GREENING
our supply chain

A guide to Environmental Sustainability for suppliers and contractors to Garden Cities NPC (RF)

Vision

GARDEN CITIES
building green communities

Contents

1. Building sustainable communities

Garden Cities NPC (RF) is committed to building developments that are sustainable. For us this means building thriving places for people to live and work that do not interfere with nature's inherent ability to sustain life.

To do this Garden Cities NPC (RF) requires the support of all its supply chain partners. Support begins with shared understanding of what is needed and why. Then it is about closely working together to find realistic solutions. This booklet is intended to be a platform for Garden Cities NPC (RF) to engage with its suppliers and contractors around environmental sustainability issues. Garden Cities NPC (RF) believes that collaboration based on shared values can lead to more sustainable built environments and healthier cities.

2. Key terms

2.1 Sustainability

Sustainability is a broad and often confusing term but is generally accepted to be about creating a world in which humanity prospers within nature's limits. Any action can be considered sustainable if it prioritises the value of all people and nature in the pursuit of its goal. Sustainability is based on a simple principle that everything we need for our survival and wellbeing depends, either directly or indirectly, on the natural environment. Sustainability creates and maintains the conditions under which humans and the Earth System can exist in productive harmony, permitting fulfilment of social, economic and other needs of present and future generations.

Prosperity is a state of flourishing or thriving, which encompasses wealth but can also include other factors of value, which can be independent of wealth such as happiness and health.

2.2 Sustainable Development

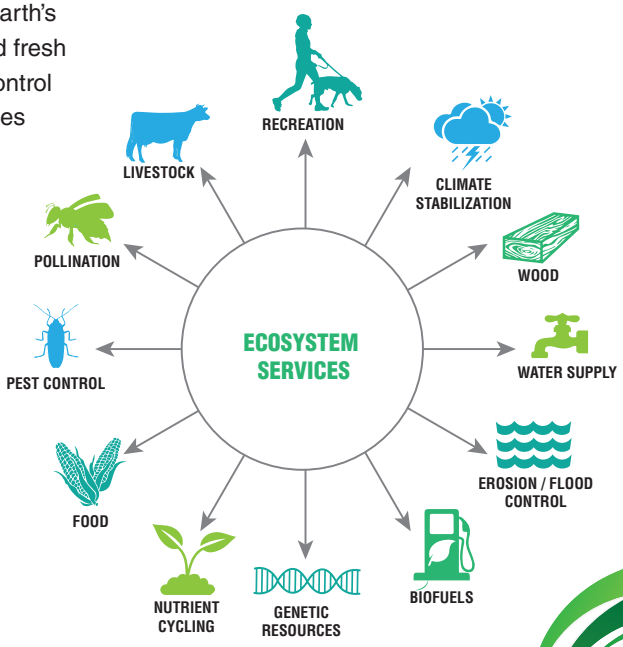
'Development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

- Our Common Future (1987), United Nations Brundtland Report

Sustainable Development is a term commonly used in the study of Sustainability. It is an interdisciplinary field connecting the domains of ecology, economics and social. The Sustainable Development Goals (SDGs) are a set of seventeen global goals and targets agreed by the United Nations member states in 2015. Officially known as 'Transforming our world: the 2030 Agenda for Sustainable Development', the SDGs call for strategic partnerships between government, business and civil society that work towards protecting people and the planet.

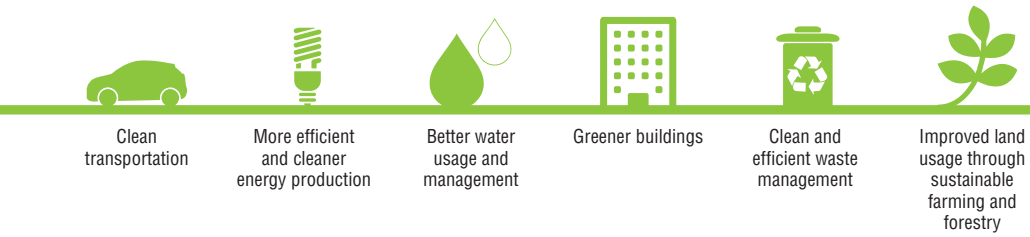
2.3 Environmental sustainability

Environmental sustainability is the part of sustainability that looks specifically at the relationship between humans and ecological systems. Protecting and restoring ecosystem services is vital for the health and wellbeing of all people. Earth's ecosystems produce food and fresh water, regulate climate and control disease, support nutrient cycles and pollinate crops, and provide beautiful places for humans to enjoy.



