

The Svalbard Church in Longyearbyen, Spitsbergen, As an Example of a Social Space in an Area with an Extremely Cold Climate

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Abstract--- *The main object of this study is the social space of the Svalbard Church (Svalbard Kirke in Longyearbyen on the island of Spitsbergen, a part of the Svalbard archipelago). It is an example of a social space that is atypical when European conditions are concerned. During the study of the architecture and urban layouts of Spitsbergen, as well as studying its inhabitants, the authors focused on the role and significance of social spaces in the lives of residents, their general characteristics and their positives and negatives, the manner of their use by various social groups, as well as their quality and functional solutions. The Svalbard Church, which is an example of a social space, was investigated while focusing on its characteristics as a place and on its context, the function and form of its architectural and urban layout, its structural system, construction materials, colour and its detail in reference to its distinct climate conditions. The goal of the study was to identify the quality of this space and its suitability to its users. The study was performed using critical analysis, on-site observation and included a survey. The survey was performed among a group of respondents composed of the users of the investigated space, divided into the following age groups: 19 or younger, 20–25 years of age, 26–44 years of age, 45–66 years of age and over 67 years of age.*

Keywords--- *Svalbard, Spitsbergen, Longyearbyen, Social Space, Church.*

I. INTRODUCTION

Social spaces have permanently integrated themselves with the urban form of cities, becoming their inseparable elements, enabling the emergence of a cohesive, symbiotic unit that is friendly to its users. At present, the establishment of spaces that can be used for common living and the integration of residents, as well as placing them within reality, has become a key problem in shaping development, irrespective of its location, characteristics, context or climate. Factors that affect the shaping of urban social spaces in cities with extreme atmospheric and climate conditions are often surprisingly different when compared to urban spaces located in temperate or near-temperate climates. At the start of the twenty-first century, the world was taken over by modern technologies and artificial intelligence. People live in a world of technology, in virtual reality. The unlimited ability to travel all over the world and maintain contact with it, irrespective of the time of day or season of the year, have become our everyday reality.[1,2,3,4,5,6,7] Does the concept of belonging to a place or a community still exist in the world of today? Are there any links between people and the city, is there a physical integration of residents and interpersonal contact without cellphones or the Internet?

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II. THE SVALBARD ARCHIPELAGO

The Svalbard Archipelago is one of the northernmost island groups of the Arctic. It is located within the arctic circle, with a longitude of between 74° and 81° N and a latitude of between 10° and 35° E. Its combined area is 62 405 km²,¹ while the length of its coastline is 3 587 km.² The islands are located around eight hundred kilometres to the north of Norway and around eleven hundred kilometres to the south of the north pole.³[8]

The discovery of Svalbard remains a matter of debate to this day. Numerous sources state that it was first reached by the Vikings. The first mentions of Spitsbergen—‘Svalbarði’, or the "cold shore"—in Icelandic Chronicles are dated to 1194. There are also numerous tales of the Pomors, who left many pieces of historical evidence of their presence on the shores of the archipelago's islands, although they never formed permanent settlements there.

It was only in the sixteenth century that the growing potential for commercial exchange with India and China convinced European explorers to search for the shortest navigable route to the East.⁴ On the seventeenth of June 1596, while searching for a sea route to China, an expedition led by the Dutch sailor Willem Barents reached the southern coast of the island, which was later named *Spitsberg* because of its distinct, tall, steep rocky mountains. It was considered a part of Greenland for many years afterwards, although the date is currently considered to be the official day of the discovery of Spitsbergen.⁵ The area around Svalbard has been very valuable to whalers and the explorers who discovered the north pole, in addition to scholars investigating geological phenomena and natural riches—particularly coal—for centuries. Coal in particular became the cause of the establishment of Spitsbergen's first permanent settlements.[9,10]

The five towns located on the main island are currently inhabited by 2726 people.⁶ 81% of the entire population lives in the largest town—Longyearbyen. The incumbent governor of Svalbard is also based there.⁷ We can meet people belonging to forty-six different nationalities on the islands. Over half of Longyearbyen's and Ny-Ålesund's residents are of working age, aged between 20 and 44.

Longyearbyen is the northernmost town on the planet with over 1000 permanent residents. At the start of 2019, Longyearbyen's population amounted to 2215, which is 84% of the entire population of Svalbard. The town was founded in 1906 by businessman John Munro Longyear, who opened a coal mine here, which is managed by the Arctic Coal Company.[11]

¹ Szupryczyński, J., *Niektóre zagadnienia czwartorzędu na obszarze Spitsbergenu*, Państwowe Wydawnictwo Naukowe, Warszawa 1968, p. 8.

