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ORIGINAL COPIES
INTRODUCTION
“The architectural copy can be schizophrenically characterised as the discipline’s perfect and evil twin, at once fundamental to architecture’s mode and its nemesis.”

- FAT, Museum of Copy, Venice Biennale 2012
In the field of architecture, the copy has existed throughout the history. It is today a word with quite negative connotations, as an architect should be innovative and find new solutions, not copy from others. But this is also based on a choice of words. Copy is the worse synonym of reproduction, but ultimately, are they not the same thing?

In architecture history, the copy was a way of studying architecture, as well as a way of keeping the tradition, heritage, and craftsmanship of architecture. With Vitruvius and his 10 books on architecture, we had more of a prescriptive view on architecture. Palladio’s Four Books of Architecture (1570, Venice), were explicit manuals published to be copied by other architects. (Victoria & Albert museum, 2016) The elements of architecture were copied, reused and developed in the search for what architecture was and could be. In the 19th century, the beaux-art schools’ education was based on learning from the historical references, as well as knowing the architectural elements to the smallest detail. The 19th century was also when copying became an important tool in the art world, as the museums started producing copies of objects and other world heritage for cultural expansion, as well as for educational reasons. (Victoria & Albert museum, 2012) There were even catalogs selling copies of architectural details. The copy was a tool for learning with a high value for society and further education. (Cormier, 2016)

Soon the copy went out of fashion in both art and architecture. In the 20th century, the photograph became the new way of preservation and physical copies in art started feeling outdated. Many museums got rid of physical copies they stored as they were considered to be cheap. The copy started to be considered as fake and kitsch. So why have them when the photograph could represent objects well enough? (Cormier, 2016) Questions about copyright and authorship started to come up, and the future of the copy was uncertain. (Cormier, 2016) Modernist architecture also bloomed in the early 20th century pushing away from the beaux arts tradition; to copy, or to reproduce what was already invented, did not answer the questions at that time and another approach to architecture developed giving the original new value. One could question the meaning of this new original though, as industrialization also came along with these new ideologies, spreading the modernist typology worldwide. Maybe history lost its’ place in architecture, but did the copy really disappear with the new mass production?
At the end of the 20th-century traditions did a comeback in the postmodern movement as some architects turned away from modern functionalism. Postmodernism in architecture has brought a doubt in major narratives and legitimated pastiche, quoting and references. Within the postmodern era copying (historicist quotes) and metaphors (references to other objects, including architectural ones) no longer were signs of bad taste, but rather became full-fledged means of expression. (Mankus, 2016) The ideological origins of the Postmodernism movement can be traced back to Robert Venturi's book Complexity and Contradiction in Architecture (1966). In his book, Venturi pointed out that great cities like Rome were built up by historical layers and vivid juxtapositions. In his texts, he embraced aspects of architectural history, decoration, and disunity, things that the modernist movement had tried to step away from. (Winston, 2015) Another important aspect that the postmodernist architecture brought with it was contextualism; a belief that all knowledge is “context-sensitive”. (Sennott, 2004: 306) “Today, architects feel free to borrow from anywhere they like, and few would be bold enough to propose a new building without attending to local conditions,” says Winston in her article from 2015. With the contextualization, the postmodern architecture might have turned out to be more original than the modernist architecture. Contextualizing a building means it is specific to its site even if one copies details and elements from other buildings. One might argue that it’s not just about reusing and copying, it’s about learning and finding a new way of implementing these elements and adapting them to new contexts that creates originality. Questions arise about architecture and its core, in what does the originality actually lie?

The copy and use of references are now coming back into fashion with the wish for preservation of both art and architecture as well as with the open-source culture. We live in a fragile world where our heritage is getting destroyed, so can the copy help save the heritage, spread the culture etc.? In the world of art, it is no longer a question about if we should make copies, but what should be copied? (Victoria & Albert museum, 2016) Why would it be any different in architecture? Can we use the copy to spread architecture, and to learn and keep developing our profession? And the biggest question of all, what is a copy? Are there really any copies and if so, when can the copy have enough value to become an original in itself?

2. AT&T Corporate Headquarters, New York, USA, 1984
THESIS / RESEARCH QUESTION

This thesis aims to investigate copying in architecture in relation to context. Is it possible to copy a building?

With the advances of 3D-scanning and digital fabrication, the possibilities for copying form and material are constantly increasing. However, more so than the artistic object, architecture is always contextual - a building exists on a specific site. Therefore, when investigating copies in architecture, context becomes crucial. How does context change the specifics of the building?

While studying the copy in relation to context and the adaptations, the relation between the original and the copy is highlighted. At what point does the copy detach itself from the original? Is there a copy or just multiple originals?

In relation to these questions, there are several issues that surface, that might be defined by studying the subject. What is architecture? What is a building? What makes a building a piece of architecture? Who has authorship over a piece of architecture? And most importantly: where in a building lies the originality?
OBJECTIVE / PURPOSE

As previously mentioned, advances in digital fabrication, 3D-scanning and open source databases have increased the relevance of the question of copying in architecture. As the possibilities of recreations of the form reach new heights, the question of the relationship between the original and the copy, and the meaning of the existence of a copy become relevant.

Further, social, economical and ecological sustainability has become major aspects of the development of the built environment, thus making context a key aspect of architectural design. The interface between the potential of the global open source culture and the specifics of the local context is thereby fertile ground for investigation.

