A high-contrast, low-key photograph featuring a silhouette of a person wearing a hijab, positioned on the left side of the frame. The person's head is bowed, and their hands are near their face in a contemplative or prayerful gesture. In the background, on the right side, a tall, slender minaret of a mosque rises against a bright, hazy sky. The overall mood is serene and contemplative, with the strong backlighting creating a halo effect around the person's head.

Mosque in Nordic context

Mahtab Aslam

Title page

Project title:	Mosque in Nordic context
Project group:	AD10_ARK 22_2010 Architecture & Design, Aalborg University
Project period:	01.02.2010 - 22.06.2010
Publishing numbers:	5
Pages:	83
Main supervisor:	Associate Professor Peter Mandal Hansen
Technical supervisor:	Associate Professor Poul Henning Kirkgaard

Synopsis

This project focuses on the design of a mosque combined with a cultural centre in a Nordic context, far north in Norway-Tromsø. By creating a common facility for Muslims of Tromsø this project looks for a new mosque typology based on the arctic context but still respecting the sacred aim of a mosque. The additional function with a cultural centre is thought to create a common facility across the cultural boundaries for Tromsø as a city, and contribute to narrowing down the cultural gap between Muslims and non-Muslim citizens of Tromsø. Beside this, the project's intention is to design a complex with aesthetic qualities based on spatial experience and materiality.

Table of content

Title page	2
Synopsis	3
Table of content	4
Preface	6
Intro	7
Program	
Motivation	10
Method	11
Analysis	12
Introduction Tromsø	12
Site location	14
Area history	16
Future plans	17
Mapping infrastructure	20
District	20
Area movement	22
Paths	24
Nodes landmarks	26
Site conditions	29
Site views and edges	29
Building typology	30
Landscape	32
Material typology	33
Climate	34
Wind conditions	34
Sun conditions	35
Midnight sun and dark period	36
Phenomenon of northern light	37
Mosque research	38
Origin of Islam	40
Mosque history	41
Mosque typologies	42
20th century's mosque architecture	44
Hierarchy in a mosque	45
Component parts of the mosque	46
The ornamental mode	49

Space requirements	50
Sub conclusion mosque research	51
Segregation why and how	51
Mosque typologies in Norway	52
Sacred architecture	54
Inspiration contemporary sacred architecture	56
Daylight	58
Acoustic	60
User group	64
Functional connections	65
Room description	66
Mosque	66
Room program Mosque	67
Cultural centre / conference hall	68
Room program cultural centre / conference hall	69
Accommodation for imam	70
Room program apartment	70
Room program accommodation visitors	71
Accommodation for visitors	71
Outdoor space	72
Functions outdoor spaces	73
Design criteria and parameters	74
Vision	76
Literature, Illustrations	
Litterateur list	80
Books	80
web	80
Illustration list	81

Preface

This project is created by Mahtab Aslam, group of ARK-22 at 4th semester master degree in the spring of 2010 at the department of Architecture & Design, Aalborg University. The research question for this report is how to design a mosque with a community centre in a Nordic context. The site chosen for this project is located in an old industrial area under redevelopment, along the eastern harbor front of the Arctic city Tromsø, far North in Norway. As a design tool, the integrated design process is used as method for the following project period. The report will be divided in four chapters; program, sketching phase, detailing phase and presentation phase. These four steps correspond with the main phases described in the integrated design process.

The project report will be divided in 2 booklets, where booklet 1 is presenting the program and booklet 2 is presenting the process, detailing and the presentation part of the project.

The program contains the analysis that creates the background for the project. Vision, and design parameters created out from the analysis will stand as guidelines and goals for the process and the design. The process will be presented in a linear order to create a clear overview. In this phase simple technical considerations will be proved. A concept is intended to be found in the end of this phase and will be detailed further in the last phase. The technical considerations in the detailing phase are more attached to the architectural qualities and the design of the building. The presentation of the final product is placed in the end of booklet 2 with illustrations visualizing the final outcome. Furthermore a CD-ROM is attached in the back of booklet 2, including a digital version of the report with all the calculation results. In addition to this, a drawing folder with illustration material in larger scale is following this project report.

Intro

The purpose of the 4th. semester MSc is to give the student an opportunity to independently carry out a project based on investigation and a defined problem by the student. [Study guide]

This project is based on a specific case, found during a search for a relevant topic to be investigated for my master's thesis. Searching on the internet, an article about the congregation Alnor Islamic Centre was found. Alnor Islamic Centre is a small congregation of approximately 350 members located in northern Norway-Tromsø. The congregation has a vision to establish the world's northern-most Mosque with a community centre designed for the specific purpose. Besides being an interesting project the location of the site in the arctic context was found interesting.

The first contact was established through a phone call to Alnor followed up by a visit to Tromsø, where my idea of using Alnor as a case for my master's thesis was presented. My intention for this project was to rethink the traditional mosque typology and the adjacent community centre to fit into the Nordic context, respecting the arctic nature and characteristics of Tromsø as a place. It is found relevant to mention that no functional program was made for this project; the functional programming for the project will be done by me in dialogue with Alnor.

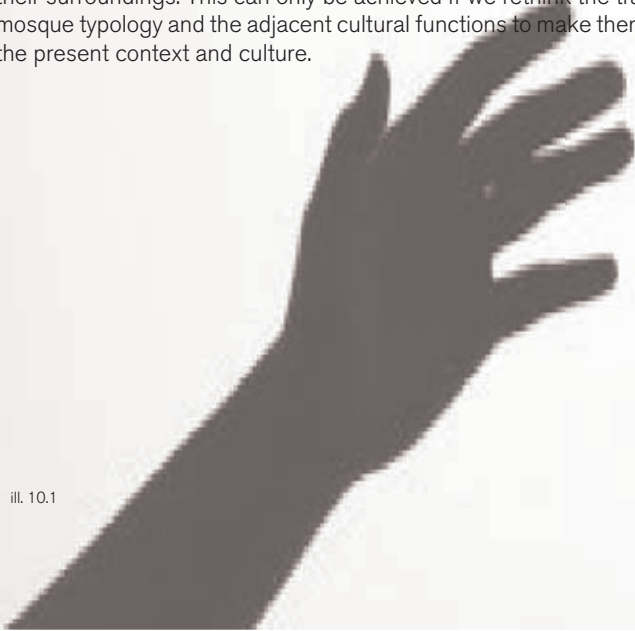
The combinations of the sacred mosque function and the social function to be implied to this complex is a part of the architectural challenge in this project. How can we combine the sacred aim of a mosque as a place for worship together with social cultural functions through rethinking the traditional Islamic mosque typology, and how can this complex function as a place for gathering across the cultural boundaries. This project finds its inspiration in the task of finding a new building typology for a mosque in Norway, in combination with the nature of Tromsø that should result in a building complex designed for the future generations of Muslims and non-Muslim citizens of Tromsø.

Program

Motivation

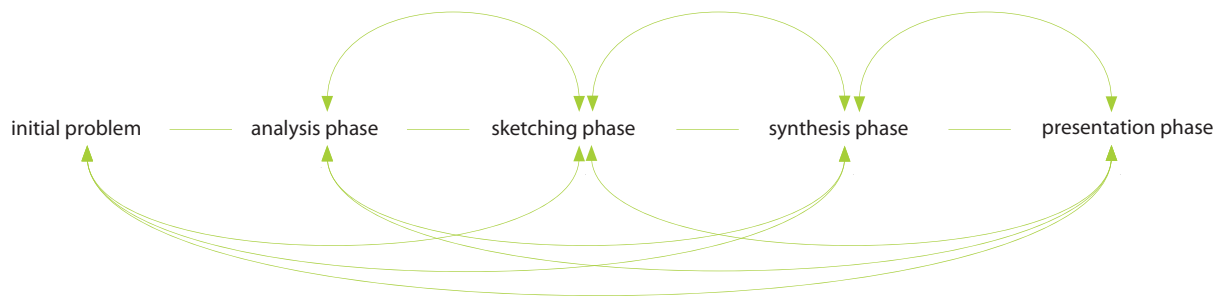
As a second generation Muslim born in Norway, the ongoing discussion about mosques in Norway and Europe in general has not passed me without reflecting on the matter. The discussion has in a way reached a level that makes me think what could be done to change the focus. Being in the position of studies and choosing a subject for a Master Thesis, the idea of designing a Mosque with a community centre came as an idea. Dealing with this task and expressing my thoughts through the architectural design of this complex was found as motivation.

Working with a task that affects people, in this case not only Muslims of Norway but also ethnic Norwegians will be the starting point for this project. A mosque is a place for worship for Muslim believers, but it's also a gathering place for Muslim society. By rethinking the mosque typology to fit to Nordic context in combination with a community centre it's possible to create an example as a framework for future generations. Reflecting on writings from Nordberg Schulz [Mellom himmel og jord] he says to live is to be friends with your surroundings and this friendship is based on qualities. In this project the motivation is also to design space where future generation Muslims can feel like being home and being friends with their surroundings. This can only be achieved if we rethink the traditional mosque typology and the adjacent cultural functions to make them fit into the present context and culture.



Method

The integrated design process (IDP) is intended to be used as the method to develop this project. The method contains four main phases; Program phase, Sketching phase, Synthesis phase and Presentation phase. IDP is characterized in the project where architectural strategies and technical principles come together to a whole. The IDP is an interactive process where all the different phases interconnect and relate to each other.



Analysis

Introduction Tromsø



At a latitude of nearly 70 degrees north, the same latitude as Alaska and Siberia, and 2200 km south of the North Pole, far north in Norway you find Tromsø. The city is known as the capital of northern Norway and the largest city in the Nordic countries north of the Arctic Circle. Most of Tromsø is situated on the island Tromsøya surrounded by fiords and mountain peaks. Travel distance to Oslo the capital of Norway is about 1700 km. [Wikitravel]

The city of Tromsø was founded in 1774 and has the biggest concentration of historic wooden houses north of Trondheim in Norway. The houses date from 1789 to 1904 when building wooden houses was banned in the city centre. In 1940 Tromsø was the capital of the unoccupied Norway for a few weeks, and as an only city in northern Norway avoided any war damage. This is one of the reasons for the high amount of the wooden buildings still in existence as a part of the (byilde) in Tromsø. [Coe].

In the early 1900's the city was the host for many expeditions to the Arctic and Antarctic regions, which in return gave the city the nickname, Gateway to the Arctic. Beside this, the city is also known as the Paris of the North. As far back as a century ago, visitors were surprised to find culture, intellectual life and the current fashions so far north, and so the city derived the name "Paris of the North". Tromsø, as the largest city among the Nordic countries north of the Arctic Circle, is home to world's northern-most university and cathedral. The city lives on research, fishing export and satellite technology. The municipality of Tromsø has almost 65.000 residents around 50.000 of this lives on the island Tromsøya. The municipality of Tromsø covers an area of 2558 km². [norwegianreport]

Because of Tromsø's high latitude it is possible to experience bright nights and midnight sun in the summer. Tromsø is ideally located in the middle of the northern light zone and is considered the best place to see the phenomena of the amazing northern lights during the dark period. [Fjordtravel]



ill. 13.1 - Midnight sun in Tromsø



ill. 13.2 - Northern light in Tromsø

Site location

The project site is located approximately 1,5 km northeast from the city centre along the old industrial harbor front also known as Stakkevollveien in Tromsø. The area mostly consists of large industrial buildings representing traces from the activity of fishing industry along the harbor front since this business started to grow in last half of 20th century. The main road in this area is called Stakkevollvegen and stretching over an area of two kilometers, this road is creating a natural boundary between the housing area to the west side of the road and the industrial activity on the east side. Stakkevollvegen is also the only entrance possibility to the proposed site.

In a complex context like described in the previous paragraph, where to the south the city centre stands and to west on the other side of the road where the housing area starts, and the old industrial harbor area to east with memories of the industrial activity calling for redevelopment, located in a short distance from city centre with bus terminal, shops and supermarkets, day nurseries, schools and institutions of higher education in north, the project of a new mosque should take place.



ill. 14.1 - Picture Island of Tromsø



Tromsøya

Breidvika

Tunnel

Tromsøysund

Nordfjellet

Site

Tromsø

Tromsø
city centre

Tromsdalen

Alfheim

ill. 15.1 - Map site location
Scale 1:20000

Area history

Tromsø Seafront is the new destination of the two kilometer long area stretching from the city centre in the south to the university campus and the city's main operative harbor. The area is adjacent to the sea and bordered by the existing structures above the main road called Stakkevollvegen. Between the road and the shoreline, the width of the area varies from 50 to 250 meters. During the last part of the 20th century, Tromsø's maritime industries as well as the construction industry were located here. The housing to the west along Stakkevollvegen is a result of the activity on the harbor. Workers built their dwellings in this area which runs almost parallel to the shoreline. Reconstruction and dismissals together with the slow emigration of traditional industry led to stagnation and decay of the area for the past 25 years.

The establishment of the new university campus with 6.500 students and the university hospital with 3.000 employees created a striking contrast to old industrial harbor area. The political authorities wanted to reindustrialize the area without much success. A new dialogue between the local authorities, the landowners, and the Ministry of the Environment resulted in a Pilot Project on an urban regeneration of the area with a focus on planning and governance. The project created the basis for Tromsø County Council's decision of 31 August 2006 which opened the entire area for revitalization, based on the vision of Tromsø Seafront. The vision for Tromsø Seafront is described more in detail under the chapter future plans. [northerngateway]



ill. 16.1 - Overview Tromsø harbour front



ill. 16.2 - Historical picture Tromsø harbour

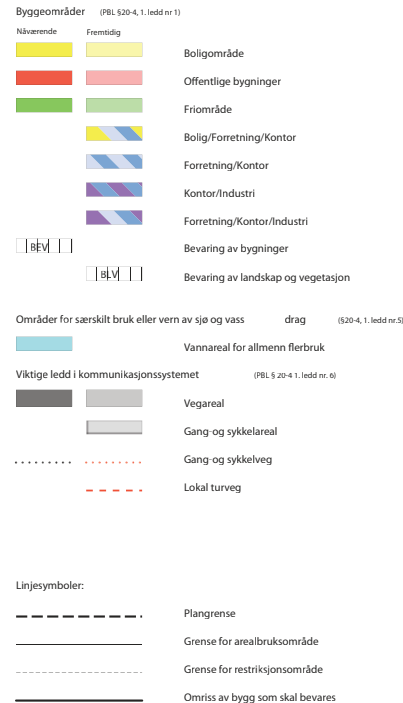


ill. 16.3 - Historical picture Stakkevollvegen - Tromsø

Future plans

The site chosen for the planned project does not have an updated local plan. The content of the new municipality plan is named "kommunedelplan for Stakkevollvegen-Tromsømarka 2009-2040" ill.17.1. The description of rules and guidelines for this plan will be used together to describe the municipality's future plans for the area.

In the municipality plan, the site area is marked as an area for commercial use as shops and offices and is given the code F/K-8. The site shares a boundary in the north with a planned free open public area. The area to south is planned for commercial and industrial use. The municipality has defined a number of rules and guidelines connected to this part of the municipality plan. The rules and guidelines cover the whole area shown on the plan ill.17.1. The only rules and guidelines found relevant for this project have been extracted from the plan description, and described further in this chapter.



ill. 17.1 - Municipality plan, Stakkevollvegen - Tromsømarka (map not in scale)

Municipality plan - Stakkevollvegen-Tromsømarka

2. design and aesthetic (§20-4, 2. ledd, b)

Documentation has to show the relationship between surrounding buildings and areas. The chosen solution must contain a good documentation.

The ground floor on buildings facing Stakkevollvegen must be designed with an appearance of openness and contain a window surface of 70% minimum.

Technical installations must be integrated in the building design.

The maximum building height for buildings along Stakkevollvegen is 15 m. Buildings facing the harbor front must be analyzed through a local plan level considering sun and shadow conditions for surrounding buildings. The maximum height for apartment buildings along the harbor front is 21 m.

3. Universel design (§20-4, 2. ledd, d)

Universal design should be used as a basis for the planning of the area.

7. Parking (§20-4, 2. ledd, b)

The area along Stakkevollvegen and to the east of Stakkevollvegen must place 75 % of all parking underground or inside a parking garage.

All new building along and to east side of Stakkevollvegen must establish bicycle parking were 50 % of this space should be covered.