² [from:] world.bymap.org/Coastlines.html (accessed: 15.08.2019)

³ [from:] hornsund.igf.edu.pl/hornsund.old/spitsbergen.html (accessed: 15.08.2019)

⁴ [from:] hornsund.igf.edu.pl/hornsund.old/historia2.html (accessed: 15.08.2019)

⁵ [from:] hornsund.igf.edu.pl/hornsund.old/historia2.html (accessed: 15.08.2019)

⁶ Data for the first half of 2019 for Longyearbyen, Ny-Alesund, Barentsburg, Pyramiden, Hornsund [from:] Statistisk sentralbyrå, Statistics Norway, www.ssb.no (accessed: 21.08.2019)

⁷ Data for the first half of 2019 for Longyearbyen, Ny-Alesund, Barentsburg, Pyramiden, Hornsund [from:] Statistisk sentralbyrå, Statistics Norway, www.ssb.no (accessed: 21.08.2019)



III. 1: View of the town of Longyearbyen phot. by Agnieszka Żabicka, 2016

The Svalbard archipelago is a unique place. It owes this uniqueness not only to its extremely harsh climate, but also its remarkable natural beauty. It has become a paradise for photographers and lovers of unique landscapes and the challenges of travel and exploration. There can be no doubt that it is a very difficult place to live, although this does not seem to affect the number of residents, which is rising. The problem is not the trip to Spitsbergen, but finding a place to live and work in a place where the dominant mammals are polar bears and reindeers, while humans appear to be intruders. [12,13]

The archipelago's terrain is mountainous, with absolute elevations varying between 0 m a. s. l. to 1717 m a. s. l.⁸ One distinct element of the landscape of Svalbard's islands are its numerous plateaus and steep mountains, in addition to their highly developed coastlines, which attract all of the life on Svalbard. The atmospheric conditions present on the archipelago and its surrounding waters are not favourable to the reproduction and development of living creatures. The sub-polar climate of Svalbard resembles polar regions in its characteristics. The average air temperature during summer in the west of Svalbard vary between 0°C and +7°C, while during winter they can fall below -20°C.⁹

Spitsbergen is described as an arctic desert, owing this to its very low yearly precipitation. It is covered in snow six months a year on average.

The Svalbard archipelago is located within the arctic circle, relatively close to the North Pole. One phenomenon that is both extreme and inseparably tied with the area is the polar night, when sunlight does not reach the islands' surface at all, as well as the polar day, when it shines 24 hours a day.

⁸The tallest peak of the archipelago, Newtontoppen, is located in the north-eastern part of the island of Spitsbergen
⁹ [from:] www.climatestotravel.com/climate/norway/svalbard (accessed: 21.08.2019)

In Longyearbyen, the first rays of sunlight appear on the eighth of March, although a full day can be experienced only after the twentieth of April. It sets below the horizon on the twenty-second of August.¹⁰[14] During winter, the only sources of light are the moon and the area's remarkable northern lights.[15]



Ill. 2: The island of Spitsbergen, a part of the Svalbard archipelago. phot. by Agnieszka Żabicka, 2016

The phenomenon of Svalbard and its polar days and nights sort of force its residents to integrate. People cannot exist within society or satisfy their need for belonging and feeling safe without interpersonal contact. Social spaces play an invaluable role in such unique living conditions. They aid in maintaining balance, delineating zones that are open and accessible to all users regardless of their race, gender, culture or religion. They make social development possible. They eliminate the feeling of alienation and create social bonds.

Spaces of public life are created either deliberately or spontaneously. They possess significant cultural value, encouraging their users to reflect on various matters and facilitate the free expression of one's views, focusing the actual public life of the town—the everyday lives of the residents of this cold land. They define the rhythm, pace and cycle of life on the northern edge of the world.

Despite the extreme harshness of its weather conditions, people constantly want to come to Spitsbergen to live, work, grow and learn in this distant, northern corner of the world. They want to integrate with the remaining residents despite their cultural and racial diversity, their many languages and personalities. The social spaces that are created here have an immense impact on the human psyche and everyday functioning in such extreme climate conditions.

¹⁰ [from:] Umbreit, A., *Spitsbergen: Svalbard, Franz Josef, Jan Mayen, 3rd*, Bradt Travel Guide 2005, p. 24.



III. 3: View of the town of Longyearbyen phot. Agnieszka Żabicka, 2016

III. STUDY OF THE SVALBARD CHURCH

This work is based on the assumption that there exists a symbiosis between cities and their users, which is shaped within social spaces irrespective of climate conditions. The differences between them are only caused by the observation that the appearance of these spaces varies. It would be impossible to create a stable, properly functioning urban unit without satisfying the needs of individuals and groups of residents.

The main subject of the study was the social space located inside the Svalbard Church in the town of Longyearbyen. Its functional solutions, landscape context, the form of its architectural layout, structural system, construction materials and detail were subjected to an analysis. The study is an attempt at answering the question as to whether it is possible to establish comfortable social spaces for the residents and tourists of Spitsbergen under such extreme climate conditions and what are the factors pertaining to the shaping of these spaces that determine this.

