



DESIGN DEVELOPMENT REPORT

PROJECT DETAILS

Project Name	Housing & Human Settlements Development
Location	Bergrivier Local Municipality
Sector	Social
Department	Department Of Infrastructure
Project Owner	Poonam Yawalkar
Project Manager	Poonam Yawalkar

1 INTRODUCTION

1.1 BACKGROUND

The Background section provides an overview of the context, challenges, and motivations that led to the initiation of the project. It explains the current conditions, identifies gaps in infrastructure or service delivery, and highlights the strategic importance of the proposed development.

Example Description:

The project originates from the need to address growing infrastructure pressures in the region, including inadequate access to essential services, rising population demands, and ageing public facilities. Existing systems are unable to sustain projected growth, resulting in service delivery backlogs and socio-economic constraints. Provincial and municipal planning frameworks have identified this project as a priority intervention to improve living conditions, support economic development, and enhance long-term resilience.

The background establishes the foundation for the project rationale and guides subsequent planning, design, and implementation decisions.

1.2 PURPOSE OF THE DOCUMENT

The purpose of this document is to provide a comprehensive overview of the project, outlining its context, objectives, scope, technical requirements, and implementation approach. It serves as a guiding reference for stakeholders, decision-makers, and project teams throughout the planning and execution phases.

This document ensures alignment on project goals, supports informed decision-making, facilitates regulatory compliance, and provides the necessary information for approvals, funding considerations, and effective project delivery.

1.3 SITE DESCRIPTION/S AND PROPOSED DEVELOPMENT AREA

The site description provides an overview of the physical characteristics, surrounding environment, and existing conditions of the project location.

Example Description:

The project site is situated within a semi-urban area characterized by mixed-use development, including residential, commercial, and public facilities. The land is mostly level with minimal vegetation and no major environmental sensitivities identified during the preliminary assessment. Existing access roads and utility connections are available nearby, although upgrades will be required to support future development. The site's strategic location makes it suitable for infrastructure expansion and community-focused development.

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2 SPATIAL ANALYSIS AND PRINCIPLES

2.1 OPPORTUNITIES AND CONSTRAINTS

Spatial Justice and Equity

Ensures that historically marginalised or underserved communities gain fair access to infrastructure, services, and opportunities. This principle promotes inclusive planning and reduces inequality through targeted investment.

[Framework for Managing Programme Performance Information.pdf](#)

Environmental and Climate Resilience

Focuses on planning that safeguards ecosystems while preparing infrastructure for climate-related risks such as floods, heatwaves, or droughts. Promotes sustainable land use and low-carbon development.

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Optimised Site Selection

Spatial analysis enables the identification of the most suitable locations for development by evaluating land availability, environmental sensitivity, accessibility, and infrastructure readiness. This ensures that project sites are strategically positioned to maximise efficiency, reduce costs, and support long-term sustainability.

[Framework for Managing Programme Performance Information.pdf](#)

Enhanced Climate Adaptation

By analysing climate risks such as flooding, heat exposure, and drought patterns, spatial planning helps integrate climate-resilient design into projects. This includes selecting safer locations, improving drainage systems, and incorporating eco-friendly infrastructure to reduce vulnerability to climate change impacts.

[national Youth Policy.pdf](#)

Strategic Integration

Aligns the project with municipal, provincial, and national development frameworks. Ensures infrastructure investments are coordinated across transport, housing, energy, and economic sectors.

[Public Service Act Regulations amendments as gazzeted on the 20 Oct 2023.pdf](#)

Evidence-Based Decision Making

Encourages the use of reliable data, spatial analytics, forecasts, and modelling tools to drive accurate and transparent planning outcomes.

[White Paper on Human Resource.pdf](#)

Economic Efficiency and Catalysis

Supports investments that deliver high economic returns, reduce development costs, stimulate local economies, and unlock private-sector participation.

[department-of-the-premier-strategic-plan-2025-2030.pdf](#)

Risk-Aware Planning

Incorporates proactive strategies to assess, reduce, and manage risks related to environmental hazards, social impacts, financial uncertainties, and operational challenges.

[Public Service Act Regulations amendments as gazzeted on the 20 Oct 2023.pdf](#)

Collaborative Governance

Promotes coordination among government departments, communities, private sector partners, and civil society stakeholders. Enhances accountability, shared ownership, and smoother project implementation. [national_policy_framework.pdf](#)

Targeted Poverty Alleviation

Spatial data reveals areas with high levels of poverty, unemployment, or inadequate infrastructure. This enables targeted interventions that improve access to basic services, support community development, and promote equitable economic growth, contributing to long-term poverty reduction.

[White Paper for Social Welfare \(1997\).pdf](#)

Unlocking Economic Potential

Through understanding land-use patterns, market access, and regional economic drivers, spatial analysis identifies zones with high potential for investment and development. This helps catalyse economic activity, attract investors, and create job opportunities that stimulate local and regional growth.

[OneCape_2040.pdf](#)

Improved Disaster Management and Resilience

Spatial tools help map hazard-prone areas such as floodplains, unstable soils, or fire-prone zones. This supports proactive planning, emergency preparedness, and the design of resilient infrastructure, reducing risks to communities and ensuring faster recovery after disasters.

[wced-stratplan-2020-2025.pdf](#)

Streamlined Approvals

Integrating spatial data with regulatory frameworks helps identify compliance requirements early in the project lifecycle. This reduces delays, improves coordination with government departments, and accelerates permitting, environmental approvals, and statutory processes.

[MTDP 2024-2029 Final Edit Version - 11 March 2025.pdf](#)

"Future-Proofing" via Scenario Planning

Scenario planning allows planners to model different future conditions—such as population growth, climate shifts, and economic changes. This ensures that infrastructure solutions remain adaptable, scalable, and effective over time, supporting long-term resilience and strategic decision-making.