Another aspect of copying in architecture in today’s globalized and digitalized society that becomes relevant is the attitude towards copyright and plagiarism. With international competitions and web publications, images of architecture become visible to an international audience. This opens up for a debate on plagiarism and authorship in architecture. What aspects of a project is the idea of originality based on? Who has the authorship and ownership of these ideas? One of the most prominent copyright cases in recent years is the Freedom Tower, pictured left, which we will look into in the next chapter.
CONTEXT

To be able to place this question about the copy in its proper context we have researched the copy and its uses, allowing us to create a background for our investigation.

Discussing the copy can be quite subjective, depending on each person's background. It seems that the view of the copy varies depending on the proposed purpose, the object value, the culture and the history. Having this in mind we are therefore doing our research through literature, articles, expositions, lectures and a few case studies of the copy.

The development of material technique and media tools in recent years have created a work environment for architects where digital tools, open source, digital fabrication and industrial production is an everyday reality, thus influencing the discourse of what architecture is and where it is heading. In a publication from the 101st annual meeting of Association of Collegiate Schools of Architecture (ASCA), Ines Weizman stated that “...simultaneous and very similar to the development of contemporary design techniques, the entire process of copying emerges at the intersection of a set of digital media and design technologies.” (Weizman, 2013: 829) The web platform for architectural culture and criticism “To the Power of Zero” (_0*) touch upon this in a recent issue: “Whereas in the beginning of the 20th century, Walter Benjamin was very suggestive of the role of originality in the age of technology, at present we live in the age of global networks transmitting data to whoever has an access to them, any time, in any place.” (Mankus, 2016) The writer continues: “... from plagiarism and copying to interpretation and collage, [all] have their common denominator, which in general can be called 'influence'. Many architects admit their creative processes are influenced not only by non-architectural sources (e.g. in most cases – by science fiction movies) but also some particular architects, trends and architectural phenomena (suprematism, constructivism, Bauhaus movement, etc.).” (Mankus, 2016) In this context of international media reach, where influence crosses vast geographical and cultural distances, the idea of copying must be questioned. Architect Tauras Paulauskas states that “Of course, the most severe breach of copyright is plagiarism, but such cases are rare nowadays because in this age of information it is quite complicated to plagiarize something on purpose or prove this is a case of plagiarism. All of us live in the same information environment.” (Sabatýte, 2013:90)

The idea of authorship in architecture has been further discussed in the anthology Architecture and Authorship edited by Tim Anstley, Katja Grillner and Rolf Hughes. In it, they claim a connection between authorship and the role of the architect, where authorship together with intention is used as an argument for the importance and legitimacy of the architect (2007: 6). Discussing the current position of authorship in architecture, Anstley et al.(2007) elaborate on the complexity of the idea. “What mechanisms legitimize such claims of ownership? How do they negotiate the paradox that the material ‘making’ is conducted almost certainly by other hands than those of the claimant? A complex blend of assumptions, claims, and exclusions are packed into such apparently simple verbal constructions.” (Anstley et al. 2007:7) Indeed, as architects claim authorship, exactly what is it that they claim to author?

The idea of authorship in architecture is very much linked to any case of alleged plagiarism and copyright infringement. One such claim that recently has caught the media’s attention is the “Freedom Tower” case mentioned above, where David Childs, of the major architectural firm SOM, was sued by architect Thomas Shine. During Shine’s studies at Yale in 1999, he had a skyscraper project, to which Childs was a juror. When Childs designed “Freedom Tower” in 2003, Shine and others claimed that it was a copy of Shine’s student project. Consequently, Shine registered his project with the U.S. Copyright Office and sued Childs for copyright infringement. In order for Shine to win the case, he had to prove ownership of a valid copyright, which he just obtained, as well as the copying of the original elements of his work. To judge the copyright issue, the court performed a “total concept and feel”-test, which is supposed to judge whether an infringing work is substantially similar to a copyrighted work, by concluding if an ordinary observer would regard their aesthetic appeal as substantially similar. (Brown, 2007) In June 2006, two parties reached a settlement (Mangino, 2006). Thus, what the court essentially judges in this case is the layman perspective on the aesthetic appearance of the building: the form, colors, and appearance of materials. In relation to the elaborations on the idea of authorship found in Anstley et al.(2007), such a view on the original and the copy seems rather blunt. Some writers question whether it is even possible to recognize plagiarism in architecture? Or, if there is an apparent connection, whether it is possible to distinguish it from the postmodern terms quoting, interpretation or pastiche?
STUDIES
STUDY OF THE COPY

We want to approach the copy in architecture through case studies of different types of copies that already exist or have been practiced.

By analyzing these case studies in themselves as well as in relation to each other we hope to be able to start to define the issue of the original and the copy.

The case studies will be examined through the physical relationship and differences between the original and the copy in their historical context - adding time and ideology as a parameter for the study. The case studies need to be placed in their specific contexts to evaluate the meaning of the copy of that time and how these relate to that standpoint.

Another important parameter is the purpose of the copy. Why is it built and how was the reaction for that type of copy?

STUDY ORIGINAL
Beaux-Arts, Paris

The académie des Beaux Arts is the new name for the French Académie Royale de Peinture et de Sculpture that was first opened back in 1648, a school for educating students in drawing, painting, sculpture, engraving and architecture. (Tate, 2016)

The program focused on classical arts and architecture from Ancient Greek and Roman culture, studying and learning from the ancient masters of architecture. (Tate, 2016) Redrawing and studying other buildings and their details was one of the bases of the education, spreading the classical style of architecture around the world.

The Paris school is the founding location of the Beaux Arts architectural movement in the early twentieth century, demanding classwork and setting the highest standards for the architectural education of that time. (Wikipedia, Ecole des Beaux Arts, 2016).
TYPE OF COPY

Studying historical architecture became a big part of the education at the Académie Royale, later called the École des Beaux Arts. Therefore this type of copy is called study original and looks at how education has influenced people’s perception of the copy throughout history.