In order to formulate an appropriate assessment, the analysis was performed at multiple levels: at the level of the landscape and urban context, its surroundings, scale, function and the form of the architectural layout, its structural system and the applied construction materials, details and colours.

The research methods used in the study include: theoretical research, field research performed on-site, the authors' original report and a survey study.

3.1. Overview



Fig. 1: The location of the Svalbard Church within the town

The history of Spitsbergen's first and only church, which is also the world's northernmost one, began with the inauguration of its construction in July 1921. The building, located in Longyearbyen, was finished in only 50 days and was consecrated on the twenty-eighth of August 1921.

In 1943, during the Second World War, the building was fired upon by German dreadnaughts and burned down. It took thirteen years to place the cornerstone underneath a new building.¹¹

The construction of the new church, designed by Hans Magnus, took two years, and the church ultimately received its shape and form, which has remained unchanged to the present day, in August of 1958. At the turn of 2005, its interior and technical infrastructure were modernised.¹² [16]

3.2. Function

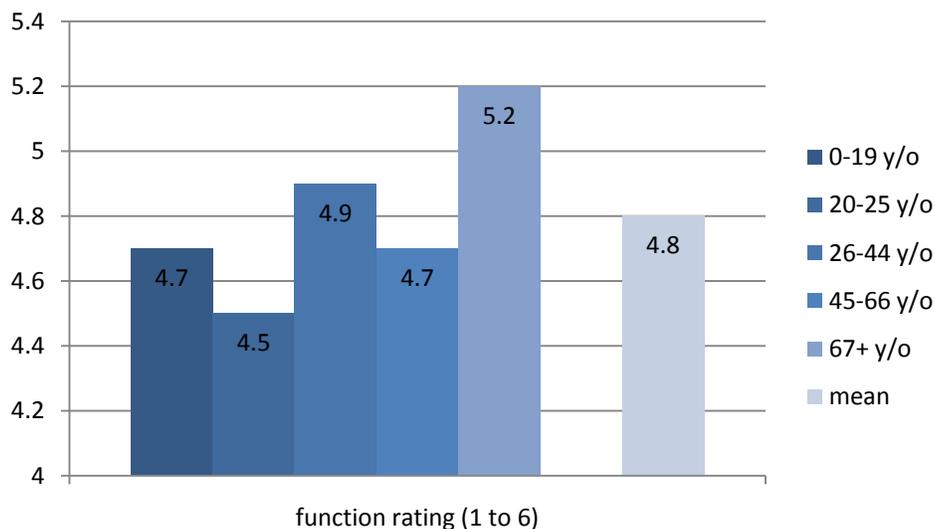
The history of the place and its local art are not the only things that the Lutheran church of Our Saviour combines. It is the main provider of shelter, reflection and rest. Regardless of the time of day and the conditions outside, the building is open twenty-four hours every day, seven days a week, integrating not only the residents of Longyearbyen, but also, as its name suggests, the population of all of Svalbard, in addition to tourists, regardless of gender, age, nationality or religious denomination. From the very entrance, Norwegian Protestants from Longyearbyen and Ny-Ålesund, the Russian Orthodox believers from Barentsburg, Catholic Poles from the Hornsund Arctic Research Station and visitors from all over the world are pleasantly welcomed by the church's symmetrical space and the polar bear statue located near its entrance. It features a cosy space with a fireplace, a library, comfortable chairs and mementos, bringing a club room to mind.

¹¹ [from:] www.kirken.no/nb-NO/fellesrad/svalbard-kirke/om-oss/om-menigheten/ (accessed: 31.03.2019)

¹² [from:] *En kirke utenom det vanlige* [in:] Apent rom, nr 2/2006, Statsbygg, Oslo, 2006, p. 22.

Every Tuesday, after evening mass, it hosts community gatherings, concerts and book reading events, offering coffee, tea, wafers and the latest newspapers everyday. It also features a small souvenir shop. At the entrance there is a visitors' book, where we can leave a small mark in the world's northernmost church. Mass is held on Sundays at 11 AM. The ministries are in Norwegian.

An analysis of the function and its impact on the quality and reception of the social space, rated on a six-point scale (1 being the lowest rating and 6 being the highest), based on a survey study performed on a group of respondents divided into the following age groups: up to 19 years of age, between 20–25 years of age, 26–44 years of age, 45–66 years of age and over 67 years of age, has been shown in table 1.