2.4 The green economy

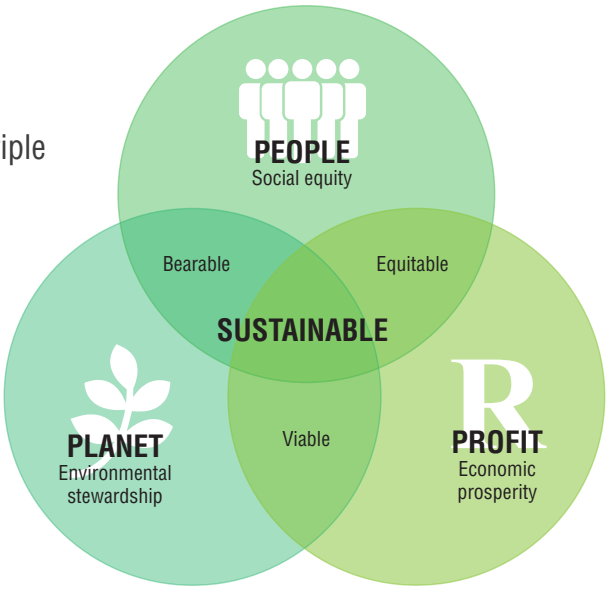
The Green Economy is the term used to describe long-term economic growth achieved by investing in environmentally friendly and socially equitable solutions. It is seen as an economic system that provides a better quality of life for all people within the ecological limits of the planet.



2.5 Sustainable business

Sustainable business is the management and co-ordination of environmental, social and financial demands and concerns to ensure responsible, ethical and ongoing commercial success. Sustainability is popularly referred to in business as the triple-bottom line. Environmental performance should include a measure of waste minimization, energy efficiency and water saving. Publically accountable businesses typically produce a Sustainability Report, which announces audited results of both financial and non-financial indicators.

The business triple bottom Line



3. A history of Garden Cities

3.1 Uplifting communities

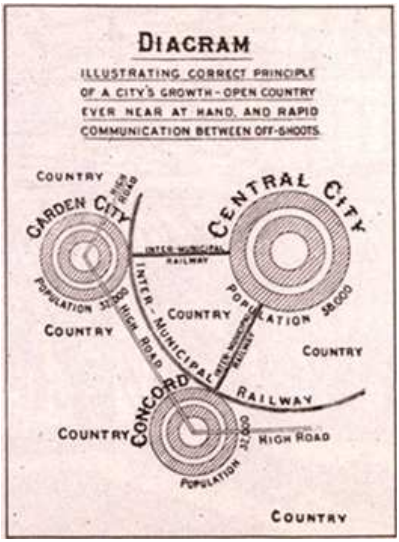
Garden Cities NPC (RF) is the Western Cape's oldest residential property developer. Incorporated in 1919 the non-profit company has been building houses and establishing suburbs across the Cape Peninsula to suit people at every stage of life.

Garden Cities NPC (RF) was established with a vision: to promote social upliftment through the delivery of quality affordable homes in safe healthy environments. This began with the company's first and founding project, developing the outlying suburb of Pinelands to combat overcrowding in Cape Town in the 1920s, and still continues today. Pinelands was the first garden city to be established in South Africa.

In the 1950s Garden Cities NPC (RF) helped reintegrate society after World War II by opening its second garden city, Meadowridge in the South Peninsula. Homes in Meadowridge were built for returning servicemen and their families. Around this time Garden Cities NPC (RF) also developed the nearby community estates of Elfindale and Square Hill. Then, as the metropolitan area began to expand in the 1970s and 1980s, Garden Cities NPC (RF) established further garden cities at Edgemead and Northpine to meet the growing accommodation needs in the northern areas of Cape Town.