The main purpose of the École des Beaux-Arts was the training of young architects of that generation through an understanding of architectural history, teaching them how to design such way of great architect's style and architecture of the past. (Fabrice, 2015) The training was based on the examples of Imperial Roman architecture, Italian Renaissance, and French as well as Italian Baroque models. It made great use of clasps that link one architectural detail to another, such as the interpenetration of forms and architecture parlante. All architects in training had to pass through the obligatory stages; the studying of antique models, constructing analos, analyses reproducing Greek or Roman models, “pocket” studies and other more conventional steps. (Wikipedia, Beaux-Arts architecture, 2016)

Comparing this to the education of today, one could argue that the historic layer has lost its importance in the studies. With an architectural style that is constantly changing, one is more likely to step away from historic references and the focus is more on the conceptual and the innovative. References are still used but the relation between these and the resulting style or building is less flagrant than it was during the Beaux Arts period. A reference can be seen more as a tool of communication than one of inspiration and for creating a knowledge base.

HISTORICAL CONTEXT

The Académie Royale de Peinture et Sculpture first opened in 1648, founded by Cardinal Mazarin (Murray, 2016), followed by the Académie de musique in 1669 and the Académie d’architecture in 1671. (Wikipedia, Académie des Beaux Arts, 2016) At its foundation, it was named the Académie Royale, as this was the term given to institutions of this kind during the late Middle Ages in Europe. Academy had, and still has, connotations of the ancient classic schools of thought and art. It was intended to teach the best and brightest students the arts of architecture, painting, drawing, sculpture, model, gem cutting, and engraving. (Murray, 2016)

In the architecture section, one of the biggest parts of the education was, from the 18th century, the Grand Prix competition where one could win a study trip to Rome. As the teaching of the antique architecture was so predominant, this was the ultimate prize, studying the originals in their context. (Fricker, 2010, 2)

The École des Beaux-arts as we know it today is a merger between the three academies, dating back to March 1816, after the French Revolution. (Wikipedia, Académie des Beaux Arts, 2016) Prior to the Revolution, the site of the school had been the monastery of the Petits Augustins, a long aisleless chapel with a western cloister and a large garden. Then, with the merging of the schools in 1816, it was given a home on the site of the Musée Des Monuments Français that now also stretches to include the monastery. (Murray, 2016)

The architect, Félix Duban, is seen as a very influential person when it comes to the architecture of the school. He envisaged the Palais des Études, the main building of the site, functioning as a museum or showroom rather than a teaching building, (Murray, 2016) exposing the ideals of the Beaux Art traditions not only to the students but to the society; an education for all in what architecture was envisioned to be. The school itself is a great example of the influence that the Beaux Art teaching had on architecture at that time.

Today the school has changed a bit and is more similar to the other institutions of its kind. The school has 8 sections; Painting, sculpture, architecture, engraving, musical composition, free members, cinema (since 1985) and photography (since 2005). (Wikipedia, École des Beaux Arts, 2016) Though the school and its program have been structured over the years it remains a school with an artistic base, more than others. The programs at the École de Beaux Arts are more cross-border with the other disciplines in the school than one might be used to. You would graduate with a diploma in fine arts rather than a technical one. (Beaux Arts de Paris, 2017)
GEOGRAPHICAL/CULTURAL CONTEXT
France has for a long time seen itself as somewhat of an intellectual center of international fine art and high culture. (Murray, 2016) The Ecole des Beaux Arts itself with its influence on architecture has most likely enhanced this vision of France as a frontrunner in architectural style and giving it a deeper historic importance. One could state that the Beaux Art style is what one relates to when discussing french architectural style in a historic perspective. Not only do the french flatter themselves with their importance in architecture history but the Beaux Art movement has influenced many projects around the world, especially in the US where many important, public buildings were constructed following the Beaux Art style. (Wikipedia, Beaux-Arts architecture, 2016)

PHYSICAL RELATIONSHIP
In the early 20th century a movement started to be created, based on the thought and education of the Beaux Art school. (Wikipedia, Ecole des Beaux Arts, 2016) Even though the Beaux Art education had already influenced the contemporary architecture of its time this was the point when the style became international. This was already a time of many new styles circling, but the Beaux Art style stayed strong, especially for new public buildings of a certain status.

Looking back at history, architecture and its stylistic elements were important at the same time as adaptation would be in order. Life wasn't the same as in the renaissance and function and program would have to be adjusted. One could call it contextualization from a time perspective.

The Beaux Arts is a classical style with a range of Greco-Roman elements: the column, arch, vault, and dome. It is the manner in which these elements are composed that gives the style its characteristic expression. General character

7. Cataloguing the predecessors of the Beaux Art elements.

a Beaux Art elements in the facade of the Palais Garnier, Paris Opera.
defining elements for the exterior include: Flat roofs, raised first story, arched windows and doors, symmetry, statuary and lastly the classical architectural details; balustrades, pilasters, garlands, cartouches, acroteria, brackets and supporting consoles. (Wikipedia, Beaux-Arts architecture, 2016) Beaux Arts buildings were designed to make a formal statement. Therefore the materials used for were to be of the best and most expensive quality. The predominant material is light colored stone, often limestone, and often richly worked. (Fricker, 2010, 4)

Looking from the outside to the inside one still finds traces of the ancient classics in layout and though, hierarchy of spaces, axial floor plans and floor plans that culminate in a single grand room are a few of the features that stayed important. (Fricker, 2010, 4) Adaptations were made to suit the lifestyle of the time, but still following the basic rules of proportion and symmetry. Materials in the interiors, as in the exterior usually were of the more luxurious ranking, including marble (often colorful and richly veined), polished woods, alabaster, terrazzo floors, polished brass and bronze, and, on fine examples, gold leaf. Interiors also featured painterly effects, fresco murals and the like. (Fricker, 2010, 5)

CONCLUSION; ACADEMIC ATTITUDES
Studying historical architecture and its originals became a big part of the education at the Academie Royale, later called the Ecole des Beaux Arts. The main purpose of the Ecole des Beaux-Arts was the training of young architects of that generation through an understanding of architectural history and using the examples of Imperial Roman architecture, Italian Renaissance, and French as well as Italian Baroque models as inspiration.