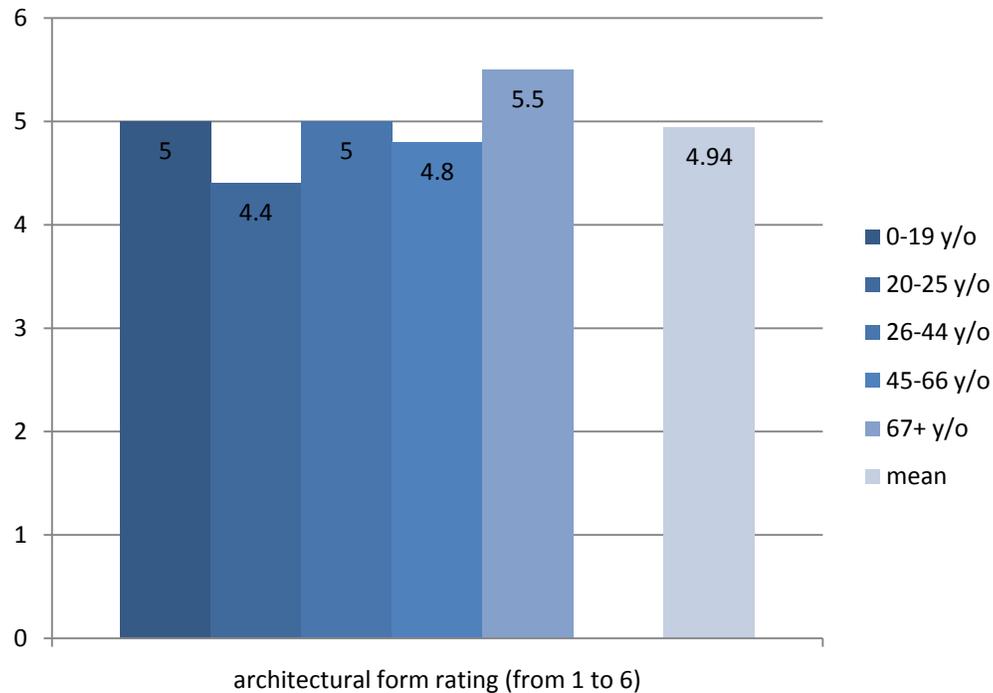
Tab. 1: Function assessment by respondents

The survey concerning the rating of the impact of the function of the social space on its quality and positive reception showed that the highest ratings were given by respondents within the 67+ y/o age group, while the lowest ones were given by those in the 20–25 y/o age group.

3.3. Form

The building is composed of the church's main body, with a chapel and meeting hall, as well as an extension which functions as a parish house. The central section has a steep gable roof and a tall eight-sided tower. The sacristy and parish house is covered with a hipped roof. The entrance zone is formed by a large hall, which, according to Norwegian tradition, is where visitors leave shoes on shelves and place their firearms in safe cabinets. The church's main hall is preceded by a meeting and integration space for residents. Six symmetrically designed windows on both sides of the prayer hall connect the interior with the surrounding area's spectacular natural landscape.

An analysis of the architectural form and its impact on the quality and reception of the social space, rated on a six-point scale (1 being the lowest rating and 6 being the highest), based on the survey study, has been shown in table 2.



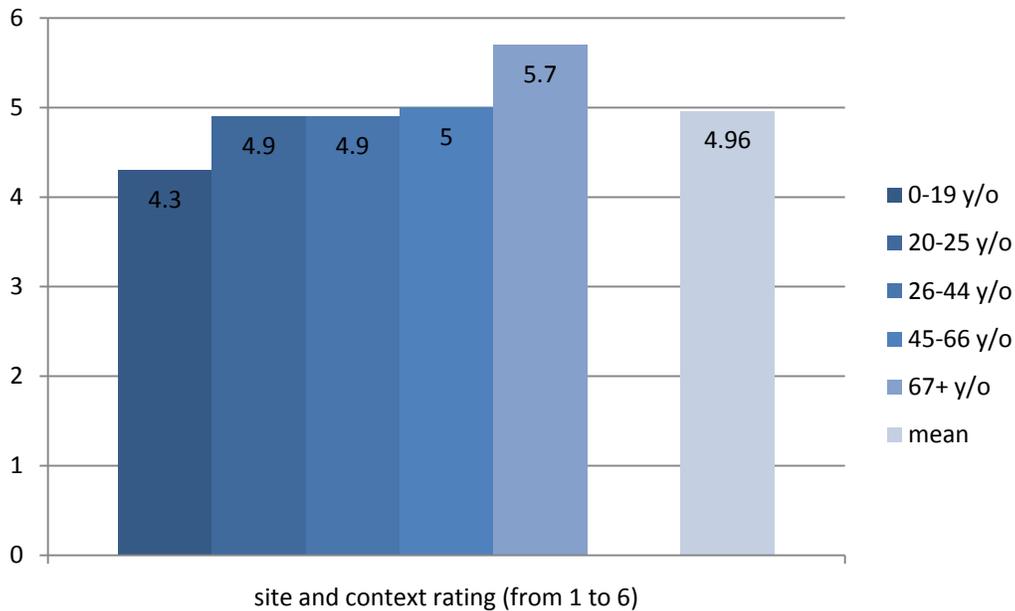
Tab. 2: Architectural form assessment by respondents

The survey concerning the rating of the impact of the architectural form of the social space on its quality and positive reception showed that the highest ratings were given by respondents within the 67+ y/o age group, while the lowest ones were given by those in the 20–25 y/o age group.