More recent Garden Cities NPC (RF) developments include the modern housing estate of Pinehurst near Durbanville and the major suburb of Sunningdale along the fast-growing west coast corridor. Running in parallel to these developments is the company's very latest project, the new town of Greenville at Fisantekraal, also near Durbanville. Ratified by the City of Cape Town in 2014 after 8 years of planning, Greenville Garden City is a model public-private sector partnership that is setting the standard in South Africa for integrated sustainable human settlements. Aligned with national government's Comprehensive Housing Plan and the Western Cape Provincial Government's Green Economy initiatives, the development at Greenville includes Breaking New Ground (BNG) housing that aims to eradicate informal settlements in the shortest possible time.

3.2 The garden city movement



Garden Cities NPC (RF) has its roots in the British Garden City movement, a pioneering urban planning method initiated by Ebenezer Howard in 1898. Howard was passionate about improving the lives of the poor and believed that humans should live in harmony with nature.

Responding to the overcrowded, polluted and dilapidated industrial cities of his time, Howard published a book called *Garden Cities of To-morrow*, in which he described his vision for reducing slums and reversing urban sprawl. He proposed a model for self-sufficient communities or 'garden cities', which combined the advantages of city living with the beauty and delight of the countryside.

Two garden cities, Letchworth and Welwyn, were built initially in England based on Howard's specific ideals. The concept then spread across the world, influencing town-planning policies and urban design in many countries, becoming among the first manifestations of sustainable developments.

At its heart, a garden city is a holistically planned new settlement that enhances the natural environment and provides high-quality affordable housing and locally accessible jobs in beautiful, healthy and sociable communities. The overarching purpose of a garden city is social reform - empowering people and communities to influence decisions that affect them.

Town & Country Planning Association (www.tcpa.org.uk/pages/garden-cities)

4. Sustainability challenges

More than 100 years after the garden cities movement was founded its principles continue to influence the design and development of cities throughout the world. Today, we still face the same primary issues confronted by Ebenezer Howard and his followers: meeting our housing shortage, generating jobs and creating beautiful and inclusive places to live. However, this century, we also have new planetary-scale challenges such as population growth, poverty, biodiversity loss, climate change and the disruption of biogeochemical flows.

4.1 Exceeding planetary boundaries

According to the 2014 Living Planet Report, global wildlife populations have declined by 52% in the last 40 years. Freshwater systems have suffered the most with a 76% decrease in the variety of plant and animal species. This is largely due to over-exploitation of natural resources and destruction of natural habitats from pollution and unsustainable human development practices. In addition to unprecedented biodiversity loss in the biosphere, the average surface temperature of the Earth is increasing at a rate unmatched in modern meteorological history. The year 2014 ranks as Earth's warmest since 1880, according to two separate analyses by NASA and National Oceanic and Atmospheric Administration (NOAA) scientists. The 10 warmest years in the instrumental record, with the exception of 1998, have now occurred since 2000.

The *Living Planet Report* is the world's leading, science-based analysis on the health of our planet and the impact of human activity.

For more information visit wwf.panda.org

Since the start of the industrial revolution in the late 18th century, but especially since the 1950s, gases like carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O) have been emitted in increasing quantities as economic development has advanced. CO2 is derived from burning fossil fuels (such as coal, oil and natural gas) to produce energy for electricity and transport, while CH4 and N2O are released during farming through livestock and the use of fertilizers. These gases are all naturally occurring radiative forcing gases, commonly known as greenhouse gases, which remain in the atmosphere for many years balancing the Earth's incoming and outgoing energy budget. An abnormal excessive concentration of these gases in the atmosphere is understood to be the cause of current global warming and climate change. When elements like carbon and nitrogen, and other manmade chemical substances move

through industrial processes and are released in concentrations greater than the environment can safely absorb, natural ecosystems and cycles become disrupted. Over time, as planetary limits are then reached, life-giving areas of the Earth are permanently destroyed.