[wcg_dea-dp_annual-report_17-september-2025-website.pdf](#)

Data-Related Constraints

Data limitations can hinder accurate analysis and decision-making. These include outdated datasets, incomplete spatial information, inconsistent data formats, or restricted access to key demographic, environmental, or economic records. Poor data quality affects forecasting accuracy, risk assessment, and the ability to model long-term development scenarios.

[constitution of republic of RSA.pdf](#)

Technical and Capacity Constraints

These constraints arise from limited technical skills, insufficient analytical capabilities, or inadequate tools and systems required for complex spatial and infrastructure planning. Challenges may include shortages of skilled professionals, outdated software, lack of GIS expertise, or insufficient technological infrastructure to support advanced modelling, asset management, and monitoring.

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Structural and Governance Constraints

Institutional and governance-related barriers can slow or complicate project implementation. Examples include fragmented decision-making, overlapping mandates, bureaucratic delays, insufficient coordination between agencies, and inconsistent policy frameworks. These structural challenges can result in inefficiencies, duplication of work, and delays in obtaining approvals or implementing plans.

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Environmental & Physical Constraints

Environmental and site-specific physical factors may limit development options. These include

floodplains, sensitive ecosystems, steep slopes, unstable soils, water scarcity, climate risks, or protected biodiversity areas. Physical constraints also encompass existing land uses, limited space, or infrastructural barriers that require mitigation or design adaptations to ensure safe, sustainable development.

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2.2 HERITAGE DESIGN AND SPATIAL INDICATORS

2.2.1. Spatial Screening

Spatial screening involves an initial high-level review of the site to identify environmental, social, and regulatory sensitivities that may influence development potential. This includes assessing land-use compatibility, surrounding infrastructure, biodiversity areas, flood zones, and protected regions. The purpose is to quickly determine whether the site is suitable for further detailed studies and to flag any early risks or opportunities.

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2.2.2. Grading of Heritage Significance

This assessment evaluates the cultural, historical, and architectural value of any heritage assets located on or near the site. Heritage resources—such as historic buildings, cultural landscapes, or significant archaeological zones—are graded based on their importance at local, regional, or national levels. The grading outcome helps guide development decisions, ensuring that heritage elements are preserved, integrated, or managed appropriately during planning and implementation.

[Road Transportation Act 74 of 1977.pdf](#)

2.2.3. Archaeological Potential

This component identifies whether the site has the potential to contain archaeological materials or features beneath the surface. Factors considered include historical land use, previous discoveries in the area, indigenous settlement patterns, and geological characteristics. If archaeological potential is high, the development may require detailed field surveys, test excavations, or specialist monitoring to ensure compliance with heritage legislation and to protect any buried cultural assets.

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2.2.4. Respect Context and Setting

The design approach ensures that the proposed development responds sensitively to its surrounding context. This includes understanding the character of the neighbourhood, existing architectural language, landscape features, and cultural or heritage elements. The objective is to create an intervention that enhances the local environment, maintains visual harmony, and supports community identity without overwhelming or disrupting established patterns.

[9057-wc-registration-licence-fees-2025-1.pdf](#)

2.2.5. Scale Massing and Height

Appropriate scale, massing, and building height are critical to achieving a balanced and cohesive built form. The design considers human-scale principles, viewsheds, neighbouring building heights, and spatial relationships to avoid overshadowing, visual intrusion, or excessive bulk. The resulting form aims to optimize functionality while maintaining aesthetic compatibility with the broader precinct or landscape.

[Road Transportation Act 74 of 1977.pdf](#)

2.2.6. Materiality and Detailing

Material choices and detailing are guided by durability, sustainability, and contextual relevance. High-quality materials that complement the surrounding architectural palette are prioritised, along with climate-responsive specifications. Detailing is refined to enhance visual coherence, reduce maintenance requirements, and ensure long-term performance, contributing to the project's overall environmental and aesthetic objectives.

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2.2.7. Adaptive Re-use

Where existing structures or heritage elements are present, the design promotes adaptive re-use solutions that preserve cultural value while enabling modern functionality. This includes retaining significant architectural features, repurposing existing building shells, or integrating original materials into new construction. Adaptive re-use supports sustainability goals by reducing demolition waste, conserving embodied energy, and maintaining historical continuity within the site.

[Strategic Plan-2025-30.pdf](#)

2.2.8. Stakeholder Engagement

Stakeholder engagement is a critical component of the project development process, ensuring that all affected and interested parties are informed, consulted, and actively involved throughout the project lifecycle. The goal is to build trust, encourage transparency, and incorporate diverse perspectives into planning and implementation.

Objectives

- To identify all relevant stakeholders, including government bodies, community groups, landowners, businesses, and regulatory authorities.
- To ensure open communication channels that support timely information sharing and feedback.
- To align project goals with community needs, regulatory expectations, and institutional priorities.
- To proactively manage concerns, mitigate social risks, and strengthen project acceptance.

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2.2.9. Form and Massing

Form and massing define the overall shape, volume, and spatial organisation of the development. The design should respond sensitively to the surrounding context, scale, and character of the area. Balanced proportions, well-considered building heights, and harmonious volumes contribute to a cohesive urban fabric. The massing must optimise views, natural ventilation, and solar access while minimising overshadowing and visual intrusion.

[Annual Performance Plan 2025-26.pdf](#)

2.2.10. Placement and Orientation

Placement and orientation ensure that buildings and infrastructure are positioned in a manner that maximises functionality, environmental performance, and contextual fit. Orientation should prioritise natural light, prevailing wind directions, and climate-responsive design. Placement must consider proximity to roads, public transport, utilities, and surrounding land uses to enhance operational efficiency and minimise land-use conflicts.

