

The City as a Gravel Pile: Building Codes, Concrete, and Urban Dwellings in Reykjavík (1903–45)

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## **LA CITTÀ GLOBALE**

La condizione urbana  
come fenomeno pervasivo

## **THE GLOBAL CITY**

The urban condition  
as a pervasive phenomenon



INSIGHTS

1

# LA CITTÀ GLOBALE

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# THE GLOBAL CITY

The urban condition  
as a pervasive phenomenon

a cura di

Marco Pretelli  
Rosa Tamborrino  
Ines Tolic

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PLANNING MODELS**

FIORELLA DALLARI  
GERARDO DOTI  
HELENI PORFYRIOU  
MARCO PRETELLI

# THE CITY AS A “GRAVEL PILE”: BUILDING CODES, CONCRETE, AND URBAN DWELLINGS IN REYKJAVÍK (1903–1945)

SOFIA NANNINI

## Abstract

*This paper deals with the urban development of Reykjavík during the first half of the 20th century, with particular attention to building techniques and their influence in the construction of a modern capital city for Iceland. By analysing its first building codes (issued in 1903 and in 1945) and some examples of residential typologies built in that same period, this research highlights the special role that concrete played in the growth and modernisation of Reykjavík.*

## Keywords

*Iceland; Reykjavík; Concrete*

## Introduction

Among the treasures that the Icelandic language discloses to its learners, one is the common saying *á mölinni*, meaning “in a town”. Interestingly, the word *möl* means “gravel”. The saying has been popular since the last decades of the 19th century [Jón G. Friðjónsson 2006, 450], a key moment in the short Icelandic urban history: the island’s trading villages and farm clusters were becoming small towns by means of a quick urbanisation process that radically changed the Icelandic society [Gunnar Karlsson 2000, 248–251]. The reference to gravel in the idiom may be directly referred to the single material around which the construction of Icelandic towns revolved, that was – and still is nowadays – concrete. In the decades spanning from its first amateurish applications in the countryside until its first use in Reykjavík, concrete (in Icelandic *steinsteypa*) became the national material with which nearly all public and private buildings were built. Alongside its technical advantages in the harsh Icelandic climatic conditions and fireproof properties, concrete also became a trademark of the emerging Icelandic architecture. In Reykjavík – Iceland’s *de facto* capital as it had been the location of the restored *Alþingi* (Parliament) since 1845 –, such extensive use of concrete was soon included in a set of building codes. Since this paper will analyse the codes issued in 1903 and 1945, it is important to mention the relevance of this particular time span: as a dependency of the Kingdom of Denmark, Iceland had slowly started obtaining some

political autonomy throughout the 19th century, until it gained its sovereignty in 1918 and its independency in 1944. On the one hand, this research aims at understanding the degree of technical knowledge on concrete in Iceland and its development throughout the first decades of the 20th century; on the other, it aims at recognising to what extent this material played a role in the physical construction of the town, with a particular focus on residential case studies.

