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Trondheim Cityscape: Preservation of the City Identity

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[INTRODUCTION]

Norway has the world's second largest shoreline, and the sea has been the most important communication system all through Norwegian history. In fact, there is a strong interaction with the landscape, climate conditions, nature resources, and traditional communication systems in the development of the Norway built environment. The ship building technology was extensively developed by the Norwegians and fishery has been a major industry in Norway, i.e., stockfish and klippfish (dried and salted cod) industry has been paramount for the economy. Therefore, most of the Norwegian historic buildings are associated with the sea, which had an important role in the construction of the Norwegian built heritage.

Wood has been the most important construction material in Norway since Viking times. In the medieval time, wood building technology was developed to a very sophisticated level, enabling the best buildings to survive up to our time. The construction systems and technologies have later been developed in different regions considering the availability of materials and other local conditions (e.g., coastal buildings have had to adapt to harsh coastal climate such as strong winds, rain and high humidity). Timber buildings proved to be very suitable facing harsh climatic conditions and adapting to the functional needs of Norwegian society.

In this report we examine the importance of the preservation of the city identity, especially considering the most iconic Trondheim buildings (i.e., warehouses and Nidaros cathedral) and their relative importance on the preservation of the city landscape. We also present herein some solutions towards the maintenance and preservation of the buildings and the city identity.

[THE WAREHOUSES]

In Mid-Norway there is Trondheim, the largest city of the country and the most important trading port for the region. The river harbour has always offered a safe port where the first urban settlement was located. The city consists almost entirely of timber buildings, often ravaged by fires, like that of 1681.

Interventions can be done in the warehouses as long as their identity can be preserved. With identity we mean their colour, symmetry, cladding, form and different roof shapes, the pile foundation, the traditional log constructions, the flatbrygge along the water, the location and the use. From a visual and social point of view, the warehouses represent an identifiable "city-scape", with cultural and aesthetic heritage value of national importance.

By tradition, Norwegian houses used to be coloured either red, white, or yellow. The colours chosen by the owners of the house would signify their financial status. So, depending on the profession, social status, and location, houses would be

painted the primary colours that symbolized their rank. This was not done to be malicious, but due to their resources. Since red was the cheapest, and easiest to produce, it was mostly reserved for fishers and farmers. Red house paint was used by mixing ochre with cod liver oil, and vegetable or animal oil, to get the bright shade that is popular in Norway nowadays. Therefore, the traditional Norway colour for lower-class houses was red, which stuck with and became a custom over the years, regardless of status. Since, yellow was slightly more expensive to produce, as it was made with ochre and cod liver oil, this was reserved for a higher status of people. Yellow typically symbolized the middle class concerning the Norwegian houses. Finally, white was reserved for the luxurious class, as minerals such as zinc were needed to get the tone. In the older days, white was the most expensive colour. Nowadays, the importance of the warehouses lies in the whole landscape and not in a single building. Therefore, the preservation of the warehouse's colour is a key aspect to preserve the identity of these historic buildings.

In Norway, it is common to have wooden architecture from the past but also in more recent buildings. In an ancient drawing, "Maschiusstikket" from 1674, it is depicted the structure alongside the river and much of the warehouses landscape is as it is today, even though almost everything burnt down in 1681. However, there are some distinct changes in size (e.g., some warehouses are built together, some of them are smaller, larger, or taller). Later, fires have led to many wharf buildings being replaced by newer, more modern types that use similar principles. In the more recent examples, like Kjøpmannsgata 27 (built between 1858 and 1876), the building structure is still clearly visible. Even though its height and size are increased with respect to the earlier warehouses, the way it is built is, of course, based on the traditional techniques: the ground floor consisted of two rows of notched log timber rooms, with a corridor in the middle. This was connected to the river via a gallery, where all the goods were brought on shore. An important aspect is that these buildings would sometimes have a space in front one of the long sides making a useful gap in the row of buildings, to minimise the risk of fire spreading.