[NPC-National-Development-Plan-Vision-2030.pdf](#)

2.2.11. Function and Programme

Function and programme define how spaces will be used and how they support the intended purpose of the development. The design should allocate adequate areas for operational requirements, user needs, and complementary uses. A well-integrated programme enhances efficiency, promotes flexibility, and ensures long-term adaptability to future demands or expansions.

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2.2.12. Materiality and Texture

Materiality and texture focus on the selection of building materials, finishes, and aesthetic qualities. Materials should be durable, sustainable, and appropriate to the local context. Textures and finishes must enhance visual appeal, reduce heat gain where required, and ensure ease of maintenance. The choice of materials should reflect a balanced combination of cost-effectiveness, environmental performance, and cultural relevance.

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2.2.13. Connectivity and Circulation

Connectivity and circulation address how people, goods, and vehicles move within and around the site.

The design must ensure safe, efficient, and clear circulation paths for pedestrians, cyclists, vehicles, and service operations. Connectivity to surrounding roads, public transport, and key nodes is crucial for promoting accessibility and reducing congestion. Internal layout should minimise conflict points and support smooth operational flows.

[NATIONAL EDUCATION POLICY ACT OF 1996.pdf](#)

2.2.14. Interface with the Public Realm

The public realm interface governs how the development interacts with external spaces such as streets, plazas, green corridors, and community areas. A positive interface helps create vibrant, safe, and people-friendly environments. Design considerations include active frontages, landscape treatments, lighting, accessibility, and public amenities. The interface should promote social interaction, enhance streetscape quality, and contribute to a cohesive urban experience.

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2.2.15. Topography

Topography refers to the natural landform, including slopes, elevation changes, ridges, valleys, and drainage patterns.

A context-responsive design should:

- Work *with* natural terrain rather than against it.
- Minimise excessive cut-and-fill operations.
- Preserve natural drainage routes and reduce erosion risks.
- Position buildings and infrastructure to optimise stability and reduce construction complexity.
- Use the landscape to improve energy efficiency, views, and microclimate conditions.

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2.2.16. Local Character

Local Character represents the identity and sense of place defined by architectural patterns, streetscapes, cultural heritage, vegetation, materials, and community lifestyle.

Design considerations include:

- Responding to existing built form, scale, and urban grain.
- Incorporating materials, colours, and textures that complement surroundings.
- Respecting cultural and historical features that contribute to community identity.
- Supporting continuity while allowing modern innovation.
- Ensuring new development enhances, rather than disrupts, the existing character.

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2.2.17. Visual Impact

Visual Impact assesses how the development will be perceived from key viewpoints and how it influences the overall visual landscape.

A visually responsive design should:

- Ensure massing, height, and form do not dominate or obstruct important views.
- Maintain scenic vistas, heritage sightlines, and natural horizons.
- Avoid visual clutter by ensuring clean, coherent design elements.
- Integrate landscaping to soften edges and blend built form with surroundings.
- Enhance nighttime visibility and safety through controlled lighting without contributing to light pollution.

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2.2.18. Water Sensitivity

Water sensitivity focuses on the sustainable management, conservation, and reuse of water resources throughout the site. Key considerations include:

- Implementing rainwater harvesting systems to reduce reliance on municipal supply.
- Using greywater recycling for irrigation, flushing, and landscape maintenance.
- Designing permeable surfaces, bioswales, and retention ponds to promote natural infiltration and reduce stormwater runoff.
- Protecting natural watercourses, wetlands, and riparian zones to maintain ecological function.
- Selecting drought-resistant indigenous landscaping to reduce water demand.

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2.2.19. Passive Design

Passive design principles prioritise natural environmental forces—such as sunlight, wind, and thermal mass—to reduce energy consumption and improve indoor comfort. Effective strategies include:

- Orienting buildings to maximise natural daylight and minimise heat gain.
- Using cross-ventilation, thermal mass, and insulation to regulate internal temperatures.
- Providing shading devices such as overhangs, pergolas, and screens to reduce cooling loads.
- Integrating green roofs and green walls to lower heat absorption and support microclimate regulation.
- Designing floor plans to allow natural airflow and reduce dependence on mechanical systems.

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2.2.20. Fire-Resistant Materials

The selection of fire-resistant materials enhances resilience to wildfires, building fires, and climate-related incidents. Key approaches include:

- Using non-combustible or low-combustible materials such as fibre cement, treated timber, metal cladding, and fire-rated insulation.
- Incorporating fire-resistant roofing, glazing, and sealing systems to prevent ignition from embers.
- Designing defensible spaces with controlled vegetation and adequate firebreaks.
- Implementing fire-rated doors, partitions, and structural elements to slow fire spread.
- Ensuring compliance with national building regulations and relevant fire safety codes.

[White Paper for Social Welfare \(1997\).pdf](#)

2.2.21. Universal Access

Universal Access ensures that all people—including persons with disabilities, elderly individuals, children, and those with mobility limitations—can safely and comfortably navigate and use the development.

Key considerations include:

- Providing ramps, tactile paving, wide pathways, and barrier-free entrances.
- Designing accessible public facilities, restrooms, and service counters.
- Ensuring consistent wayfinding through signage, lighting, and visual cues.
- Prioritising inclusive design across transportation nodes, buildings, and public spaces.
- Complying with SANS accessibility standards and international universal design principles.

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2.2.22. Eyes on the Street

“Eyes on the Street” relates to passive surveillance created by people’s presence and visibility, enhancing safety and reducing crime.

A spatially just design should:

- Encourage active frontages through shops, residences, and community facilities that overlook public areas.
- Provide adequate lighting and clear visibility across streets, walkways, and open spaces.
- Avoid blank walls, isolated zones, or obstructed sightlines.
- Promote pedestrian activity and social interaction, naturally increasing surveillance.
- Integrate mixed-use environments where day- and night-time activity boosts safety.