8. Kids and youths (§ 20-4, 2. ledd, b)

Safe paths must be planned from all apartments to relevant schools.

10. Green Structure (§ 20-4, 2. ledd, d)

The area should be designed with a notion of use for the public representing all ages, and especially kids.

A collective green structure on the east side of Stakkevollvegen consists of future open green areas and promenades as principally shown on the municipality plan ill.17.1

11. Continues promenade (§20-4, 2. ledd, b)

- The promenade:
- a) must be established with solid pavement and have the possibility of car traffic
 - b) must be a universal design
 - c) the design should be applied to the areas in case of crossing parks / public squares
 - d) safety along the waterfront must be considered
 - e) building boundary is measured 7 meters from center line of the promenade / street

New effort inside the planned area should be designed with architectural and aesthetic qualities reflecting the present time. The design should be durable / sustainable and reflect the ambitions which are the basis for this principle decision taken by the planning committee. Ref case no. 151/06 :

1. Area character:

Connecting the city centre and the area of Breivika (university area in north see ill.xx) through a systematic urban development of the area along Stakkevollvegen. This area should be the main element in the future town development strategy.

2. Vision for Stakkevollvegen:

- Stakkevollvegen should be developed / transformed into an attractive part of the town for existing and new business sectors, housing, and pubic serving functions.
- The area should stand out, underlining the profile of connecting the city centre to the university and hospital area in Breivika.
- The area shall be especially attractive for new companies who wish to establish business in Tromsø that will benefit from the close distance to city centre with both a national and international profile.

The principles for universal design should be used to improve the quality of life, health, and working environment.

Statens Vegvesens guidelines for bicycle parking should be used for this planning

"Safe paths" means the establishment of a walkway or sidewalk for the whole distance.

Open public areas should be planned as good meeting points.

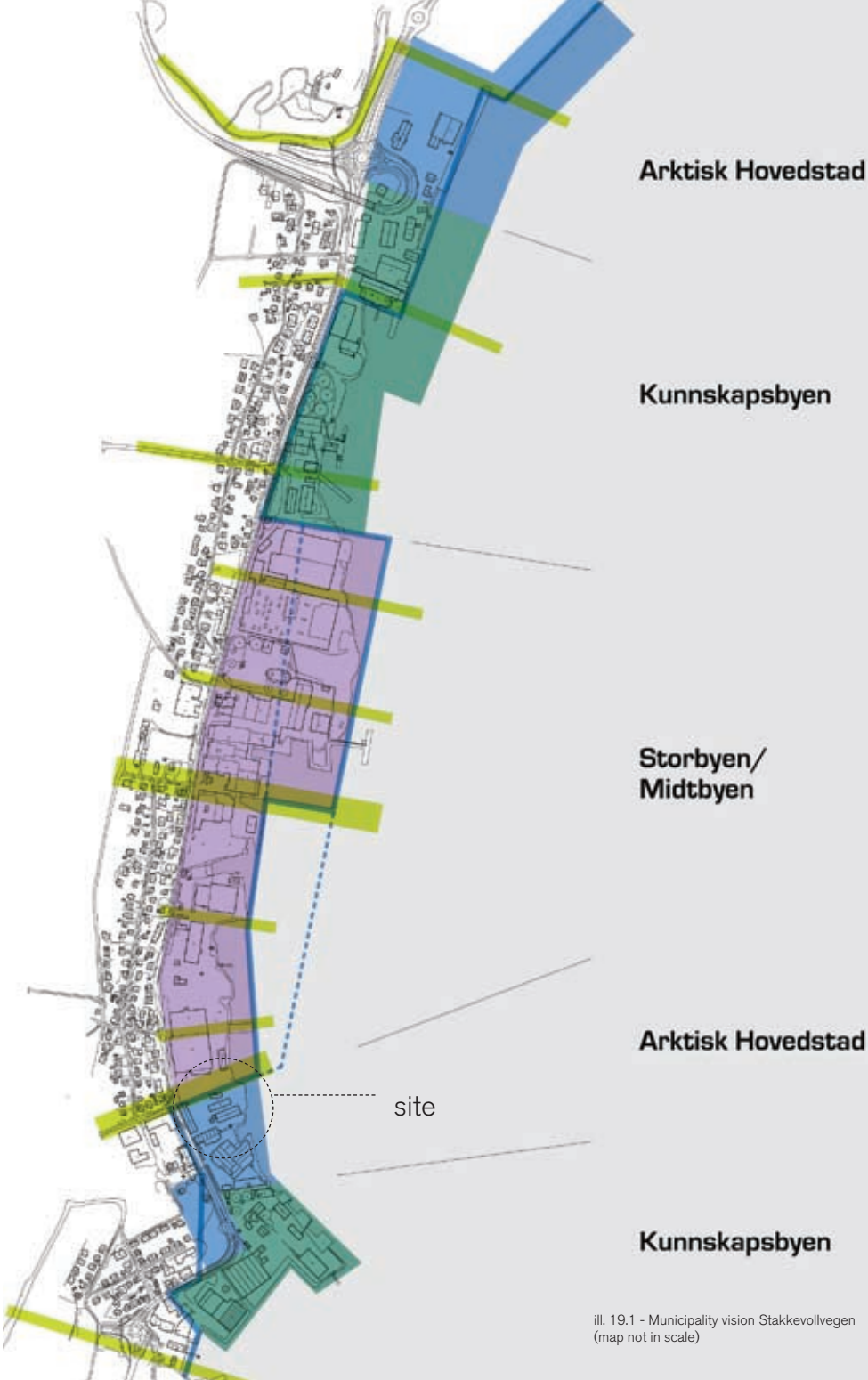
The functions of the promenade must keep the municipalities' notion of a town park with recreational areas for stroll, exercise, play and the experience of nature.

Building and outdoor areas along the promenade should create a variation in the open outdoor spaces. The spaces should be designed so they could be accessible to the public. A playground of high quality is recommended to connect the promenade, to create an environment, and unify activities. The businesses and functions established in this area are recommended to use the promenade for outdoor activities addressed to the public.

- building up and shape:
- high quality in material use and with elements of greenery
 - lighting should be designed with low light

safety

- Promenade should be designed with principles taking care of safety in transition between land and water.



ill. 19.1 - Municipality vision Stakkevollvegen
(map not in scale)

2.3 Vision – Tromsø's harbour front

The following note is extracted from the municipality description: Chapter 2.3 – Vision for Tromsø's harbor front. The note has been one of the ideas that formed the vision for Stakkevollvegen.

The area should be developed to an attractive part of the city with some clear characteristics ill.17.1; it should contain business sector, housing culture and educational purposes. Area along the harbor front on east side must be connected to the housing area to west. The area must be given clear profiled projects that give the area a new identity. [Municipality plan]

Sub conclusion

By studying the municipality plan it is clear that Tromsø commune has ambitions for the area chosen for the project. Defined rules and guidelines will make it possible to control the development. The municipality's vision of looking at the whole area as a totality will create a coherence in the development. In the future scenario the development along Stakkevollvegen is seen as a pulsing element connecting the city centre and university / hospital area in the north. The planned common infrastructure, promenade with public interaction and public spaces, will create a great opportunity to establish cultural related activities in the area.

Mapping infrastructure

In this chapter the nearest area to the site will be analyzed to give an overall picture of how the chosen part of Tromsø is organized in terms of district with their rough functions, overall infrastructure and location of important landmarks and nodes.

District

The district mapping ill. 21.1 is made to give a sense of how the chosen part of Tromsø is organized in terms of overall functions. Tromsø is a small and compact town with very concentrated and dense areas. The area could be divided in 4 main functions: dense residential, industry, educational and recreational / forest areas. The site is located in the industrial part of the town. This area is planned to undergo a transition in function in the future and hopefully create a connection between the city centre and the university in northern part of the town.



Area movement

Area movement ill. 23.1 shows how the overall infrastructure is organized in Tromsø. The main traffic to the island of Tromsø is led through two main roads, E8, which become the highway connection from the south to Tromsø. The traffic from this road is led to the island through a tunnel under the fiord called Tromsøundet. This tunnel ends in the northern part of Tromsøya near the university and hospital area called Breidvika. The other traffic connection is via the car bridge and the national road RV 862. This connection leads the traffic to the city centre and to a tunnel for connection across the island. In fact, most of the heavy traffic from east to west is led across the island of Tromsøya through tunnels and RV 862 outside the dense city area. This organization seems to be a unique and sustainable way to direct the heavy traffic away from the city centre of Tromsø.



Tromsøya

Breidvika

Tunnel

Tromsøysund

Nordfjellet

Tromsø

Tromsdalen

Tromsø
city centre

Alfheim

Site

Hareprinsgt.

Stakkevollvegen

Motorway E8, heavy traffic

Motorway RV 862, heavy traffic

ill. 23.1 - Map primary paths
Scale 1:20000

Paths

The purpose of this research is to discover how the city centre and the surrounding site areas are arranged in connection with public transportation, vehicle and pedestrian paths.

Through this study it is obvious that the city centre with a density is arranged as a traditional urban grid with open paths leading pedestrians all the way down to the harbor front and shoreline to the east. The housing area north of the concentrated city centre adjacent to Stakkevollvegen appears a bit more scattered in its organization, however still with reference to the urban grid. The difference in these two areas is very clear; while the area in the south is open to the harbor front, the area in the north is along the western boundary of Stakkevollvegen. The industry is creating a natural wall and does not invite pedestrians to the shoreline. Two main roads named Stakkevollvegen and Dramsvegen are the roads taking the heaviest traffic load of this area, serving the analyzed area with public transportation. The chosen site is ideally located with good public transportation and makes the location attractive for users. The location also contributes to having a more sustainable focus for the project with an increased use of public transportation.

Sub conclusion

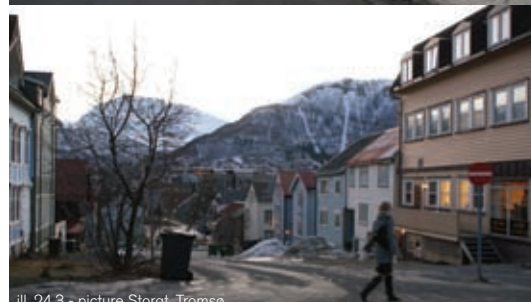
The conclusion on the infrastructure analysis is that the chosen site is ideally located close to city centre and a dense housing area. The placement of the site provides a great opportunity for pedestrian communication in addition to public transportation. The site is located in between the two main traffic nodes that connects the island of Tromsø to the eastern part of the town. The location of the site is one of the key factors to succeed in creating a mosque with the adjacent cultural functions become alive and used by the citizens of Tromsø.



ill. 24.1 - picture pedestrian street Tromsø



ill. 24.2 - picture Storgt. Tromsø



ill. 24.3 - picture Storgt. Tromsø



ill. 24.4 - picture stakkevollvegen Tromsø



Tromsøya

Breidvika

Tunnel

Tromsøysund

Nordfjellet

Site

Tromsø

Tromsdalen

Tromsø
city centre

Alfheim

Light vehicle traffic, pedestrians

Heavy traffic vehicles and public transportation

ill. 25.1 - Map secondary paths
Scale 1:20000

Nodes | landmarks

Nodes

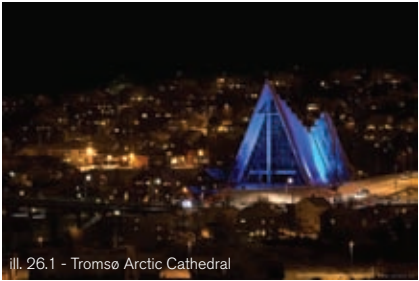
Nodes are points of places where different paths meets or cross each other. Two different types of nodes are observed in this study; 1. pedestrian nodes and 2. traf- fic nodes.

City square ill.26.2 marked no.1 in the map ill. 27.1 becomes a pedestrian node because of its central location and its characteristic use. City square is public space located in the heart of the town, functioning as a meeting place for citizens and becomes a destination in the town.

Nodes marked no. 2 to 5 in the map are all considered as traffic nodes in Tromsø, where important roads meets or cross each other. The interesting observation in this research shows that two of the impor- tant nodes marked as number 3 and 4 in the map ill.27.1, are placed on each side of the industrial area. The chosen site area is placed ideally between this connection points and gives a good communication trough the already existing infrastructure to the site



ill. 26.2 - Tromsø city square



ill. 26.1 - Tromsø Arctic Cathedral

Landmarks

Landmarks are buildings or areas with a special character or visual remarkable in Tromsø. Landmarks found in the area could be divided up in two main categories; Visual Landmarks in terms of their design and location and landmarks in terms of their functions.

1 .Polaria Museum ill. 26.3 are considered as a visual landmark, located along the south eastern harbor front. The building shape is inspired by the arctic ice bergs. The shape stands out with a special character creating a contrast to its surroundings.

2. Tromsø Cathedral ill. 26.4 are the biggest wooden cathedral in Norway and a historical landmark in the Tromsø. The building is both a landmark because of its large scale, the sacred function and its remarkable gothic inspired design.

3. University library ill. 26.5 are holds a central func- tion in the town and becomes a place of destination.

4. Tromsø bridge ill.26.6 is considered as a visual land- mark with its remarkable design connecting the island of Tromsø to the land on the eastern side.

5. Arctic Cathedral ill. 26.1 is the most known visual landmark of Tromsø, the church with its large scale al- lows it to standing out with its design making it visible from far distance.

6. Tromsø university and University hospital are both landmarks in terms of the functions they hold



ill. 26.3 - Polaria museum



ill. 26.4 - Tromsø Cathedral



ill. 26.5 - Tromsø University library



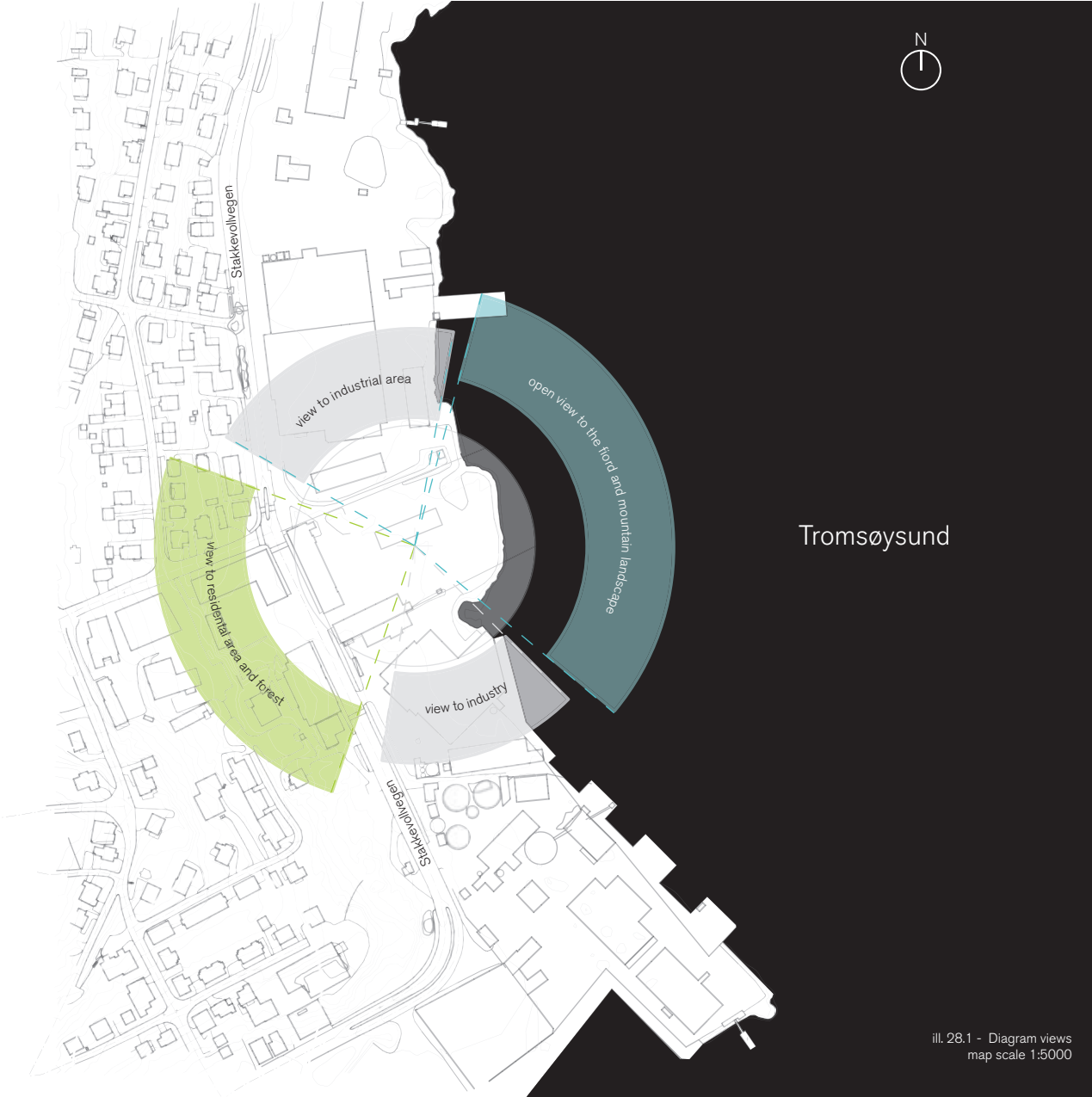
ill. 26.6 - Tromsø bridge



Nodes

Landmarks

ill. 27.1 - Mapping landmarks and nodes
Scale 1:20000



Site conditions

Site views and edges



ill. 29.1 - View industrial area north



ill. 29.2 - View industrial area south



ill. 29.3 - View residential area towards west

The chosen site is currently used as an automobile workshop with an old wooden single storey building with pitched roof placed on the boundary of the project site to west.

