GTR 82
14/08/2026

Green Thinking REVIEW

Promoting Innovations and Best Practices in Sustainable Building for A Flourishing Future

NATURE-BASED SOLUTIONS

Good Design Works Like Nature.

Nature Never Sleeps.

Floreat Vita | *Let Life Flourish.*

When Nature Becomes Infrastructure.

Cover:

A city may appear to be made of concrete, steel, glass and asphalt. Yet many of the systems that keep it habitable are alive.

Trees intercept sunlight before it reaches streets and buildings. Healthy soils absorb rainfall before it becomes destructive runoff. Wetlands hold excess water, filter pollutants and provide habitat. Mangroves weaken waves and stabilize vulnerable coastlines. Rivers move water through landscapes while sustaining communities and ecosystems.

These are not empty spaces awaiting development. They are functioning systems.

Yet conventional development often treats nature as something to clear, contain or add later. Streams are forced into concrete channels. Wetlands are filled. Trees are removed to widen roads. Soil is sealed beneath hard surfaces. Vegetation then returns as a decorative layer after the major design decisions have already been made.

The consequences appear in hotter neighbourhoods, overwhelmed drainage systems, polluted waterways, eroded coastlines and declining biodiversity. Nature-based solutions begin with a different question:

What work is the natural system already doing—and how can design strengthen it?

This approach does not ask architects and engineers to abandon conventional infrastructure. It asks them to integrate buildings, roads, drainage and public spaces with ecological processes that can absorb, cool, filter, protect and renew.

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Editor's Note:

Dear Green Thinkers,

Nature Never Sleeps

Cities are often designed first and landscaped afterwards. Buildings, roads and drainage systems take priority, while trees, soils, wetlands and waterways are treated as finishing touches.

But nature is never merely decorative.

Trees cool streets, provide shade, hold soil and support life. Wetlands receive floodwater and filter pollutants. Mangroves weaken waves

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Healthy soils absorb rain, nourish vegetation and moderate temperature.

Nature is always working–and it rarely performs only one task at a time.

Nature-based solutions invite us to recognize these living systems as essential parts of the built environment. This does not mean replacing architecture, engineering or technology. It means designing them in ways that strengthen, rather than suppress, the ecological processes already sustaining life.

Good design should do more than place greenery around buildings. It should learn from nature's cycles, relationships, adaptability and quiet efficiency.

In GTR 82, we explore how design can cool, absorb, protect, restore and renew by working with living systems.

Because even when buildings pause and cities sleep, nature continues its work.

Nature Never Sleeps.

Floreat Vita | Let Life Flourish
– The Editorial Team

GTR Reflection

Nature never sleeps. It is always cooling, absorbing, renewing and sustaining life. Good design pays attention—and learns to work the same way.

Good design works like nature when it supports life, strengthens connections and allows places to adapt, recover and flourish.

A concrete drain may move stormwater rapidly away from one location. A restored wetland can hold it temporarily, slow its movement, filter contaminants, recharge the ground and support plant and animal life.

Mechanical cooling can reduce temperatures inside a building. But a coordinated network of shade trees, courtyards, vegetation and permeable surfaces can reduce heat before it reaches the building, making indoor comfort easier to achieve.

A seawall may resist waves at a fixed edge. Mangroves, dunes and coastal vegetation can absorb wave energy, hold sediment and adapt as conditions change.

Nature rarely performs only one task.

That multifunctional intelligence is one of its most important lessons for design. A landscape created to manage rainfall may also provide shade, habitat, recreation and beauty. A green roof may reduce heat gain, slow runoff and support insects and birds. A school courtyard may become a shaded gathering place, a rain garden and an outdoor learning environment.

Good design therefore works through relationships.

Water, soil, vegetation, buildings, climate, infrastructure and human activity cannot be treated as independent layers. Each affects the others. When one is neglected, the wider system becomes more vulnerable.