[OneCape_2040.pdf](#)

2.2.23. Dignified Public Interfaces

Dignified Public Interfaces ensure that public-facing areas—such as entrances, walkways, gathering spaces, transit stops, and service points—convey respect, safety, and comfort for all users.

Design principles include:

- Creating welcoming and well-maintained spaces that protect user dignity.
- Providing seating, shading, landscaping, and accessible amenities.
- Designing façades and entrances that feel safe, inclusive, and culturally sensitive.
- Ensuring equitable treatment of all users through thoughtful spatial organisation.
- Avoiding overcrowded, poorly lit, or unsafe access points.

[White Paper for Social Welfare \(1997\).pdf](#)

2.2.24. Interpretive Design

Interpretive Design focuses on communicating the cultural, historical, and environmental significance of a place in ways that are engaging, informative, and meaningful.

Key objectives include:

- Telling the story of the site through signage, exhibits, art, or landscape elements.
- Providing contextual information that helps visitors understand the heritage value.
- Integrating interpretation seamlessly into the built environment through subtle, place-specific design.
- Using multimedia, interactive tools, and narrative pathways to enhance public learning.
- Ensuring the interpretation is accurate, culturally respectful, and accessible to all ages and abilities.

Interpretive design strengthens the connection between people and place, fostering appreciation and stewardship.

[OneCape_2040.pdf](#)

2.2.25. Conservation and Adaptation

Conservation and Adaptation ensure that significant heritage elements are protected while allowing appropriate, sustainable changes that support modern use.

This approach includes:

- Preserving historic buildings, landscapes, vegetation, and cultural features that contribute to identity.
- Implementing adaptive reuse strategies that extend the lifespan of heritage assets.
- Ensuring alterations are reversible, minimal, and sympathetic to the original character.
- Using traditional materials and techniques where appropriate, combined with modern technologies for efficiency.
- Balancing heritage preservation with contemporary functional needs, safety standards, and accessibility requirements.

This principle promotes long-term sustainability by integrating heritage into future development.

[OneCape_2040.pdf](#)

2.2.26. Memorialisation

Memorialisation involves recognising and honouring significant historical events, individuals, or cultural narratives associated with the place.

Key components include:

- Creating dedicated spaces that encourage reflection, remembrance, and learning.
- Incorporating symbolic elements such as monuments, plaques, public art, or landscape features.
- Ensuring designs are culturally sensitive, inclusive, and respectful of diverse community perspectives.
- Integrating memory into everyday public spaces so that history remains visible and relevant.
- Providing interpretive materials that accurately represent the stories and communities connected to the site.

Memorialisation strengthens cultural identity and supports healing, awareness, and collective memory.

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2.2.27. Local Labour and Materials

Using local labour and materials supports economic inclusion, reduces project costs, and strengthens community ownership.

Key considerations include:

- Prioritising local workforce recruitment to promote job creation and skills development.
- Sourcing construction materials (brick, stone, timber, aggregates, finishes) from local suppliers to reduce transport costs and carbon footprint.
- Supporting small, medium, and micro enterprises (SMMEs) through subcontracting opportunities.
- Incorporating locally available, climate-appropriate materials that blend with regional architectural identity.
- Ensuring compliance with B-BBEE, local content requirements, and fair labour practices.

This approach enhances economic resilience while building community trust and long-term support for the project.

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2.2.28. Design for Maintenance

Design for Maintenance ensures that buildings, infrastructure, and public spaces remain durable, functional, and cost-effective over their lifespan.

Effective maintenance-oriented design includes:

- Selecting robust, low-maintenance materials that can withstand local climate and environmental stresses.
- Designing building systems (HVAC, plumbing, electrical) for easy access, repair, and replacement.
- Minimising operational costs by integrating energy-efficient and water-efficient technologies.
- Using modular building components that simplify upkeep and reduce downtime.
- Planning landscaping and site elements that require minimal irrigation, cleaning, or specialist care.
- Providing clear asset management guidelines and maintenance schedules.

Prioritising maintenance from the design phase reduces long-term expenditure and improves lifecycle performance.

[Framework for Managing Programme Performance Information.pdf](#)

2.2.29. Phased Implementation

Phased Implementation refers to constructing the project in structured stages to optimise resources, reduce risk, and align with funding availability.

Key elements include:

- Dividing the project into logical phases (e.g., enabling works, core infrastructure, building works, final finishing).

- Ensuring early phases unlock value—such as access roads, bulk services, or essential utilities.
- Allowing flexibility for adjustments based on community feedback, environmental assessments, or budget constraints.
- Ensuring seamless integration between phases with minimal disruption to operations or surrounding areas.
- Aligning phasing with cash flow planning, procurement cycles, and stakeholder approvals.
- Supporting gradual scaling to accommodate future growth or demand.

Phasing enables cost-effective delivery, reduces upfront risks, and ensures steady progress toward long-term development objectives.

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2.2.30. Multi-Functional Spaces

Multi-functional spaces are designed to support a variety of activities and user needs without requiring major structural changes.

Key characteristics include:

- Designing rooms, halls, and public spaces that can serve multiple uses (e.g., community gatherings, training, administration, events).
- Incorporating movable partitions, flexible furniture, and adaptable layouts.
- Ensuring spaces can easily transition between low- and high-intensity uses.
- Supporting shared use across different departments or community groups.
- Enhancing efficiency by maximising space utilisation throughout the day and week.

Multi-functional spaces provide long-term value by reducing redundancy and increasing versatility.

[White Paper on Human Resource.pdf](#)

2.2.31. Service Flexibility

Service flexibility involves designing infrastructure systems so they can be upgraded, expanded, or altered as needs evolve.