The area on the east side of the building is open and appears flat with an old half demolished building; only a frame of a steel structure is standing left from this building. The project site is surrounded by larger industrial buildings. A factory producing concrete is located on the neighbor site to the south; the site to the north consists of an industrial building occupying a bigger area by a company producing prefabricated houses. The eastern boundary of the site is facing the harbor edge.

The proposed site has an ideal location considering the exposure and views to the surroundings. The view segment to the east is marked with an edge of the harbor front and from this tip gives an open view to the "ord "Tromsø sundet "surrounded by a drama of beautiful mountain peaks further away in the horizon. The northern and southern view is dominated by industrial buildings. To west the residential area is rising up and meeting the forest area creating a clear contrast in building and terrain typology.



ill. 29.4 - View to the fiord and mountains towards east

Building typology

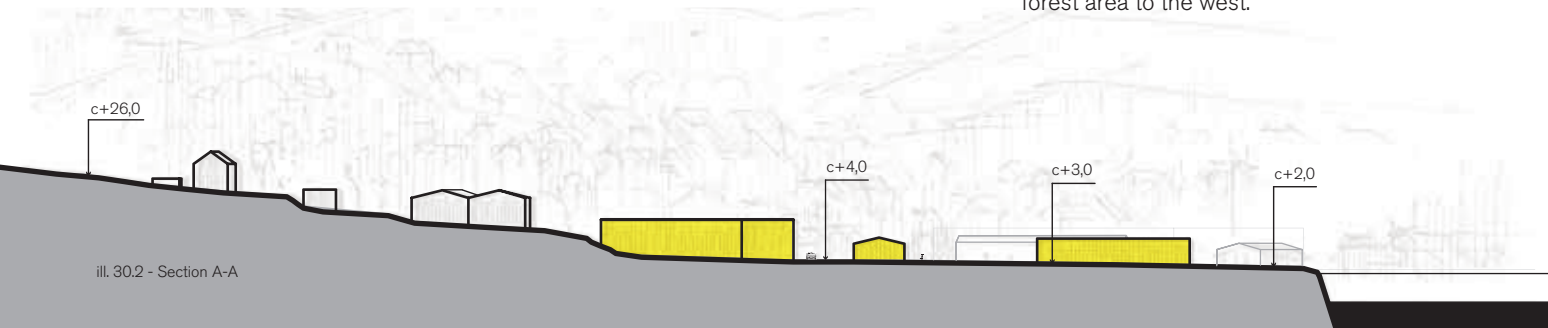


ill. 30.1 - Map building typologies, scale 1:5000

The building typology in this area has a clear division separated as earlier mentioned by the main road Stakkevollvegen. On the east side along the harbor front the area is flat and has an industrial character with reference to the "fishing industry. Some of this activity is still going on in the area.

The industrial area to the east looks at the moment a bit unorganized and fragmented with no clear profile regarding the architecture and infrastructure. The building typology varies in shape from large industrial and office buildings with flat roofs to smaller buildings with supporting function and circular shaped silos. Building heights vary from single storey and up 4 stories with the silos as the highest points in the skyline.

The area to the west of Stakkevollvegen is a traditional housing area with mostly timber houses up to 4 stories. Some elements of public and office buildings could be found in the row facing Stakkevollvegen. The whole area west of Stakkevollvegen is organized as an urban grid with straight lines of roads separating the clusters of housing buildings. The organization is quite common for the whole town. The landscape is rising from the boundary of Stakkevollvegen and all the way up to the forest area to the west.



ill. 30.2 - Section A-A



ill. 31.1 - Residential building typology



ill. 31.2 - Residential building typology



ill. 31.3 - Industrial building south



ill. 31.4 - Industrial building stakkevollvegen



ill. 31.5 - Industrial building stakkevollvegen

Residential buildings typology:

Single family houses with pitched and flat roof, mostly two and 3 stories

Multi storey houses with pitched and flat roofs up to 3 stories

Industrial building typology:

A combination of single sided pitched roof, normal pitched roofs and flat. The is dominated by lager flat roof buildings. Concrete silos with up to 20 m height is dominating the skyline height

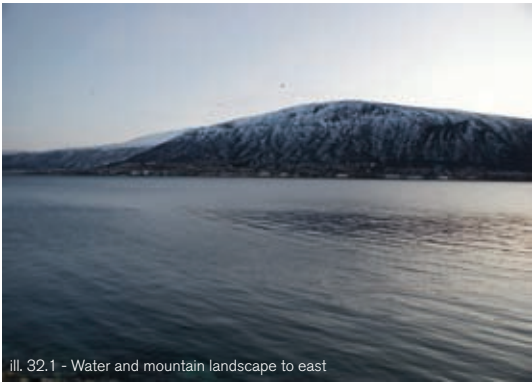
Landscape

On the first visit to Tromsø, some specific elements appeared in the context. The strong presence of the arctic landscape and the water were standing out and defining the character of the area.

The proposed site is located on a "at landscape where the nearest context is to the east adjacent to the fiord and the mountain on the eastern side. The landscape from the site to the mountain in the east is dramatically changing character and creating a wall in the horizon by rising up in the sky. The combination of snow and vegetation creates a play of colors in this mountain wall. The landscape in the western side appears as a steep slope consisting of housing areas rising up to the spruce forest. The presence of the landscape to the north and south is cut away by the industrial buildings defining a wall in the horizon. The characteristics of the landscape are creating a feeling of being in a valley or a defined space with the landscape on each side. Mountains rising up in the sky give a feeling of being protected by the surroundings. The fiord is creating a boundary to the landscape to the east but at the same time is stretching in between these two entities and connecting them together to a continuous landscape.

The far context seen from the mountains in the east gives the overall picture of the arctic landscape. A beautiful drama of mountain peaks in various sizes overlapping each other covered by snow. The mountain landscape is separated by the fiord appearing as a carpet stretching in between the mountains. The island of Tromsø appears "at in the overall picture and underlining the feeling as described above. The landscape appears as a continuous almost endless beautiful picture of the wild arctic landscape as far as the eye can reach.

As Christian Nordberg Schulz says, the different elements in the landscape creates the basic shape of the earth, the landscape stretching out and rising up, some places it creates a feeling of endless extension and other places defined space as valleys and fiords. [Norberg-Schulz] Reflecting upon his theory one can say that the observations made in this study correspond with Nordberg Schulz theory.



ill. 32.1 - Water and mountain landscape to east



ill. 32.2 - Picture landscape from mountains in east



ill. 32.2 - Picture towards west from mountain in east

Material typology

This chapter introduces the material typology that was observed in the nearest context to the site. Three main materials were dominating the context and are described below.

Wood

Tromsø has the biggest concentration of historic wooden houses north of Trondheim in Norway. The houses dates from 1789 to 1904 when building wooden houses was banned in the city centre. Building with wood is connected to the historical building traditions in Norway. The presence of the wooden buildings is creating a soft environment in the rough arctic climate.



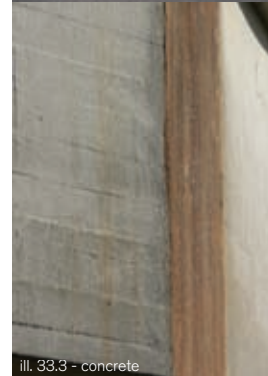
ill. 33.1 - Wooden housing



ill. 33.2 - Wooden

Concrete

Use of concrete was a natural result of the law that banned building in wood in 1904, the tall silo buildings and chimneys are the most visible concrete constructions in the nearest context breaking the skyline of the industrial areas with their size. The famous Tromsø bridge was built in 1960. The bridge stands on slim concrete pillars with a deck cast in situ. Concrete buildings are a natural part of the built architecture of Tromsø. The material has a great resistance against the harsh climate and is used a lot along the harbor front.



ill. 33.3 - concrete



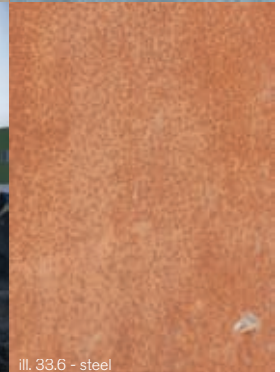
ill. 33.4 - concrete

Steel covering

Use of steel covering is quite visible in the surrounding buildings to the site. From the visual experience one can get the feeling that steel covering is used as a material to fulfill a functional purpose without aesthetical demand. The building observed gives the impression of temporary use and no maintenance.



ill. 33.5 - steel covering



ill. 33.6 - steel

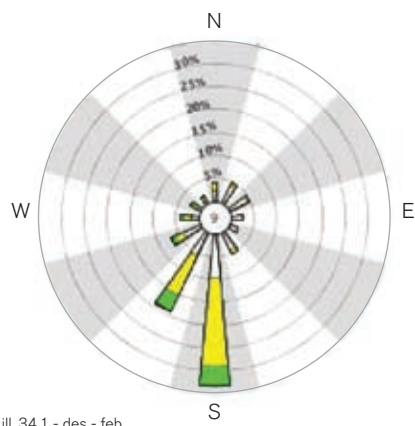
Climate

Wind conditions

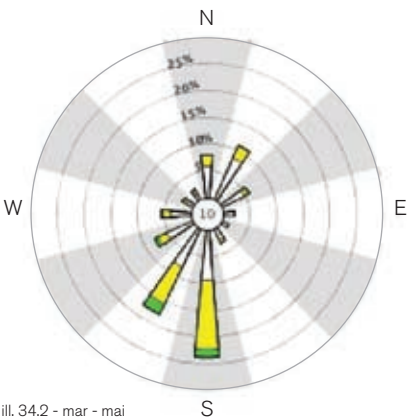
Tromsø is located near the sea which has a calming influence on the temperature variations. Studying the seasonal wind roses it becomes clear that the predominant wind direction in the winter period from December to May comes from the south and south west. The wind rose for the period between June and August shows a change in the direction for the wind. In this period the wind is mostly dominated from north and north east. A reason for this change in wind direction is influenced by the low pressure that leads the soft mild air to north during the winter, in the summer period the effect of low-pressure releases and gives a wind more dominated from north and north east.

Tromsø island is located relatively well defended against strong winds from the sector between south-east and north-east, so the all the strong winds that come here are from the western side. Because of the high mountains, the strong winds are rare in Tromsø, and storms seldom take place. [www.tromso.havn.no]

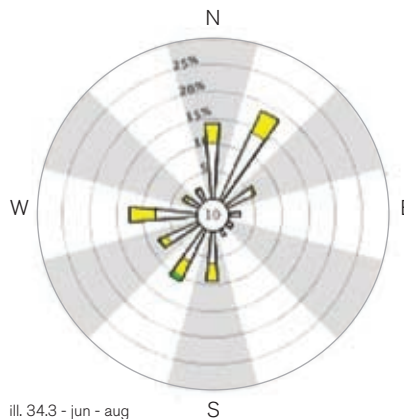
This fact proves the importance of implementing this information in the design of the building complex. Outdoor spaces will be highly affected by the wind and need to be planned carefully during the design process to supply the users with environmental and spatial qualities.



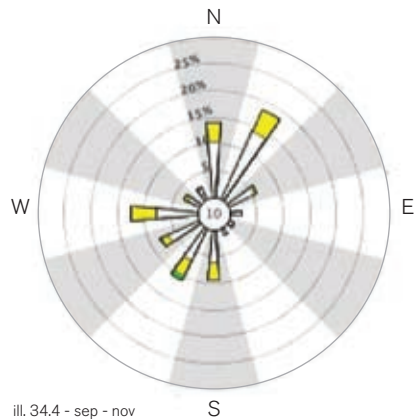
ill. 34.1 - des - feb



ill. 34.2 - mar - mai



ill. 34.3 - jun - aug

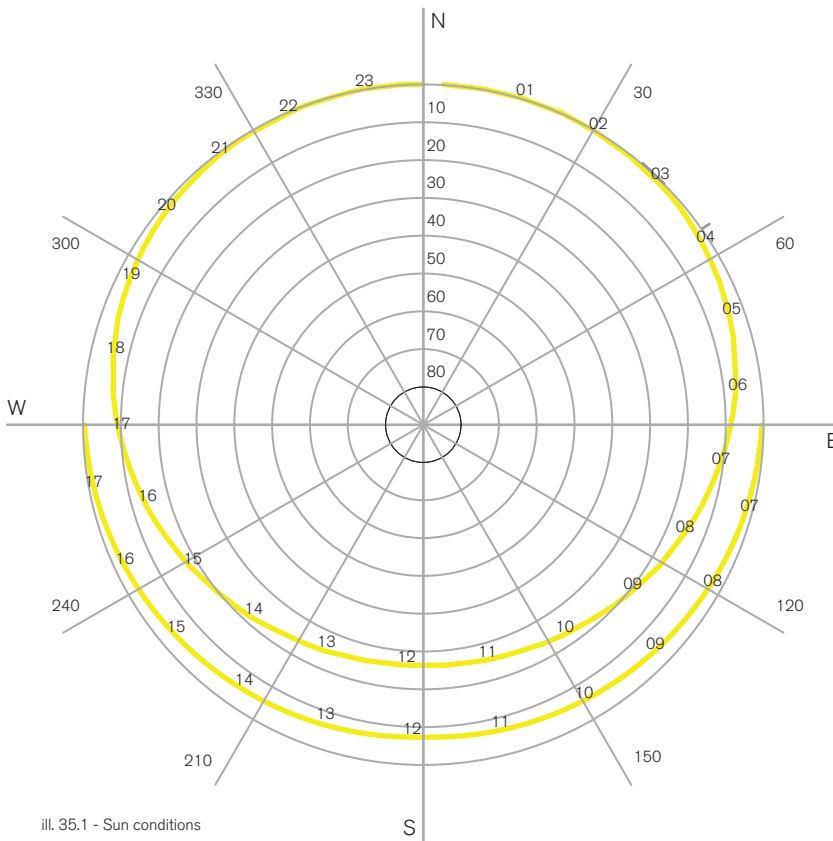


ill. 34.4 - sep - nov

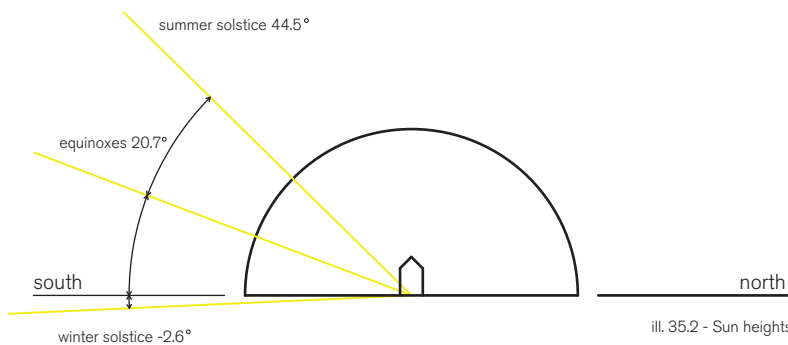


Sun conditions

As a result of the high latitude position of Tromsø (lat. 69,68 N and lon. 18,91 E), the sun conditions create a quite special experience. By studying the diagram for sun conditions and sun paths, it is possible to understand the scientific reason for the phenomenon of dark periods and mid-night sun.