### The First Building Code for Reykjavík: Towards a *Steinbær* (1903-1915)

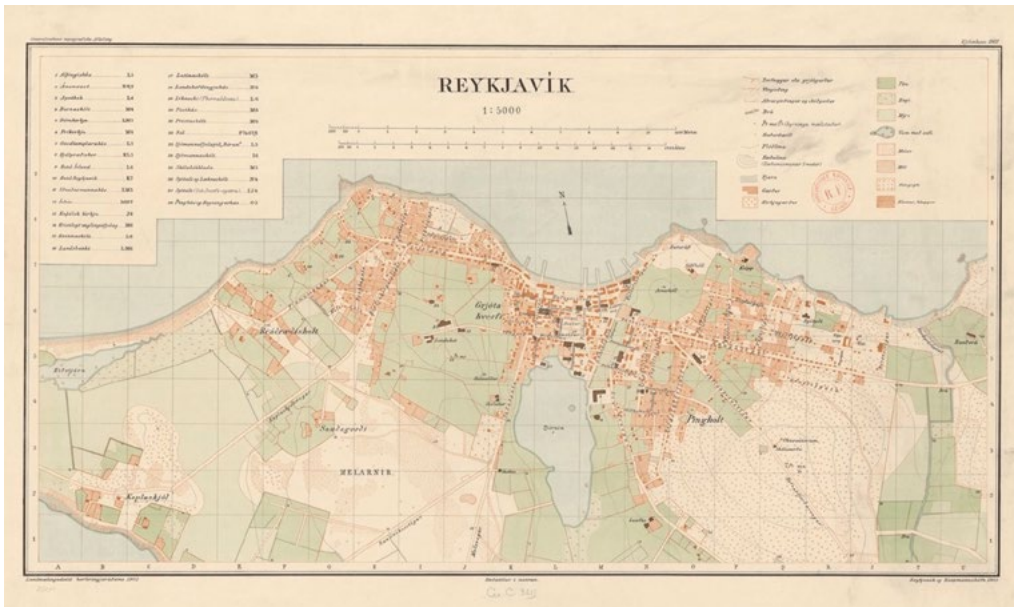
At the turn of the century, Reykjavík was a small fishing village, composed of low wooden houses around an unsheltered harbour, and turf farms in the surrounding grass fields (Fig. 1). No less than fifteen years later, the newspaper *Morgunblaðið* titled a front-page article as *Steinbær*, meaning a wish for the Reykjavík of the future to become a “city of stone”, after that a tragic fire burst in April 1915 [*Steinbær* 1915]. The fire destroyed most of the houses in the city centre, between the pond Tjörnin and the harbour. *Steinbær* was not only a wish, but a mandatory rule that changed the current building code: in the future, with a few exceptions, all houses of Reykjavík would have to be built out of fireproof materials, such as stone or concrete. This choice paved the way towards a new age, which since 1911 Icelandic engineers, and afterwards also historians, have named as *steinsteypuöldin*: the age of concrete [Lýður Björnsson 1990]. What regulated the construction of the town in those years?

Since its colonisation around 874 and until the first decades of the 19th century, Icelandic settlements had not developed as proper villages or cities: the island was largely settled by means of scattered turf farms, present in almost all its regions, with the exception of the central, barren highlands. Even today one of the Icelandic words for



1: The city centre of Reykjavík at the turn of the century [in Valtýr Guðmundsson 1904, 20].





2: Map of Reykjavík, 1903 [Copenhagen: *Generalstabens topografiske Afdeling*. Bibliothèque nationale de France, département Cartes et plans, GE C-3615. gallica.bnf.fr].

city, *bær*, also means “farm”. In 1786, the settlement of Reykjavík acquired the status of *kaupstaður* (trading centre). At first, Reykjavík was a trading spot for merchants, but it slowly acquired social and political functions [Gunnar Karlsson 2000, 182–185; Guðjón Friðriksson 1991, 69–84]. The first attempt towards a building regulation for the village was held in the so-called *opið bréf* (open letter) issued in 1839, that established a building commission for Reykjavík [Páll Lindal 1982, 104]. In 1894, some additional clauses were issued: among them, one represented the start of a revolution in the construction habits of the island: turf houses were banned in the centre of the village. Reykjavík was still a small settlement compared to European standards (Fig. 2), but it had already incredibly expanded if likened to the other Icelandic trading centers.

The growing town required rules for its development. At first, the rules did not refer to a general planning of the city: the first planning commission for Reykjavík was established only in the 1920s [Seelow 2011, 162–163]. The first building rules for Reykjavík were limited to the obtaining of a construction permit, to where, when and if to build a house, and – most importantly, in a country that lacked educated architects and engineers – they also had to teach the landowners *how* to build. In fact, the first code<sup>1</sup> was written in 1903 by one of the leading figures both in politics and in the technical development of Iceland, Knud Zimsen (1875–1953), the third Icelander ever

