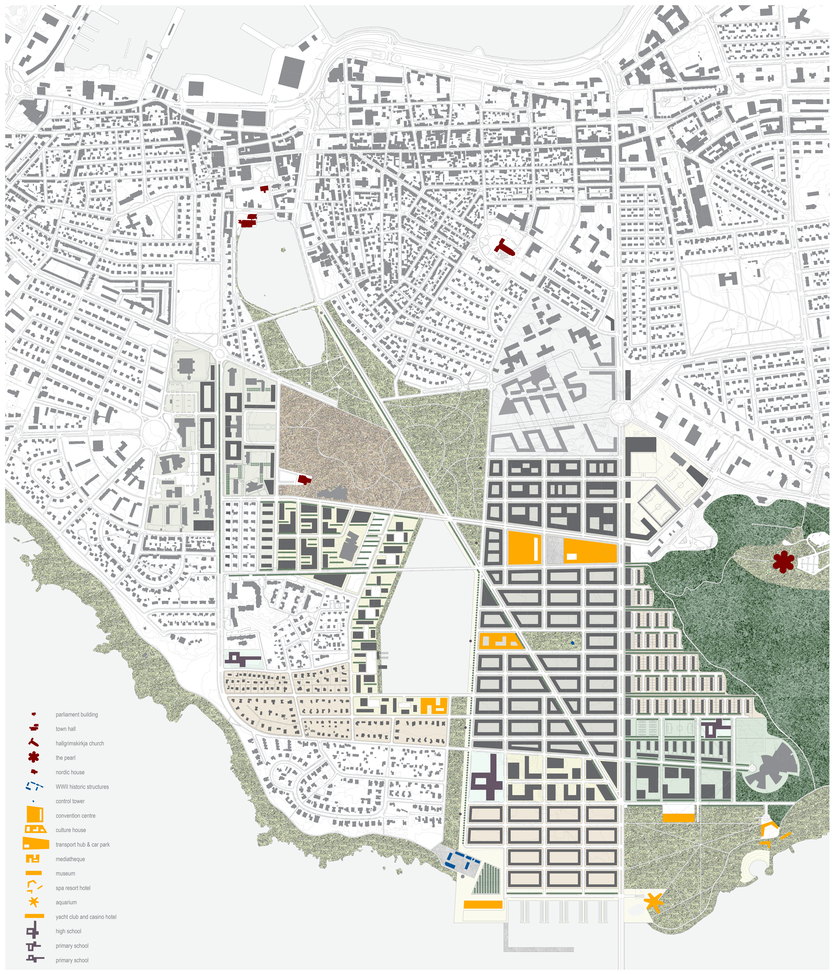


RECIPROCITY
the shaping of a capital city

The city of Reykjavik is flourishing. A strong economy combined with the vibrancy associated with the city leads to an influx of new workers. However, the low density of current urban expansion is unsustainable - economically, socially and environmentally - while pressure to develop the heart of the city raises the prospect of dramatically changing the face of the city's most recognisable and characterful area. Informed by the intertwined relationships of urban fabric, lake, waterfront, hill and landmark, 101 is the global face of the city; however, the redevelopment of Vatnsmyri can further enhance the reputation and identity of Reykjavik as an international destination, attractive to residents, business and tourism.

To succeed it must be based on a framework which integrates with the existing infrastructure and built fabric, is wholly sustainable, removes development pressure from 101 and enhances the global reputation of the city.

We propose a solution which draws from 101 a reciprocal relationship between urban fabric, lake, waterfront, hill and landmark, creating a new district which is at once both recognisable and distinct: urban in character but intrinsically linked to the landscape.

Connections

Airport Relocation

The premise of our proposals involves the relocation of the domestic airport. Both currently studied options for its relocation can be readily integrated.

Local Alternative:
The flexibility of the road network can accommodate a link between a new local airport and the city centre, with regular bus services departing from the transport hub. Keflavik:
A high-speed rail link can connect the existing international airport at Keflavik to the centrally located transport interchange at Vatnsmyri.