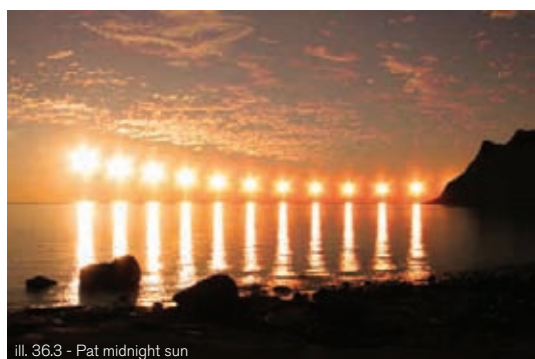


ill. 35.1 - Sun conditions



ill. 35.2 - Sun heights

Midnight sun and dark period



Since the plane on which the earth's axis orbits the sun is at an angle, there is a variation in the length of day and night during a year. North of the polar circle one can experience periods when the sun totally disappears during the winter, and periods with sun 24 hours a day. The dark periods and periods with midnight sun are getting longer the farther north we get from the polar circle.

Tromsø has its dark period from 25th of November to 17th of January. In this period the center of the sun is below the horizon which means that the town does not experience the sun. Because of the tall mountains in the south of Tromsø, the island of Tromsøya cannot experience the sun between the periods of 22nd to 20th of January. However, because of the twilight, there is some daylight for a couple of hours even around midwinter, often with beautiful bluish light. The special light and the play between spectacular colors and nature has always been a relevant issue among artists as an inspiration source.

The 21st of January is the winter solstice, when the sun path reverses and Tromsø starts to experience brighter days and sunlight. The phenomenon of midnight sun could be experienced in a certain period during a year when the horizon is free to the north. In the period of 19th May to 26th of July the upper part of the sun is visible which means sunlight continues for 24 hours. [ill.36.3]

Midnight sun, the dark period, and the northern lights have inspired many artists in their work. The special light creating a play of colors with the nature is a never ending issue for artists. [Tromsø kommune, darkperiod]

Phenomenon of northern light



The phenomenon of Aurora Borealis, also referred to as the Northern lights, is one of the greatest attractions connected to the far northern location of Tromsø at a latitude of nearly 70 degrees north. The phenomenon is only visible in the northern hemisphere between 50 and 80 degrees latitude, and is displayed as a curtain of greenish yellow light, a spectacular multi colored fusion stretching across the sky. Tromsø is ideally located in the middle of the Northern lights zone - considered one of the best places the world to observe the amazing Northern lights.

The Northern lights have inspired many artists in their work both in art and poetry because of the spectacular light, colors and the mysterious experience connected to it. Among many others, the well-known Norwegian artist Knut Hamsun has written poetry inspired by the Northern light. The Danish artist Harald Moltke has also used the motif of the Northern light in many of his paintings.

The Northern light is a result of interaction between the Sun and Earth's outer atmosphere. The Sun emits electrically-charged particles called ions which correspondingly move away from the sun in a stream of plasma (ionized gas) known as the solar wind. As the plasma comes in contact with the Earth's magnetic field, the ions will be agitated into moving around the Earth. Some of the ions become trapped and will consequently interact with the Earth's ionosphere (an average of 60-80 miles above the surface), causing the ions to glow [Northern light]

Sub conclusion

The context analysis shows a context highly influenced by the nature and nature phenomenon. The context could be defined by four main elements; the characteristic arctic nature landscape with a drama of mountain peaks surrounding the Tromsø, the presence of water stretching between the mountains connecting the landscape, the phenomenon of midnight sun and the dark period in addition to the phenomenon of northern light that creates the amazing light conditions in the town during a year.

This analysis calls for a design reflecting some of the main characteristics of Tromsø. These characteristics are in many ways describing the spirit of this place and will be adapted to the architectural expression of this project.

Mosque research

>> It must be a silent place facing toward Mecca. It needs to be spacious so that the heart may feel at ease, and high so that prayers may breath. <<

[Le Corbusier, Journey to the east, 1987:100]



Origin of Islam



ill. 40.1 - Masjid Al Nabwi, the holy Prophets Mosque in Medina

The origin of Islam is directly connected to the Prophet Mohammed who founded the Islam. Mohammed the prophet of the third monotheistic religion Islam was born in year 570 in Mecca. Mohammed lost his family at an early age and was raised by his uncle according to the Arab traditions. He worked with leading Meccan caravans across the desert all the way to Syria. In year 610 also marked as the birth of Islam, the prophet in the age of 40 years heard the voice of The Archangel Gabriel commanding him to recite in the name of Allah (God). Inspired by the messages he received, Mohammed started preaching for the one and only god to people of Mecca. He did that for about 12 years. The traders of Mecca became aware of the prophets gathering of followers. Under hostility and threats of death the Prophet decided to leave Mecca. With a small group of followers the Prophet emigrated to Yatrib, which later got the name Medina or Medinat Al Nabi (The city of the Prophet). The emigration in year 622 is marked as the beginning of the founding of the Islamic era. Medina became the Prophet's place of residence until his death in the year 632. The first mosque was established in the prophet's home and still exists today under the name Masjid al Nabi meaning the mosque of the Prophet.



ill. 40.2 - Holy Quran

Islam was rapidly spread after the Prophet's death and in about a century, Islam was spread throughout the Arabian Peninsula into Northern and Southern Africa, to Spain, and stretched as far as China and South and Eastern Asia.

The basis of Muslim belief is described in the holy book Quran, which was written down shortly after the Prophets death, and is seen as the word of God recited by the Prophet Mohammed. Islam is today counted as the second largest religion and counts a population of 1,66 billion believers, which is about 23 % of the total world population. [Muslim population] and [Wikipedia, population]

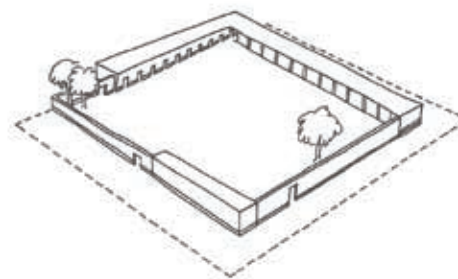
Mosque history

The term mosque comes from the Arabic word "Masjid" and literally means "a place for prostration". A mosque serves as a place for worship five times a day and is considered as a sacred space and the most important building in Islamic world. The mosque history could be dated back to year 622 when the holy Prophet Mohammed emigrated to Yatrib, later named Medina. The first example on Muslim architecture appeared during the prophet's life time where he adapted his residence to the first mosque for worship for the believers of Islam.

Other words used for Mosque in the Islamic world is "Jami", this term is used for congregational mosque where people gather for the Friday prayer. >>The Jami was often connected to the political authority and it was there where the official Friday ceremony "khutba" was delivered<< [Naquib, Mosques in Norway, 2001:56] Khutba originates from the practice of the Prophet Mohammed who used to deliver words of exhortation, instruction, or command at gatherings for worship in the mosque. [Wikipedia, khutbah]. Today the word Jami and Mosque are used without any clear distinction [Naquib, Mosques in Norway, 2001:56].

Muslims are less dependent on buildings than Christians and Jews, the rite to worship is sufficient, with the base form, the nature of Muslim faith, and the minimalistic literal requirements. Only a square marked out by a line drawn in the sand is sufficient for a communal prayer, underlining the only demand that the prayer is facing the direction of Kaba in Mecca. Still, the mosque plays an important role in the Muslim societies, and functions as place for gathering where prayers are celebrated and public affairs are connected. A prayer in a mosque is also seen as more virtuous. Islam's early expansion was spread quickly westwards to Africa and

Spain and stretched all way eastwards to China and East Asia. In terms of architecture and styles, the evolution was dependent on local building traditions and availability of raw materials. This gave a variation in Mosque styles influenced by existing local culture. >>In the early days Islam like Christianity borrowed features from existing buildings associated with local religions before establishing its own specific architectural identity.<<[Frishman & Khan, 1994:12]



ill. 41.1 - The early development of the mosque in based on The house of the Prophet in Medina.



ill. 41.2 - Prayer in Sahara

Mosque typologies

Including regional factors one can say that every mosque ever built before the modern movement in 20th century falls under one of five main categories of mosque types. These are;

1. The Arab hypostyle mosques mostly found in Arab heartland, Spain and North Africa are recognized with a clear reference to the Prophets mosque in Medina. The hypostyle halls were constructed with rows of columns supporting a flat roof and a central large space covered with one or more smaller domes. This type of mosque was the dominant type in the early period of Islam.

Example on hypostyle mosque is the Umayyad Great Mosque in Damascus (709-15) and The mosque of Ahmed ibn Tulun in Cairo (876-9) ill. 43.1 and ill. 43.2

2. The bi-axial four iwan Mosque known from Iran and Central Asia is a basic arrangement derived from four vaulted gates arranged axially around a squared courtyard. Each iwan except the one serving as entrance represents the gate to a prayer hall. The style of this mosque type was most popular in the medieval period and remained dominated in Iran.

The Friday Mosque in Isfahan ill. 43.3 is a great example on four iwan mosque.

3. The Indian subcontinent triple dome Mosque is typical for Mughal architecture and could be connected to Imperialism in the 15th and 16th century. In the reign of Mughal Empire one of the most important styles of Islamic architecture occurs. A melting of Hindu and Islamic traditions resulted in a mosque type with three domes, walled with a large courtyard. This Mosque was often of monumental scale.

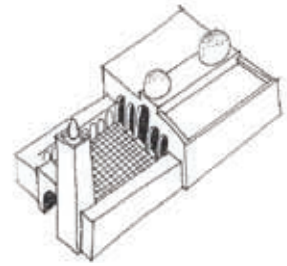
Some of the most known triple dome Mosques is Jami Mosque in Delhi – India and Badshahi Mosque in Lahore – Pakistan ill. 43.5.

4. Central Dome Mosque was introduced by the Ottoman Empire in the 15th century. This Mosque was arranged with prayer hall based on the Mosque of the Prophet as a regular hypostyle hall, covered by a central large dome surrounded by smaller and lower semi-domes.

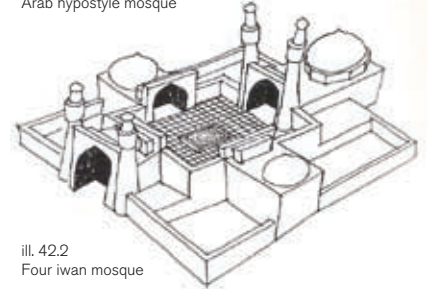
Hagia Sophia Church erected in the 6th century was converted to a Mosque in 15th century. The design of Hagia Sophia became an inspiration for the design of other imperial Mosques. The Blue Mosque in Istanbul ill. 43.4 is an example on Central Dome Mosque.

5. Mosques with detached pavilions within a walled garden could be found in China. Chinese Islamic architecture reflects the local building traditions in its style with small influences from western style.

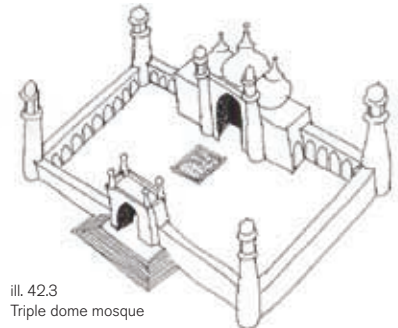
Example on traditional Chinese Mosque architecture is The Great Mosque of Xi'an ill. 43.6 from the year 792 [Frishman & Khan]



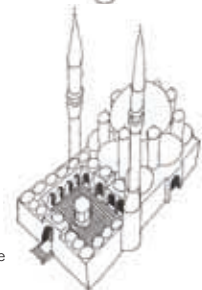
ill. 42.1
Arab hypostyle mosque



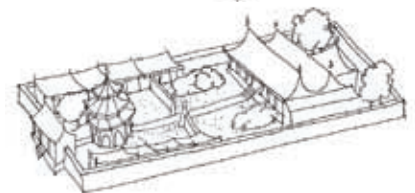
ill. 42.2
Four iwan mosque



ill. 42.3
Triple dome mosque



ill. 42.4
Central dome mosque



ill. 42.5 - Mosque with detached pavilions



ill. 43.1 - Umayyad Great Mosque, Damascus



ill. 43.2 - Ahmad ibn Tulun Mosque, Cairo



ill. 43.3 - Friday mosque Isfahan, Teheran



ill. 43.4 - Blue mosque, Istanbul



ill. 43.5 - Badshahi mosque, Lahore - Pakistan



ill. 43.6 - The Great Mosque Xian, China

20th century's mosque architecture



ill. 44.1 - Mamez khane - Teheran, Iran



ill. 44.2 - Shah Faisal Mosque - Islamabad, Pakistan



ill. 44.3 - Penzberg mosque, Germany

The 20th century Islamic architecture was confronted with technical advantages and influence of western architecture. The discussions about large mosques were often a political agenda and the issue of whether the mosque should be based on its pure form or if it could be possible to find a way to keep the regional traditions in combination with Modernism. The common response to the advancement of modernism was to demand that mosque architecture too kept free of western influence. This notion was supported by many Islamic nations. Many architects designed buildings relying on traditional materials and forms of construction. To maintain the regional architectural vocabulary many technical advances have been avoided in the construction. Though keeping the regional traditions, the present day technology has not been ignored. The King Hassan II Mosque in Casablanca is the second largest place for worship in the world and is an example of a building built upon regional traditions. Modern technology is applied to the roof construction which can be opened hydraulically, and a laser beam pointing towards Mecca is demonstrating this.

Moving away from traditions and toward modernism many examples could be seen. Examples from Iran show the Iranian contribution to modernism. The Iranian architect Kamran T. Diba designed the buildings of the Johndishapor University in Iran. The complex was constructed in yellow brick without a dome, minarets and ornamentation. A few years later he designed a prayer room in the ground of the carpet museum in Tehran in the form of two plain cubes one enclosing the other. So a clear change in direction towards modernism is visible in the Islamic architecture. Architectonic regionalism transported to nations of Diaspora is visible many places in Europe. The need of upholding cultural traditions has resulted in Mosque architecture with strong parallel to traditional Muslim houses of worship. Shia Imam Ali Mosque in Hamburg (1960-65) is an example visibility in nations of Diaspora. The form of this building is for instance closer to traditional Islamic mosque design than the above mentioned examples from Iran. The first Jami Mosque in Norway, built in 1995, is also designed according to traditional Islamic design. The question in the twenty-first century is rising in Europe and the Nordic countries whether these traditions should be upheld or move in a direction more connected to the actual context and local traditions? The questions are at the moment unanswered and architects are working towards this challenge seeking for ways to deal with this task. [The Mosque architecture]

Hierarchy in a mosque

In Islam and in the house for worship there is not a church-like hierarchy as in Christianity. When a Muslim prays he prays directly to God. The spiritual communication is direct, without any intermediary. By doing this act the person is serving the God. It's said in Islam that every human being is individually responsible for their own acts. This is underlined in the equal hierarchy in a Mosque. There are religious leaders in a Mosque such as Imams, and their function is first leading the congregation for prayer and also to serve the users in religious teaching and guidance. The physical hierarchy is still equal. The ritual of prayer is showing that every prayer is standing on the same level, as is the imam who is leading the prayer.

The first pillar of the total five that forms the basis of the Muslim belief is underlining this fact. The shahada says; "There is no God but the God" and Mohammed is his Messenger. The shahada is proving the fact that all human beings are seen equally in Islam and the only one above in hierarchy is The God.