Radiative Forcing (RF) is the measurement of the capacity of a gas or other forcing agents to affect that energy balance, thereby contributing to climate change. Put more simply, RF expresses the change in energy in the atmosphere due to GHG emissions.

4.2 Reducing our ecological footprint

It is clear that the demands on nature of modern human development are not sustainable and are increasing. At present, our global population consumes resources at a rate 1.5 times faster than the Earth can provide. This rate of impact, known as our Ecological Footprint, means we are making it more difficult to sustain the needs of future generations. The dual effect of a growing population and high per capita Footprint will multiply the pressure we place on our ecological resources. To live more sustainably means altering our ways of life to protect our natural capital and ecosystem services. This means reducing greenhouse gas emissions, producing our energy from clean renewable resources, conserving natural resources and protecting biodiversity. Food, fresh water and energy security for all present and future generations of people can be achieved if all levels of society work together within the bounds that nature has provided for us. Putting ecosystems at the centre of planning, and carefully managing activities that depend on natural resources, brings economic and social benefits.

> It is by acknowledging the problem and understanding the drivers of decline that we can find the insights and, more importantly, the determination to put things right.
>
> **Living Planet Report 2014**

5. Our commitment

5.1 Making environmental sustainability core to business

Garden Cities NPC is making the principles and practices of environmental sustainability core to the way it does business. This means the company is committed, wherever materially possible, to conserving resources and protecting natural ecosystems throughout its operations.

As the Cape Town metropolitan area grows and the green economy is prioritized in the Western Cape, Garden Cities NPC (RF) is striving to maintain its legacy of social upliftment by continuing to build quality affordable homes and establish communities, and specifically with a lighter ecological footprint. From using tried and tested green-building methods in the design and construction phase of its latest houses to adding finishing touches like custom-fitted waste recycling bins in the kitchens, Garden Cities NPC is determined to play its part in saving resources and minimizing degradation of the planet.

Garden Cities NPC is known for the quality, aesthetics and affordability of its developments and its forward-thinking understanding of society's needs. The establishment of new settlements provides the opportunity and the economies of scale to truly fulfil the ambitions of sustainable development by delivering multiple benefits including: social housing, low carbon energy efficient design, sustainable transport, local food sourcing and the protection of biodiversity and ecosystem services. New communities also offer a powerful prospect to put in place new governance structures that put people at the heart of developing new communities and owning community assets.

5.2 Environmental sustainability policy

At Garden Cities NPC we believe that Earth's natural resources and ecosystem services should be protected and maintained for future human generations, and that the integrity of ecosystems should be maintained through ethical, scientific and economically viable decision-making. To guide our thinking we have written an Environmental Sustainability policy, which states:

- The Earth should be viewed as a system where all elements are interconnected and inter-dependent;
- Respectful care of the environment and its conservation for future generations is everyone's moral obligation, personal responsibility and constitutional right;
- The true value of natural resources, biodiversity and ecosystem services should be accounted for in their use, and any harm to the natural environment should be avoided or minimised; and
- Potential benefits to the environment or human health and safety should always be maximized.

5.3 Green building guidelines

Putting this thinking into practice, Garden Cities NPC constantly evaluates the Sustainability attributes of the planning, design and construction phases of its development projects. We comply strictly with environmental legislation and strive to pursue and exceed industry standards, To assist us we have compiled a comprehensive Green Building guidelines, a living document based on local and international Green Building and Green Development best practice.

The framework guides our development strategy, which aims to:

- Provide diverse, quality, affordable, and healthy places to live, work and play
- Protect, maintain and restore the natural environment by reducing the ecological footprint of our developments
- Demonstrate leadership and commitment to Environmental Sustainability
- Achieve real value for money through demonstrated whole-of-life cost savings; and
- Encourage opportunities for efficiency, innovation and economic development

6. Recommendations for suppliers and contractors

6.1 Water sensitive design

Sustainable water resources management is a priority for Garden Cities NPC (RF). We support building processes that save water and promote natural water cycling and recycling. To help us build sustainably, we encourage our suppliers and contractors to help us build sustainably, we encourage our suppliers and contractors to be water sensitive.