The shape of the roof also says a lot about the history of the warehouses, as it was changed over time. Considering the shape of the roof it is possible to know when the warehouse was approximately built. The roof with the ridge in the east-west direction was predominant. From 1845 until about 1925 all the roofs that were built were half-hipped on both sides because of fire regulation. The same regulations also set the maximum height of the bryggen to less than 14 metres and most of the bryggen from 1850-1860 present those dimensions.

The warehouses were used as a food storage, to be able to market it. Therefore, the river is an important point where fishers can access the docks with their boat to put the fish inside the warehouses. Originally, the stairs, next to the doors that faced the river as the street, allowed one to quickly enter the warehouses to transport the merchandise, through a forklift. The building is a dark and cold place, where large air currents occur, allowing food to be better stored.

The original warehouses were not used as dwellings, but today many have been

converted into residential houses, however it is not allowed in the row next to the city along the river. Some are art galleries, cafes, restaurants and boutiques. Trondheim's warehouses were generally made as a combination of wood frames and log structures allowing the creation of many different space distributions. Most of the buildings contain small and low rooms in the lower levels and very large and high spaces in the upper levels. New buildings are frequently built using concrete instead of wood because these buildings have improved fire performance. Sometimes, the concrete is covered with wood to simulate the old structures. However, the use of the original building material is neglected and can somehow affect the cultural and aesthetic values of the houses. For example, the facades are often retrofitted using aluminium windows, while the original were built using wood. The preservation and retrofitting of these traditional buildings should be always conducted using compatible and reversible materials and interventions. Furthermore, climate change (CC) can also affect the landscape and the structural integrity of the warehouses. In 1816 there was a sand slide upriver, which caused the Nidelva River to be shallow, causing the rise of the water to occur in a more important way. With CC the sea can rise up to 3.4 mm per year and this can strongly affect the warehouses.

[TRONDHEIM LANDSCAPE AND NIDAROS CATHEDRAL]

Trondheim is well known for its wooden built environment with traces back to the Middle Age. In more recent times much of the traditional wooden houses are being replaced by architecture structures made of brick, concrete and steel, creating a more heterogeneous typology with variations in scale, volume and heights. Moreover, the cultural and historical aspect of the landscape also includes the urban fabric with its green areas, gardens and parks and also how the tangible and intangible dimensions are perceived.

The natural landscape is integrated into the city centre of Trondheim in such a way that the urban and the natural landscape interact with each other for the development of the city. Moreover, the historic city is integrated by natural elements such as the Nidelva River, the Trondheim Fjord, the coastal area, the valley and the hills surrounding the city.

Trondheim developed in medieval times, from the bank to the mouth of the river Nidelva. However, in 1681, almost the entire city was destroyed by a strong fire, which allowed the creation of a new city plan, thus proposing larger streets and building two-storey homes. However, until the 19th century, it was still a village of low-rise wooden dwellings.

In 1841 and 1842 two fires left large parts of the city in ashes and the use of wood as main construction material was banned in 1845. However, before this legislation was implemented, the citizens managed to reconstruct the city using wood. With the implementation of the new legislation, a new architectural style based on brick was introduced. Later on, the use of concrete and steel gradually changed the performance of some parts of the city center into a more diverse and complex urban landscape (i.e. new materials were introduced, and the new typology opened up for buildings in several stories, creating a brand-new

architectural style).

World War II changed the organization of the landscape, giving it a more modern imprint. The biggest variation concerned the use of new materials, such as brick, concrete and steel, and for this reason the image of the city has changed a lot, passing from a landscape rich in wood to a heterogeneous landscape.

Also, there are new changes taking place nowadays. Think, for example, of the fact that people want to work in the city center (Kjøpmannsgata 37 is an example), and this generates pressure to construct new buildings on limited space. This situation can certainly represent a risk to the historical urban fabric of Trondheim, which must be preserved.