3.4. Context

The church rises above the northern slope of Longyeardalen valley, in the oldest district of the town—Skæringa. The original church building was surrounded by residential, public and institutional buildings. It was located near the town's main street. After the War, only the church was rebuilt, while the remaining buildings and the town centre, along with its main street, were relocated to the other side of the valley. At present, the church stands above Longyearbyen almost completely by itself. It is surrounded by the natural landscape and can be clearly seen from every place in the town, which highlights its exceptional character. Its location gives it breathtaking views of the Longyeardalen and Adventdalen valleys, which can be seen from its windows. Near the church is a small set of stairs that used to be a part of an old hospital. Every year, on the eighth of March, around 12:30, all of Longyearbyen's residents gather here to celebrate the return of the first rays of the sun after the end of the year's polar night. The Solfestuka celebrations often begin in the church's main hall, which everyone then leaves to go to the site where the sun is welcomed.

An analysis of the impact of the site and its context on the quality and reception of the social space, rated on a six-point scale (1 being the lowest rating and 6 being the highest), based on the survey study, has been shown in table 3.



Tab. 3: Site and context assessment by respondents

The survey concerning the rating of the impact of the site of the social space and its context on said space's quality and positive reception showed that the highest ratings were given by respondents within the 67+ y/o age group, while the lowest ones were given by those in the 0-19 y/o age group.

3.5. Scale

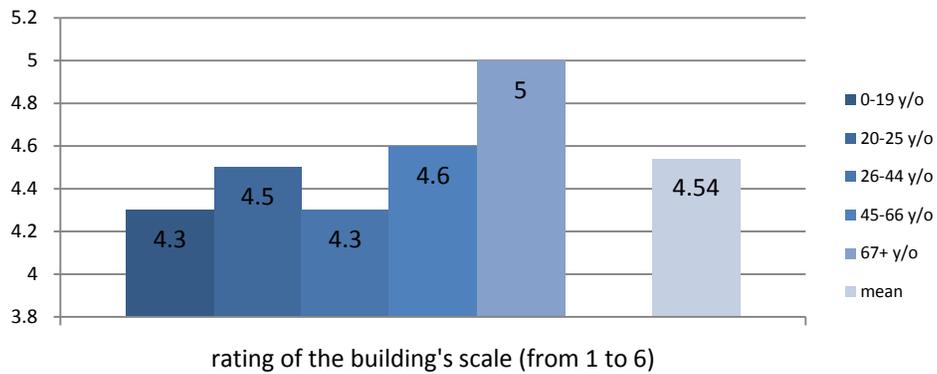
The main body of the Svalbard Church is a single-storey structure, while the parish house wing is divided into parts, one that has two and one that has three storeys. The overall floor area of the structure is 910 m².¹³ The church has around one hundred and forty seats.

In terms of scale, the church is adapted to human physical and psychological dimensions, as well as to other buildings within the town and its surroundings, creating mutual linkages and cohesion. Despite the building being located above the main street of Longyearbyen, it does not appear to dominate over it and the residents and tourists do not find it imposing. It appears to be an integral part of the town. The extensive space around the church highlights its function against the background of other buildings.

The interior of the Svalbard Church positively affects its reception. The size of the interior spaces is well-suited to the number of people that frequent the church. The use of large windows, which provide visual contact with the surrounding landscape, enables one to catch their breath without losing the feeling of cosiness.

An analysis of the impact of scale on the quality and reception of the social space, rated on a six-point scale (1 being the lowest rating and 6 being the highest), based on the survey study, has been shown in table 4.

¹³ [from:] www.statsbygg.no/Prosjekter-og-eiendommer/Eiendommer/Samfunnssektor/00877-Svalbard-Kirke-Longyearbyen/ (accessed: 05.04.2019)



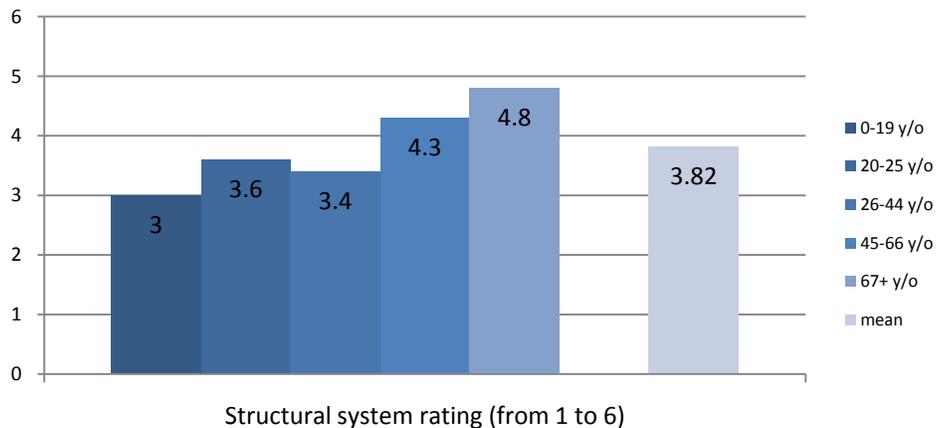
Tab. 4: Assessment of the building's scale by respondents