Through this case study and the understanding of how the education was organized at the time of the Beaux Art school, we can make a comparison to our educational system today, questioning the use of references and the influence the school and its thoughts have on the architecture society. When comparing to the education of today, in our own context, we would conclude that the historic layer has lost its importance in the studies. Even though references are used, they no longer hold the same value as before. The relation between references and the resulting style or building is expected to be less flagrant than it was during the Beaux Arts period when it was very literal.

In our continuous work with the Nordic Pavilion and the copy adaptation, it, therefore, becomes important that we have a clear standing point towards the copies. In our context, how would one adapt the original to a new context? Will it be important to keep the adaptation as true to the original as possible, using the same elements, programmatic structure and thought, or will the context be the most influential power leaving the original to be merely a starting point and first inspiration, changing to be a new building of the same kind, in a new place?

b. Conclusion diagram
TYPE OF COPY
Slowly our heritage and the architecture around us is fading and disappearing or being destroyed. (Cormier, 2016) The destruction caused by natural disasters is next to inevitable, but human-induced hazards have the capacity to outdo even natural disasters in their destructive effects on our heritage and cultural memory. (Jayaram, 2013)

Throughout history, cultural sites have been a target for destruction mainly because of their deep ties to social, cultural, or religious identities and war, civil disorder, terrorism, theft, neglect and vandalism are just some of the factors that have contributed to the accidental or deliberate destruction of our heritage. (Jayaram, 2013) And though the destruction of cultural heritage is an illegal act, few have been punished for these type of crimes throughout history.

Mapping, copying and reconstructing our lost heritage is becoming more and more important with all the conflicts and the destruction in the world, as well as with climate change and the increasing number of natural disasters we. Today there is a listing of 55 sites/buildings, counted as important cultural heritage in danger, around the world. (Cormier, 2016) This cultural heritage is important to preserve and reconstruct as it is, in many cases, a symbol of culture and history as well as of the technology and craftsmanship of its time. For many people, it can also be a reminder of past events and a way of learning from history.

Reconstruction after war is quite common and there is more than one example of this. (Cormier, 2016) One of the most recent reconstructions of lost heritage, after warfare, is the Stari Most in Bosnia & Herzegovina.

HISTORICAL CONTEXT
The historic town, in the deep valley of the Neretva River, was a relatively small settlement with two towers around the bridge, which dated 1459. The current name, Mostar, was mentioned for the first time in 1474 and derived from “mostari” - the bridge keepers. Mostar developed in the 15th and 16th centuries as an Ottoman frontier town and has long been known for its old Turkish houses and Old Bridge, Stari Most, after which the town is named. (UNESCO, 2016)

The historic part of Mostar is a result of interaction between the natural phenomena and human creativity throughout a long historical period. The essence of centuries-long cultural continuity is represented by the universal synthesis of life phenomena: the bridge and its fortresses – with the rich archaeological layers from the pre-Ottoman period, religious edifices, residential zones (mahalas), arable lands, houses, bazaar, its public life in the streets and

There is a lot of built heritage that has gotten and is still getting destroyed all around the world and some are of such high cultural value that it is being rebuilt.

One example is Stari Most, a reconstruction of the historical bridge of Mostar, that was destroyed during the Bosnian War in 1993. The bridge was rebuilt as true to the original as possible and inaugurated in 2004. (Victoria & Albert, 2016) with the supervision of The World Bank, the United Nations Educational, Scientific and Cultural Organization (UNESCO), the Aga Khan Trust for Culture and the World Monuments Fund. (Wikipedia, Stari Most, 2016)

It is one of the country’s most recognizable landmarks and considered an exemplary piece of Balkan Islamic architecture. It was designed by Mimar Hayrudden and the original bridge was built between 1557 and 1567. Upon its completion, it was the widest man-made arch in the world. (Wikipedia, Stari Most, 2016)
The original Stari Most was built on order from Suleyman the Magnificent to replace an older wooden suspension bridge. (Wikipedia, Stari Most, 2016) The planning started in 1557 and the bridge was completed in 1566, to become an engineering marvel of its time. (Deano’s Travels, 2016) Stari Most was the last standing and most treasured of seven bridges across the Neretva river gorge. It was once compared with a ‘rainbow rising up to the sky’ by the traveler Evliya Celebi in the 17th century and was included in the United Nations list of cultural heritage.

The bridge managed to survive for centuries, including the Italian occupation in World War Two, to be destroyed in November 1993 by Bosnian Croat artillery fire during the Bosnian War (1992-1995). (Deano’s Travels, 2016)

In the early 1990s, a heavy retaliation by Bosnian Croat forces against the Bosnian army and government triggered the Bosnian War. This resulted in the division of the city of Mostar into two halves, separated by the Neretva river and the Stari Most. (Jayaram, 2013)

“Many considered it a miracle the delicate Ottoman bridge had survived so long. Pitted by sniper and mortar fire, its steep arch was festooned with old car tires in a futile attempt at protection. The bridge had taken dozens of hits during the past 19 months, but gave way when 60 Croatian shells rained down on it yesterday.” Wrote The Independent on November 10th, 1993, after the bridge had collapsed.