This is particularly important in rapidly growing African cities, where urban heat, flooding, coastal exposure, infrastructure deficits and pressure on open land frequently converge. Nature-based solutions can offer practical responses, but they are not achieved simply by planting more trees or adding greenery to buildings.

A tree planted without sufficient soil, water or protection may never become cooling infrastructure. A wetland receiving untreated pollution cannot perform effectively. A green roof without maintenance soon becomes a failed installation.

Working with living systems requires observation, ecological knowledge, long-term stewardship and design responsibility.

It asks us to preserve before replacing, restore before constructing substitutes and understand the land before imposing a solution upon it.

Because the most intelligent infrastructure may not always be the largest structure or newest machine.

Sometimes, it is a living system being allowed–and enabled–to do what it does best.

Good design works like nature.

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Innovations & Best Practices:

Nature Never Sleeps:

Seven Nature-Based Systems for Resilient Places

Nature-based solutions are most effective when they are treated as connected systems rather than isolated green features. The following approaches can help buildings, neighbourhoods and cities manage heat, water, biodiversity and climate risk more intelligently.

1. Urban Forests and Shade Networks: Connected trees along streets, schools, markets and public routes reduce radiant heat, improve pedestrian comfort, support biodiversity and create cooler movement corridors across the city.

2. Wetlands and Flood-able Landscapes: Restored wetlands, detention parks and flood-able open spaces hold excess rainwater temporarily, slow runoff, filter pollutants and reduce pressure on conventional drainage infrastructure.

3. Bioswales and Rain Gardens

Shallow planted channels and depressions receive stormwater from roofs, roads and paved areas. They slow, absorb and filter water before it reaches drains or waterways.

4. Green Roofs and Living Walls: Vegetated building surfaces can reduce heat gain, retain rainfall, improve microclimates and provide habitat where ground-level space is limited. Their success depends on appropriate planting, irrigation and maintenance.

5. Mangroves and Coastal Ecosystems. Mangroves, dunes and coastal vegetation absorb wave energy, hold sediment, reduce erosion and support fisheries and biodiversity while strengthening vulnerable shorelines.

6. Permeable Landscapes and Healthy Soils

Permeable paving, planted courtyards and restored soils allow rainwater to infiltrate rather than rush across sealed surfaces. Healthy soils also store carbon, support vegetation and moderate temperature.

7. Green Corridors and Biodiversity Networks

Connected habitats allow plants, insects and animals to move through fragmented urban areas. They can link parks, waterways, streets and neighbourhoods while also supporting walking, cycling and recreation.

Green Thinking Insight

A tree, wetland or rain garden becomes infrastructure when it is deliberately connected to the wider systems of water, movement, climate, habitat and human use.

Good design does not simply add nature. It helps living systems work together.

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Top 5 Action Points

Five Actions for Designing with Living Systems

Nature-based solutions succeed when ecological knowledge is translated into deliberate decisions—from the first site study to long-term maintenance.

1. Understand the Site Before Designing. Map existing trees, soils, water flows, habitats, slopes and seasonal conditions before fixing the building footprint or infrastructure layout. Good design begins by recognizing what the land is already doing.

2. Preserve and Restore Before Replacing: Retain healthy trees, wetlands, waterways and permeable ground wherever possible. Restoring an existing natural system is often more effective than removing it and later attempting to construct an artificial substitute.

3. Design Every Intervention to Perform More Than One Function: A shaded landscape can also manage stormwater, support biodiversity and create social space. A rain garden can filter water, cool its surroundings and enrich the public realm. Nature works through multiple benefits; design should do the same.

4. Connect Buildings to Wider Ecological Systems: Do not treat green roofs, courtyards, trees or bioswales as isolated features. Connect them to drainage, movement routes, habitats, public spaces and neighbourhood-scale green networks so that they reinforce one another.