Garden Cities (NPC) RF recommends the following water sensitive criteria and focus areas in the design and construction of its developments.

Criteria	Focus areas
Water efficiency	1. Understand and comply with City of Cape Town bylaws for water and wastewater.
Water wise installations	2. All new fittings and fixtures must comply with SABS/JASWIC requirements and comply with bylaws. 3. Ensure that the optimum pipe size and water pressure is used. 4. Avoid long “dead-leg” runs on hot water systems, which waste both energy and water. 5. Select fittings, fixtures and appliances with WELS certification. 6. Spec low flow shower heads on all showers. 7. Spec tap aerators on all taps. 8. Select low volume, dual-flush toilets. 9. Spec manual flush urinals. 10. Consider rainwater and recycling systems to augment potable water supply. 11. Consider communal laundries and wash bays. 12. Spec swimming pools with blankets and no requirement for backwashing.
Water sub metering	1. Install sub-meters on all substantive water demands, harvesting or recycling schemes and fire systems for communal buildings. 2. Install sub-meters on domestic dwellings for potable, non-potable and domestic hot water.

Alternative water supply	1. Consider rainwater harvesting systems. 2. Install greywater systems. 3. Consider boreholes and well points where relevant.
Alternative sanitation	1. Include reed-bed systems for passive water treatment. 2. Consider alternative sanitation options such as Biolytix systems. 3. Biogas digesters and commercial wastewater treatment plants (for larger buildings) to mitigate both water demand and sewer flows.
Stormwater	1. Mitigate stormwater run-off through permeable paving, swales and detention tanks/ponds. 2. Design surface drainage to slow stormwater run-off. 3. Collect rainwater and stormwater for re-use. 4. Mulch to present evaporation.
Water Wise Landscaping	1. Plant indigenous plants. 2. Create water wise gardens and consider xeriscaping. 3. Avoid large expanses of lawn. 4. Plant appropriate grass species.
Irrigation	1. Use drip or bubbler irrigation to reduce evaporative losses. 2. Install irrigation timers. 3. Use soil moisture monitors to avoid watering when rainfall has met the irrigation needs.

6.2 Sustainable energy

Energy for sustainability is a priority for Garden Cities NPC (RF). We support energy processes that are environmentally friendly, reduce greenhouse gas emissions and utilize renewable resources. To help us build more sustainably, we encourage our suppliers and contractors to be innovative in their use of electricity and fuels.

Garden Cities (NPC) RF recommends the following sustainable energy criteria and focus areas in the design and construction of its developments.

Criteria	Focus areas
Passive solar design	1. Use passive solar design principles. 2. Orientation: orientate rooms to the north for effective summer shading and winter solar access. 3. Orientation: use short E-W facades and longer N-S facades. 4. Reduce solar gain in summer and allow solar access in winter with shading, orientation, glazing ratio, building fabric performance and thermal mass. 5. Create optimally ventilated spaces, using natural ventilation. 6. Provide dual aspect windows to occupied spaces for effective natural ventilation. 7. Shading: use fixed shading devices on windows, deep eaves or awnings to block high angle sun in summer and allow low-angle solar access in winter. 8. Use deciduous trees for seasonal shading or facades and outside spaces. 9. Select appropriate glazing materials and provide suitable fenestration.
Energy efficient materials	1. Select materials that are energy efficient. 2. Select materials with low embodied energy. 3. Combine materials effectively (i.e. reflectivity and insulation) to mitigate solar gain in summer and retain warmth in winter.
Thermal mass	1. Increase thermal mass through design and material selection. 2. Provide and insulate ceilings effectively in houses. 3. Make use of thermal mass to balance heat gains and losses between day and night. 4. Make use of exposed thermal mass to provide radiant heating or cooling to improve occupant comfort. 5. Be mindful of the heat island effect.