This includes:

- Providing accessible service corridors for future cabling, water lines, ICT infrastructure, and electrical systems.
- Using smart-building infrastructure that can integrate with emerging technologies.
- Allowing for capacity upgrades (e.g., additional ICT bandwidth, power load, or water supply).
- Designing plant rooms and technical spaces with spare capacity and adaptable layouts.
- Ensuring compliance with modular engineering standards to simplify future changes.

Service flexibility supports operational resilience and accommodates future innovation.

[Public Service Act Regulations amendments as gazzeted on the 20 Oct 2023.pdf](#)

2.2.32. Modular and Open-Ended Design

Modular and open-ended design ensures that buildings and infrastructure can expand, reconfigure, or evolve without significant demolition or disruption.

Key principles include:

- Using modular components that can be added, removed, or rearranged as demand changes.
- Designing structural systems that support vertical or horizontal expansion.
- Providing open floor plates that allow reconfiguration of layouts and services.
- Planning site layouts that allow future extensions of buildings, utilities, and public spaces.
- Ensuring operational continuity during expansions or modifications.

This approach “future-proofs” the development, ensuring long-term adaptability and reducing lifecycle costs.

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2.3 LANDSCAPE AND URBAN DESIGN INFORMANTS

2.3.1. Topography and Geology

Biophysical and environmental informants describe the natural systems that shape how land can be used, developed, or protected. Understanding these elements is essential for responsible planning, climate resilience, and environmental compliance.

Key considerations include:

- Identifying ecological sensitivities, protected areas, and natural assets.
- Assessing environmental risks such as flooding, erosion, and habitat fragmentation.
- Ensuring development aligns with natural systems to reduce long-term costs and impacts.
- Supporting sustainable land use by integrating environmental constraints into design.

These informants form the foundation for environmentally sound decision-making.

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2.3.2. Hydrology and Water Systems

Socio-cultural and heritage informants highlight the human dimensions of a site, including culture, traditions, history, and community identity.

They include:

- Cultural heritage sites, archaeological areas, and buildings of historical importance.
- Community values, social behaviours, and patterns of use.
- Local traditions, languages, and intangible heritage.
- Social networks, gathering spaces, and community dynamics.

Integrating these informants ensures that development respects local identity, protects heritage, and strengthens social cohesion.

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2.3.3. Climate and Microclimate

Climate and microclimate conditions influence comfort, building performance, and environmental sustainability.

Key factors:

- Temperature ranges, rainfall, humidity, and prevailing winds.
- Solar exposure, shading patterns, and heat islands.
- Localised microclimate variations caused by vegetation, topography, and built form.
- Climate risks such as droughts, storms, heatwaves, and changing weather patterns.

These inform design strategies for passive cooling/heating, orientation, landscape design, and overall climate resilience.

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2.3.4. Ecology and Biodiversity

Ecology and biodiversity refer to the living components of the environment, including flora, fauna, and ecological processes.

Assessment considers:

- Protected species, habitats, and ecological corridors.
- Indigenous vegetation and opportunities for ecological restoration.
- Potential impacts on wildlife movement, breeding areas, and natural systems.
- Invasive species, habitat loss, and ecosystem degradation risks.

Protecting biodiversity ensures ecological stability, improves sustainability, and enhances long-term environmental quality.

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2.3.5. Spatial History & Heritage

Spatial History & Heritage examines how the site and surrounding area have evolved over time, identifying historic patterns that continue to shape present-day conditions.

Key elements include:

- Historical land uses, settlement evolution, and cultural landscapes.
- Significant heritage resources such as buildings, monuments, archaeological sites, and intangible heritage.
- Past planning decisions that influenced current spatial patterns, boundaries, and infrastructure networks.
- Historic economic, social, or political drivers that shaped the area's identity.

Understanding spatial history ensures the development respects heritage, reinforces place identity, and avoids disrupting historically significant features.

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2.3.6. Community Structure & Needs

Community Structure & Needs describe the socio-economic and demographic characteristics of the local population, as well as their service, housing, and infrastructure requirements.

Assessment covers:

- Population composition (age, household types, income levels).
- Social services needs: education, healthcare, recreation, safety, housing.
- Economic needs including employment opportunities, local enterprises, and livelihood activities.
- Social cohesion, community networks, and cultural practices influencing spatial use.
- Key challenges faced by the community such as overcrowding, service backlogs, inequality, or vulnerability.

This understanding helps shape developments that are equitable, demand-responsive, and community-focused.

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2.3.7. Movement & Access Patterns

Movement & Access Patterns examine how people and goods move through the area and how accessible key services and destinations are.

Key considerations include:

- Major roads, public transport routes, pedestrian networks, and cycling paths.
- Connections between neighbourhoods, job centres, and essential services.
- Traffic flows, congestion points, and mobility challenges.
- Accessibility for persons with disabilities, elderly individuals, and vulnerable groups.
- Opportunities to enhance walkability, promote non-motorised transport, and improve public transport integration.

Understanding movement patterns ensures the development supports efficient mobility, reduces travel barriers, and enhances spatial connectivity.

[Road Transportation Act 74 of 1977.pdf](#)

2.3.8. Existing Land Use & Infrastructure

These elements shape the natural constraints and opportunities of the site and guide environmentally responsive design.

- **Topography and Geology**
Understanding landform, gradients, soil conditions, and geological stability to inform layout, construction technique, and risk mitigation.
- **Hydrology and Water Systems**
Assessment of drainage patterns, stormwater behavior, groundwater movement, and proximity to water bodies to support water-sensitive design.

- **Climate and Microclimate**
Local temperature patterns, prevailing winds, solar exposure, and seasonal variations used to guide passive design strategies.
- **Ecology and Biodiversity**
Identification of existing flora and fauna, sensitive habitats, ecological corridors, and opportunities for conservation and restoration.

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2.3.9. Policy & Regulatory Frameworks

These elements ensure the design aligns with cultural identity, community needs, and historical context.