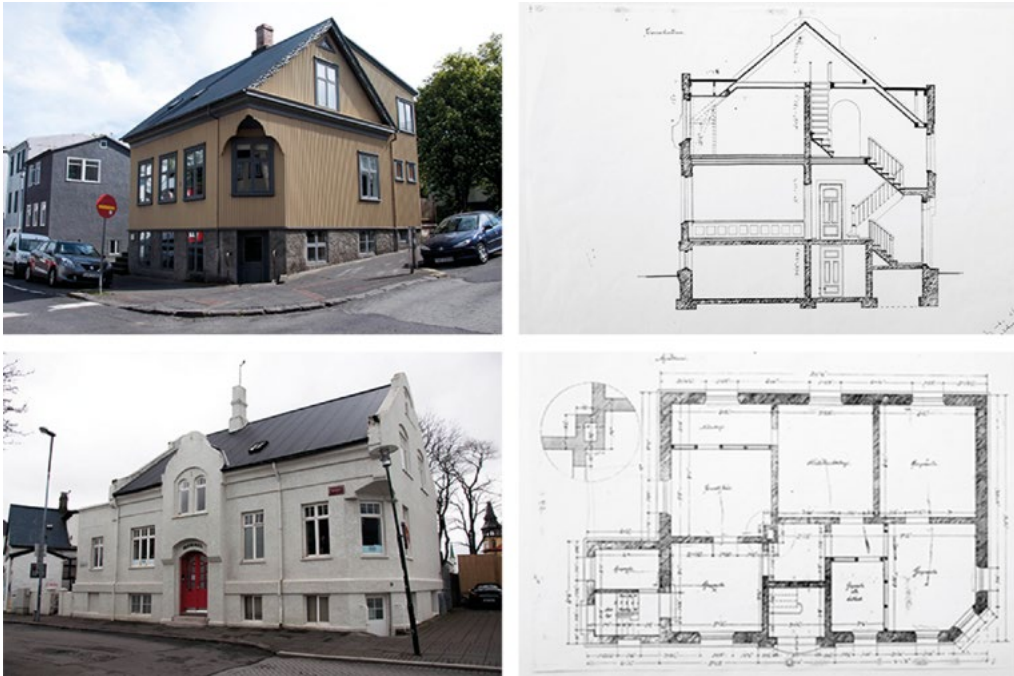
<sup>1</sup> Stjórnartíðindi fyrir Ísland 1903. B-deild. Byggingarsamþykkt fyrir Reykjavík [Building Code for Reykjavík] 135–44.

graduating in engineering. He soon understood that in a country where there were no other building materials rather than expensively imported timber and hard basaltic rocks, what Icelanders could do was import cement and learn how to build in concrete. Therefore, the building code of 1903 appointed an incredibly large role to cement and concrete as building materials, and also devoted quite a lot of explanations regarding construction techniques. First of all, if timber houses were limited to a height of 14 *álnir* (ca. 9m, being one *alin* – an ell – ca. 0,63m), stone and concrete houses could be as high as 25 *álnir* (ca. 16m) – in general, houses could not be higher than the street width [Art. 13], and the still low technical skills regarding concrete did not usually allow the construction of higher structures. For all two-storey or higher buildings, foundations had to be made of stone or gravel, bound together with lime or cement. In order to avoid damp within the walls, a layer of tar or cement was mandatory and it had to be located right above the ground floor [Art. 16]. A precise mix ratio for load-bearing concrete walls was given, as concrete could not be weaker than 1 : 5 : 10 (cement : sand : gravel); and it was also remarked that it was forbidden to cast concrete walls if the temperature was 2°C or below [Art. 17]. The code briefly mentioned the possibility of reinforced concrete walls, yet such technique was still quite unexplored in Iceland. According to the engineer, the extremely high degree of precision regarding concrete construction techniques aimed at one single scope, that is the possibility of «building for the future» and having «houses of the best quality» [Úr bæ í borg 1952, 31]<sup>2</sup>. Building for the future meant both building enduring houses and building towards modernity. One clause was added and was a turning point in Icelandic history: turf houses were entirely banned, both in the city centre and on the outskirts [Art. 29]. Not only was the traditional turf farm (*baðstofa*), usually very dark, damp, and prone to damages, but it also required continuous repairs each generation, thus making it an unsuitable dwelling for the rising modernisation of Reykjavík [Hjörleifur Stefánsson 2013, 89].

Despite the technical progress embodied in the first building code, many clauses still regarded carpentry. Yet, timber had two drawbacks: it was extremely expensive, as it had to be imported from Norway and Sweden, and it was under the constant threat of fires. The latter was the reason why Reykjavík first developed as town of low houses surrounded small plots of land: dwellings had to be isolated by means of unbuilt areas with dimensions comparable to those of the house [Art. 14], or – if closer than 5 *álnir* (ca. 3m) – divided by a fire-proof wall, usually built in stone or concrete [Art. 20].

In 1912, Rögnvaldur Ólafsson (1874–1917), Iceland's first educated architect, stressed the need for an upgrade of the building code of 1903. According to him, timber had to be more strictly limited and greater details had to be provided on the use of concrete. As a builder, he was very interested in technical issues, such as the resistance of concrete structures against earthquakes and fires. As an architect and urban

<sup>2</sup> «[...] með því væri verið að byggja fyrir framtíðina og því mikils um vert, að til þeirra væri sem bezt vandað».