Connections to Neighbouring Districts

The central location of Vatnsmyri within Reykjavik is a positive attribute; however for the redevelopment of the area to succeed it must be fully connected and integrated with the surrounding areas. As well as infrastructural connections, social and cultural links must also be established.

Perhaps most importantly the proposals for Vatnsmyri must successfully integrate with, and complement, the existing heart of the city - 101. In forming a dialogue with 101 a new city identity can be developed based on the duality of old and new.

Tracing History

Although the project anticipates the relocation of the existing domestic airport, a number of structures will be retained as a connection with the history of the site.

The WWII structures on the south coast will be retained and refurbished, while similarly the original Airport Control Tower will be retained as an artifact in a new central garden, and could be rehabilitated for public use as a cafe. The alignment of the existing runways are replicated in the street network, determining both the main grid system and the principal diagonal connection between Vatnsmyri and 101.

Neighbourhood Integration

Although the central grid is dense and urban, towards the western periphery in particular, the system adapts and merges back into the fabric of the existing city, accommodating a mix of typologies in response to adjacent and anticipated uses. The inclusive nature of the plan readily accommodates diverse development, with neighbourhoods of distinct character.

Landscape, in the form of parks and lakes, is used as a mediating device, ensuring that conflicting building scales and uses are adequately separated.

Visual Links

Integral to the proposal is the retention of views to existing landmarks, such as The Pearl on Oskjuhlid Hill, Hallgrimskirkja Church, and to City Hall and the administrative heart of Reykjavik.

The particular spatial qualities of the Urban Plan frames distant and local views to these landmarks, and as such facilitates easy orientation within the new district.

In retaining and framing such views the project knits itself into the fabric and atmosphere of Reykjavik.

Knowledge Axis

The proposed knowledge axis between the University of Iceland, the Science Park and the Hospital is formed around a landscape setting. Good pedestrian and public transport routes facilitate the links between these nodes.

An offshoot of this principal axis is further extended to link through the transport hub and convention centre to Reykjavik University.

Transport

Integrated Traffic Management

For the new proposals to be successful movement through, in and around Vatnsmyri must be diverse in nature, accommodating car, bus, cycle or foot. Safe, legible, and easily navigable routes must accommodate opportunities to pursue each form of movement.

To achieve this an integrated approach is essential which views all means of transport as equal, and in doing so does not prioritise the car.

Road Network

The main elements of infrastructure align with the existing runways and connect into the present principal road network. The new transport hub is located centrally with good connections to this principal network. New Hringbraut is tunnelled under the central park, establishing free movement from 101 to Vatnsmyri.

The secondary street network organises the new development into a central grid formation and all the edges connects back into the existing street layout. The streets are scaled to retain a balance between vehicles and pedestrians.

Car Parking

The car parking strategy is diverse in the nature of its provision, but in all cases is based on the premise that parking should be locally provided within each development block ensuring easy access is maintained throughout the site. This is particularly important during periods of inclement weather.

In the central area, on-street parking is complemented by basement parking within the urban blocks, while the transport hub contains five levels of raised parking above a bus station. Further out from the centre the need for basement parking diminishes.

Public Transport

The transport hub forms the focus of an extended public transport network, principally utilising buses. The centrally located hub includes a terminus building and refuelling depot for hydrogen buses. The permeable nature of the road system allows for easy integration of public transport, however a loop route connecting Vatnsmyri with other key areas is essential.

Potentially, a high-speed rail link directly connecting the centre with Keflavik Airport can be accommodated under the transport hub and can connect to the terminus building.

Cycle Lanes

Clear systems of dedicated cycleways are proposed, linking Vatnsmyri with neighbouring areas, therefore encouraging both a healthier and more environmentally friendly lifestyle. The landscaping strategy allows a car-free, safe environment for cyclists stretching from 101 to the south coast.