- **Spatial History & Heritage**
Understanding historical land use, heritage structures, cultural landscapes, and memory sites to inform preservation, adaptation, and respectful development.
- **Community Structure & Needs**
Demographics, social dynamics, key activities, and service requirements to support inclusive, community-centred design.
- **Movement & Access Patterns**
Everyday pedestrian flows, desire lines, public transport routes, and vehicular circulation to guide safe, efficient, and equitable mobility.

[Road Transportation Act 74 of 1977.pdf](#)

2.3.10. Visual & Perceptual Qualities

These factors provide the regulatory, infrastructural, and spatial conditions for development.

- **Existing Land Use & Infrastructure**
Current settlement patterns, building conditions, service networks, and development intensity forming the baseline for future planning.
- **Policy & Regulatory Frameworks**
Municipal plans, zoning schemes, environmental regulations, heritage guidelines, and national standards shaping allowable development.
- **Visual & Perceptual Qualities**
Viewsheds, visual prominence, sensory experiences, and place identity influencing urban character and aesthetic integration.

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2.4 SPATIAL PRINCIPLES

Principle 1: Spatial Integration and Alignment

Ensures that developments are coordinated with existing and planned infrastructure, land-use frameworks, and regional spatial strategies. This principle promotes connectivity, reduces duplication, and aligns projects with broader national, provincial, and municipal development objectives.

[final-wcmd-strategic-plan-2025_2030.pdf](#)

Principle 2: Spatial Justice and Equitable Access

Promotes fair distribution of services, opportunities, and amenities across all communities. It prioritizes historically underserved or marginalised areas, ensuring that development contributes to reducing inequalities in access to infrastructure, mobility, housing, and public facilities.

[pocs-strategic-plan-2025-2030.pdf](#)

Principle 3: Environmental and Climate Resilience

Integrates environmental protection and climate-adaptive design into planning. This includes safeguarding ecological systems, reducing carbon impacts, and preparing for climate risks such as flooding, heat stress, and resource scarcity. The aim is to ensure long-term sustainability and resilience.
[wced-app-2023-2024.pdf](#)

Principle 4: Evidence-Based and Data-Driven Decision Making

Supports planning decisions using reliable data, spatial analytics, modelling, and research. This ensures that proposals are grounded in factual understanding of demographic trends, environmental conditions, market dynamics, and projected future scenarios.
[pocs-strategic-plan-2025-2030.pdf](#)

Principle 5: Economic Efficiency and Sustainable Growth

Promotes optimal use of resources to stimulate long-term economic value, job creation, and investment attractiveness. This principle ensures that development choices maximise returns, minimise operational inefficiencies, and support sustainable economic ecosystems.
[wcdhw-annual-report-2024-2025.pdf](#)

Principle 6: Risk Mitigation and Future-Proofing

Incorporates proactive strategies to anticipate, reduce, and manage risks related to climate, environmental hazards, regulatory changes, financial uncertainty, and technological shifts. It encourages flexible, adaptable planning to ensure the site remains viable and functional over time.
[dlg-annual-performance-plan_2024-25_english.pdf](#)

Principle 7: Collaborative and Transparent Governance

Encourages inclusive engagement with government agencies, private sector stakeholders, communities, and civil society. Transparent processes, shared decision-making, and strong intergovernmental coordination improve accountability, legitimacy, and successful implementation.
[constitution of republic of RSA.pdf](#)

3 CONCEPTUAL DEVELOPMENT OPTIONS

3.1 CONCEPT DESIGNS

3.1.1. Description of development options

This section outlines the various conceptual development approaches considered for the project. Each option represents a different configuration of land use, infrastructure integration, spatial arrangement, and functional programming. The purpose is to evaluate multiple pathways to determine the most feasible, sustainable, and cost-effective solution.

[MTDP 2024-2029 Final Edit Version - 11 March 2025.pdf](#)

3.1.2. Common Elements

Across all development options, several core components remain consistent. These include:

- **Basic infrastructure requirements**, such as roads, utilities, water, and sanitation systems.
- **Compliance with zoning, regulatory frameworks, and environmental guidelines.**
- **Integration of essential public amenities**, such as pedestrian networks, safety measures, and universal access.
- **Adherence to spatial principles**, including climate resilience, spatial justice, and economic efficiency.

These shared elements ensure that each option meets minimum development standards and aligns with broader strategic objectives.

[wced-stratplan-2020-2025.pdf](#)

3.1.3. Qualifications and limitations from a design perspective

Spatial design strategies, such as compact development, transit-oriented development, green-buffered layouts, or dispersed clusters.

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3.1.4. Characteristics of the conceptual development options

- **Infrastructure phasing and delivery models**, ranging from immediate, high-investment options to incremental growth approaches.
- **Levels of community interface**, public realm activation, and socio-economic integration.

These characteristics help compare the strengths, weaknesses, and long-term impacts of each development scenario before selecting the preferred option.

[wcg_dea-dp_annual-report_17-september-2025-website.pdf](#)

3.2 FINANCIAL FEASIBILITY

3.2.1. Background

The purpose of this assessment is to understand the development potential of the site by examining its spatial characteristics, regulatory context, market drivers, and environmental constraints. The background analysis provides a foundation for determining feasible land-use options and evaluating the economic viability of future development. It considers historical land use, current zoning, infrastructure availability, accessibility, and socio-economic context to ensure that the recommended option aligns with strategic planning frameworks and community needs.

[wcg_dea-dp_annual-report_17-september-2025-website.pdf](#)

3.2.2. Land Valuation Approach

The land valuation approach assesses the economic value of the site by combining market analysis, comparable sales data, development potential, and regulatory considerations. Key steps include:

- **Market Comparison Method:** Evaluating similar land parcels in the region to establish a benchmark value.
- **Income Approach:** Estimating future revenue potential based on the proposed development scenario, discounted to present value.
- **Cost Approach:** Assessing land value relative to potential development costs and required infrastructure investment.
- **Regulatory & Physical Constraints:** Adjusting valuation based on zoning restrictions, environmental constraints, heritage considerations, and service availability.