3: Top left: house in Grettisgata 26 (1904). Bottom left and top/bottom right: Rögnvaldur Ólafsson, house in Skólabrú 2 (1912) [Photos by the author and drawings from Teikningavefur Reykjavíkurborgar, teikningar.reykjavik.is].

planner, he also claimed that building materials would have changed the outlook of the city. Concrete could allow a denser urban tissue, with higher fireproof qualities [Rögnvaldur Ólafsson 1914, 31]. Houses of concrete meant less unbuilt plots of land, therefore a denser urban tissue that could finally give Reykjavík the look of a proper city, rather than that of a village. Yet, his plea for a revision of the code did not arrive soon and more detailed rules on reinforced concrete will be featured only in the building code of 1945.

By 1915, timber houses were still the first choice of Reykjavík's richer inhabitants. Some of these houses followed the code's guidelines: for example, all houses located on an intersection showed a decorated corner [Art. 9] – as one can see in the timber house in Grettisgata 26 (1904) [Hrefna Róbertsdóttir 1989, 21]. Yet, in those years a new fashion was rising: the so-called *steinsteypuklassík* (concrete classicism), whose architecture reproduced in concrete the decorated, neo-baroque, and expensive timber dwellings. One example is the house in Skólabrú 2 (1912). Its thick concrete walls, rounded gables, and prominent corner do echo the shapes of the traditional Nordic timber constructions (Fig. 3), and more generally they mirror a neo-baroque fashion that was also common in Denmark at that time [Seelow 2011, 91–94; Hörður Ágústsson 2000, 319–322].

Less than two months after the fire, an additional clause was added to the code: «from now on, all new houses in Reykjavík will have to be built out of stone or concrete, or

in another reliable and fire-proof materials»<sup>3</sup>, only with an exception of isolated buildings standing at least 3,15m away from a neighbouring plot and 2m from street border. Reykjavík was now entering its age of concrete, and so were all the other villages of the country: from Borgarnes (1914) until Ísafjörður (1943), all Icelandic urban settlements slowly obtained a building code, modelled after that of Reykjavík.

## The Youngest Town of the Continent: building in Reykjavík in the Inter-War Period

The inter-war period was an intense moment of cultural clashes and modernising novelties. This seesaw between tradition and modernity was mirrored in the growth of Reykjavík: in 1929, the town appeared as an «incredibly styleless and shapeless mixture of two towns, a town of timber houses and a newer town in concrete» [Kristján Albertsson 1929, 44; Seelow 2011, 85]<sup>4</sup>. Reykjavík was growing towards the new residential areas of *Vesturbær* (the Western City) and *Austurbær* (The Eastern City). In the early 1920s, a new generation of architects returned to Iceland after their studies in Europe: the most influential was Guðjón Samúelsson (1887–1950), who was granted the title of State Architect from 1919 until his death. This wave of professionalism was recorded by a change in the building code, issued in 1924: not only had the new drawing measures to follow the metric system, but those very drawings had to be made by skilled technicians, approved by the building commission<sup>5</sup>.

The first Post-war years also saw the establishment of the City Planning Commission for Reykjavík, particularly thanks to the work of the medical doctor Guðmundur Hannesson (1886–1946) He was a town planning expert and published the first Icelandic book on these issues, *Um skipulag bæja*, meaning *On Town Planning* [Guðmundur Hannesson 1916]. Indeed, he created a sort of Icelandic “vocabulary” on urban planning [Ásdís Hlökk Theodórsdóttir 2016, 26]. Influenced by Garden City models, Guðmundur Hannesson supported a view of the city that was composed of low, detached houses, in order to benefit from a greater sun exposure and higher hygiene standards [Guðmundur Hannesson 1916, 85]. Moreover, he also criticised the different “cultural character” of foreign models for high-rise buildings if compared to the low houses of Icelandic villages [Guðmundur Hannesson 1916, 95]. In the 1920s, the whole town required residential dwellings for its growing population, that was still largely living in shelters or unsuitable basements. The first apartment building of Iceland (Fig. 4), built in 1919, still showed the figurative influence of the pre-war

<sup>3</sup> «Framvegis má ekki byggja neitt hús í Reykjavíkurbæ úr öðru efni en steini eða steinsteypu, eða öðru efni, ekki ótraustara eða óeldtryggara». Stjórnartíðindi fyrir Ísland 1915. B-deild. Samþykkt um viðauka við byggingarsamþykkt fyrir Reykjavík [Addition to the Building Code for Reykjavík], 152.

