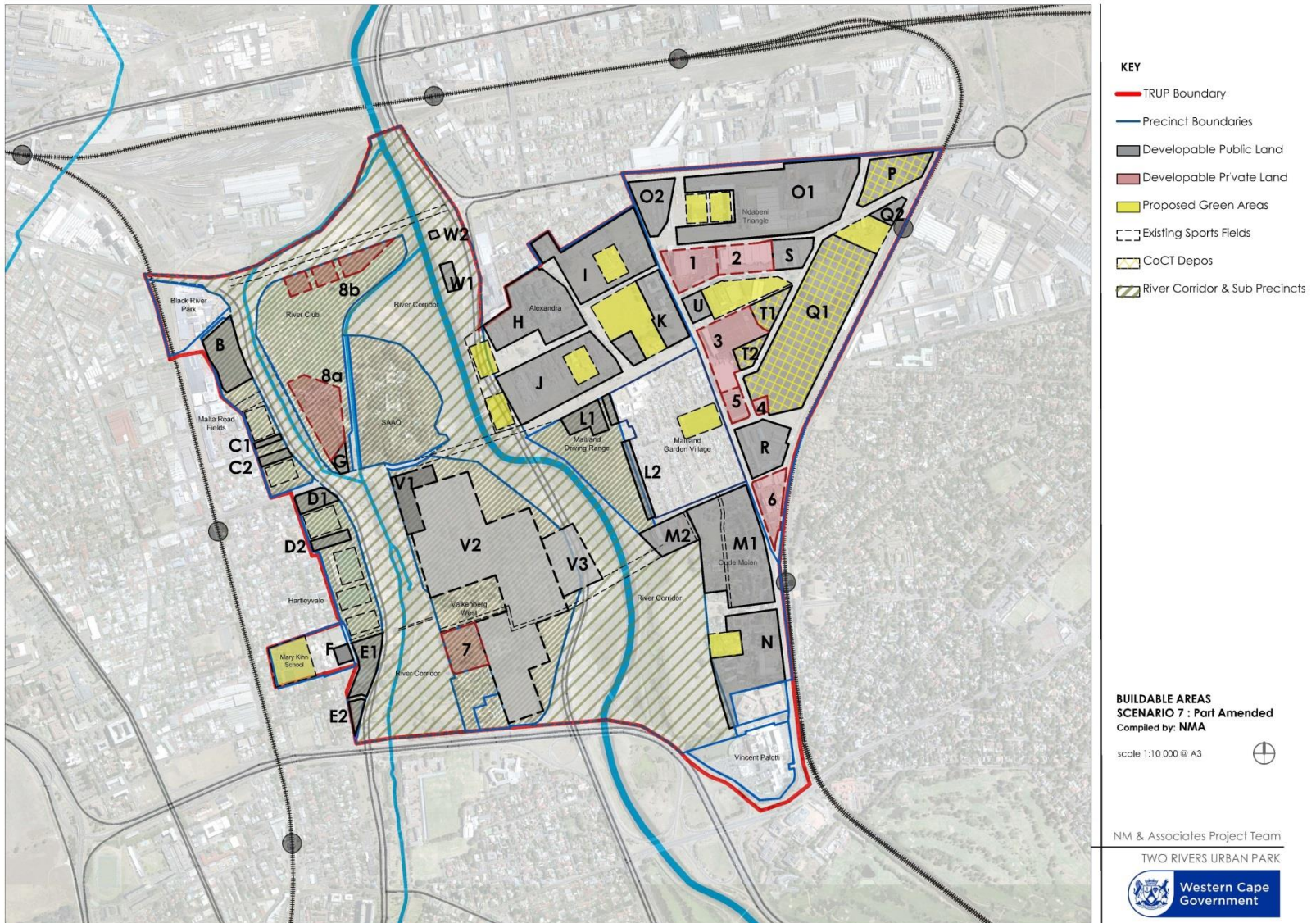
Approximate Existing Land Use	
Location	Area(m ²)
River Club	5 561
Western Park Edge	12 023
Alexandra Hospital	54 986
Eastern Park Edge	22 382
Ndabeni Triangle	179 148
M5 River Docking	0
Valkenberg Ridge	65 825
Total	339 925