Principal vehicular routes will also be designed to accommodate necessary dedicated cycleways providing safe routes into and through the more urban areas.

Pedestrian Links

The landscaping strategy embraces pedestrian movement in and around Vatnsmyri, as well as connecting back to 101, and encourages walking and outdoor recreation as part of a healthy lifestyle.

Within the more urban context, broad and expansive pavements provide a safe environment for pedestrians, while colonnaded arcades provide shelter from the weather.

Landscape and Ecology

The landscape plays a vital role in the organisation and cohesion of the newly enlarged city centre. It is a unifying element linking old and new, natural and man-made. In essence it is an extension of the existing park, though as it extends, its diversity will reflect its changing context. The sensitive wetlands are retained and extended, preserving and enhancing their ecology.

A board-walk for pedestrians and cyclists extends from 101, past the new lakes to the southern waterfront. Running adjacent is a tree-lined boulevard along the route of a former runway.

At the southern waterfront the landscape responds to its coastal context through the creation of a major new park area - South Park. Within the park there is the potential to locate public amenities such as an aquarium, spa hotel and resort, and a museum. Bordering the park is the wooded slope of Oskjuhlid Hill.

This evolving and diverse landscape serves as a device to wrap, support, and structure the subsequent developments within the masterplan.

Green Axis connecting old and new

1. Hljomskalagardur Park and the Lake

Hljomskalagardur Park and the lake is an integral element of central Reykjavik and a key component of the city's identity. The park takes a traditional form and accommodates a diversity of flora. Similarly the lake provides an important habitat for wildlife. It is from the existing park that the new landscaping strategy begins. A simple tree-lined walkway progresses southwards to adaptively embrace diverse ecologies and the built environment.

2. Extension to Hljomskalagardur Park

The expansion of the parkland surrounding the lake extends, retains and protects those qualities that make Hljomskalagardur Park distinctive and important to the city of Reykjavik as an ecologically secure natural environment. The extension of the park builds on the character of the existing park and accommodates space for recreational outdoor pursuits, while similarly extending natural habitats.

3. Wetlands & Bird Sanctuary

This important and fragile ecosystem is extended and protected, easing habitat pressure on migratory bird species such as the Pinkfooted and Greylag geese and the Common Scoter duck. It encourages the growth of wetland flora, rare lichens, mosses and vascular plants. The connecting boardwalk creates a responsible access to such a rich bio-diversity, allowing appreciation and study. Here the atmosphere is quiet and tranquil, a place of retreat for nature and the population of Reykjavik.

4. Vatnsmyri Lakes

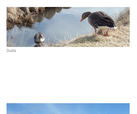
The double lakes of Vatnsmyri are a lively social space. Here the landscaping expands to accommodate a large open waterscape for recreation, bordered by the continuation of the wide boardwalk. The double lakes also form part of a Sustainable Urban Drainage Strategy for the Vatnsmyri area, performing a role as attenuation pools for water run-off, reducing risk of flooding. The lakes will attract birdlife and further expand and enhance the ecological variety of the area.

5. Central Gardens

The Central Gardens are formed by the omission of a single block from the urban grid system, and will provide a valuable amenity space in the centre of the new district. The gardens are planted with native tree species such as Birch, Willow and Rowan, along with similarly native flower, shrub and heather species, endowing the space with a strong local quality. The cultivated gardens will provide a strong contrast with the natural qualities of Oskjuhlid Hill which is visible from within the space.

Grass Verge

Reed



Swans

Geese

Dwarf Willow

6. Linear Park

A large open space evocative of the Icelandic landscape will work with composite and varied landscaping to mediate between the larger urban blocks of Vatnsmyri and the low-rise single dwellings to the west. The park will sustain mosses and native grasses on tundra meadow and volcanic rockscape, and will create a vital breathing space for a diverse ecology of plants, insects, small birds and animals to thrive.