The survey concerning the rating of the impact of the building's scale on the quality and positive reception of the social space showed that the highest ratings were given by respondents within the 67+ y/o age group, while the lowest ones were given by those in the 0-19 y/o and 26-44 y/o age groups.

3.6. Structural system

The church was built using a timber frame structural system. Its foundations were constructed in the form of piles that rest on the permafrost. The main body of the building is placed 1 metre above grade, while the entrance can be accessed by wide timber stairs. The space underneath the deck of the main level is an empty space that prevents the building from being flooded when large amounts of snow melt during summer. The building's roof was built using a simple rafter frame. The deck above the main hall of the church was built out of timber beams that are visible within the internal space.

An analysis of the impact of the building's structural system on the quality and reception of the social space, rated on a six-point scale (1 being the lowest rating and 6 being the highest), based on the survey study, has been shown in table 5.



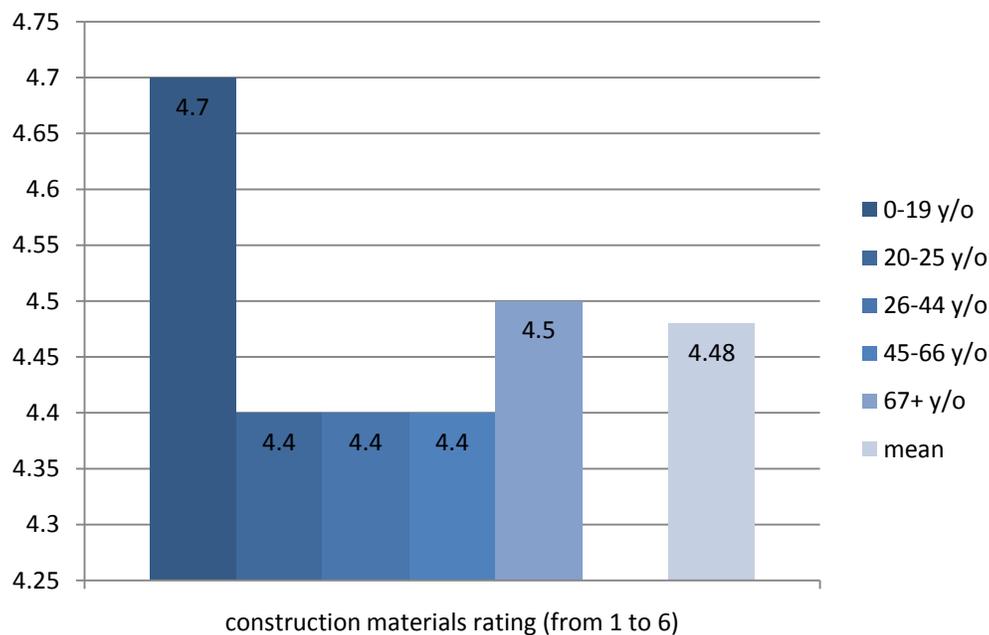
Tab. 5: Assessment of the building's structural system by respondents

The survey concerning the rating of the impact of the building's structural system on the quality and positive reception of the social space showed that the highest ratings were given by respondents within the 67+ y/o age group, while the lowest ones were given by those in the 0-19 y/o age group.

3.7. Applied construction materials

The church's facades, interior and furnishings were made from oak wood. The facade of the main body of the church, along with its tower, was finished using vertical wooden board siding. The gable wall has a finish made from trapezoid shingles.

An analysis of the impact of the building's construction materials on the quality and reception of the social space, rated on a six-point scale (1 being the lowest rating and 6 being the highest), based on the survey study, has been shown in table 6.



Tab. 6: Assessment of the construction materials by respondents.

The survey concerning the rating of the impact of materials used within the social space on its quality and positive reception showed that the highest ratings were given by respondents within the 0-19 y/o age group, while the lowest ones were given by those in the 20–66 y/o age groups.