5. Plan for Stewardship, Maintenance and Adaptation: Living systems require time, care and adjustment. Define who will water, prune, monitor, repair and protect them. Select species and systems suited to local conditions, available skills and realistic maintenance resources.

Resources for Further Study

Tools for Designing with Nature. Learn from living systems. Design for Life

READ 👉 IUCN Global Standard for Nature-based Solutions — Second Edition
A current framework for designing, evaluating and scaling credible nature-based solutions, with attention to ecological integrity, social equity, financial viability and long-term adaptation.

👉 **A Catalogue of Nature-Based Solutions for Urban Resilience — World Bank and GFDRR**
A practical guide to fourteen families of urban nature-based solutions, helping practitioners identify suitable responses to flooding, heat, erosion and other resilience challenges.

EXPLORE 👉 Smart, Sustainable and Resilient Cities: The Power of Nature-Based Solutions — UNEP
Examines how cities can restore ecosystem functions, improve climate resilience and strengthen governance and investment for urban nature.

👉 **Nature-Based Solutions for Climate Resilience — GFDRR Knowledge Hub**
A growing collection of guidance on planning, financing, assessing and implementing nature-based infrastructure.

Green Thinkers' Takeaway

Nature-based solutions are not completed when construction ends. Their value grows as living systems establish, adapt and mature.

Design the intervention. Protect the relationships. Sustain the life within it.

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Case Study Snippet

Mozambique: Beira's Chiveve River - When the River Resumed Its Work

Multifunctional park with pedestrian route, to the left is the Chiveve River, Image Credit: www.elastudio.co.za

Beira, Mozambique, is highly exposed to flooding and coastal climate risks. Running through its port, business district and low-income neighbourhoods, the 3.5-kilometre Chiveve River had become disconnected from its natural tidal flow, choked by waste and stripped of much of the mangrove and native vegetation that once helped regulate water.

Instead of treating the river only as a drainage channel, the city adopted a hybrid green–grey response. The tidal basin was widened, a controllable tidal outlet was constructed and conventional drainage infrastructure was improved. Alongside these engineered measures, communities helped restore mangroves, clear the river and rehabilitate native vegetation.

The intervention also created a 17-hectare multifunctional park with pedestrian routes, community spaces, kiosks, a market and event areas. The restored river landscape now retains stormwater, supports natural drainage, provides public space and creates livelihood opportunities. It is estimated to improve flood protection for about 50,000 people.

The Chiveve project demonstrates that nature-based solutions are not alternatives to engineering. Their greatest value often emerges when ecological processes and constructed infrastructure are designed as one system.

The river did not need to become something entirely new. It needed its flow, vegetation and capacity to hold water restored.

By repairing those relationships, Beira allowed the Chiveve to resume the work it had always been capable of doing.

Green Thinking Insights

The Intelligence of Living Systems

Nature does not work through isolated parts. It works through relationships.

Water moves through soil, roots and wetlands. Trees shape shade, air movement and habitat. Mangroves hold sediment while protecting shorelines and supporting fisheries. Healthy ecosystems depend on diversity, interdependence and continuous renewal.

This offers several lessons for design.

Green Thinking Tip

Good design did not replace the river's natural function. It restored the conditions that allowed the river to perform it.

Good design should perform more than one function. It should adapt as conditions change. It should strengthen the systems around it rather than transfer problems elsewhere. It should also recognise that resilience is rarely created by one element acting alone.

Nature-based solutions are therefore not simply about adding vegetation. They are about restoring connections between water, soil, climate, biodiversity, infrastructure and human life.

The deeper intelligence of nature lies not only in what each part does, but in how the parts support one another. Good design works like nature when every element contributes to the flourishing of the whole.

Nature Never Sleeps

Outside the Box

2040: When the City Worked Like Nature

By 2040, cities were no longer designed as machines standing apart from the landscapes beneath them.

They had learned to behave more like living systems.