The monumental streets and squares replaced the narrow and curvy streets after the fire of 1681. Furthermore, the urban landscape of Trondheim is also characterized by the river Nidelva and the canals surrounding the historic core on the peninsula, establishing attractive urban spaces with its water surface, representing more a visual element than a functional one. Another important spatial element connected to the historic urban landscape of the city center, is the green parks. Marinen park, located on the south of Nidaros cathedral, is the most important green space in the city, especially in summer periods where it also hosts festivals. The river Nidelva and the canals form important prerequisites for the development of the urban landscape that also encompasses the built environment. Nidaros Cathedral is the world's northernmost important Gothic cathedral and Norway's national sanctuary. It is situated in the middle of Trondheim city centre and was originally made of wood and built from 1031 onwards. During the Middle Ages, and after independence was restored in 1814, the Nidaros Cathedral was the coronation church of the Norwegian kings. In 1991, the present King Harald V and Queen Sonja were consecrated in this cathedral, demonstrating the importance of the monument for the Norwegians.

[A REFLECTION ON THE IDENTITY OF THE WAREHOUSES AND THE CATHEDRAL]

The identity of Trondheim is very much influenced by the Warehouses and the Nidaros Cathedral, and some of the aspects that are related to the colour, form, location and use of both buildings are of paramount importance for the preservation of the cityscape. It should be stressed again that intervention can be done in the Warehouses as long as their identity can be preserved because they represent an identifiable cityscape with cultural and aesthetic values of national importance. Those buildings vary in height, width and proportions, roof shape and angle, as well as in colour and detail. These aspects give the Warehouses their charming and characteristic rhythm and at the same time appear as clear individual parts in a whole. Therefore, the importance of the Warehouses lies in the whole landscape and not in the single building. Over a period of time, warehouses have not been used, so no significant structural changes have been made. An important aspect is that these buildings would sometimes have a space in front one of the long sides making a useful gap in the row of buildings, to minimise the risk of fire spreading. What increases its patrimonial value, but the lack of maintenance produces an unattractive visual aspect. The original

warehouses were not used as dwellings, but today many have been converted into residential houses. Therefore, the preservation of the warehouse's identity is a key aspect to preserve the landscape of Trondheim. Interestingly, the warehouses were repeatedly destroyed by fires and rebuilt always on the same sites and following the same construction rules established in the twentieth century.

Nidaros Cathedral is the world's northernmost important Gothic monument, and it is an important part of the city's identity: i.e., in the study of Kyttang and Bye (2019) the Cathedral was identified as the most significant historic building in Trondheim landscape. In this case, aspects like the colour, form, location and use are also of fundamental importance in the preservation of the city landscape. The interaction between nature and the urban fabric is evident. Monumental historical landmark buildings like the Cathedral dominate the urban landscape and thus shape the cityscape. Therefore, all new buildings should not break important landscape silhouettes. The case of Nidaros is representative of the fact that it is necessary to preserve the colour and above all the structure and shape because they are peculiar characteristics of the historical period in which it was built and part of the cityscape. Additionally, the air pollution situation in climate change has contributed to an accelerated deterioration of the monument. Therefore, it is necessary to think of some strategies to avoid irreversible damage and, at the same time, to keep the original materials and the identity of the Cathedral. These strategies, listed in the following subsections, concern architectural barriers, the use and maintenance of the historic building considered, and the proper maintenance of the green spaces.

- **Barriers**

The barriers in the city prevent free movement and make it difficult to use some spaces (Figure 1). It is important that the city has easy connections with the most emblematic sites and that there are spaces of utility and to further relationship between people. For this reason, certain obstacles such as different elevations, various vehicle and train crossings, etc. are complicating free movement. For example, the barriers between the warehouses were set up in order to prevent the spread of fire. And yet, in the cathedral, there is only one minor barrier, which is an outer fence with a gate, that allows people to get close to it (Figure 2).