[Investigating Islam]



ill. 45.1



ill. 45.2



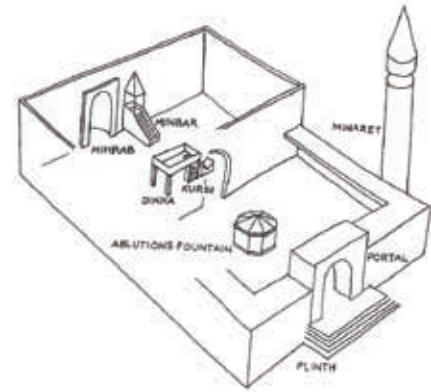
ill. 45.3

Component parts of the mosque

In its capacity as a house of worship, the Mosque has a standardized assembly of components. Depending on the type of Mosque, small variations could occur whether it's a small local mosque or a large Jami also called Friday Mosque. The basic elements of the Mosque are;

Space Organization

1. A defined space partly covered and partly open to the sky. The size of the prayer hall (haram) varies according to the size of the courtyard (sahn), often surrounded on three of its sides by columns or arches and the fourth side giving the access to the prayer hall. The principle affect on the size of a mosque depends on the numbers of the worshippers to be accommodated. The prayer hall, usually square or rectangular in plan, is a common shape as a hypostyle hall with a roof supported by a large numbers of evenly distributed columns. This shape is inspired by the first Mosque in the house of the Prophet Mohammed in Medina. The shape and layout of the Mosque varies depending on the location, local climate and building traditions.



ill. 46.1 - Standard components of the mosque

The quibla wall and mihrab

2. The prayer hall must have one wall facing the direction of Mecca. In the middle of this wall, a mihrab is placed as a recess or a niche. A Mihrab is usually the most decorated feature of the Mosque. The mihrab itself is not seen a sacred, what is seen as sacred is the direction of the prayer mirhab indicates. Mihrab is the prayer niche from where the imam leads the prayer, beside this the feature also serves as an acoustic device to reflect the sound to the worshippers behind him. It is said that the place where The Prophet Mohammed used to stand was marked with a stone (quibla) after his death. The architectural shape of the Mirhab is adapted from the Roman niche, semicircular in plan and an arched top. The quibla wall and mihrab are the most essential features of all Mosques other than Haram Al Sharif in Mecca where Kaba is located. Since all worshippers at prayer must face Kaba in Mecca they form rows parallel to it. This practice explains the tradition of rectangular plans for a mosque.



ill. 46.2 - Mihrab, Hagia Sophia - Turkey



ill. 47.1 - Minbar, Hagia Sophia

ill. 47.2 - Minbar



ill. 47.3 - Dikka, Sultan Hassan Mosque, Cairo



ill. 47.4 - Kursi



ill. 47.5 - Kursi

The Muqsura

6. >>Is a separate square enclosure in the mosque often placed next to the mihrab, and was used to screen the rulers from rest of the worshippers.<< [Naquib, Mosques in Norway 2001:59]

The minbar (pulpit)

3. This feature is always positioned to the right of the mihrab and consists of a staircase in varying heights from three steps to more monumental scale leading up to a platform often covered with a cupola typed roof. The minbar was first introduced in the house of the Prophet in Medina when numbers of his followers started to increase. The idea behind the pulpit was for the Prophet to position himself above the head of audience to make his words more easily heard. Minbar became an important equipment of the mosque where large numbers of Muslims assembled for Friday prayer. The weekly khutba (oration) was delivered from the minbar, always one step below the top platform which is symbolically reserved for the Prophet.

The Dikka

4. A wooden single storey platform positioned in the same line as the mirhab, from where the quadi (respondent) of the mosque repeat the words of imam so the stages of prayer could be transmitted to a large congregation. Depending on the climate and location, this feature could also be placed in the courtyard. Today the position of dikka has been replaced by modern technology as loudspeakers.

The Kursi

5. Is a small lectern on which the holy Quran is placed, often placed next to the dikka.



ill. 47.6 - Muqsura

The ablution fountain / pool

7. This feature is often placed centrally in the courtyard with or without a fountain, and is indented for the prescribed ritual ablution before prayers. When used for ablution the fountain is often designed for a number of worshippers to wash simultaneously under running water. The pool is often displayed with inventive design with domes and pavilion like roofs. Some places the pool's only function is ornamental and washing facilities are placed in a close distance.



Ill. 48.1 - Ablution fountain

The minaret

8. The original purpose of this feature, besides marking as a landmark, was to reach the voice of the muezzin making the adhan to a far distance, calling people for prayer five times a day. During the life time of the Prophet the adhan was given from the roof of his residence in Medina. This way was adapted and practiced until the fourteenth and fifteenth centuries. The architectural form of the minarets was based on the inspiration from Roman watch towers, lighthouses or church towers. The single minaret was generally provided to the Mosques. Under the Ottoman and Mughal Empire, to signify royal protection, twin minarets were frequently built. Some examples have four and up to six minarets like in the Sultan Ahmet mosque in Istanbul with six minarets. The figure of minarets is only exceeded in Mecca with seven minarets. Today in modern designed Mosques its usual to include a minaret but it's inclusion is not essential.



Ill. 48.2 - Masjid Al Nabwi, the holy Prophets Mosque in Medina

The portal

9. A general characteristic of Mosque architecture from the Muslim world is the concealment of the building from outside with high walls. The gateway to the Mosque has a powerful psychological importance marking the entrance to the God's house is an important feature to be applied to a Mosque.



Ill. 48.3 - Buland Darwaza, The Portal - India

The ornamental mode

Use of figurative art is forbidden in Islam and is a result of injunction from the hadith. Aesthetic in Islamic visual art rests on four main factors, these are;

1. Mathematics and geometry; often used in composition of overall patterns. The basic shapes for these patterns are based on a circle and its star shaped derivatives.

2. Decoration and ornamentation; main function is to make a space whole by marking the boundaries between them and at the same time connecting them.

3. Writing; often referred to as Calligraphy. Arabic has acquired a special status of sacredness in the Muslim world, and is the standard language for writing monumental inscription. Calligraphy plays the same role as the religious symbol of the holy cross in Christianity. The writing is often used as art by decorating important features as mirhrab, minbar and walls and portals by repeating writings from Quran and hadith. Calligraphy in a mosque has a notion to provide the viewer with a message and focus on meditation.

4. Use of colors has been used in Islamic visual art to contribute giving a three dimensional texture to patterns. Seven basic colors are mainly used for this purpose. These are: black, dark and light blue, turquoise, green, red-brown, yellow ochre and white. These colors are sometimes charged with symbolic meanings and vary from region to region.

A combination of all these features mentioned above have together contributed in spectacular pieces of art in Islamic Architecture.

[Naquib, Mosques in Norway, 2001]



ill. 49.1 - Ornamentation based on circles and star shaped geometry



ill. 49.2 - Combination of colorful three dimensional ornamentation and calligraphic writings

Space requirements

The functional demands for a Mosque are dependent on the number of users. The space requirement for prayer per person in a Mosque is according to the architect Fridjof Wise from Pride and is 1,25 m x 0,6. Since Norway is a country with winter climate it requires use of winter clothes. The size advised for calculating space is instead 1,25m x 1,0m. The total amount of users and numbers of lines for prayer could be calculated based on this information.

[Fridjof Wise, Pride Architects AS]



ill. 50.1 - Space requirement for muslim worship

Segregation why and how

Segregation between male and female worshippers in Mosques is based on traditions (sunnah) and writings in hadith. The idea behind this segregation is that men and women would not get distracted by each other during the prayer. Mosques around the world are dealing with the gender segregation in different ways.

In a mixed congregation, the segregation is made in the prayer rows, men are standing in front rows and women are occupying the rows behind. This way of segregation was practiced during the Prophet Mohammed's time. Other ways of segregation used include using curtains or other physical barriers to create a division. In bigger Mosques the segregation is made either as separate room or by a women's gallery above the men's prayer space. Today modern technology serves technical advantages that ease the women's ability to follow the imam during the prayer.

[Wikipedia, segregaion] and [Answer.com]



ill. 51.1 - Gender segregation in mosque

Sub conclusion mosque research

Many things connected to mosque functions and Islam has been investigated through this mosque research. As a general reflection on the topics investigated one can conclude that it's almost not anything according to the theology that puts limitation for the mosque design. Most of the topics such as traditional mosque typologies, component features and ornamentation and also gender segregation is culturally related. The only real demand for a place for worship is the true direction towards Mecca. According to Islam the place a person puts down his prayer rug, that place becomes his mosque. On basis of this conclusion and the research made it's possible to challenge the traditional mosque typology to find new ways to incorporate the house of worship to fit better in to a Nordic context.



ill. 51.2 - Gender segregation in mosque

Mosque typologies in norway

The purpose of this chapter is to visualize the existing typologies of Mosques in Norway. I will not go into details about each typology but instead visualize the different spaces through images and short descriptions for some of these typologies.

Norwegian mosque typologies could be divided into 6 main categories, these are;

1. Room in larger building complexes. This type of room area is called musalla ill. 52.1, and these are rooms often in connection with institutions such as universities etc. The size of these musallas varies between fifteen and thirty square meters and functions only as a room for prayer. The rooms are separated normally by curtains for segregation. The layouts of these rooms are normally very simple. The qibla is often marked with pictures of Kaba and a prayer rug indicating the quila direction serving as an improvised mirhab. There are no minbars in this musallas. Washing facilities are normally placed outside these rooms.



ill. 52.1 - Musalla



ill. 52.2 - Alnor mosque in residential building, Tromsø

2. Converted flats, lofts and basements are according to the book, "Mosques in Norway" written by Saphinaz Amal Naquib the most common Mosque typology in Norway. Especially flats either on ground floors or upper floors. A normal layout of this type of mosque is a space for shoes, and racks and pegs for coats at the entrance. The washing facility and kitchen is normally close to the entrance area. The entrance is often leading directly to the main prayer hall. This hall is usually large square room with painted walls and wall to wall carpet, sometimes multi-niche carpet indicating the qibla direction. The qibla wall is normally marked with a simple mirhab. The minbar is often a simple stairway built of light wood. Praying facility for women is often in a separate room. Some Mosques have facilities for teaching beside the prayer facility. The entrance if possible is separate for women and men as for the Alnor Islamic centre mosque in Tromsø.



ill. 52.3 - Converted flat for mosque

ill. 52.4 - Converted flat for mosque

3. Warehouse and old factories have been taken in use to serve as Mosques. The most visible example of this was the Jamaat-E Ahl-ESunnat mosque in Oslo earlier located in an old factory hall. The mosque has now been relocated to a newly built mosque built for the purpose it was meant to. The old mosque as mentioned was located in a large open hall. The outer structure of the building was kept originally while the interior was modified. The main prayer hall was located in the centre while women's space with a separate entrance was arranged on the mezzanine. The layout of this Mosque was also quite simple with painted walls and plain grey wall to wall carpet. A construction of painted surface indicating the quibla with a mihrab was placed in the one end of the main prayer hall. An interpretation of a minaret was placed left of the mihrab and minbar placed to the right of the mihrab.

3. Converted schools

4. Houses with gardens

6. From research made for this project, three mosques has been found in Norway that are built for the specific function of serving as a Mosque. All of these Mosques are located in Oslo. Common to them all is that they are placed in an existing context of Oslo as a part of an urban town structure.

The first built mosque is the traditionally designed Word Islamic Mission's Jami Mosque situated between two apartment buildings from 1994. The mosque is a traditional central dome mosque with 2 minarets and is clearly an Islamic inspired design and a contrast to the context. The facades and interior have tiled surfaces with clear reference to Islamic architecture.



ill. 53.1 - Converted warehouse



ill. 53.2 - Converted single family house



ill. 53.3



ill. 53.4 - ICC mosque in Oslo



ill. 53.5 - Jami mosque Oslo

ill. 53.6 - Jami mosque Oslo

Sacred architecture

>> Make transparent the boundary between matter and mind, flesh and the spirit <<

[Quote by Architect Norman L. Koonce, Wikipedia quote]

Sacred Architecture also known as religious architecture is mentioned in relation to design and construction of places for worship such as churches, synagogues, temples or mosques. Many cultures have used considerable recourses for their sacred architecture and their places of worship. Sacred spaces are some of the most impressive and permanent monolithic buildings created by humanity and often evolved over centuries representing some of the largest buildings in the world. [Wikipedia, sacred]

>>Architecture is asked to deliver many things to many people- shelter, comfort and perhaps beauty, expanding to more specialized programmatic or formalistic requirements. The demands for religious structures may include all of these, but it is the extra things that they must provide or at least facilitate – spirituality – that sets them apart from secular buildings. This is a quality that contributes greatly to their cultural value since they are meant to inspire something beyond the physical satisfactions of space and, in many cases, say something about the community that they serve.<< [Richardson, New sacred architecture, 2004:7]

Sacred spaces are often defined spaces and oriented towards a symbolic focal point providing direction to religious groups. In the case of a mosque, the sense of direction is normally felt and noticed when entering a mosque. The change of setting between the exterior and interior space is clearly marked with a Quibla wall, with a mihrab indicating the direction of Mecca. Sacred spaces are also tied to expectations and memories; the cross in a church reminds the Christian believers about Jesus and the picture of Mecca and the symbolical direction marked by the mihrab wakes the memories of the Prophet Mohammed. Human perception is deeply tied to an expectation for what that person can expect in the house of God. [Naguib, Mosques in Norway, 2001]



ill. 55.1 - Trinity church, Boston



ill. 55.2 - Umayyad mosque, Damascus

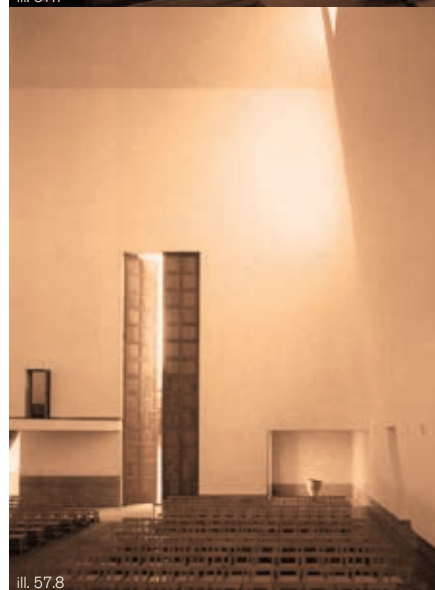
A natural question to be asked is, what is making a place sacred and how can architecture contribute to achieve the desired feeling and atmosphere in this space. A place is considered sacred when it's serving a religious purpose. It should be a centre for gathering and at the same time offer a feeling of pleasure and provide an atmosphere of stillness and quiet which is to be experienced from the interior rather from the surroundings. Spirituality and sanctity are some of the most important qualities that can be expressed through architecture. [Creating sacred space] Sacred spaces combine physical and conceptual qualities and architecture is the medium to express this. The spatial quality of the space, materiality together with light and sound propagation, are all features if used in a correct way; mediums that can help to trigger our senses. Architecture becomes in this way through perception an instrument to provoke memories through senses, by capturing and triggering important memories, architecture can bring people together to unite individual memories into a collective memory and hereby as earlier mentioned in this chapter create a place for gathering. Sacred spaces are not only considered holy because they fulfill certain rituals that are performed; it is also because they convey an effective response to the believers. [sensingarchitecture.com]

Sub conclusion

Dealing with the task of designing a sacred space it's essential to design with a notion of creating a spiritual feeling and experience. The desired experience could be achieved through the architectural as an instrument to the design of the space using structure, materiality, light, acoustic and spatial experience of the space as main elements. Reflecting back on the writings in this chapter the quality of a sacred space is achieved through sensing and perception. Creating a framework for worship based on these qualities will give the space intended for prayer a bigger mental dimension and put this space apart from a secular space.

Inspiration contemporary sacred architecture





Daylight

>> to me natural light is the only light, because it has the mood - it provides a ground of common agreement, it puts us in touch with eternal. Natural light is the only light that makes architecture, architecture <<

[Louis Khan, The architecture of natural light, 2009:10]

The phenomenon of daylight is making life possible on earth. The simplest function of light allows a human being to see and know their surroundings. Daylight is the source of energy that makes possible all growth and activity of all living things on earth and maintain the human biological rhythm and hormonal distribution. [Henry Plummer, The Architecture of natural daylight, 2009]

Light has been a fundamental element of architecture throughout history, the light in the sky effect every part of our life. The way this source has been handled historically by architects proves that light can change buildings and shape space. Play of light and shadow creates a feeling of architectural shapes and materiality. The light has the phenomenal capacity to create spiritual atmosphere in a sacred space touching human emotions. Beside this, the light and shadows help the human, through perception, to get a sense of time understand the depth of a space with a more three dimensional understanding. The light could be used creatively to enlarge space, or make it look smaller, highlight points of interest or simply create connection between spaces both inside and outside. The medium of light has through history been used to create a spatial atmospheric feeling in a space. The most remarkable of these spaces are religious where light was employed to arouse feeling of mysticism and to convey sacredness of a space.