Rain no longer rushed immediately from roofs and roads into overloaded drains. It moved through planted courtyards, permeable streets, rain gardens, wetlands and restored waterways—slowed, filtered and returned gradually to the ground.

Trees were no longer planted as isolated ornaments. They formed connected shade networks linking homes, schools, markets, workplaces and public transport. Walking through the city became cooler, safer and more comfortable.

Buildings also changed.

Roofs stored water, supported vegetation and reduced heat. Walls shaded themselves. Courtyards directed breezes and provided habitat. Development responded to soil, slope, sunlight and seasonal water flows rather than erasing them.

Coastal settlements strengthened mangroves and dunes alongside carefully designed protective structures. Flood-prone land became parks, farms and public landscapes capable of receiving water during storms and returning to everyday use afterwards.

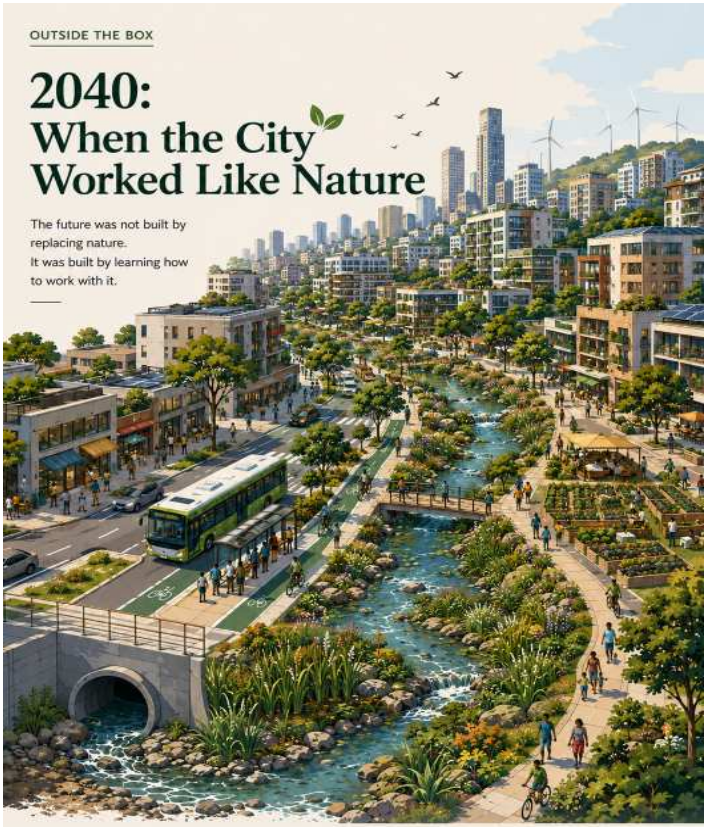
The city had not abandoned engineering or technology. It had learned to govern them with ecological intelligence.

Each intervention performed several tasks. Every system supported another. Waste from one process became nourishment for the next. Infrastructure protected life while also creating beauty, belonging and opportunity.

The transformation began when planners stopped asking how much nature development could accommodate and started asking:

How could development become part of the living systems that already sustain this place?

By 2040, the city was not merely greener. It was cooler, more absorbent, more adaptive and more alive. It had finally learned that resilience does not come from controlling nature completely. It comes from learning how to work as nature works.



A Question for Today:

What would your city do differently if it were designed to behave like a living system?

GTR Closing Reflection:

Good design works like nature when it strengthens the relationships that allow life to flourish.
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The Living City

A flourishing city does not silence its natural systems. It designs as part of them—allowing water to move, trees to cool, soils to absorb, habitats to connect and life to renew.