Insulation	1. Insulate roof and ceiling constructions. 2. Insulate hot water cylinders and pipework. 3. Insulate walls and windows. 4. Select insulation with high recycled content. 5. Select insulation with zero-ozone depleting potential in manufacture or composition. 6. Check insulation installation with respect to overall compliance with SANS10400: XA and SANS 204.
Tight construction	1. Seal openings properly. 2. Prevent infiltration and leakage of air. 3. Design to prevent draughts.
Electrical appliances	1. Spec energy efficient products. 2. Spec products with an Energy Rating labelling system. 3. Consider non-electrical powered appliances.
Lighting	1. Design buildings with effective natural lighting e.g. a daylight factor of greater than 2% for at least 30% of floor areas as a minimum. 2. Provide daylight, occupancy and dimmer controls to artificial lighting systems. 3. Select CFL lamps instead of incandescent. 4. Select LED lamps for task lighting and some architectural lighting initiatives.
Water heating	1. Install solar hot water heaters. 2. Install gas instantaneous heaters. 3. Install efficient shower heads, taps and appliances. 4. Install insulation in the form of geyser blankets and pipe insulation on hot water cylinders and pipes. 5. Install geyser timers to only provide hot water during times when it is required and check temperature settings
Space heating	1. Consider gas, oil and solid fuel space heaters instead of electrical. 2. Consider energy efficient space heaters such as ECO-heaters. 3. Install timers on all space heating equipment.

Renewable Energy	1. Consider biogas digesters. 2. Consider PV systems.
Energy Sub metering	1. Install energy sub-meters on common property infrastructure. 2. Install home energy monitoring systems.

6.3 Material selection and procurement

Building with sustainable materials is a priority for Garden Cities NPC (RF). We support building processes that are resource efficient, focus on recovery of waste materials and minimize the life cycle impacts of materials on the environment. To help us build more sustainably, we encourage our suppliers and contractors to select materials that have minimal environmental impact.

Garden Cities (NPC) RF recommends the following material selection criteria and focus areas in the design and construction of its developments.

Dematerialisation

Dematerialisation encourages designs that produce a net reduction in the amount of material used, for example exposed structures with no cladding, or reduced finishes such as polished concrete floors.

Low embodied energy

Embodied energy is the energy consumed by all of the processes associated with the production of a material, from the mining and processing of natural resources to manufacturing, transport and product delivery. Materials with low embodied energy (for example mud brick, stabilised earth, air-dried timber, concrete blocks, precast concrete and recycled materials) or materials that have had little processing are preferred. Materials with high-embodied energy can be considered when properties such as strength or longevity are critical.

Local sourcing

Local Sourcing reduces transportation requirements and the embodied energy of a material while also supporting local business.

Eco-rated products

Eco-rated products are considered less harmful to the environment than other products within the same category. They carry independent third-party assessments or recognised certifications backed by laboratory testing and should comply with ISO 14020 series, which deals with environmental labels and declarations.

Recycled content and reused materials

Recycled content and reused materials encourage prolonging of the useful life of existing products and encourages uptake of products with recycled content. Where reasonable, materials that have proven recycled content (such as aluminium, glazing, gypsum, flooring, carpets and roofing materials) should be used.

Concrete with recycled aggregate

The use of concrete encourages the reduction of high embodied energy materials and resource depletion, especially if industrial waste or recycled aggregate is included.

Sustainable timber

Sustainable Timber encourages the use of post consumer recycled timber products or timber sourced from FSC certified sources.

Concrete masonry

Concrete masonry encourages the reduction of embodied energy and resource depletion with a reduction of virgin masonry units. Concrete bricks and blocks with recycled content are desirable.

6.4 Waste minimisation

Garden Cities (NPC) RF recommends the following waste minimisation criteria and focus areas in the design and construction of its developments.

- Use of materials that have resulted in minimal waste during their production;
- Use of materials that will result in minimal waste during the construction, maintenance and demolition of developments;
- Waste management systems that facilitate separating waste at source (for composting, re-use and recycling)
- Installation/design of systems within homes that facilitate the easy separation of household waste into main recyclable categories (glass, metal, plastic and paper) and non-recyclable waste (which goes to landfill);
- Design of layouts that ease servicing by local waste-collection services i.e. a separate recyclable collection and drop-off points or embayments within areas for this purpose;
- Provision of recycling and waste management infrastructure for schools.

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