This approach ensures a balanced and evidence-based valuation aligned with real market conditions and development feasibility.

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3.2.3. Highest and Best Use Option

The Highest and Best Use (HBU) refers to the most economically productive, legally permissible, physically feasible, and socially appropriate use of the land. The selected HBU option is determined through:

- **Legal Permissibility:** Ensuring the land use complies with zoning, environmental regulations, heritage overlays, and municipal policies.
- **Physical Feasibility:** Considering topography, site size, access, infrastructure capacity, and environmental factors.
- **Financial Viability:** Selecting the option that provides optimal returns relative to development costs and long-term operational sustainability.
- **Community & Strategic Alignment:** Ensuring the proposed use supports broader spatial development strategies, economic objectives, and community needs.

The recommended Highest and Best Use option identifies the development scenario that delivers

maximum socio-economic value while remaining feasible and compliant with all statutory requirements.
[wced-stratplan-2020-2025.pdf](#)

4 SPECIALISTS' PRELIMINARY ASSESSMENT OF DEVELOPMENT OPTIONS

4.1 PRELIMINARY ASSESSMENTS OF DEVELOPMENT

4.1.1. Technical Viability

Technical viability assesses whether the proposed project can be implemented using proven engineering methods, available technology, and existing infrastructure capacity. This includes evaluating site conditions, service availability (water, electricity, sewer), geotechnical properties, transportation access, and compatibility with industry standards. A technically viable project demonstrates that construction, operation, and long-term maintenance can be completed safely, efficiently, and without excessive technical risk.

[Annual Performance Plan 2025-26.pdf](#)

4.1.2. Financial Implications

This component examines the full financial requirements of the project, including capital expenditure (CAPEX), operational expenditure (OPEX), lifecycle costs, and financing needs. It assesses affordability, funding sources, potential revenue streams, and long-term budget implications. Financial implications also include sensitivity analyses to evaluate how cost fluctuations, interest rates, or delays could impact project sustainability. A financially sound project demonstrates clear cost justification and long-term fiscal stability.

[Strategic Plan-2025-30.pdf](#)

4.1.3. Socio-Economic Impact

Socio-economic impact analysis evaluates how the project will affect communities, local economies, and broader development goals. This includes job creation, poverty reduction, improved access to services, skills development, and stimulation of local businesses. It also considers potential negative impacts such as displacement, inequality, or community disruption. A positive socio-economic impact strengthens the justification for public investment and supports inclusive, equitable development.

[Strategic Plan-2025-30.pdf](#)

4.1.4. Environmental Sustainability

Environmental sustainability assesses the project's impact on natural resources, ecosystems, and climate resilience. This includes evaluating carbon emissions, water usage, waste generation, biodiversity protection, and compliance with environmental regulations such as EIAs. Sustainable design strategies—such as energy-efficient systems, green materials, and climate adaptation measures—are also considered. A sustainable project ensures minimal ecological harm and supports long-term environmental health.

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4.1.5. Risk Management

Risk management identifies potential risks across technical, financial, operational, social, and environmental areas. It includes assessing their likelihood, potential impact, and required mitigation measures. Risks may include cost overruns, delays, regulatory changes, contractor failure, environmental hazards, or community opposition. A strong risk management plan outlines clear mitigation strategies, monitoring mechanisms, and contingency provisions to ensure successful project delivery.

[NPC-National-Development-Plan-Vision-2030.pdf](#)

4.1.6. Compliance and Governance

This section evaluates whether the project adheres to relevant legal, regulatory, and governance frameworks. This includes zoning laws, environmental legislation, procurement policies, land-use

permissions, building codes, and national standards. Governance focuses on transparency, accountability, ethical decision-making, and alignment with public-sector oversight frameworks. Strong compliance and governance ensure that the project is legally robust, ethically managed, and aligned with institutional and statutory requirements.

[wc-provincial-treasury-2024_25-annual-report.pdf](#)

5 PREFERRED DEVELOPMENT OPTION AND GUIDELINES

5.1 MOTIVATION FOR PREFERRED DEVELOPMENT PLAN

Parameter	Description	Option 1	Option 2	Option 3
Completeness	Are all required sections and data included?	Yes		
Accuracy	Are the technical and financial details correct and well-supported?	Yes		
Alignment with Strategy	Does the design support WCG infrastructure goals and ministerial priorities?	Yes		
Feasibility	Is the project realistically deliverable within time, budget, and scope?	Yes		
Stakeholder Engagement	Have relevant departments, communities, and experts been consulted?	Yes		
Sustainability Measures	Are environmental and long-term maintenance factors addressed?	Yes		
Risk Identification	Are risks clearly identified and mitigation plans provided?	Yes		
Innovation and Efficiency	Does the design incorporate modern, efficient, or innovative solutions?	Yes		

Preferred Option: OPTION1

Justification

These guidelines ensure that the preferred development option delivers functional, sustainable, and high-quality urban environments.

a. Urban Design & Planning Guidelines

- Promote compact, mixed-use development where appropriate.
- Ensure legible and pedestrian-friendly layouts with safe movement corridors.
- Provide clear hierarchy of public spaces and green corridors for recreation and ecological connectivity.
- Maintain an integrated transport system allowing safe access for pedestrians, cycles, and vehicles.

b. Architectural Guidelines

- Use locally relevant architectural forms and materials that respond to site context and climatic conditions.
- Encourage energy-efficient building design through passive ventilation, solar orientation, and shading strategies.
- Apply universal access principles across all structures to ensure inclusivity.
- Promote façade articulation and design treatments that enhance visual quality and human-scale relationships.

c. Landscape & Environmental Guidelines

- Use indigenous, drought-resistant landscaping to support biodiversity and reduce water consumption.
- Integrate stormwater-sensitive design features such as bioswales, retention ponds, and permeable paving.
- Protect significant natural features, heritage elements, and ecological buffers.