Table 1 : Existing Development

- Proposed concept development (basis for calculations)

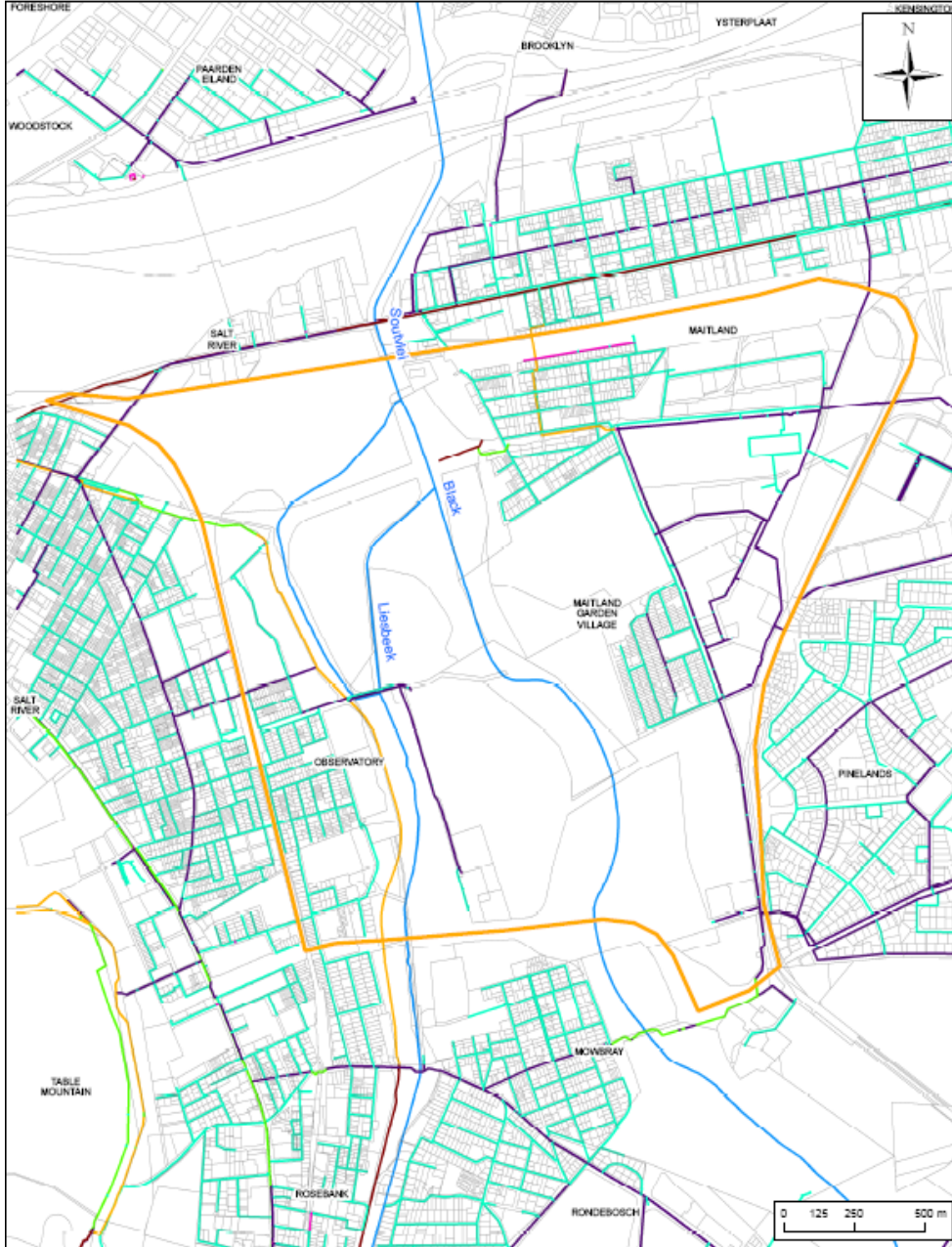
- ✓ Development area of 2 034 520 m²
- ✓ Space allocated for parking converted to 1059 residential units
- ✓ Engineering services model based on total of 14 086 residential units (equivalent), 11 schools, 226 744 m² institutional & 212 512 m² commercial development.
- ✓ Above provides a conceptual starting point of what could be developed. Ultimate development details will be informed by several factors with an Engineering Services Model adapted to suit.
- ✓ Provide **sustainable & efficient engineering solutions** that suit the development & environment.