3.8. Detail and colour

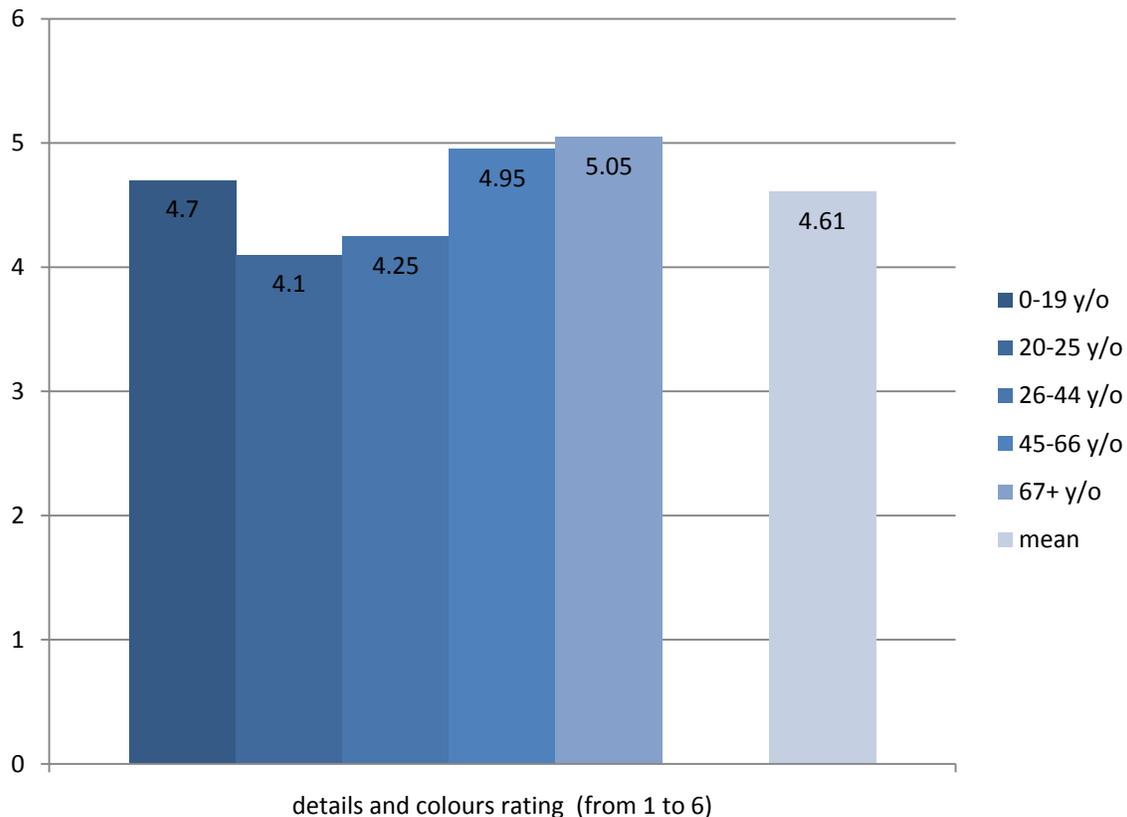
The elevation of the building above terrain level was highlighted with horizontally-placed wood in a light-blue colour. The colour blends with the natural shade of the snow during winter. The windows, window frames and cornices that highlight the high-pitched gabled roof were coloured white. The main entrance is highlighted by an ascetic, minimalist portal with a natural colour scheme. The parish house section was set apart from the main body of the church through pale green wooden board siding, while its windows are the colour of bright wood.

The roof surface is made of light-brown bitumen shingles. The tower is topped by an eight-sided tent, covered in brown steel sheets. The vertical wooden board siding of the facade is dark red. Raw wood gives the building's interior a warm and pleasant character.

The furniture was also made from natural materials. The ascetic interior of the main hall, which is used for religious services, is decorated with a remarkable painting located near the altar, painted by Norwegian artist Kaare Mikkelsen Jonsborg.

The prayer section is outlined by a red carpet. A ship is suspended above the hall's simple wooden chairs, acting as a symbol of sailing across human life. The main hall of the church used to be separated from the guest hall with a door. At present, the spaces are joined and the altar can be seen from near the entrance.

An analysis of the impact of the building's details and colours on the quality and reception of the social space, rated on a six-point scale (1 being the lowest rating and 6 being the highest), based on the survey study, has been shown in table 7.