5.2 DESIGN / ARCHITECTURAL / PLANNING GUIDELINES

5.2.1. Design

The design guidelines provide a framework for creating functional, sustainable, and community-centred spaces within the development.

Key Principles

- **Human-Centric Design:** Prioritise safety, accessibility, comfort, and usability for all residents, including vulnerable groups.
- **Context-Responsive Layouts:** Designs must respond to the site's topography, climate, hydrology, and surrounding land uses.
- **Integrated Open Spaces:** Provide a connected network of public spaces, recreational areas, and green infrastructure.
- **Sustainability:** Incorporate water-efficient landscaping, energy-efficient systems, waste-smart design, and climate-resilient materials.
- **Legibility & Wayfinding:** Ensure clear movement patterns, visibility, and intuitive navigation throughout streets, nodes, and public places.

[NPC-National-Development-Plan-Vision-2030.pdf](#)

5.2.2. Architecture

Architectural guidelines ensure consistency, quality, and resilience in building form and style, while promoting local identity and long-term durability.

Key Principles

- **Local Identity:** Encourage designs that reflect the cultural, social, and environmental character of the area.
- **Materiality:** Use durable, low-maintenance, locally sourced materials where possible to support local suppliers and reduce lifecycle costs.
- **Energy Efficiency:** Employ passive design strategies—solar orientation, natural ventilation, shading devices, and thermal efficiency.
- **Universal Access:** Ensure all buildings meet universal design standards, including barrier-free access, ramps, tactile indicators, and inclusive facilities.

- **Façade Articulation:** Promote visually appealing buildings with balanced proportions, articulated surfaces, and climate-appropriate shading.

[national_policy_framework.pdf](#)

5.2.3. Planning Guidelines

Planning guidelines guide the spatial structuring of the development to ensure efficiency, inclusivity, and integration with broader municipal planning frameworks.

Key Principles

- **Spatial Integration:** Connect the development with surrounding neighbourhoods, transport networks, amenities, and economic nodes.
- **Mixed-Use and Density Management:** Support appropriate land-use mix and density to promote walkability, job creation, and reduced travel demand.
- **Transport & Movement:** Provide a clear road hierarchy, safe pedestrian and cycling paths, universal access routes, and public transport integration.
- **Infrastructure Alignment:** Ensure the layout aligns with bulk services capacity and supports phased implementation of water, sanitation, energy, and ICT networks.
- **Environmental Stewardship:** Protect ecologically sensitive areas, integrate stormwater management, and ensure compliance with environmental regulations.
- **Risk-Aware Planning:** Consider flood lines, fire risk, geotechnical conditions, and climate hazards in layout decisions.

[Framework for Managing Programme Performance Information.pdf](#)

5.3 FRAMEWORK AND GUIDELINES

5.3.1. Design Principles

The design principles provide a foundational framework that guides the creation of functional, sustainable, and people-centred environments. These principles ensure that the development is socially inclusive, environmentally responsible, economically efficient, and aligned with long-term planning goals.

1. Contextual Responsiveness Design must be sensitive to the site's natural, cultural, and built context.

- Respect the existing landscape, topography, and ecological systems.
- Respond to local architectural character and community identity.
- Minimise visual impacts on surrounding areas and maintain natural vistas.

2. CLIMATE RESILIENCE & ENVIRONMENTAL SUSTAINABILITY

The development must enhance environmental performance and reduce climate-related risks.

- Integrate passive design strategies for thermal comfort and reduced energy demand.
 - Use water-sensitive urban design (WSUD) to manage runoff and protect waterways.
 - Employ green infrastructure, renewable energy, and low-carbon materials.
 - Ensure resilience to floods, heatwaves, storms, and fire risks.
- 3. Spatial Justice & Inclusive Access**

Ensure equitable access to services, mobility, and opportunities for all users.

- Promote universal design principles for people with disabilities, children, and the elderly.
- Enhance walkability through accessible pedestrian networks and safe crossings.

- Provide dignified public spaces that encourage safety, inclusion, and social cohesion.

4. FUNCTIONAL EFFICIENCY & SMART LAYOUTS

Design must optimise land use, movement, and infrastructure performance.

- Ensure efficient space planning that supports mixed uses and appropriate densities.
 - Provide clear circulation networks for vehicles, pedestrians, and cyclists.
 - Promote compact layouts that reduce service costs and improve accessibility.
- 5. Heritage Sensitivity & Cultural Integration**

Design should reflect and preserve the cultural, historical, and social character of the area.

- Protect heritage elements and integrate them meaningfully into the project.
- Use interpretive design to respect cultural narratives and historical significance.
- Support adaptive reuse where feasible.

[national_policy_framework.pdf](#)

6 CONCLUSION

The spatial analysis provides a comprehensive understanding of the site’s opportunities, constraints, and strategic value. By integrating principles of spatial justice, climate resilience, economic efficiency, and evidence-based planning, the assessment supports the identification of an optimised development pathway. The analysis highlights areas of high potential while acknowledging critical limitations such as data gaps, environmental sensitivities, and governance challenges.

Overall, the findings offer a strong foundation for informed decision-making, enabling stakeholders—including government entities, investors, and communities—to plan confidently and collaboratively. This ensures that future development is sustainable, equitable, resilient, and aligned with long-term regional growth objectives.

SUBMISSION & APPROVAL

Self Approved By: **Poonam Yawalkar**

Self Approved On: **04 Dec 2025 06:25:26 AM**

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