Different cultures and religions have, through history, used the light to express the feeling of their sacred space. In Christianity, light became on a metaphoric level a symbol of God himself, a divine light that shines in the darkness and was incarnate in the Christ, who claimed: I am the light of the world. Illumination of an Ottoman mosque was often designed to produce a calm environment where emotions were reduced and tension resolved. By contrast Hindu and Buddhist temples were often designed with gloomy darkness, expressing the spiritual rebirth in the access area ending up in an emergent center. All the mentioned examples have used the medium of light to somehow express the sacredness of the space. [Henry Plummer, The Architecture of natural daylight, 2009]



ill. 59.1



ill. 59.2 - Hagia Sophia, Turkey



ill. 59.3 - Ronchamp chapel, LeCorbusier

Sub conclusion

Daylight is a challenging task to work with. The nature of this phenomenon is changing constantly during a day and through different periods of the year, with changing character through intensity and colors. Working with a source without being able to touch it, calls for creative solution to grasp the quality. The focus in this project will partly be to work with natural daylight in relation to the architectural perception in sacred mosque space and the adjacent functions in the community centre. Materials in combination with light are important features to consider in the design. Material can reflect, diffuse and absorb light. The perception of light in a space is highly tied to materiality and must be considered carefully in the interior design in order to achieve the intended atmosphere in the mosque.

Acoustic

The following chapter will present acoustics as a term together with important parameters that have to be considered in order to achieve the acoustic quality in a space for worship for Muslim believers. Acoustics are an important part of the total experience of being in a space; design with focus on this task creates a more total solution where materiality is playing an active role. Our aural perception in a space is connected to the design and shape of the space and its materiality.

Regarding aural perception, the Danish architect, Steen Eiler Rasmussen in his book, *Experience Architecture* [Eiler Rasmussen, 1957] asks the question, can we hear architecture? Many people will immediately think that architecture doesn't make sound. The truth is that sound is an essential part of the architecture; our aural perception makes us capable to sense architecture of a space and our surroundings through sound. We can sense if a space is large or small, the sound reflection creates a picture of the space through our capability of sensing this phenomena. Imagine a room with hard surfaces as concrete walls and tiled floor and no curtains on the windows. This space will often create a feeling of something cold. The acoustic in such a space will be hard and with high sound reflection. By putting a carpet on the floor and curtains in front of the windows the same room will change character in our aural perception; the acoustic will be felt softer and the space will appear warmer. This simple example above proves the human ability to experience architecture through sound.

Acoustic and functions' sound in sacred spaces has always been of great importance for the perception of spatiality. However the way sound is received varies in the different religions and their house of worship. The acoustic design of a mosque will be totally different from a church where the space is designed for both speech and music. The acoustic must be designed for the specific purpose. In case of a mosque the main acoustic objectives are speech intelligibility since music is not allowed in a mosque space.

The normal prayer ritual performed in a mosque is done by congregation standing in lines side by side behind the imam facing the quibla wall in direction of Mecca. The imam is usually standing in the prayer niche in the quibla wall. In many cases this niche is working as a reflector for spreading the sound to the receivers behind. The mihrab often is one of



ill. 60.1 - Soft acoustic, Umayyad mosque - Damascus



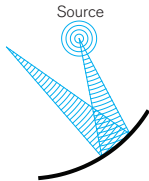
ill. 60.2 - Hard acoustic, The rock church - Helsinki

the most decorated architectural features of a mosque, besides being a sacred feature, this also serves an acoustic purpose. The acoustic design of a mosque must be carefully thought according to the ritual performed in a mosque. The main ritual is the prayer as earlier mentioned and the other is the weekly Friday speech given by the imam facing the congregation.

Acoustic and expression

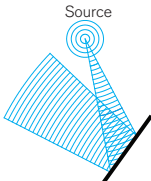
Acoustic and expression the main aim of this project is to design a mosque and the architectural perception of the space will have a huge influence on the design. Reflecting back on Ramussen's writings about sensing sound, it is of great importance to consider materiality, expression and acoustics, which must go hand in hand in the planning. Traditional mosque spaces in eastern countries were often designed with hard materials and as large volumes to create a spatial experience, with a hard acoustic that underlined the sacred feeling. To achieve the intended acoustic quality in the space different solutions could be made. Beside the spatial shape and materiality, additional parameters could be added. These parameters will be presented in the following paragraph.

The reflections of the sound in a room are very important to the way the sound is perceived by the listener. Different surfaces can gather or scatter the reflections a bit while others diffuse the reflections depending on the shape of reflectors. Concave surfaces gather the reflections, linear surfaces scatter the reflections and the convex surfaces diffuse the reflections.

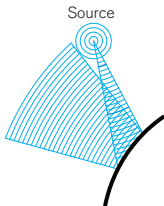


Reflection from a concave surface.

ill. 62.2 - Diagram reflections

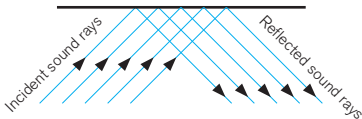


Reflection from a linear surface.



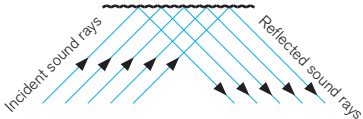
Reflection from a convex surface.

The reflections are also dependant on the surface treatment of the reflector. If the irregularities on the surface are small in relation to the wavelength, the reflections will behave as with a smooth surface. If the irregularities on the surface are comparable to the wavelength the reflections will behave as if the surface is made from many planes.

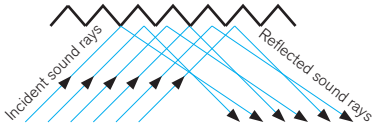


Reflection from a smooth surface.

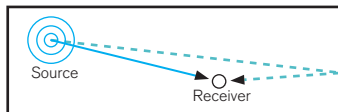
ill. 62.3 - Diagram reflections



Reflection from a surface with small irregularities

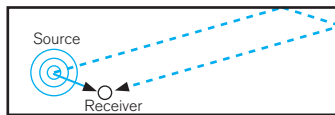


Reflection from a surface with big irregularities

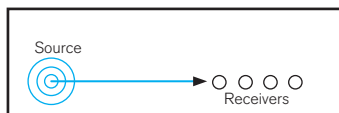


The difference between direct and reflected sound should maximum be 50 ms
 $= (340 \text{ m/s} \times 0.05 \text{ sek}) = 17 \text{ m}$

ill. 63.1

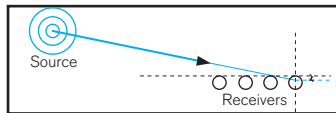


Rectangular rooms often has problems with echo.



Example of a bad solution. The direct sound is not optimal for the receivers far behind.

ill. 63.2



The direct sound should be able to reach the receiver without screening from others

To prevent echoes it is important that the difference between the direct and the reflected sound is less then 50ms or 17m. This can be done by shaping the room in the right way and using materials to absorb the sound waves in troubled areas. Long rooms can be hard to create in a way where the echoes do not exist because of the distance to the rear wall/the reflectors in relation to the length of the direct sound.

The organization of the receivers in a room is related to the position of the sound source. For the receivers to get the right amount of sound they have to be organized in a way where they do not screen for each other. This can be solved by placing the sound source high in the room or creating a surface that is sloping upward for the receivers.

Sub conclusion

From the research presented in this chapter it becomes clear that acoustics as a parameter have a huge impact on the architectural expression of a space. Our human ability of sensing architecture through sound is underlining the importance of acoustic design. The acoustic design should therefore be an integrated part of the architecture combined with the technical aspects to achieve the sacred expression and atmosphere perceived through sound.

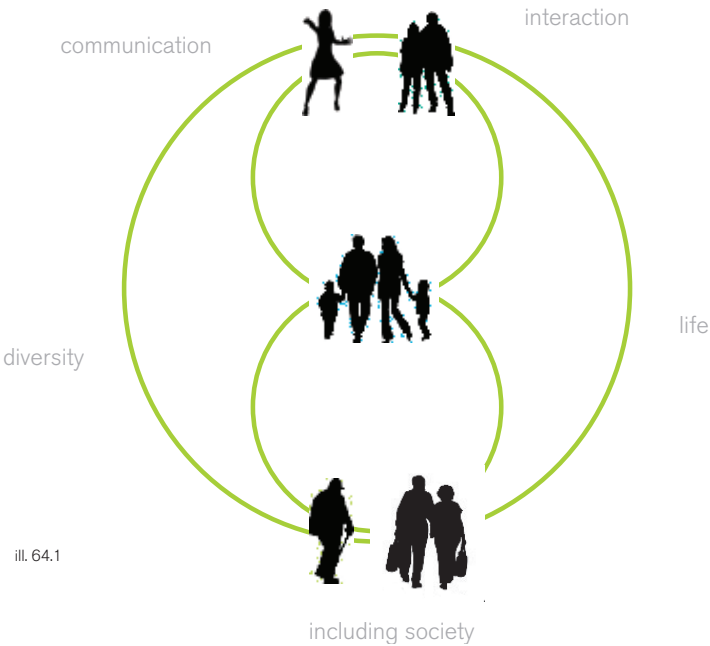


ill. 63.3 - Banský Church

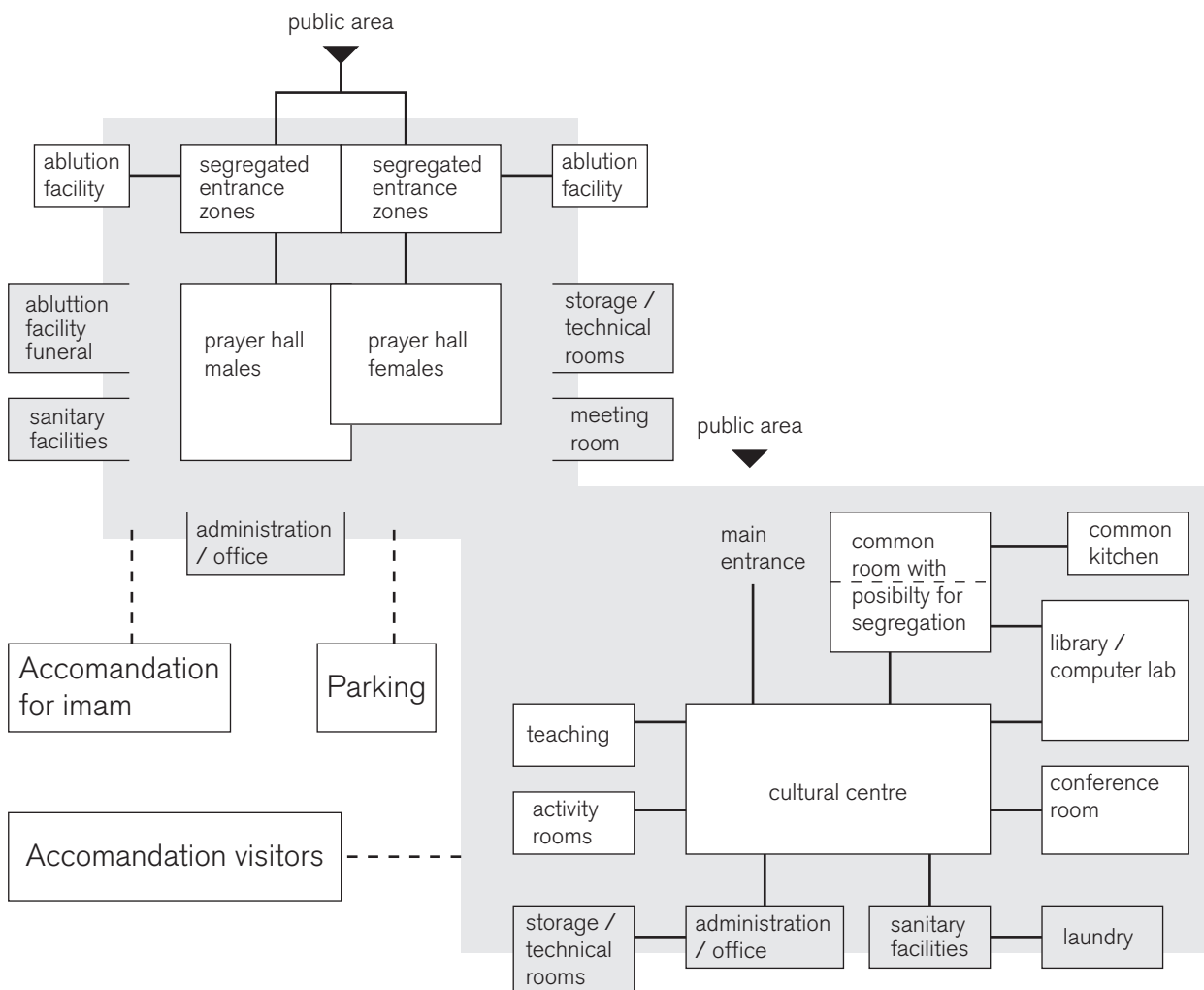
user group

It's a fact that Norway is turning in to a multi-cultural society. What used to characterize the typical mosque user and Muslim has changed in Norway. Today the Muslim society represents a wider ethnical user group including ethnic Norwegians. Tromsø is representing a large diversity among the citizens and counts around 800 Muslims in total [www.alnor.no]. University students with Muslim faith are also a potential user group for a Mosque, a place where Muslim students could find space for their religious practise.

The intended project with a mosque and a community centre will create a facility for Tromsø as a city across the cultural boundaries, based on dialog and respect. A complex with attractive architecture representing openness will hopefully contribute in building bridges against xenophobia and complement the religious diversity in a positive way for Tromsø.



functional connections



ill. 65.1 - Function diagram

Room description

Mosque

The mosque area is considered as the sacred space in this building complex. The spaces must be carefully planned according to Islamic norms and rules for orientation. Nordic architecture also known for simplicity and bright minimalistic expression, and is seen as a natural inspiration source for the interior design of this Mosque.

Prayer Space

Two prayer halls, one for male worshippers and one for female worshippers, will be the central spaces in the Mosque. The spaces will have different sizes with segregated entrance areas, but are intended to provide the same quality in terms of architecture and the spatial experience. The prayer hall for males will be considered as the main prayer room including the mosque components as mihrab and kursi. The female part must be designed with a clear element indicating the direction of Mecca.

Ablution

Segregated areas must be provided for the ritual ablution before prayer. Additional ablution space in connection with funerals must be established.

Entrance

Common segregated entrance spaces with wardrobe facilities. Both entrance areas will have the same spatial quality leading to the different prayer halls.

Administration

Office spaces for administration and meeting rooms must be planned. The spaces must be centrally placed giving access for both male and female users.

Additional spaces

Common sanitary facilities, storage space and technical room must be arranged.