Ten years later, the Bosnian government decided that the bridge should be rebuilt to replace the temporary wooden bridge. The reconstruction aimed to be as close to the original structure as possible, using the same technology and materials. Some of the stones from the destroyed bridge were recovered from the river below and the rest were mined from the original quarries. (Jayaram, 2013) With financial assistance and support from an international coalition, the reconstruction of the Stari Most bridge commenced in 2001 and was completed in 2004. The final cost of the reconstruction is estimated to around 15 million US dollar. (Carlo et al. 2004:6-17) In 2005 the Stari Most inscribed as a UNESCO World Heritage Site. Originally celebrated for its elegance, architectural ingenuity, and structural endurance, Stari Most became, and is today, a symbol of the importance of tolerance and diversity. (Jayaram, 2013)

PHYSICAL RELATIONSHIP
The arched bridge was an architectural wonder in its time made up by a single-span stone masonry arch, 29 meters in length, 20 meters high and 4 meters wide. Stari Most was built of tenelija, a locally found, fine-grained limestone. The individual stones were held together by iron clamps and joined with molten lead, a technology that was significantly advanced at the time of the original construction in the 16th century. (Jayaram, 2013)

On each side of the bridge, two towers protect the entrances. These massive stone structures stand in contrast to the delicate silhouette of the bridge, only emphasizing its beauty and simplicity. (Wikipedia, Stari Most, 2016)

The reconstruction of the Stari Most was based on thorough and detailed analyses of the remains of the original. The authenticity of form, use of authentic materials and techniques are fully recognizable while the reconstruction has not been kept secret. Remaining original material has been reused or exposed in a museum, becoming a part of the reconstruction and the history of Stari Most. (UNESCO, 2016)

At the urban scale, in trying to keep the authenticity a rehabilitation of the historic core has been made by the renovation of physical structures and the introduction of the appropriate functions. The use of the original volumes, sites and building materials for each structure preserved the typology and
morphology of the historic fabric. The key features of the city, natural surroundings, and the urban matrix with the architectural landmarks remain genuine and how they had been thought out to be many years ago. (UNESCO, 2016)

GEOGRAPHICAL/CULTURAL CONTEXT
The Stari Most Area, with its pre-Ottoman, Eastern Ottoman, Mediterranean, and Western European architectural features, is an example of a multicultural urban settlement. (UNESCO, 2016) But apart from this built-in object value, in the case of the Stari Most one can also look at the symbolism of the bridge itself. A bridge can be seen as a link between people and a neutral place for all. Without it, there is a gap, something missing to connect different people and cultures as one.
The reconstructed Stari Most and the old city of Mostar are symbols of reconciliation, international cooperation and the coexistence of diverse cultural, ethnic and religious communities. (UNESCO, 2016)

The reconstruction has helped to reinforce and strengthen the community, underlining the unlimited efforts of human solidarity for peace and powerful cooperation in the face of overwhelming catastrophes. (UNESCO, 2016)

CONCLUSION; SYMBOLIC VALUE
With our heritage at risk through natural disasters as well as human destruction, the reconstruction of lost heritage becomes important. The case study of Stari Most in Bosnia-Herzegovina shows us that our cultural heritage is important to preserve and reconstruct as it is often a symbol of culture and history as well as of the technology and craftsmanship of its time. For many people, it can also be a reminder of past events and a way of learning from history. The reconstructed Stari Most and the old city of Mostar are now standing as symbols of reconciliation, international cooperation and the coexistence of diverse cultural, ethnic and religious communities.

But what does mean to make a reconstruction? Answering this question, based on the study of Stari Most, a reconstruction should be as true to the original as possible. It should preferably use the same materials and techniques as the original, and of course stay true to its shape and form. Nevertheless, it should also be honest with what it is, a reconstruction, as this adds further value to the building or structure. One could even state that the reconstruction itself enhances the importance and symbolism of the building or structure at hand.

When studying the Nordic Pavilion, its symbolic value is, therefore, important to discuss and analyze. We will look at the symbolic value it has in its context but also its influence on Nordic architecture, which it represents.

10. The temporary bridge.

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With our heritage at risk through natural disasters as well as human destruction, the reconstruction of lost heritage becomes important. The case study of Stari Most in Bosnia-Herzegovina shows us that our cultural heritage is important to preserve and reconstruct as it is often a symbol of culture and history as well as of the technology and craftsmanship of its time. For many people, it can also be a reminder of past events and a way of learning from history. The reconstructed Stari Most and the old city of Mostar are now standing as symbols of reconciliation, international cooperation and the coexistence of diverse cultural, ethnic and religious communities.

But what does mean to make a reconstruction? Answering this question, based on the study of Stari Most, a reconstruction should be as true to the original as possible. It should preferably use the same materials and techniques as the original, and of course stay true to its shape and form. Nevertheless, it should also be honest with what it is, a reconstruction, as this adds further value to the building or structure. One could even state that the reconstruction itself enhances the importance and symbolism of the building or structure at hand.

When studying the Nordic Pavilion, its symbolic value is, therefore, important to discuss and analyze. We will look at the symbolic value it has in its context but also its influence on Nordic architecture, which it represents.