Good Design
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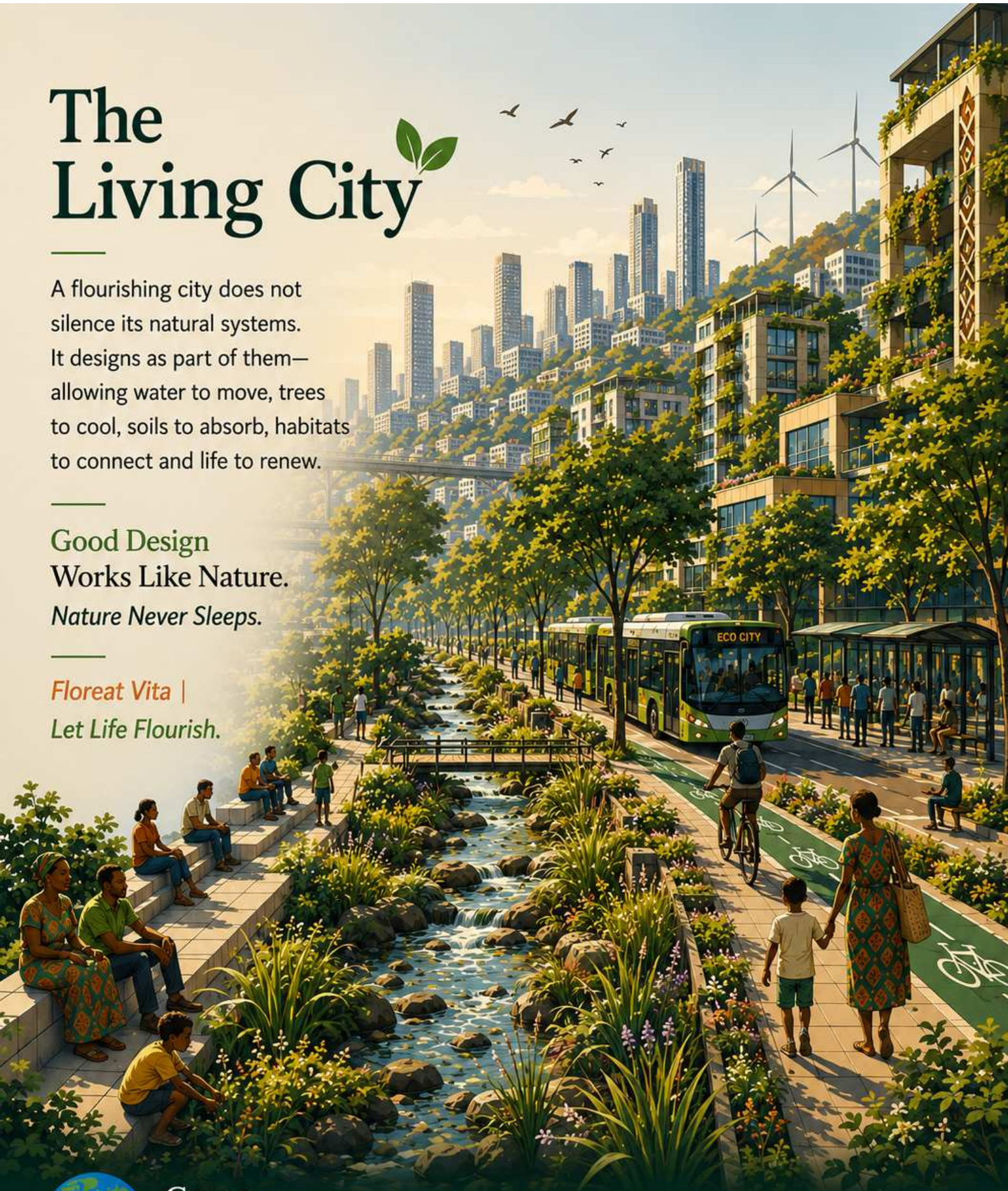

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Editor-in-Chief:
Arc. Denis Uche Akabogu, FNIA, FIMC

Published by:
Green Thinking Review (GTR)

Powered by:
SheltaGroup Ltd.

Correspondence:
info.greenthinking@sheltagroup.com

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