

NÁTTÚRUFRAEÐISTOFNUN NORÐURLANDS

THE AKUREYRI MUSEUM OF NATURAL HISTORY

P.O.BOX 580 - 602 AKUREYRI - ICELAND

**GEOLOGICAL REPORT ON THE BUILDING SITES AT DYSNES
AND ÁRSKÓGSSANDUR.**

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By the request of lönþróunarfélag Eyjafjarðar

This report is written by request of Iðnþróunarfélag Eyjafjarðar. In connection with this report, a brief geological survey of Árskógssandur was conducted and pits dug at Dysnes, to measure soil thickness. Other material used in this report is from published sources in Icelandic.

This literature is available at the Akureyri Museum of Natural History.

1.0. DYSNES

Bedrock:

The bedrock is made of 9 m.y. old basaltic lava layers, exposed along the coast and in a small river channel in the western part of the area. In other parts of the area the bedrock is covered by sediments and soil.

Sediments:

The building site is located on the southern and lowest part of an north-south orientated drumlin like landform. The thickness of the sediment cover at the building site is unknown, but is expected to be variable.

Major part of the sediments is till (moraine), rich in fine material (clay and silt) with few outside clast. The upper most part of the till is usually soft, but becomes compact with depth. The till is porous, but with low permeability.

To the south around the brook Pálmholtslækur the till is overlain by thin gravel which thickens towards the coast where it forms a small platform. This is probable a small glaciofluvial deposition formed at a higher sea level at the end of the last glacial.

The till and the gravel is usually overlain by fine sand (0.1-1.0 m thick). The sand is composed of ash. The ash dates from the earliest part of post glacial times, just about the time vegetation and soil formation started in the area. With comparison to other parts of the Eyjafjörður area it is likely that the ash/sand is separated from the till by thin soil layer of mudlike character (0.2 m thick). This could also explain the soft character of the top of the till.

Vegetation and soil thickness:

The major part of the area is covered by bog and wetland vegetation. Parts of it is cultivated land.

The bog occupies a gentle basin in the till cover (moraine). The thickness of the peat in the bog is from 2.0 m to 4.5 m, and it gets thicker to the west.

A flow of groundwater was observed around the ash/sand that separates the till and the peat.

On the steep hillside facing the coast, solifucation terraces have been observed. There the vegetation cover probable sides on the surface of the clay rich till (moraine).

Building material:

No suitable building material is available at the building site. The nearest suitable sediment depositions are at Möðruvellir, 4 km from Dysnes. The depositions in question are mostly cultivated land.

In Glæsibæjarhreppur, south of river Hörgá, a lot of suitable material is found. The disadvantages of this area is the distance from the building site, complex structure of the sediments and this is the future mining area of Akureyri. A thorough geological survey of the sediments is also lacking.

Building material is also found in the Hörgárdalur area. There a geological survey is also lacking and distance from the building site is a disadvantage.

Pumping of material from the sea bottom, just outside the delta of river Hörgá has been suggested, but further investigation of the sediments there is needed. The Hörgá delta is a nature conservation area.

Quarry possibilities in the area have not been investigated.

Water supply:

Water supply may be a problem at Dysnes. Sea water can be used for industrial purposes.

Water for other purposes could at present be partly supplied from the water supply system of Akureyri in Hörgárdalur (8 km) or from river gravel along the river Hörgá.

High in the mountain west of Dysnes, at Hofsskarð, springs 80-90 l/sec. have been observed. Some technical difficulties are in utilizing these sources.

At Hraun í Öxnadal, 30 km from springs of over 200 l/sec. have been observed.

Nature conservations areas:

Hörgarósar, the delta of river Hörgá (1-2 km from Dysnes) is nature conservation area on grounds of spectacular bird life and vegetation.

Sediment transport:

Gravel is transported along the coast at Dysnes. The sediments have accumulated as points at Hjalteyri and Bakkaeyri. It is not clear if the sediment transport can be a problem for a harbour at Dysnes.

2.0. ÁRSKÓGSSANDUR.**Bedrock:**

The bedrock is 9 m.y. old lava layers. It is exposed along the coast and forms the core of the small hillock Helluhöfði, north of the building site. Bedrock is also exposed along the course of the river Þorvaldsdalsá.

Sediments:

The area in question is outwash plain of a former glacial river (sandur), formed at a higher sea level at the end of the last glacial. The material in the landform is sand and gravel, at least 3 to 4 m thick. Under the gravel there is a least 5 to 6 m of till (moraine). Hillocks to the north and south of the area are composed of bedrock covered by till of variable thickness.

Vegetation and soil thickness:

The area is covered by dwarf scrub heath vegetation. The soil thickness is not known but values up to 1 to 2 m can be expected.

The major part of the area is dry, but a small bog is found in the northeastern most part. It is formed in connection with a small spring and a little brook coming from it.

Building material:

The gravel of the outwash plain on the building site is of good quality, and it is easily accessible. Material of lower quality is found to the north and south of the area. A quarry is at work in Helluhöfði.

Water supply:

Industrial water can be supplied from the river Þorvaldsdalsá.

Two springs are found in the outwash plain (at least, 70 l/sec. and 80 l/sec.). At present one of those is planned as a water supply for a fish farm.

The two villages Árskógssandur and Hauganes utilize water from a rockslide in the mouth of Þorvaldsdalur (3 km from Árskógssandur). Only a part of the springs there are used.

In Þorvaldsdalur, springwater from rockslides can easily be utilized as water supply.

Nature conservation areas:

Nature conservation areas are none in the vicinity of Árskógssandur.

3.0. EARTHQUAKES IN THE EYJAFJÖRÐUR AREA.

One of the major earthquake zones of Iceland is located north of Northeastern Iceland. This is a 80 km broad area, which lies mostly on the shelf north of Iceland. In this area epicentres of earthquakes form two distinct lines. Earthquakes up 6-7 on Richter scale are known in this area. At Dysnes and Árskógssandur the influences of a big earthquake occurring in the shelf area are approximately the same.

It has been suggested that the third earthquake line transcends the peninsula between Skagafjörður and Eyjafjörður. This line is postulated few km north of Árskógssandur. At the present, activity on this line is low.

In 1934, earthquakes up 6.3 and 4.3 on Richter scale occurred on this line. The influences were considerable on Árskógssandur, but gradually grew less towards the south.

Reports on such a damaging activity in this area are not known from written Icelandic sources. Many of these sources (the annals covering the years between 1600-1800) originate from Northern Iceland, so one would expect them to have kept records of natural catastrophic on this scale. The possibility of the 1934 earthquake being an unique event should be considered, and calls for a more thorough study of the earthquake zone north of Iceland.