The bridge as a link

The unbuilt barrier

c. Conclusion diagram
Many would recognise Palladio as one of the most copied architects through history. The exhibition “Villa Rotunda Redux” by FAT at the 13th Architecture Biennale in Venice focus on this fact and write that “The Villa Rotunda is perhaps the Ur example of the architectural copy. It is a building composed out of copies - an assemblage of temple and Pantheon, arranged to produce a radically new architectural typology.” (2012) Further, they state that “Palladio’s Four Books of Architecture (1570, Venice), for example, were explicit manuals published to be copied by other architects.” (2012) This is typical for the architectural ideals of the renaissance, where the entire base of the renaissance was to reuse and reinvent the ideas and ideals of past times. As the renaissance was to a great extent based on antique ideas, the Palladian idea of manuals of ideal symmetry and order may be linked to Plato’s notion of the artists’ aspiration to mimic the higher realm of Ideas.
TYPE OF COPY
La Rotonda and its copies through history are here categorized by us as “ideal architecture”. This classification is based on the renaissance idea of the antique ideals and its manifestation in the Palladian building and its copies. This idea lies in the intention of both the Palladian original as well as, to different extents, in its copies.

The idea of the Palladian villa as a manifestation of “ideal architecture” is supported by a study of the copy Mereworth Castle. Mereworth Castle was designed by the British architect Colen Campbell, who was a great fan of Palladio, in 1723. Campbell published an architectural treatise, Vitruvius Britannicus, in the early 18th century, that was to a large extent based on Palladio’s writings and drawings. For the book, Campbell did several versions of La Rotunda. (Holowka, 2014) This shows that he thought it to be ideal enough to illustrate his theories on the ideal.

The Chiswick House, erected in London in 1729, was designed based on Roman ideals. Contrary to the original Rotunda, the building was never intended as a private residence, but as a showcase building (Chiswick House & Garden Trust, 2017). The building is about displaying art and refined taste and thus the building itself should manifest architecture as art. It, therefore, makes sense to use a prime example of a highly regarded “high culture” architecture. However, the client Burlington was offered the plans of an exact copy of La Rotunda to fit his purposes, but rejected this in favour of a new design based both on La Rotunda, as well as other renaissance and Roman models. (Harris, 1994) Thus, this building has a similar intention as the original, to manifest the ideals of the Romans, but does this through the interpretation of Palladio and his contemporaries.

One of the latest examples of a Rotunda copy is located in Palestine and built between 1998-2000 for the influential businessman Munib Rashid al-Masri, also known as "the Godfather". The house, called Beit Falasteen or "House of Palestine", was intended as a direct copy of the Palladian original. Masri had encountered Palladio’s Rotonda as a cultural icon when he studied in the USA in the 1950s. (BBC Outlook, 2007) His initial contact with the building was thus through an American contemporary lens. “I fell in love with the Palladian style of a house, [...] And I decided from that time that when I went back to my country I should build something like this on one of the mountains.” (BBC Outlook, 2007) However, despite the formal origin in La Rotunda alone, the origin of the act of creating a copy of this specific building may be linked to the tradition of Palladian copies throughout the western world. La Rotonda has maintained an iconic position in western art history and often has been used by powerful figures. Thus, the idea of the Palladian original as “ideal architecture” has been reinforced, and the act of copying it has been filled with a strong cultural meaning.

PHYSICAL RELATIONSHIP
The formal relationship between the original and the copies are different in each case. However, of the cases studied, the main aspects that have been copied are the geometrical layout and spatial sequence, together with the stylistic features of the Palladian renaissance.
The Mereworth Castle was designed by the British architect Colen Campbell with the intention of creating a copy of the original Rotonda that was as close to the original as possible, while still being inhabitable in the colder and wetter British climate (Beckett, 2012). As shown in the illustration X, the plans are close to identical. The copy is larger than the original, but the proportions have been kept. As has the materiality of the facade. The main differences are first that there are no stairs connecting the outdoor areas on the two sides with the ground level, and secondly that Mereworth has exchanged the two small rooms on the back to one long salon, stretching from one side of the building to the other. This salon was better suited to the contemporary social life of the inhabitants. Other adaptations to the context of the copy were made in order to be noted as little as possible. One such adaptation is the fireplaces and their chimneys. In the 18th century England, fireplaces were customary in every room. This was not the case in the Italian climate. The architect was able to solve the chimneys without disturbing the original facade by incorporating them into the double skin of the dome. (Beckett, 2012) This is also interesting in relation to the other copy Chiswick House, which will be discussed next.

In Chiswick House, the geometrical layout of a cross through a square remain the main spatial divider. There are some differences in the main layout of the building, most notably in the entrances, where the original four entrances with straight stairs have been replaced with a main entrance with a more complex stair. However, this type of stair also has a Palladian predecessor in Villa Piovere (Lewis, 2017). The other tree sides of the building have departed from the four square symmetry of the original, and have instead adopted a Venetian window motif, common in 16th century Italian design (Cherry, Pevsner, 1991). Thus, the copy has deviated from the original and replaced its influence with that of other originals from a similar cultural and historical context. Many of the decorative elements of the original building have been left out for more practical substitutes, perhaps most notable is the disappearance of the large exterior sculptures and the big chimneys that have appeared in their place. Though, much like the entrance stairs, the obelisk-like design of the chimneys also have a renaissance model from the architect Scamozzi. (Sullivan, 2003) As for the physical construction of this copy, it is built in brick, faced with Portland stone, with a small amount of stucco. The interiors are lavishly decorated with carvings and painted ceilings. The building boasts its renaissance influence with two large sculptures: one of Palladio himself and one of the famous Anglo-Palladian architect Inigo Jones. (Chiswick House & Garden Trust, 2017)
The physical relationship between the original and the Palestinian copy is not as easily analysed, as there are no available plans or sections. However, we know that the architect, Masri’s son, based his design directly on La Rotunda, and that the main layout of the plan is kept, with a major space under the dome with four salons on its sides (Hardie-Buckley, Scott, 2012). Judging from pictures of the facade, the copy has barely derived at all from the original. However, the interior cladding and design are not at all based on the original but is carefully put together by interior decorators to suit the taste and style of this specific sociocultural context. Thus, we can make conclusions on the limit of the influence of the original in this specific case, where it dominates the spatial layout and appearance and materiality of the façades, but not the use or appearance of the individual interior spaces.