7. Coastal Path

The boardwalk continues its path south to the Skerjafjordur coast where once again the ecology changes. An existing path borders grasslands providing good nesting sites for some saltwater wading birds. Species such as Oystercatchers benefit from the rich mudflats. Gulls and related seabirds are also common. The coastal path establishes a continuation of the pedestrian and cyclist network offering recreational opportunities.

8. Waterfront

The marina and yacht club take advantage of a southerly aspect, scenic views, and ready access to the sea for boating and sport. It is backed by a tree lined promenade and serviced with a variety of shops, bars and restaurants. The land of the Waterfront is partly reclaimed - formed by responsibly depositing the treated and decontaminated excavations of Vatnsmyri's lakes, demonstrating a commitment to conscientiously engage with the environment.

9. South Park

Located at the foot of Oskjuhlid Hill, bordering the campus of Reykjavik University and adjacent to the Waterfront, the South Park is a large, easily accessible amenity space. It allows for a variety of activities and sports - the landscape changing to suit different activities sited on its grounds. The park is also populated with a diverse range of public buildings: aquarium, museum and a spa hotel, which expands on the facilities at Nautholsvik thermal beach.

Mist

Grasses

Autumn Colour

Winter

Sustainability

The urban plan has been designed to minimise the impacts of building on the environment. It is understood that Iceland is at the forefront of renewable energy research with the aim of becoming an energy-independent country and that great steps have already been taken towards this goal. Mindful of this the proposals for Vatnsmyri aim to take advantage of, and build upon, the continually developing infrastructure that exists in Reykjavik. Furthermore a broad range of initiatives, both urbanistic and infrastructural in nature, are integral to the framework. These initiatives are aimed at reducing the area's resource consumption and help contribute to the provision of energy from renewable sources which, when implemented in tandem with further building-specific measures, will offer a range of environmental and economic benefits.

Make Use of Existing

Renewable energy has supplied over 70% of Iceland's primary energy supply for almost a decade, proportionally more than any other country. This is possible largely due to geothermal energy sources that have been harnessed to almost meet the entirety of Iceland's heating requirements. The proposals for Vatnsmyri assume heating to be principally derived from geothermal energy sources and provided as a large scale community energy system by Orkuveita Reykjavikur. The plan includes a series of small heat generation facilities to supply local community energy to districts. These will also represent a visual symbol of the renewable energy production on site.

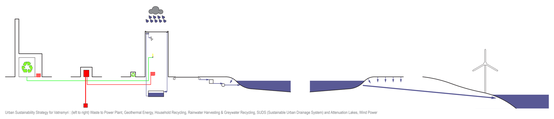
Icelandic geothermal energy

Hellisheidi power plant

Minimise Demand

Although Iceland is exemplary in its use of renewable energy sources, to avoid increasing the reliance on non-renewable resources to meet the inevitable increase in demand caused by expansion of the city a key strategy is the minimising of energy demand. Although this strategy will have most impact at the stage of design of individual buildings, the urban plan provides guidelines on floorplate depth to help ensure good levels of daylighting and the provision of natural ventilation.

Water is also treated as a valuable resource, with grey water being recycled where possible and rainwater collected for use, or attenuated through naturalistic features such as green-roofs, permeable paving and surface stores that form parts of the new landscape.



Urban Sustainability Strategy for Vatnsmyri: (left to right) Waste to Power Plant, Geothermal Energy, Household Recycling, Rainwater Harvesting & Greywater Recycling, SUDS (Sustainable Urban Drainage System) and Alternative Lakes, Wind Power

Contribute to Supply

The plan also offers the opportunity to contribute to the energy mix by meeting some of the demand through the provision of electricity generated by both wind turbines and energy from waste.

Energy from waste is the thermal treatment by incineration of municipal, clinical and some industrial solid waste under controlled conditions, recovering renewable energy in the form of electricity. This process, which could be undertaken at a small local plant thus limiting the distance waste is transported (and relieving the pressures on landfill sites), could provide an effective method of dealing with waste that can't be recycled as part of the extended public waste recycling initiative.