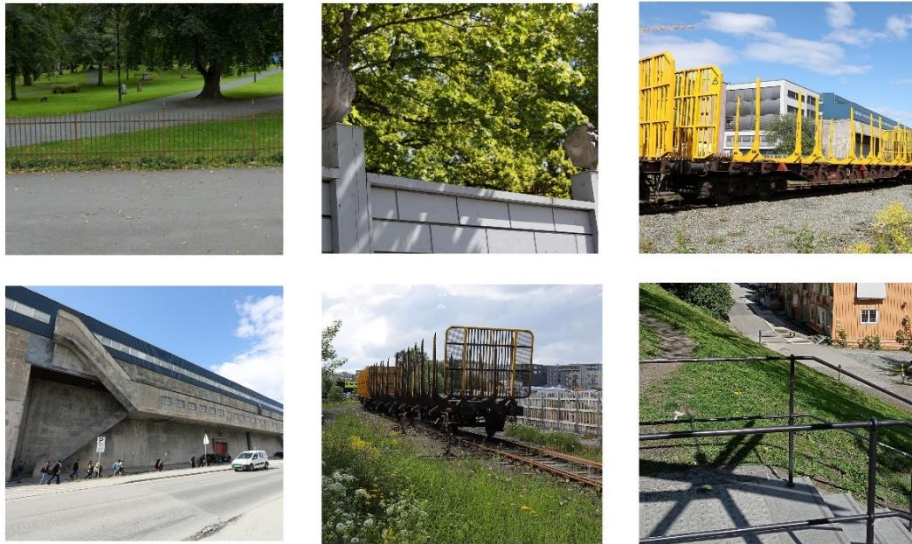


Figure 1. Some of the barriers identified in the city of Trondheim.

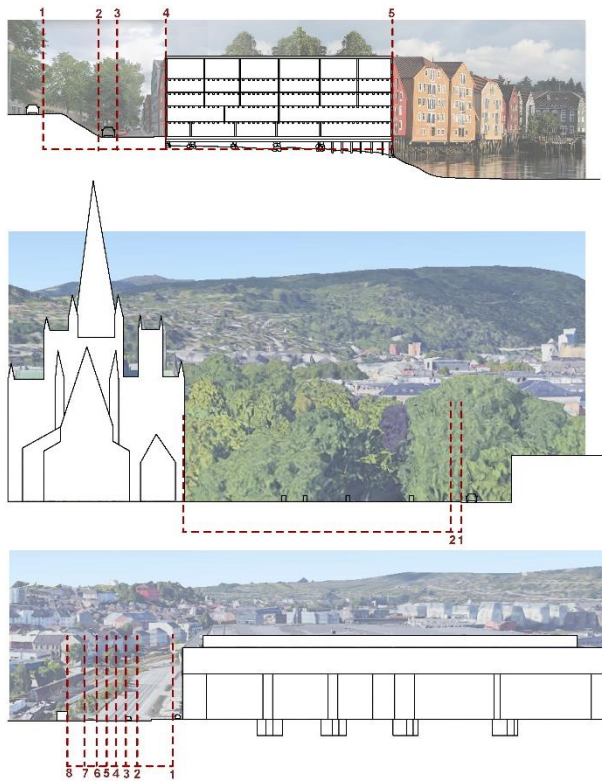


Figure 2. Comparison of the different barriers identified in the city.

- **Warehouses use**

Currently, most warehouses are not in use, so they are not maintained. It is important to reactivate the use of warehouses so that cultural events can take place and business offices can settle herewith encouraging the economy to support the revitalization of the neighbourhood. Therefore, important events such as concerts, social events, and cultural events will help to revive the area.

- **Maintenance**

It is important that maintenance is carried out on a regular basis to maintain the heritage and landscape of Trondheim. An example would be the cathedral of Nidaros, which can be kept in good condition by ongoing repair and restoration. However, the lack of maintenance in warehouses is due to the fact that they are not used and/or due to the lack of funds to keep them intact.

- **Green spaces**

Integrating green spaces means giving the city spaces to develop activities such as sports and provide a "green lung" (Figure 3). Nature provides spaces where you can interact with other people and integrating it can be an option to remove some barriers, such as heavy traffic. An example would be The Fortress and its environs, with large natural spaces where people can relax and relate to each other.



Figure 3. Green spaces that can be integrated in the landscape.

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