HISTORICAL CONTEXT
The original Rotonda may be described as a renaissance copy of an idealised “original” as mentioned above. With this perspective, its well-executed renaissance ideal might be the reason behind its influence. The building strived to accomplish architectural ideals and was successful enough in doing so that it was considered an ideal itself.

La Rotonda has been frequently copied through history, placing the copies both in their unique historical context as well as in a continuous context of Palladian copies. In the case of both Mereworth Castle and Chiswick House, the copy might be seen as following the tradition of British “grand tour” interpretations of Roman ideas, that was very popular at the time of its construction. This is a specific context of the European upper class, that lasted from the 17th to the 19th centuries. The idea of representational buildings dedicated to art and leisure also belong to this specific cultural context. As mentioned briefly, this reinforcement of the historical and cultural significance of La Rotunda by a powerful class has strengthened the position of the original as an iconic building.
The historical context of House of Palestine is quite different, as copying renaissance buildings are no longer mainstream or in accordance with contemporary architectural ideologies. However, as this specific building has been so repeatedly copied throughout history, the historical context of this copy is as part of a continuum. Had it been based on a less popular historical original, the situation would have been different. Still, a contemporary copy of La Rotonda, especially if seen in the sociocultural context of the billionaire patriarch, could be seen as a further construction of the persona of the patriarch, overshadowing its potential as a great piece of architecture. Indeed, much of Masri’s actions while creating his Palladian dream could be seen as an echo of the British aristocracy. Much like Burlington’s collections of Italian antiquities in his Chiswick House, Masri has filled his House of Palestine with antiquities and art, mainly from France (BBC Outlook, 2007).

GEOGRAPHICAL / CULTURAL CONTEXT
The cultural context of the Mereworth Castle and Chiswick House have been previously described as that of the British/ European upper class. This context has become part of the idea of these copies, and arguably of the original as well. This fact could be argued for using House of Palestine as an example. It is clear that Masri has an idealised image of the Palladian original, and that the idea of building a copy would be something major, perhaps linking Masri to the long ranks of powerful men who completed that task before him. In an interview with BBC, he states that he wanted “…to show to the Israelis and to the world that Palestinians have the urge, the perseverance and the stamina to do something like this.” (BBC Outlook, 2007) This quote shows that, to him, the act of copying this specific original into this context is a great act. Indeed, copying the iconic original into this troubled context is something quite different than to copy it into a British or American pastoral landscape. Masri states that: “This house is a small dream […] It’s become real despite the fact it looked impossible at times. But the real dream is creating a free, independent Palestinian state. If we had not built the house here, there would likely be a Jewish settlement in its place.” (Hardie-Buckley, Scott, 2012) Besides from the political implications, the act of constructing the building in Nablus at that time could perhaps be seen as a political act in itself. Even during the Israeli bombings, and while battles were taking place in Nablus, the construction work continued with 500 people taking part in the construction site. (BBC Outlook, 2007)

CONCLUSION: PROPORTIONS & STYLISTIC ELEMENTS
La Rotonda and its copies through history are here categorized by us as “ideal architecture”, describing their intention to embody architectural ideals. With this perspective, La Rotonda’s well-executed renaissance ideal might be the reason behind its influence. The building strived to accomplish architectural ideals and was successful enough in doing so that it was considered an ideal itself.

La Rotonda has been frequently copied through history, placing the copies both in their unique historical context as well as in a continuous context of Palladian copies. The continuous reinforcement of the historical and cultural significance of La Rotonda by a powerful class has strengthened the position of the original as an iconic building.

When studying the original in relation to its copies, we have concluded that there are two main aspects that have been transferred to the copies: proportions and stylistic elements. By proportions, we mean the geometry and spatial layout of the plan. The plan of the original is carefully designed striving for ideal proportions and geometry. This has created spaces that have impacted people over centuries. By stylistic elements, we mean the visual keys of the Palladian style that communicate the character of the original. These stylistic elements are constituted of the order, proportions and symbolic values of details and ornament, in this case exemplified by the components and compositions of window pediments.

These aspects have been found the fundamental features of the original, the features that link the copies to their original. In our continued studies, we intend to seek for the same aspects in the original of the Nordic Pavilion. What are the geometries of the spatial layout? And what stylistic elements are keys to this building?
Every 20 years the shrine buildings of Naiku and Geku are rebuilt on an adjacent site in the town of Ise, Japan. The rebuilding is part of a belief in the impermanence of all things and helps to transmit the craft knowledge from one generation to another. The rebuilding of these shrines is a ritual, a ritual of copying the exact same building over and over. (Victoria & Albert museum, 2016)

The buildings will be forever new and forever ancient and original.

One can question if it really is a copy that they are rebuilding? Was it only the first shrine that was the original or where in the process lies the original? Are they all copies or are they all originals? Is it the built object in itself that one is copying or the process and the idea?