Basis of concept development



Water supply

- The site is serviced with water supply through two existing supply zones
- Western section serviced from Molteno Reservoir. Existing 450 dia. bulk supply pipeline has spare capacity of approx. 87 l/s
- Eastern section serviced from Voortrekker Rd bulk main. Existing 535 dia. bulk pipeline has spare capacity of approx. 79 l/s
- TOTAL SPARE CAPACITY ON EXISTING SYSTEM = 166 l/s during peak demand
- Proposed development concept: Water demand approx. 421 l/s during peak demand without water saving measures.
- Thus approx. 40% of conceptual development can be serviced without any upgrades & and water savings.



Water Supply

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T01.CPT.000306/W1 - Water

1:12 000

Rivers	300 - 450mm
Diameter Unknown	450 - 600mm
< 150mm	600 - 900mm
150 - 300mm	TRUP Boundary

Water supply

- Water saving measures considered
 - Water management devices, awareness campaigns, pre-paid water meters, sliding scale rates (incl. penalties & incentives)
 - Water pressure management
 - Grey & roof water flushing systems
 - Efficient water use devices
 - Irrigation using treated effluent and/or rain water harvesting/river water
 - On-site bulk water storage (and treatment)
- Estimated impact of water saving measures could lower development water demand from 421 l/s to 214 l/s, thus still leaving a shortfall on existing system = 48 l/s (approx. 20-25% shortfall)
- Limiting development to suit existing water supply can service 10 952 residential units, 8 schools, 1 176 79 m² institutional & 1 65 232 m² commercial development.
- Alternative supplementary water supply on site will require approval from CoCT and is currently not preferred.

Sewerage

- On-site treatment of sewerage not deemed to be cost efficient and not allowed by CoCT due to risks & accompanying responsibilities.
- On-site wastewater treatment works could also impose a 500m radius development barrier and/or costly measures to eliminate odours & health risks and visual impacts.
- In turn this eliminates the options for effluent re-use & waste-to-energy generate (from wastewater)
- Proposed that all effluent from development be pumped to the existing Athlone WWTW
- Water saving measure will positively impact and limit requirement for upgrades



Sewerage

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T01.CPT.000306/W1 - Sewer Gravity Mains



1:12 000

- Sewer Manhole
- Rivers
- Diameter Unknown
- 100 - 300mm
- 300 - 750mm
- 750 - 900mm
- 900 - 1350mm
- TRUP Boundary

Conclusions up to date

Water & Sewerage

- Existing bulk water supply infrastructure can accommodate approx. 40% of the current proposed development concept
- Water use efficiency and water saving measure could increase this to 80% of the proposed development footprint
- On-site potable water storage and treatment not currently seen as an option due to associated risks
- Sewerage conveyance will require upgrade to existing bulk infrastructure for treatment at Athlone WWTW
- On-site wastewater treatment not currently seen as an option due to associated risks
- Water & Sewerage Services Model developed to be adaptable to suit development needs whilst being fully integrated with City of Cape Town existing capacity, planning and standards.
- Current findings & conclusions are conceptual and provides a guideline towards ultimate development of the site

Thank you