Wide Ranging Benefits

The benefits associated with building in accordance with the sustainable development strategy for Vatnsmyri, broadly speaking, fall into three categories: environmental, social, and economic.

Environmentally: the adoption of basic strategies will contribute to the landscape and may help improve the ecological diversity of the area. Socially: the occupants of the buildings will enjoy improved working or living conditions and better indoor air quality that is associated with improved public and occupant health. Economically: there are likely to be reduced operating costs as a result of using less energy and water, as well as increased productivity.

Meeting Targets

By establishing these simple basic principles as fundamental components of the urban plan for Vatnsmyri together with sustainable urban transport plans it should be possible to ensure that the new urban fabric works towards Iceland's Ministry for the Environment's target of achieving a 50-75% reduction of net emissions of greenhouse gases by 2050.

Furthermore, the additional established environmental, social and economic benefits of adopting these sustainable design principles should help contribute to the success of Reykjavik both nationally and internationally.

Diversity

Table of Floor Areas

Residences	451 300m²
Offices	360 100m²
Public / Cultural	39 950m²
Research	147 400m²
Retail / Commercial	220 900m²
Education	67 800m²
Transport	13 000m²
Total Floor Area (a)	1 370 100m²
Total Site Area within Calculation Boundary (b)	1 606 600m²
Urban Density (a/b)	0.85

Land Use Breakdown

Building Lots	701 160m²	43.6%
Public / Green Space	502 860m²	31.3%
Streets & Public Parking	402 980m²	25.1%
Total Site Area within Calculation Boundary	1 606 600m²	100%

Scale and Density

The urban plan is characterised by a dense and diverse urban core, defined by perimeter blocks of varying heights and of multiple uses, similar in scale to those found in Reykjavik 101. It will yield an overall density ratio of 0.85 built floor area / total land area offering a sustainable alternative to the low density suburban growth that characterises Reykjavik's recent expansion. The urban quality of the busy centre is determined by a consistent base level of four stories for all perimeter blocks, with the opportunity to build taller. Towards the periphery of the urban plan the scale and density is modified and merges backs into the adjacent neighbourhoods.

Mixed Use

The structure of perimeter blocks within a responsive grid is zoned to accommodate the needs of individual stakeholders. It has the flexibility to react to local conditions ensuring a sustainable and prosperous urban growth.

A mixed-use development will accommodate commercial and public facilities at ground level, with offices and residential above. This diverse core will provide a focus for the Vatnsmyri community producing a busy urban environment ensuring safe and active streetscapes by generating activity throughout the day and evening.

Economic Flexibility

As each subsequent phase of the masterplan is implemented, the proportion of different programmes can be varied to relate to emerging local demand and economic forces. The nature of large urban blocks allows the flexibility and adaptability to respond to a changing financial and construction environment. Plot sizes within blocks can be varied and sub-divided to accommodate the needs of various stakeholders. Proceeding phases of development will make available appropriate amounts of amenity and public function space to meet the needs of the prospering area.

Distinct Communities

The initial implementation of the central landscaping elements will strongly influence the defining character of each individual district as the built form responds to the natural geology of Reykjavik and the differing ecologies nurtured by the landscape. The majority of stakeholders can build at their own pace and the independent nature of each neighbourhood allows for flexibility in the sequence of construction. Each district will begin to develop its own individual atmosphere based on scale and the prevalent typology, material responses and size of openings influenced by environment and purpose.

Social Inclusivity

The inclusive nature of the plan accommodates a dense and diverse development. The urban form of perimeter blocks allows for a comprehensive variation in tenure, catering for a broad spectrum of financial incomes through owned and rented housing. The blocks' mixed core generates opportunities in trade and industry, from small independent businesses to large corporations. The landscape structure integrates built fabric with natural environment, embracing each neighbourhood as a resource for the whole city and creating easy access to parks and recreation areas. All inhabitants can enjoy a mix of live, work and play in the Vatnsmyri area.