The exact numbers of rooms and sizes is presented in more detail in the room program.



ill. 66.1 - Interior Penzberg mosque



ill. 66.1 - Interior Namaz Khane, Teheran

Room program Mosque

Room type	Area m2	Room height	Function	Activity level	Public interaction	Orientation
Basement						
Ablution basement		2,7 m	Ablution facility in connection with funeral	L	+	-
Storage / technical	77 m2	2,7 m	Storage and technical room basement	L	+	
Corridor / entrance basement	70 m2	2,7 m	Transit area	L	+	-
Elevator x 4	12,0 m2	3,0 m	Transit area all floors	H	+++	-
Ground floor						
Prayer hall male	380 m2	5 - 20 m	Sacred space for praying	H	+++	South east
Entrance / wardrobe (m)	150 m2	4,7 m	Entrance to prayer hall with wardrobe	H	+++	North
Ablution (m)	40 m2	3,0 m	Ablution facility for males	H	+++	North
Entrance / wardrobe (f)	160 m2	3,0 m	Entrance to prayer hall with wardrobe	H	+++	North
HC-WC 1	4,7 m2	2,4 m	Sanitary facility for wheel chair user	L	+	South west
HC-WC 2	4,7 m2	2,4 m	Sanitary facility for wheel chair user	L	+	South west
WC 1 (m)	2,7 m2	2,4 m	Sanitary facility	M	++	South west
WC 2 (f)	3,0 m2	2,4 m	Sanitary facility	M	++	South west
Cleaning room	4,0 m2	2,4 m	Cleaning room with sink	L		East
Wardrobe imam	6,0 m2	2,4 m	Changing room for Imam	L	+	East
Corridor ground f.	50 m2	4,7 m	Transit area	H	+++	-
Staircase to basement	12 m2	-	Transit area	L	-	-
1st floor						
Womens gallery	176 m2	6,0 m	Sacred space for praying	H	+++	South east
Ablution (f)	40 m2	3,0 m	Ablution facility for females	H	+++	North
WC 3 (m)	2,7 m2	2,4 m	Sanitary facility	M	++	South west
WC 4 (f)	3,0 m2	2,4 m	Sanitary facility	M	++	South west
Corridor 1st floor	50 m2	3,0 m	Transit area	H	+++	-
2nd floor						
Meeting / office	40 m2	2,7 m	Adm. space	M	+	North
Gallery 2nd floor	130 m2	-	Extra praying space / guest gallery	M	++	-
HC-WC 3	4,7 m2	2,4 m	Sanitary facility for wheel chair user	L	+	South west
WC 5	3,0 m2	2,4 m	Sanitary facility	L	+	South west
Area total	1459,0m2					iii. 67.1 - Room program mosque

Cultural centre / conference hall

The cultural centre is meant to be a gathering space separated in function from the sacred mosque space but still connected to the mosque providing additional spaces. The cultural centre is thought to be a new social meeting place across the cultural boundaries for both Muslims and non-Muslim citizens of Tromsø city, contributing to narrow down the cultural gap in the society.

Administration

Office spaces for administration and staff in total two rooms, additional space for copy machines and office equipment.

Teaching

Lecture rooms for religious and language teaching for kids and adults. In total 6 rooms must be planned.

Conference room

Large space intended to have qualities for taking conferences of international format. The space must be designed spatial qualities. Beside this the acoustic qualities and technological facilities such as a projector and screen must be provided.

Library

Library space with literature and computer facilities.

Kitchen

Large scale kitchen layout.

Activity space

With pool and table tennis, a separation for the youngest kids with playing facility.

Common rooms

Two segregated common rooms in connection with the kitchen, serving as smaller common living spaces.

Additional spaces

Common sanitary facilities, storage space and technical room must be arranged



Room program cultural centre / conferance hall

Room type	Area m2	Room hight	Function	Activity level	Public interaction
Basement culture centre					
Technical room	32 m2	2,7 m	Space for technincal installations	L	-
Storage	25 m2	2,7 m	Storage space	L	-
Laundry	23 m2	2,7 m	Storage space	L	-
Basement entrance	75 m2	2,7 m	Storage space	L	-
Ground floor culture centre					
Entrance / common space	435 m2	4,0 m	Access area / public common space	H	+++
Library	75 m2	6,0 m	Libraray with religious littarature, computer facility, possibility for study uce	H	+++
Kitchen	40 m2	4,0 m	Large scale kitchen with working facility, big dish washer, refrigerator, cooling store	M	++
Lecture room 1	32 m2	2,7 m	Teaching / ofice adm. / copy/ printing	M	++
Lecture room x 3	66 m2	2,7 m	Teaching 3 rooms of 22 m2	M	++
Corridor	67 m2	-	Transit area to teaching and kitchen	M	++
HC-WC 1	4,6 m2	2,4 m	Sanitary facility for wheel chair users	L	++
WC x 2	5,4 m2	2,4 m	Sanitary facility 2 x 2,7 m2	M	++
1st floor culture centre					
Kitchen	14 m2	4,0 m	Administration / staff space	M	++
Office adm	15 m2	2,7 m	Administration / staff space	M	+++
Lecture room x 2	30 m2	4,0 m	Teaching	M	++
Entrance / common space	167 m2	4,0 m	Public common space / sosial area female	H	+++
Area total	1106 m2				
Confrenence					
Confreance room	237 m2	4-12 m	Space for lectures, common meetingse, Possibility for segregation	M	+++
Entrance hall / Corridor	75 m2	-	Access area	M	++
Wardrobe	15 m2	4,0 m	Chancing room for public	M	++
HC-WC	4,0 m2	2,4 m	Sanitary facility for wheel chair users	L	++
WC x 2	5,0 m2	2,4 m	Sanitary facility wc 2,4 m2 x 2	M	++
Activity space	70 m2	4,0 m	Common space with pool / table tennis	H	+++
Area total	406,0m2				

Accommodation for imam

Living facility with 3 bedroom apartment for imam with family. The apartment must be designed with all necessary facilities for a family with outdoor space according to the municipality demands. The outdoor connecting space could be either arranged on ground level or as a balcony or roof garden.

The apartment is intended to be designed based on the spatial experience and bright minimalistic expression.



Room program apartment

Room type	Area m2	Room high	Function	Activity level	Public interaction	Level
Entrance / corridor 1	18,0 m2	2,7 m	Access area, with wardrobe	M	-	Level 1
Living room	37 m2	5,0 m	Common livingspace, TV, dining space social activities	H	-	"
Kitchen	11 m2	2,7 m	Cooking, storage, dishwasher, refrigerator	H	-	"
Bathroom	4,3 m2	2,7 m	WC, shower, washbasin, washing machine, dryer	M	-	"
Toilet	3,0 m2	2,4 m	WC, wash basin	M	-	"
Master bedroom	10,2 m2	2,7 m	2 x sleeping, wardrobe	M	-	"
Bedroom 1	8,2 m2	2,7 m	1 x sleeping, wardrobe, working desk	M	-	Level 2
Bedroom 2/office	7,5 m2	2,7 m	1 x sleeping, wardrobe, working desk	M"	-	"
Living level 2 / corridor	12,8 m2	2,7 m	Living space level 2	M	-	"
Area total	103,0 m2					

ill. 70.2 - Room program apartment

Accommodation for visitors



Accommodation facility for visitors and invited guests with single rooms in connection with the cultural centre must be planed. These spaces must be arranged with easy access from the main entrance of the cultural centre. Eventually arranged with separate access from the outside entrance area. The spaces must be designed as small hotel room units with sanitary facilities.

Room program accommodation visitors

Room type	Area m2	Room hight	Function	Activity level	Public interaction	Level
Accomondation unit 1	20 m2	2,7 m	Sleeping facility with single bed, working desk, wardrobe, bathroom, kitchen	L	+	Ground floor
Accomondation unit 2	26 m2	2,7 m	Sleeping facility with single bed, working desk, wardrobe, bathroom, kitchen	L	+	Ground floor
Accomondation unit 2	16 m2	2,7 m	Sleeping facility with single bed, working desk, wardrobe, bathroom, kitchen	L	+	1 st floor
Accomondation unit 2	23 m2	2,7 m	Sleeping facility with single bed, working desk, wardrobe, bathroom, kitchen	L	+	1 st floor
Area total	85,0 m2					

ill. 71.2 - Room program accommodation

Outdoor space

The whole outdoor space is planned as an open public space, with park like environment and paved paths leading to the planned functions on the site. The intended open connection with public flow along the shore line as promenade will be implemented in the planning of the footprint of the building mass. Outdoor spaces with appealing design will hopefully contribute to a natural public interaction to the area. The design must at the same point reflect the presence of the sacred space a mosque is representing. The entrance area must, through the design, create expectations for the sacred activity of a mosque.

The outdoor spaces will be planned without vehicle traffic. The paths will still be planned with possibility of getting to the main entrance of the complex with emergency vehicles and fire truck.

Outdoor lighting

To define direction of paths, the light could either be low light poles or integrated in the pavement.

Parking

Underground parking in a parking garage for 7 cars. Size pr. parking 2,5 m x 5,0 m and HC- parking size 3,7 x 5 m

Waste

Closed storage space for waste.



ill. 72.1 - Inspiration outdoor green area



ill. 72.2 - Inspiration outdoor hard park



ill. 72.3 - Atmosphere outdoor space

Functions outdoor spaces



ill. 73.1 - Atmosphere outdoor space



ill. 72.2 - Atmosphere outdoor space

Type of space	Area m2	Room hight	Function	Activity level	Public interaction	Flow
Car parking under ground	500 m2	2,7 m	Parking garage for approximately 7 cars. Function placed under ground.	M	++	Connection to infrastru- cture.
Bycycle parking	40 m2	2,7 m	Outdoor bycycle parking	H	+++	Connection to infrast.
Outdoor hard park	-	-	Outdoor space connecting functions on the site. Open public square	H	+++	Connection to infrastru- cture.
Playground	-	-	Playground for kids placed on the future green area to north	H	+++	Connection to future infrastructure in the area
Waste storage	40 m2	2,4 m	Closed shed for waste	L	+	Connection to roads for easy access with truck
Area total	-					

Design criteria and parameters

In this chapter some criteria and design parameters will be presented as a result of the research made in the analysis phase. This information will work as guidelines for the development conceptualization of mosque in Nordic context . Together with the The room program and vision for this should form the basis for the design.



ill. 74.1 - diagram scale

Overall scale

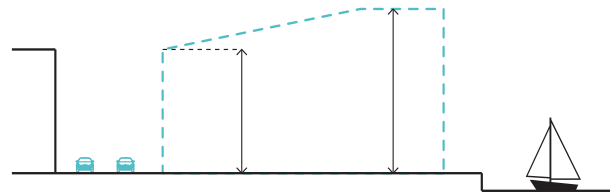
The overall scale should be reflected in the design so the building volume adjacent to the road to west meet the scale of existing building area.



ill. 74.3 - diagram flow

Flow

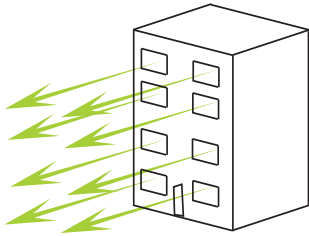
The building complex and the whole outdoor site area should stand out as an open public space with free pas-sage for pedestrians and cyclist.



ill. 74.2 - diagram heights

Heights

According to municipality demand the maximum allowable building height to west along the existing road is 15 m and maximum building height to east along the shoreline is 21 m.



ill. 75.1 - diagram openness

Design with openness

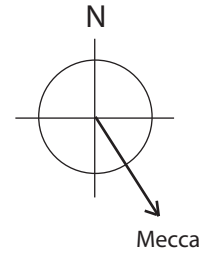
The building design should reflect openness and create a dialogue to the outdoor space and addition create good daylight conditions in the space.



ill. 75.2 - diagram parking

Parking

The area is intended to be vehicle free and all parking should be place under ground



ill. 75.3 - diagram direction to Mecca

Direction to Mecca

The mosque space should be designed so the direction of prayer is towards Mecca.

Design criteria

- The design of the mosque and the adjacent functions should trough the make a contrast to the everyday secular space, and give an experience of being in a sacred space.
- The transition from the secular to the sacred space must communicate the message of sacredness.
- The mosque space should be designed with a clear sense of direction.
- Gender segregation in the mosque and culture centre must be designed with equal architectural qualities.
- The design should reflect a simplicity in material use. The spaces should in addition create different spatial quality according to the function applied to the space.

Vision

>> The vision for this project is to design a mosque with a community centre that could function as a gathering place for Muslims and non Muslim citizens of Tromsø.

The traditional Islamic mosque typology will be reconsidered with a notion of finding a contemporary framework that could provide the sacred and spiritual facilities of a mosque designed in Nordic context for future generations.

Herby the design will hopefully contribute to a discussion of the future mosque and Islamic centres. <<



Literature
Illustrations
Appendix

litterateur list

books

[Frishman & Khan, 1994] The Mosque, Frishman ad Khan, Thames & Hudson Ltd, 1994, ISBN 978-0-500-28345-5

[Naquib, 2001]

[Stirelin, 2009] Islam from Cordoba to Bagdad, early architecture from 7th to the 13th century, Henri Stirlin, 2009, Taschen Gmhb, ISBN 978-3-8365-1059-2

[Plummer, 2009] The architecture of natural daylight, Henry Plummer, Thames and Hudson Ltd, 2009, ISBN 978-0-500-34252-7

[Understand Islam, 2006] En kort illustrert guide for a forstå Islam, I. A. Ibrahim, I. A. Abu-Harb, 2006, ISBN 9960-52-502-3

[Richardson, 2004] New sacred architecture, Richardson, Laurence king publishing, 2004, ISBN 185669 384 8

[Norberg-Schulz] Mellom himmel og jord, Pax Forlag As, 1992, ISBN 82-530-1582-2

[The Mosque architecture]

[Municipality plan] [Tromsø kommune, 2009, kommunedelplan for Stakkevollvegen – Tromsømarka plan 229, bestemmelser og retningslinjer]

[Richardson] New sacred architecture, Richardson, Laurence king publishing, 2004 ISBN 1 85669 384 8

[Eiler Rasmussen, 1957], Om at opleve arkitektur, Steen Eiler Rasmussen, G.E.C. Gads Forlag København, 1957, ISBN 87-886-5618-7

web

[Study guide]	http://studieweb.aod.aau.dk/master/Mastertom%2C+MSc1%2C+UD%2C+courses/4527331
[wikitravel]	http://wikitravel.org/en/Troms%C3%B8
[coe]	http://www.coe.int/t/dghl/standardsetting/minjust/mju29/Tromso_intro_en.asp
[norwegianreport]	http://www.norwegianreport.com/?p=13
[Fjordtravel]	http://www.fjordtravel.no/images/destinations/tromso/tromso_norway4.html
[northerngateway]	http://www.northerngateway.no/Default.aspx?tabid=397
[Tromsø kommune]	http://www.tromsø.kommune.no
[Tromsø kommune, dark period]	http://www.tromsø.kommune.no/macrketid-og-midnattsol.4547051-122549.html
[Northern light]	http://www.crh.noaa.gov/fsd/astro/aurora.php
[Muslim population]	http://www.islamicpopulation.com/
[Wikipedia, population]	http://en.wikipedia.org/wiki/List_of_countries_by_Muslim_population
[Wikipedia, khutbah]	http://en.wikipedia.org/wiki/Khutbah
[Investigating Islam]	http://www.islamic.org.uk/nochurch.htm
[Wikipedia, segregation]	http://en.wikipedia.org/wiki/Sex_segregation_and_Islam
[Wikipedia, sacred]	http://en.wikipedia.org/wiki/Sacred_architecture
[Wikipedia, quote]	http://en.wikipedia.org/wiki/Sacred_architecture
[Creating sacred space]	http://drc.ohiolink.edu/handle/2374.OX/9025
[Sensing architecture.com]	http://sensingarchitecture.com/