Tab. 7: Assessment of the building's details and colours by respondents

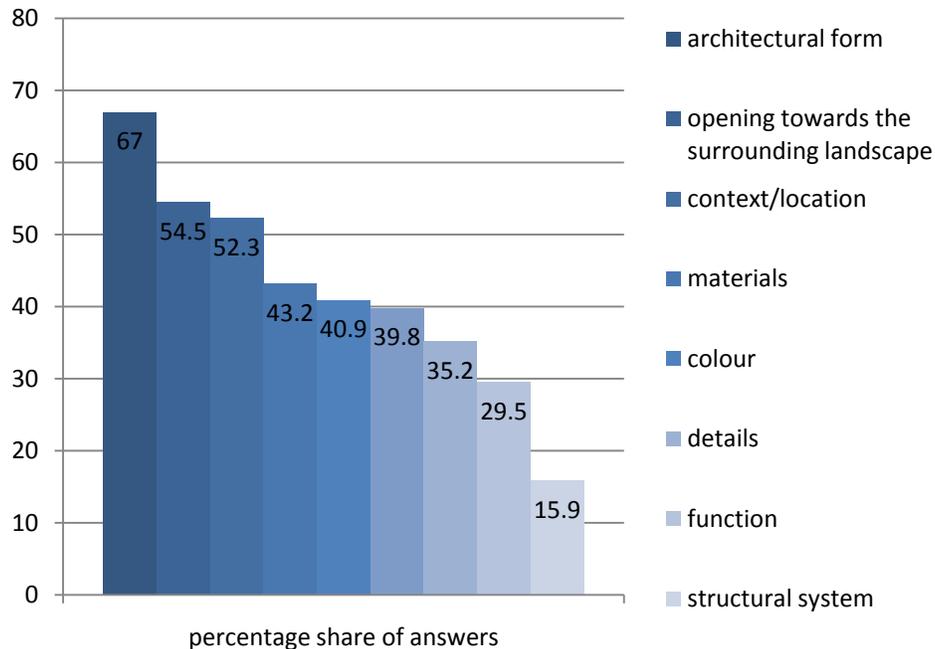
The survey concerning the rating of the impact of details and colours within the social space on its quality and positive reception showed that the highest ratings were given by respondents within the 67+ y/o age group, while the lowest ones were given by those in the 20–25 y/o age groups.



Ill. 4: View of the church's meeting hall in the foreground and the alter and prayer hall in the background. phot. by Mariusz Twardowski, 2016, Ill. 5 Frontal facade of the Svalbard Church. phot. by Agnieszka Żabicka, 2016, Ill. 6 View of the church against the background of Longyeardalen valley. phot. by Agnieszka Żabicka, 2016, Ill. 7 The church as seen from the centre of the town of Longyearbyen. phot. by Agnieszka Żabicka, 2016.

3.9. Summary

An analysis of the factors that were identified as having the greatest impact on the quality and reception of the social space in the survey study has been presented in the scheme below, shown in table 8.



Tab. 8: Factors that have the greatest impact on the quality and positive reception of social spaces, as reported by the study's respondents

The study concerning the assessment of the impact of each factor on the quality and positive reception of social space showed that the highest-rated factors were architectural form, opening towards the surrounding landscape and context/location. The structural system had the lowest percentage share.

IV. DISCUSSION

Architectural form plays a crucial role in perceiving a building, a public space or a social space by residents. It is architectural form, along with location and context, that decides whether people will frequent places that are available to them. Spitsbergen, through its exceptionality, makes it impossible not to consider contact with the surroundings in this assessment. The unique landscape, impossible to encounter in a temperate or equatorial climate, makes us gravitate towards it. The extraordinary phenomenon of polar days and nights, extremely cold temperatures and a relatively low permanent population are factors that contribute to the need for contact with other people. These factors increase the importance of the use of materials, colours and details in social spaces. They make a given social space friendly and cause it to encourage interpersonal contacts, integrating residents and aiding in forming local bonds. These spaces are conducive to the formation of social groups and facilitate the appropriate functioning of the housing environment, giving individuals a sense of safety and belonging.

V. CONCLUSIONS

In conclusion, it can be stated that the most important factors that affect the quality and positive reception of the social space within the Svalbard Church the most are architectural form, the opening of the interior towards the surrounding landscape and its extant context, with factors such as colour, detail and the function of a building being secondary. The results of the analyses are predominantly the effect of Spitsbergen's extraordinary scenery and its one-of-a-kind natural landscape. It is a place that is exceptional in every way. The traditional architectural form, which features references to the remaining buildings of the town, is important to its residents and helps them to find their everyday place-based identity within a difficult climate.

Today, in a world of modern technologies and the Internet, we pay particular attention to the significance of social spaces within the lives of residents and users of cities and towns located within polar circle, particularly Spitsbergen, which is isolated from the continent. Shaping public life plays an invaluable role in overcoming everyday adversities and challenges associated with this area's climate and atmospheric conditions. Its extraordinary scenery and unique natural landscape cannot satisfy human physical and psychological needs, it will not allow us to form bonds or create social identities.

The Svalbard Church, a structure that is unique—because of its function and its location, its opening towards the surrounding landscape, its architectural form, its materials, details and colours. It manifests the undisturbed exceptionality of the northern edge of the world, a place where all are welcome. It allows us to feel safe and that we belong to this place, to this community. It creates a bond between the town and its residents.

The Svalbard archipelago breaks away from the stereotypes of the city, and its phenomenon is highlighted by the fact that people should not be there, and yet they are, and their integration and interpersonal contact is aided by social spaces such as the Svalbard Church.

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