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Urridaholt neighbourhood Iceland - Sustainable drainage solutions interwoven in the urban pattern - a cooperative approach

Le quartier 'Urridaholt' en Islande - Solutions durables pour la gestion des eaux pluviales dans le tissu urbain - une approche collaborative

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RÉSUMÉ

Urridaholt est une nouvelle communauté de 100 ha dans la ville de Gardabaer, en Islande. Elle est située sur une colline surplombant un lac sauvage, et entourée de zones humides et de prairies. Elle est à l'avant-garde du développement durable pour deux raisons majeures. En premier lieu, la mise en place d'un système d'assainissement urbain durable (SUDS) pour protéger le lac et les zones humides environnantes. En second lieu, c'est le premier programme en Islande qui ait reçu la certification environnementale de l'association BREEAM.

Le programme Urridaholt a été mis au point en étroite collaboration entre les dirigeants politiques et les professionnels dans des spécialités diverses, avec la participation de la communauté, et met l'accent sur la qualité de vie et la durabilité. Il représente un exemple en matière de coopération interdisciplinaire. Urridaholt est considéré comme étant le premier projet SUDS de cette ampleur dans le monde et la première mise en œuvre de ce type à grande échelle en Islande, où des méthodes traditionnelles ont dû être adaptées à la pente escarpée de la colline et au climat islandais. Des mesures importantes ont été prises à Urridaholt pour adapter les principes d'assainissement durable et la méthode BREEAM aux conditions présentes en Islande. Urridaholt a reçu des éloges pour la manière dont la durabilité est intégrée dans le développement. Il sert déjà de laboratoire international pour les chercheurs et les dirigeants.

ABSTRACT

Urridaholt is a new 100 ha. community in the town of Gardabaer, Iceland. Located on a hillside, with a pristine lake below the hill, surrounded by wetlands and meadows. It is pioneering as a sustainable development in two important ways. First is the implementation of sustainable urban drainage system (SUDS) to protect the lake and its wetlands. Secondly, it is the first masterplan in Iceland to be certified by the internationally acclaimed BREEAM Communities assessment method.

The Urridaholt master plan was developed in close cooperation between political leaders and professionals from many fields with community participation, emphasizing quality of life and sustainability. It sets an example for interdisciplinary cooperation. Urridaholt is believed to be the first SUDS project of this scale worldwide and the first large scale implementation in Iceland where established methods had to be adapted to the steep hillside and the Icelandic climate. Key steps have been taken in Urridaholt to adapt SUDS and BREEAM to Icelandic conditions. Urridaholt has received acclaim for the way sustainability is integrated into the development. It already serves as an international laboratory for scholars and leaders.

KEYWORDS

Urridaholt, Iceland, neighbourhood

1 PROJECT OVERVIEW

The Urridaholt project is a new neighborhood in the town of Gardabaer, located on the outskirts of the Reykjavik capital area in Iceland. The neighborhood is still under construction, but 7-9000 people will be living and working there when fully built. Its development is based on a masterplan with a strong vision to create a compact and diverse mixed-use neighborhood, focusing on sustainable solutions and quality of life issues in close contact with the surrounding natural environment.

Urridaholt is located on a hill with a pristine, shallow lake below and diverse wetlands and meadows. The lake and its nearest surrounding is protected as an environmental exclusion zone.

The masterplan includes around 1600 residential units, 90.000 m² of office and retail space, an elementary school and kindergartens and up to 65.000 m² of civic uses. The hilltop itself provides a natural focal point for the development with a central square. It includes housing units and space for office and retail units as well as a cultural center.

A sustainable drainage system (SUDS) has been fully integrated in the masterplan to ensure that the water level of the lake will not drop. The SUDS also plays an important part in creating dynamic landscaping in green areas within the neighborhood. This is the first time that a large-scale sustainable drainage system (SUDS) is implemented in Iceland. This is also the first

masterplan in Iceland to be certified by the internationally acclaimed BREEAM Communities assessment method (Interim Assessment - Step 1). A site plan will receive the full BREEAM Communities certification shortly.



2 ICELANDIC CONTEXT

In Iceland, availability of land is generally not a development constraint, and this has led to urban sprawl. Driving out from the intimate central core of Reykjavik, the European model of compact urban form soon gives way to a North-American scenario with large, low-density, residential suburbs. Here, people are pushed apart, distances become too great for walking, pavements disappear, and bus routes become unviable. Everything has become designed around the car. The Urridaholt masterplan has presented an opportunity to reverse this trend. The new development will recall the walkable character of downtown Reykjavik with the additional benefit of being only a footstep away from the natural environment.



3 THE SITE - OPPORTUNITIES AND CHALLENGES

The hill where Urridaholt is located is a bedrock formed during the last ice age. The hill rises around 70 m above a lava field on the site's north side and the lake at its southern edge. The site offers great views of the Reykjavik capital area, a ring of mountains, and the North Atlantic Ocean. Located between residential neighborhoods and a nature preserve the site serves as a gateway from the city to

the natural Icelandic landscape beyond. The most unique aspect of the site is the lake, which is formed behind the lava as it wraps around the foot of the hill.