illustration list

ill. 3.1	3	
ill. 10.1	10	http://3.bp.blogspot.com/ , (12.03.2010)
ill. 11.1 - Relation between the different phases of the project.	11	Self generated
ill. 12.1 - Map Norway	12	Self generated
ill. 13.1 - Midnight sun in Tromsø	13	http://www.panoguide.com/gallery-images/1057.jpeg , (04.02.2010)
ill. 13.1 - Northern light in Tromsø	13	http://www.panoguide.com/gallery-images/1057.jpeg , (04.02.2010)
ill. 14.1 - Picture island of Tromsø	14	http://upload.wikimedia.org/ , (04.02.2010)
ill. 15.1 - Map site location	15	http://upload.wikimedia.org/ , (04.02.2010)
ill. 16.1 - Overview Tromsø harbour front	16	www.norherngateway.no , (04.02.2010)
ill. 16.2 - Historical picture Tromsø harbour	16	www.norherngateway.no , (04.02.2010)
ill. 16.3 - Historical picture Stakkevollvegen - Tromsø	16	www.norherngateway.no , (04.02.2010)
ill. 17.1 - Municipality plan, Stakkevollvegen - Tromsømarka (map not in scale)	17	www.tromso.kommune.no , (04.02.2010)
ill. 17.1 - Municipality vision Stakkevollvegen (map not in scale)	19	www.tromso.kommune.no , (04.02.2010)
ill. 21.1 - Map district	21	Self generated
ill. 23.1 - Map primary paths	23	Self generated
ill. 25.1 - Map secondary paths	25	Self generated
ill. 26.2 - Tromsø city square	26	http://farm1.static.flickr.com/62/189965298_7e9feae58f.jpg , (14.02.2010)
ill. 26.1 - Tromsø Arctic Cathedral	26	http://www.khfoto.no/blogg/uploaded_images/ishavskatedralen2-703153.jpg
ill. 26.3 - Polaria museum	26	http://www.travel2music.com/images/news/GRADOVI/tromso/Polaria_by_Ola_Reed.jpg
ill. 26.4 - Tromsø Cathedral	26	http://greaker.googlepages.com/tromso_kirke.jpg /tromso_kirke-full.jpg, (14.02.2010)
ill. 26.5 - Tromsø University library	26	Private photo
ill. 26.6 - Tromsø bridge	26	http://farm1.static.flickr.com/155/347851761_904bb01262.jpg , (14.02.2010)
ill. 27.1 - Mapping landmarks and nodes	27	Self generated
ill. 28.1 - Diagram views	28	Self generated
ill. 29.1 - View industrial area north	29	Private photo
ill. 29.2 - View industrial area south	29	Private photo
ill. 29.3 - View residential area towards west	29	Private photo
ill. 29.4 - View to the fiord and mountains towards east	29	Private photo
ill. 30.2 - Section A-A	30	Self generated
ill. 30.1 - Map building typologies, scale 1:5000	30	Self generated
ill. 31.1 - Residential building typology	31	Private photo
ill. 31.2 - Residential building typology	31	Private photo
ill. 31.3 - Industrial building south	31	Private photo
ill. 31.4 - Industrial building stakkevollvegen	31	Private photo
ill. 31.5 - Industrial building stakkevollvegen	31	Private photo
ill. 32.1 - Water and mountain landscape to east	32	Private photo
ill. 32.2 - Picture landscape from mountains in east	32	Private photo
ill. 32.2 - Picture towards west from mountain in east	32	Private photo
ill. 33.1 - Wooden housing	33	Private photo
ill. 33.3 - concrete	33	Private photo
ill. 33.3 - steel covering	33	Private photo
ill. 33.2 - Wooden	33	Private photo
ill. 33.4 - concrete	33	Private photo
ill. 33.6 - steel	33	Private photo
ill. 34.2 - mar - mai	34	Self generated
ill. 34.3 - jun - aug	34	Self generated
ill. 34.1 - des - feb	34	Self generated
ill. 34.4 - sep - nov	34	Self generated
ill. 35.1 - Sun conditions	35	Self generated
ill. 35.2 - Sun heights	35	Self generated
ill. 36.1 -	36	http://www.alnor.no/en_midnightsun.htm , (23.02.2010)
ill. 36.2 - Midnight sun	36	http://hum.uit.no/lajanda/sommarseminar/midnattsol.jpg , (23.02.2010)
ill. 36.3 - Path midnight sun	36	http://yoga108.org/images/blog/2006/midnight_sun.jpg , (23.02.2010)
ill. 37.1 - Aurora Borealis	37	http://www.alnor.no/en_northern_lights.htm , (29.02.2010)
ill. 37.2 - Aurora Borealis	37	http://www.alnor.no/en_northern_lights.htm , (21.02.2010)
ill. 37.3 - Aurora Borealis	37	http://www.alnor.no/en_northern_lights.htm , (23.02.2010)

- | | | |
|---|----|---|
| ill. 39.1 - Kaba in Mecca | 39 | http://www.wikitravel.org, (13.02.2010 |
| ill. 40.1 - Masjid Al Nabwi, the holy Prophets Mosque in Medina | 40 | http://www.akademifantasia.org/wp-content/uploads/2009/02/masjid-nabawi.jpg, (24.02.2010 |
| ill. 40.2 - Holy Quran | 40 | http://wisdomtoislam.com/wp-content/uploads/2009/12/holy-quran.JPG, (24.02.2010 |
| ill. 41.1 - The early development of the mosque in based on The house of the Prophet in Medina. | 41 | The Mosque, Frishman ad Khan, Thames & Hudson Ltd, 1994, ISBN 978-0-500-28345-5 |
| ill. 41.2 - Prayer in Sahara | 41 | http://www.readthespirit.com/explore/images/2008/03/23/01_muslim_prayer_2.jpg, (24.02.2010 |
| ill. 42.1 - Arab hypostyle mosque | 42 | The Mosque, Frishman ad Khan, Thames & Hudson Ltd, 1994, ISBN 978-0-500-28345-5 |
| ill. 42.2 - Four iwan mosque | 42 | The Mosque, Frishman ad Khan, Thames & Hudson Ltd, 1994, ISBN 978-0-500-28345-5 |
| ill. 42.3 - Triple dome mosque | 42 | The Mosque, Frishman ad Khan, Thames & Hudson Ltd, 1994, ISBN 978-0-500-28345-5 |
| ill. 42.4 - Cental dome mosque | 42 | The Mosque, Frishman ad Khan, Thames & Hudson Ltd, 1994, ISBN 978-0-500-28345-5 |
| ill. 42.5 - Mosque with detached pavilions | 42 | The Mosque, Frishman ad Khan, Thames & Hudson Ltd, 1994, ISBN 978-0-500-28345-5 |
| ill. 43.1 - Umayyad Great Mosque, Damascus | 43 | http://en.wikipedia.org/wiki/File:Omayyad_mosque.jpg, (24.02.2010 |
| ill. 43.3 - Friday mosque Isfahan, Teheran | 43 | http://www.flickr.com/photos/mitopen/courseware/2989589108/, (24.02.2010 |
| ill. 43.5 - Badshahi mosque, Lahore - Pakistan | 43 | http://i.pbase.com/g4/18/75718/2/60963657.LHR_1047.jpg, (24.02.2010 |
| ill. 43.2 - Ahmad ibn Tulun Mosque, Cairo | 43 | www.essential-architecture.com/.../NA-EG-001.htm, (24.02.2010 |
| ill. 43.6 - The Great Mosque Xian, China | 43 | http://photos.igougo.com/images/p479087-Xian-The_Great_Mosque.jpg, (24.02.2010 |
| ill. 43.4 - Blue mosque, Istanbul | 43 | http://students.ou.edu/C/Hannah.E.Clay-1/blue-mosque.jpg, (24.02.2010 |
| ill. 44.1 - Namaz khane - Teheran, Iran | 44 | http://www.flickr.com/photos/a_h_momeni/2934328218/sizes/l/in/photostream/, (24.02.2010 |
| ill. 44.2 - Shah Faisal Mosque - Islamabad, Pakistan | 44 | http://www.flickr.com, (24.02.2010 |
| ill. 44.3 - Penzberg mosque, Germany | 44 | http://www.worldarab.net/sites/default/files/images/Penzberg%20Mosque%209.jpg, (24.02.2010 |
| ill. 45.1 | 45 | http://3.bp.blogspot.com/_oz151VAgulk/Sw5t8n5UCV/AAAAAAAAAQ/2AungpdlXng/s1600/ |
| Gallery-Eid-al-Adha-Afgha-017.jpg, (24.02.2010) | | |
| ill. 45.2 | 45 | http://i.timeinc.net/time/photoessays/muslimschool/images/07.jpg, (24.02.2010 |
| ill. 45.3 | 45 | http://3.bp.blogspot.com/_oz151VAgulk/Sw5t8n5UCV/AAAAAAAAAQ/2AungpdlXng/s1600/ |
| Gallery-Eid-al-Adha-Afgha-017.jpg, (24.02.2010) | | |
| ill. 46.1 - Standard components of the mosque | 46 | The Mosque, Frishman ad Khan, Thames & Hudson Ltd, 1994, ISBN 978-0-500-28345-5 |
| ill. 46.2 - Mihrab, Hagia Sophia - Turkey | 46 | http://en.wikipedia.org/wiki/File:Haga_Sofia_RBS.jpg, (24.02.2010 |
| ill. 47.1 - Minbar, Hagia Sophia | 47 | http://en.wikipedia.org/wiki/File:Haga_Sofia_RBS.jpg, (24.02.2010 |
| ill. 47.3 - Dikka, Sultan Hassan Mosque, Cairo | 47 | http://pagesperso-orange.fr/istanbul/minbar.jpg, (24.02.2010 |
| ill. 47.4 - Kursi | 47 | The Mosque, Frishman ad Khan, Thames & Hudson Ltd, 1994, ISBN 978-0-500-28345-5 |
| ill. 47.2 - Minbar | 47 | http://pagesperso-orange.fr/istanbul/minbar.jpg, (24.02.2010 |
| ill. 47.5 - Kursi | 47 | The Mosque, Frishman ad Khan, Thames & Hudson Ltd, 1994, ISBN 978-0-500-28345-5 |
| ill. 47.6 - Muqsura | 47 | The Mosque, Frishman ad Khan, Thames & Hudson Ltd, 1994, ISBN 978-0-500-28345-5 |
| ill. 48.1 - Ablution fountain
(24.02.2010) | 48 | http://upload.wikimedia.org/wikipedia/commons/8/8a/Cairo_Citadel_Ablution_fountain.jpg, |
| ill. 48.2 - Masjid Al Nabwi, the holy Prophets Mosque in Medina | 48 | http://www.akademifantasia.org/wp-content/uploads/2009/02/masjid-nabawi.jpg, (24.02.2010 |
| ill. 48.3 - Buland Darwaza, The Portal - India | 48 | http://www.shunya.net/Pictures/NorthIndia/Agra/FatehpurSikri/FatehpurSikri33.jpg, (24.02.2010 |
| ill. 49.1 - Ornamentation based on circles and star shaped geometry | 49 | http://library.wustl.edu/subjects/islamic/MihrabIsfahan.jpg, (12.03.2010 |
| ill. 49.2 - Combination of colorful three dimensional ornamentation and calligraphic writings | 49 | http://library.wustl.edu/subjects/islamic/MihrabIsfahan.jpg, (12.03.2010 |
| ill. 50.1 - Space requirement for muslim worship | 50 | http://s3.images.com/huge/45.229312.JPG, (25.02.2010 |
| ill. 51.1 - Gender segregation in mosque | 51 | http://www.jannah.org/ramadan/r5.jpg, (25.02.2010 |
| ill. 51.2 - Gender segregation in mosque | 51 | http://static.guim.co.uk/men-and-women-3886.jpg, (25.02.2010 |
| ill. 52.1 - Musalla | 52 | Mosques in Norway, Sapinaz-Amal Naquib, Novus forlag, 2001, ISBN 82-7099-340-9 |
| ill. 52.2 - Alnor mosque in residential building, Tromsø | 52 | Private photo |
| ill. 52.3 - Converted flat for mosque | 52 | Private photo |
| ill. 52.4 - Converted flat for mosque | 52 | Private photo |
| | | |

ill. 56.9	56	http://www.swamppolitics.com/news/politics/blog/BethlehemP1010004.JPG , (11.03.2010)
ill. 56.10	56	http://22.media.tumblr.com/WS7ReC9ySfcm9fstMgVxA3GWo1_400.jpg , (11.03.2010)
ill. 56.11	56	http://static.panoramio.com/photos/original/22272141.jpg , 13.03.2010)
ill. 57.1	57	http://www.archnewsnow.com/features/images/Feature0123_02x.jpg , 13.03.2010)
ill. 57.2	57	http://www.rockwool.dk/files/RW-DK/current_architecture/The_Fish_Chapel/1.jpg , (14.03.2010)
ill. 57.3	57	http://reisetips.visitnorway.com/EPiServerCommunity/Modules/ImageGallery/ ,
Thumbnails/63/2063/408_1394.jpg (13.03.2010)		
ill. 57.4	57	http://kwc.org/blog/archives/resources/2005/ando.pulitzer.jpg , (13.03.2010)
ill. 57.5	57	http://archipreneur.blogspot.com/2009/03/tadao-ando-church-of-light.html , (13.03.2010)
ill. 57.5	57	http://img142.imageshack.us/i/faisalmosque2ai4.jpg/ , (13.03.2010)
ill. 57.6	57	http://www.sacred-destinations.com/pakistan/islamabad-faisal-mosque-pictures/int-c-aga-
khan-award-for-architecture.JPG, (13.03.2010)		
ill. 57.7	57	http://farm2.static.flickr.com/1197/3172633253_1b716be153.jpg , (13.03.2010)
ill. 57.8	57	http://farm4.static.flickr.com/3594/3464354132_1873d8fca6_o.jpg , (13.03.2010)
ill. 59.1	59	http://news.bbc.co.uk/media/images/46276000/jpg/_46276877_dpcsafp4.jpg , (13.03.2010)
ill. 59.2 - Hagia Sophia, Turkey	59	http://www.istanbultoursonline.com/images/hagia_sofia.jpg , (12.03.2010)
ill. 59.3 - Ronchamp chapel, LeCorbusier	59	http://www.bc.edu/bc_org/avp/cas/fnart/Corbu/ronchamp6.jpg , (12.03.2010)
ill. 60.1 - Soft acoustic, Ummayad mosque - Damascus	60	http://ic2.pbase.com/u10/brambos/upload/2212927.011damascus.jpg , (12.03.2010)
ill. 60.2 - Hard acoustic, The rock church - Helsinki	60	http://www.planetware.com/i/photo/rock-church-helsinki-sf146.jpg , (12.03.2010)
ill. 62.2 - Diagram reflections	62	Self generated
ill. 62.3 - Diagram reflections	62	Self generated
ill. 62.1 - Berlin Philharmonic	62	1http://images.google.dk/imgres?imgurl=http://www.germanyandafrika.diplo.de/Vertretung/
pretoria__dz/Bilder/05__German__Life/Culture, (12.03.2010)		
ill. 63.3 - Banskværd church	63	http://www.kunstonline.dk/indhold/pics/jornutzon_4.jpg , (12.03.2010)
ill. 63.1	63	Self generated
ill. 63.2	63	Self generated
ill. 64.1	64	Self generated
ill. 64.2	64	http://www.dagsavisen.no/multimedia/archive/00063/tsunamien_63151q.jpg , (12.03.2010)
ill. 65.1 - Function diagram	65	Self generated
ill. 66.1 - Interior Penzberg mosque	66	http://www.trip-guide.ru/img/399/15030.jpg , (12.03.2010)
ill. 66.2 - Interior Namaz Khane, Teheran (12.03.2010)	66	http://www.worldarab.net/sites/default/files/images/Penzberg%20Mosque%204.jpg ,
ill. 67.1 - Room program mosque	67	Self generated
ill. 68.1	68	http://www.isdef.org/download/ISDEF2009/Conference-hall.jpg , (12.03.2010)
ill. 68.2	68	http://www.isdef.org/download/ISDEF2009/Conference-hall.jpg , (12.03.2010)
ill. 68.4	68	http://www.flickr.com , (15.03.2010)
ill. 68.3	68	http://www.abrahamsvision.org/unityweblog2008-09/images/PHH-MAS_3.JPG , (15.03.2010)
ill. 69.1 - Room program Culture centre and conference space	69	Self generated
ill. 70.2 - Room program apartment	70	Self generated
ill. 70.1 - Inspiration interior apartment	70	http://media.aftenposten.no/archive/01140/_F-Br_dtekst-Os_3_1140155g.jpg , (12.03.2010)
ill. 71.1 - Inspiration interior apartment	71	http://www.olevigspark.no/bilder/3d/soverom2.jpg , (12.03.2010)
ill. 71.2 - Room program accommodation	71	Self generated
ill. 72.1 - Inspiration outdoor green area	72	www.blark.no/flash.blark.no/ , (12.03.2010)
ill. 72.2 - Inspiration outdoor hard park	72	commons.wikimedia.org , (16.03.2010)
ill. 72.3 - Atmosphere outdoor space	72	http://www.blockmagazine.com/media/Nature-1.jpg , (12.03.2010)
ill. 73.1 - Atmosphere outdoor space	73	1http://4.bp.blogspot.com/_MjV4PYhQ68Y/SFLz7nvdgNI/AAAAAAAAABf4/EgeOR6pdiZl/s1600/
Lekeplass+in+camping+ground.jpg, (12.03.2010)		
ill. 73.3 - Program outdoor space	73	http://www.flickr.com , (12.03.2010)
ill. 72.2 - Atmosphere outdoor space	73	Self generated
ill. 74.1 - diagram scale	74	Self generated
ill. 74.2 - diagram heights	74	Self generated
ill. 75.1 - diagram openness	75	Self generated
ill. 75.2 - diagram parking	75	Self generated
ill. 75.2 - diagram direction to Mecca	75	Self generated
ill. 77.1 - muslim girl praying	77	teenperspectives.com , (13.03.2010)