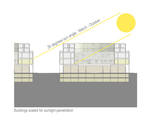
Lighting

The effect of light in northerly latitudes such as that of Reykjavik has a profound impact on the quality of the life for inhabitants. The cycle of daylighting is extreme, with daylight throughout the night from May to August, but only 4-5 hours daylight at the winter solstice. At the same time these northerly latitudes are also witness to the natural light spectacle of the Aurora Borealis.

We propose lighting solutions which are appropriate to a city at this latitude: ensuring adequate daylighting when possible, and utilising innovative, low-energy artificial lighting techniques to create a vibrant city atmosphere.

Urban blocks are scaled to provide maximum levels of daylighting. Typically, city centre blocks are designed with 4/5 storeys, while the scale of building diminishes as the plan extends outwards.

In the mixed-use city centre, lighting is designed to provide relief during the long winter days, and to complement the Winter Lights Festival to which Reykjavik plays host. This encompasses three main strategies:
- key urban spaces, such as the lakefront and central gardens, are picked out in coloured light
- key public buildings are floodlit in a complementary colour
- colonnades are highlighted in a bright white light



Buildings scaled for sunlight penetration

Coloured lighting in city centre

Illuminated colonnades within city centre

Aurora Borealis

Phasing

Phase 1

Phase 1 consists of the area of site currently outside the boundaries of the existing domestic airport, and as such is available for development immediately. It will provide additional accommodation for the University and a new business park.

Phase 2

Phase 2 will see the undertaking of preparatory work for the future phases of development. This will include the demolition of existing structures, and the decontamination of the soil and ground make-up.

Phase 3

Phase 3 establishes key landscape infrastructures to provide a natural connection to the existing city centre. New building is dispersed and will include the northern commercial district and transport hub, detached housing to the west and potentially Reykjavik University.

Phase 4

Phase 4 will see the undertaking of the major building works around the new lakes, forming a new mixed-use core to Vatnsmyri and research units associated with the University. At this stage the project develops a strong mix of uses: commercial, education, residential, leisure.

Phase 5

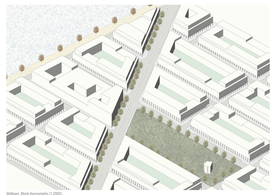
Phase 5 wraps a further layer of accommodation around the mixed-use core. On the bottom reaches of Oskjuhlid Hill, strips of terraced housing follow the contours of the land, while to the south Reykjavik University expands along with associated research facilities.

Phase 6

The final stages in the redevelopment will see the construction of a new high density residential district on the waterfront. Significant leisure and cultural facilities, as well as a potential bridge link to Kopavogur, complete the project.

Responsive Grid

Midtown Area



Midtown, Block Axonometric (1:2000)

The Midtown is arranged as a responsive grid structure. In addition to the retention of key city-wide views to landmarks such as Hallgrimskirkja Church and the Pearl, the grid also traces the alignment of the two principal runways of the existing airport and connects into the existing road network.

Perimeter blocks define the street and so prioritise urban space over architectural object. To achieve an appropriately vibrant urban environment, mixed-use developments will be promoted with on-street and underground parking. Commercial space, cultural and leisure facilities will be provided at ground level, with offices and residential above. A central urban garden acts as a focus for the new developments.

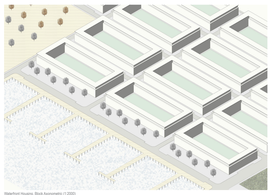
In response to the harsh climatic conditions, colonnades around all central blocks provide continuous cover for pedestrians.

Materially, the Midtown area should be robust and urban; concrete, render, metals, ceramics and glass. Public buildings should be characterised by the use of high quality materials such as basalt and fine concrete.

Colonnade colonnades provide cover

Waterfront Living

Waterfront District



Waterfront Housing, Block Axonometric (1:2000)

The Waterfront neighbourhood takes advantage of the southerly aspect, scenic views and ready access to the coastline in providing both a significant residential element and a new park with cultural amenities.