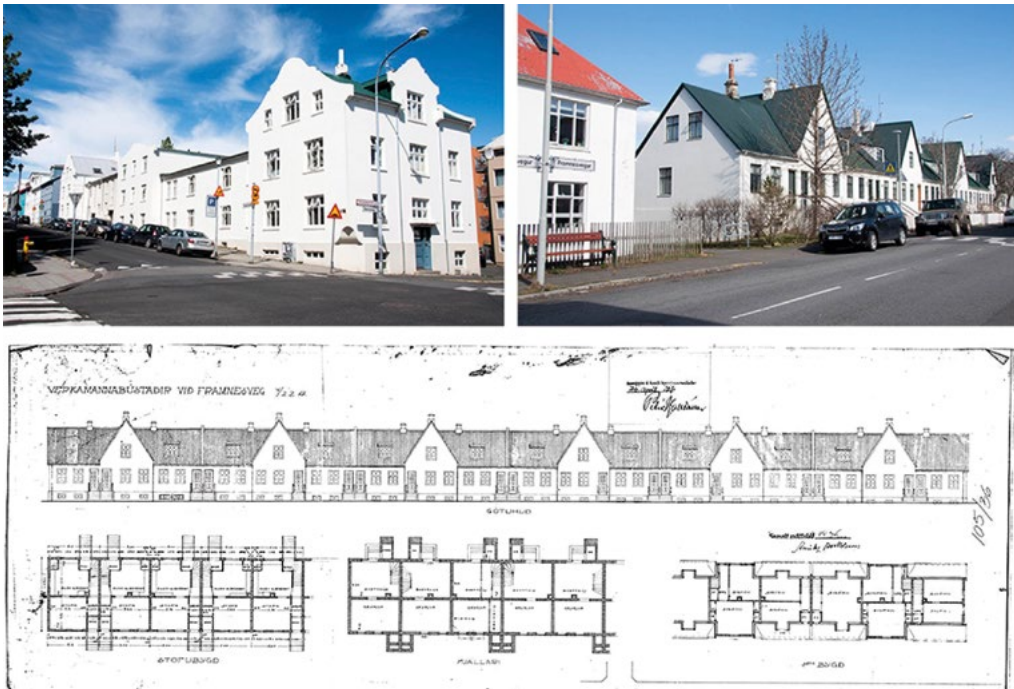
<sup>4</sup> «Þetta undarlega stílleysi og svípleysi... Sambland af tveim bæjum, timburhúsabæ og nýrri bæ úr steinsteypu».

<sup>5</sup> Stjórnartíðindi fyrir Ísland 1924. B-deild. Samþykkt um breytingu á byggingarsamþykkt fyrir Reyjavík 7. sept. 1903 [Changes of the Building Code for Reykjavík 1903], 80–82.

*steinsteypuklassík*, yet it also offered modern facilities that promised a new future for the Icelandic housing [Seelow 2011, 270–271].

Since the first example of *steinsteypuklassík*, concrete became a cheaper way to mimic local or foreign architectural styles, without having to use expensive bricks or weak turf blocks. If *concrete classicism* was strongly influenced by Danish and continental models, a new fashion rose in the 1920s and was employed in the search for a true and rural-inspired Icelandic architecture. In 1921, Guðjón Samúelsson designed a row of communal houses in the western part of the city, funded by the State Bank. These houses boasted pointed gables that reminded of the rural turf farms still to be found around the countryside (Fig. 4), aiming for a traditional style in the emerging Icelandic architecture [Jónas Jónsson 1957, 42 and 120].

Around the end of the 1920s and thanks to the Stockholm Exhibition of 1930, Icelandic architects started being influenced by European functionalism. Its formal consequences were to be seen in workers' houses built in the western area of the city between 1930 and 1936 (Fig. 5). These project also offered communal areas and services that were an absolute novelty for the Icelandic context [for more details on the adopted typologies, see: Seelow 2011, 279–296]. Until the mid 1940s, housing in Reykjavík was mainly constituted by low houses of no more than two-storey high, despite the growing lack of apartments for its inhabitants, and this choice could be due to



4: Top left: apartment block in Bergþórugata 39–45 (1919); top right: *Bankahús* (Bank Houses) in Framnesvegur 20–26a, Reykjavík. On the bottom row: elevation and plans of the houses (1921, built 1922–193) [Photos by the author and drawings from Teikningavefur Reykjavíkurborgar, teikningar.reykjavik.is].