Site specific challenges include the hydrology of the lake, as the catchment area consists of the slopes around the lake, along with some spring fed water and creeks. They also include the Icelandic weather conditions, low angle of sun, making use of the splendid views, the steep pitch of the land, geological fissures and the edge of the lava field around the Urridaholt hill. Last but not least the integration of the built environment with sensitive nature, heritage and the waterfront. The need to turn these challenges into opportunities was emphasized during the planning process, by having a dialogue between experts in various fields.



From the outset the project has emphasized the use of new ideas and techniques to create an environmentally, socially and economically sustainable development.

4 INTEGRATING SUDS WITH GREEN PUBLIC SPACES

This project engages with the natural environment while requiring responsibility for its sensitive stewardship. At the outset, the design team felt it was critical to protect the natural resources and features of the site and surrounding area. Foremost in this effort was careful consideration of the lake and protection of its watershed. To meet this goal the team integrated site access and green space with the sustainable management of stormwater to reduce the impacts of the development on the hydrologic cycles.



The interplay between SUDS and green public spaces is an important element in the neighbourhood landscape design. A key feature are “green wedges” in the hillside, that lead through the urban landscape and channels water to the lake and surrounding natural areas. They are located adjacent to single family houses and blocks of flats and act as a visual amenity. These green wedges also work as a pedestrian connection from the major public space on the hilltop to lakefront. SUDS solutions are also evident in small public gathering spaces along pedestrian routes where play structures, barbeques, and other amenities are located. Elsewhere a number of small spaces have been included to add focal points, playgrounds and community gardens, into different neighborhoods.



The SUDS strategy in a nutshell: There are permeable surfaces where possible, to get the water naturally into the ground. The rain from the roofs drains into the garden soil in raingardens or soakaways and there are grassy water-channels, swales by the roadsides, into which the stormwater can drain. The system integrates the development with a network of swales placed to collect water from the roads and allow infiltration as the rainwater runs along the contours. When the rate of

infiltration of these swales is exceeded, they feed retention ponds in the green wedges that run down the hill. Should these exceed capacity, water will flow down channels on the hillside and discharge into a final swale adjacent to the lake frontage. The central row of trees on the main boulevard grows from a swale featuring a cascading water course. On this most public connection through the site, water meanders through the swale and falls from stone to stone to showcase the sustainable urban drainage methods employed throughout Urridaholt.

5 SUSTAINABLE DEVELOPMENT

The Urridaholt development has, through a shared vision of many, led by example by implementing new sustainable urban solutions in Iceland. The project has approached the natural environment of Urridaholt with restraint, treading gently on the natural environment by interlacing with nature rather than overpowering it. Moreover, the Urridaholt neighbourhood is truly a pioneer in urban sustainable development Iceland in two important ways. The first is the implementation of the sustainable urban drainage, being the first large scale development to do so in Iceland. Secondly by being the first neighbourhood plan in Iceland to be certificated by the internationally acclaimed BREEAM Communities assessment method. In both areas, the Urridaholt developers have made key steps to adapt these methods to Icelandic conditions, and therefore making further implementations in other areas in Iceland easier.

Along with the integrated SUDS principles, many other elements are emphasised in the plan to achieve the goal of sustainable development. The scheme utilises mixed-use principles, not seen in Iceland outside of the small, downtown area of Reykjavík. Public buildings that create the most activity were located around a highly sheltered space on the top of the hill, at the geographic centre of the development to minimize walking distances. This hub of activity is surrounded by a series of residential neighbourhoods each with their own identity. To strengthen the sense of community and provide a variety of place character a range of housing types are planned. Within each neighbourhood, housing types include single family detached, row housing and apartments that provide diversity.



To minimize power consumption, buildings are sited and designed to take advantage of daylight and reduce glare from low-angled sun. In addition to natural ventilation, the use of energy-efficient mechanical systems is encouraged for heating and ventilating all the buildings. Guidelines on sustainable design are prepared for designers and others who are involved in development on the site, where the use of local and sustainable materials is promoted. To reduce fossil fuel consumption, travel by bicycle and public transportation is encouraged. Safe disposal of hazardous materials and recycling of glass, paper, plastics and metal is encouraged. Educational material on environmental practices will be provided for residents and the neighbourhood school will have a special environmental and ecological focus.

6 COMMUNITY INVOLVEMENT

Community participation in its broadest definition has been a key element throughout the preparation of this plan. The masterplan has been developed in close association with the town council, planning committee, town officials and key stakeholders.

7 LESSONS FOR THE FUTURE

Being the first large SUDS scale project in Iceland, Urridaholt has set an important example. Key steps have been taken in Urridaholt to adapt SUDS and BREEAM to Icelandic conditions. Urridaholt has received acclaim for the way sustainability is integrated into the development. It already serves as an international laboratory for scholars and leaders.