The infrastructure is formed by a continuation of the Midtown grid and terminates at a quayside with public facilities including marina, boathouse and casino hotel, as well as street level activities below the apartment buildings.

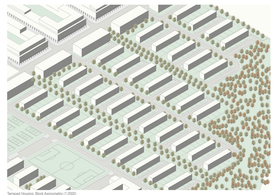
As a linking device, the proposals unite the southern coastline, tying together new and existing structures through a carefully considered sequence of landscaping and public spaces.

The waterfront area should make use of robust, tactile materials to define its character; render, ceramics and timber.

Apartments with views over water to Kopavogur

Hillside Terraces

Oskjuhlid Terraces



Terraced Housing, Block Axonometric (1:2000)

The proposals for this area respond to the natural beauty of Oskjuhlid Hill. Each street will be lined with coniferous trees, extending the natural attributes of the wooded hill into the neighbourhood below.

The street network which organises the area is an extrapolation of the Midtown grid. Traffic feeder roads give way to short cul-de-sacs, lined with low-rise terraced housing, with private gardens to the rear and off-road parking. Alternating between tree-lined pedestrian and vehicular routes, easy access to outdoor pursuits on the hill is achieved.

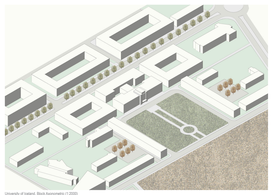
This terraced development will draw on the geology and ecology of Oskjuhlid to define its character, affording the neighbourhood a natural and arboreous quality.

This residential neighbourhood should develop a character based on the natural tones of the adjacent landscape; brick and timber.

Oskjuhlid Terraces, Low-rise residential development

Urban Thinking

University of Iceland



University of Iceland, Block Axonometric (1:2000)

The proposals for the University of Iceland's campus centralises facilities around the main building and a newly defined quadrangle. Additionally, an increase in building density and the rehabilitation of Suðurgata as a tree-lined boulevard unifies the east and west sides of the campus, while the new Students Union block forms a southern gateway to the university.

The new proximity of faculty buildings will encourage the sharing of knowledge across disciplines, greatly enriching the experience of learning, and create a defined sense of place.

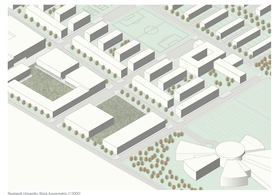
New buildings and planting clarifies the hierarchical arrangement of public space and creates sheltered external courtyards suitable for recreation or car parking.

The University of Iceland should be defined by a character that is progressive, utilising materials which both contrast and complement the existing structures; roughcast, quartz, glass and steel.

University of Iceland, Suðurgata Street

Natural Campus

Reykjavik University



Reykjavik University, Block Axonometric (1:2000)

Located at a prominent corner of the urban masterplan, Reykjavik University is placed to benefit from excellent links within the City's knowledge community, and enjoys proximity to a new vibrant city district.

The campus is organised around a university square, a sheltered public space forming the hub of student and academic life. University departments are densely sited on campus with views of, and easy access to, the South Park and Oskjuhlid Hill. A new school is planned to share the campus grounds and recreational facilities.

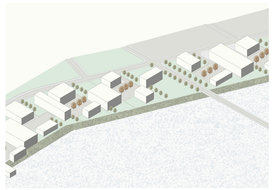
As Reykjavik University matures, its culture of learning and education will profit greatly from a centralised and dense campus, encouraging an inter-disciplinary sharing of knowledge, and a prominent sense of identity in the expanding city.

Reykjavik University should build on the material qualities of the proposed main building, to create a campus which is both closely linked to its natural surroundings yet also forward thinking; metals, timber and glass.