5: On the top row: *verkamannabústaðir* (workers' houses) in Hofsvallagata 15–23 (1931–1932); apartment blocks in Hringbraut 35–49 (1942–1924); On the bottom row [Photos of the author and drawings from Teikningavefur Reykjavíkurborgar, teikningar.reykjavik.is]

several factors. First, the «general antiurban national feeling» [Seelow 2011, 59] supported low and detached dwellings, rather than high apartments blocks. Second, the construction industry was to a greater extent in the hands of master builders, rather than engineers, and the very architects were dependent on these builders' knowledge on concrete. This might be reason why reinforced concrete-frame structures were still rare, also when it came to public buildings. According to the code of 1903, the limit in height was set at ca. 12m to concrete houses. Yet, throughout the 1930s the limitations of 1903 and the urban planning philosophy of Guðmundur Hannesson stopped being sustainable: in order to accommodate an the increase of population, low and detached housing was not convenient anymore. By the 1940s, the need for housing exploded, as many of its inhabitants were forced to live in the barracks left by the British and American soldiers since 1940. Due to such critical conditions the City Council planned the construction of five-storey apartment buildings (1942–1944), later on replicated in several areas (Fig. 5). Not only did the architects draw inspiration from some Swedish communal housing examples [Seelow 2011, 319], but their heights implied that concrete was going to be finally used as suggested by Rögnvaldur Ólafsson almost thirty years before – “to build more densely” – and that the obsolete building code of 1903 had to be fully revised.

## Towards a Scientific Construction. The Reykjavík Building Code of 1945

In 1944 the first Icelandic conference on building topics was held in Reykjavík, and it addressed all the issues regarding housing, planning and the production of building materials [Byggingarmálaráðstefnan 1944, 10]. The new Republic of Iceland was now looking for lasting solutions regarding its housing needs: a year later, the new building code for Reykjavík was issued in 1945<sup>6</sup>.

The code stressed the use of concrete as the only building materials allowed in town – timber and other materials were subjected to a particular permit that could have been granted by the building commission [Art. 16]. It made precise mentions to the type of cement, the quality and the storage of the aggregates [Art. 17], the design mix, production and application of concrete, of the formworks and the reinforcement bars [Art. 18], and the seventh chapter was devoted to “concrete houses” [Art. 21–4]. In particular, the very weak design mix required by the building code of 1903 changed greatly: in the new code, reinforced concrete for walls and foundations could not be weaker than 1 : 3 : 3. The code did not mention turf farms anymore. Far from its rural past, Reykjavík was moving towards the future faster than ever, and its new code became the written promise for a more reliable and scientific use of the building materials. Construction was now going to be only in the hands of skilled technicians, graduated architects and engineers, established building companies and mastermasons societies, whose contributions led to a full modernisation of the building industry.

## Conclusions

By tracing the island’s peculiar urban and architectural history, that lays between an agricultural past and a quick modernisation process, one can understand how a building material had physical effects on the shape of the city. Concrete was first a means to overcome the threats of fires, then a way to imitate forms deriving from an European tradition or a disappearing rural world; eventually, the only answer to Post-war housing needs. Especially in the areas of Vesturbær and Austurbær, concrete gave Reykjavík the outlook of a denser city, overcoming the image of a wooden village. Yet, the strong political and cultural influence of the United States on Post-war Iceland had its effects on the local architectural practice. Prefabricated structures and some relatively high residential blocks were soon introduced in the outskirts of Reykjavík, but generally low-density neighborhoods transformed the periphery of the Icelandic capital into something that is more similar to the American suburbia.

Although concrete is still the most used building material of nowadays’ Iceland, the epic adventure of concrete that brought Reykjavík into modernity now only remains in the

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<sup>6</sup> Stjórnartíðindi fyrir Ísland 1945. B-deild. Byggingarsamþykkt fyrir Reykjavík [Building Code for Reykjavík], pp. 357–375.

Icelandic language and in a few, specialised publications. Both the historiographic term of *steinsteypuöldin*, and the saying *á mölinni* remind us of the new historical age that this material prompted in remote Iceland, and of the metonymy that still connects the idea of a city to its main components – some cement, water, sand, and a lot of gravel<sup>7</sup>.

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<sup>7</sup> All translations to English from Icelandic, if not specified, are by the author. All original quotes have been provided in footnotes.

<sup>8</sup> Icelandic authors have been listed alphabetically following the order of their first names, being the last name usually a mere patronymic (-son, -dóttir). Consequently, references to Icelandic authors in the text show their full names. An English translation of all Icelandic titles can be found in square brackets.



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<sup>9</sup> All sources are in: Reykjavík. Landsbókasafn Íslands [The National Library of Iceland]. Íslandssafn.