Reykjavik University, Tree-lined Avenues

Research Clusters

Science Park



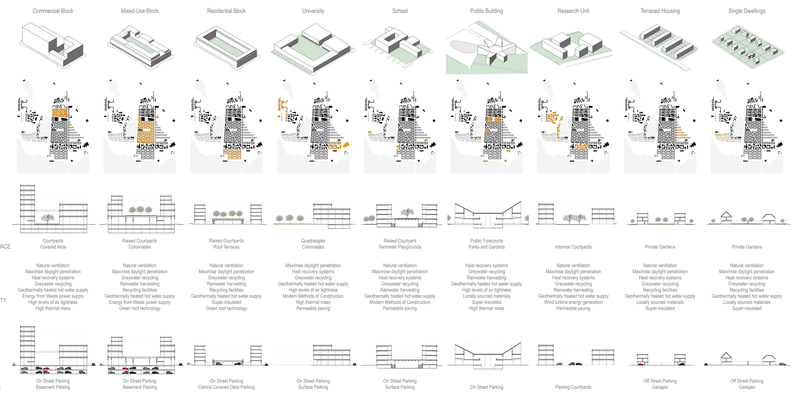
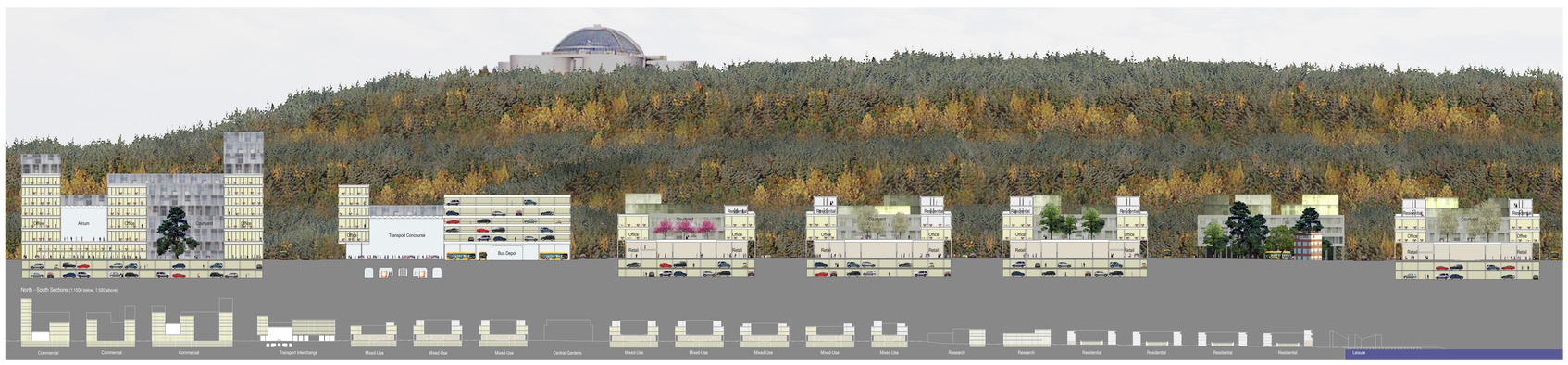
Science Park, Block Axonometric (1:2000)

The Science Park is adjacent to the University of Iceland and near to the hospital, maximising mutual benefits within the Knowledge Axis.

The planned infrastructure forms excellent physical connections to 101 and the Midtown neighbourhood of Vatnsmyri, facilitating commuting and business links appropriate for the development of a hub for Iceland's knowledge economy.

The ethos of the Science Park's development centres on the creation of research clusters that define informal courtyards. This arrangement creates a visual permeability offering oblique views to the wider area and also allows for the development of independent buildings that can vary in scale and respond directly to the needs of the individual occupiers.

The Science Park should be seen as being at the forefront of materials research, creating an atmosphere which is pioneering and challenging; metals, plastics, composites, fibres and glass.

Courtyard with views to lake and The Pearl

TYPOLOGY / LOCATIONS / EXTERNAL SPACE / SUSTAINABILITY STRATEGIES / CAR PARKING