**RITUAL COPYING**

Naiku & Geku, Japan

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**TYPE OF COPY**

The Naiku and Geku shrine in Ise, Japan, where Amaterasu-Omikami is worshiped, is the only periodic reconstruction/relocation system in Japan. One that we choose to call “ritual copying”.

Adjacent to the main sanctuary where the latest version of the sacred palace of Amaterasu-Omikami stands is a site of exactly the same size. A new building with the same specifications as the current one is constructed at this alternative site every 20 years, after which the other one is demolished. This ritual is called Shinkinen Sengu. (Jingu, 2013, 46) Shinkinen Sengu involves 32 rituals and ceremonies starting with the ritual cutting of the wood for the new buildings and continuing until the transfer of the sacred mirror 8 years later. (Jingu, 2013, 47) It is said that the 20-year cycle for reconstruction was determined by Emperor Tenmu (673-686), who established the Shinkinen Sengu ceremony tradition. Thanks to this system, the ancient skills of artisans and carpenters have been passed down to the present (Japanfs, no.132, 2013) and the Japanese cultural heritage has been preserved.

The concepts of sustainability and reutilization and the maintenance of know-how and skills are considered more important than the actual physical existence of a building or structure. This is the essence of “eternity” and the reason for choosing to build and rebuild dwellings for the kami. (Jingu, 2013, 48) The main focus of each building, therefore, lies in the process and not the building itself. One could then ask how important the builder and its influence becomes, as the craftsmanship is in main focus.

This presents this type of copy with a duality. As the finished result is, to the eye, an exact replica of its predecessor there will always be a layer of influence and interpretation added to each new building. Even with the same schooling
the whole idea of craftsmanship is that it is unique. Likewise, a log of wood has its own character and will never be the same as the other. Moreover, this ritual is not about the copy of the building itself, the physical relationship, but of the idea and process, which is also where the originality of this project lies.

Shinkinen Sengu plays a very important role by enabling the transfer of the Japanese technical skill and spirit to the next generation. This transfer maintains both the architectural heritage and over 1000 years of artistic traditions. (Jingu, 2013:49)

**PHYSICAL RELATIONSHIP**
The architectural style of the Ise shrine is called shinmei-zukuri, and is characterized by its extreme simplicity and antiquity, with the basic principles dating back to the Kofun period (250-538). The shrine buildings, Naiku and Geku use a special variant of this style called Yuitsu-shinmei-zukuri, which is specific only for the shrine in Ise. (Wikipedia, Ise Grand Shrine, 2016) The shrines are always reconstructed in the exact same style.

The Naiku shrine is constructed of Japanese cypress, with wood being an important material - representing sustainability and reutilization. The main building is built on pillars set directly on the ground and measures 10.9 by 5.5
5.5m
≈ 1:2

17. Drawings of the Naiku main building.

18. Construction axonometry.

meters. The shrine has a raised floor, verandas all the way around the building and a staircase leading to a single central doorway. The roof is made of thatched reed with ten billets located on the ridge of the roof. (Wikipedia, Ise Grand Shrine, 2016)

GEOGRAPHICAL/CULTURAL CONTEXT

Shinto is the indigenous faith in Japan. It is a way of life and thinking that has been part of the Japanese culture since ancient times. The Shinto faith means worshipping ancestors as the guardians of the family. It also means showing your respect for the infinite kami, “deity” in English, residing in the natural world. (Jingu, 2013:11)

Kami is found everywhere and mostly derives from nature, such as the kami of the rain, the kami of the mountains, the kami of the sea, and the kami of the thunder that have a deep relationship with our lives and activities. Individuals
who have made a great contribution to the state or the society may also be enshrined and honored as kami. (Jingu, 2013:14)

Through ceremonies, called matsuri, one propitiates the kami and wish for further blessings. (Jingu, 2013:16) In ancient times there was no need for special buildings as the kami was thought to exist everywhere, but later dwellings were built for the kami where rituals could be held in its honor. This is the origin of the shrines called jinja. (Jingu, 2013:22) Jinjas are places for worship but also for relaxation. (Jingu, 2013:25)

Shinto finds a great value in honesty and purity and has no dogma, doctrine or founder but has been practiced in Japan for over 2000 years. (Jingu, 2013:12)

In Ise Jingu, one can find 125 jinja, centered around Kotaijingu (Naiku), dedicated to Amaterasu-Omikami, and Toyo’uke-daijingu (Geku), dedicated to Toyo’uke-no-Omikami. Its area is roughly the same size as Paris. More than 1,500 rituals are held here every year to pray for the prosperity of the Imperial family, peace in the world, and a good harvest. (Jingu, 2013:36) The Emperors of Japan are considered to be direct descendants of Amaterasu-Omikami and she symbolizes the unity of all kami. (Wikipedia, Ise Grand Shrine, 2016)

HISTORICAL CONTEXT
Amaterasu-Omikami was originally worshiped in the Imperial Palace by the Emperors of Japan. However, during the reign of the 10th Emperor Suinin, the Holy Mirror, symbolizing Amaterasu-Omikami, was moved from the Imperial Palace. Then, during the reign of the 11th Emperor Suinin, the Emperor ordered his princess to seek the most appropriate place to permanently enshrine and worship Amaterasu-Omikami. (Jingu, 2013:38) After searching in many regions, finally, the princess had a revelation that Amaterasu-Omikami should be enshrined and worshiped in Ise. (Wikipedia, Ise Grand Shrine, 2016)

The ritual of rebuilding the sacred palace of Amaterasu-Omikami dates back to year 690, meaning this tradition has been kept for over 1300 years. (Wikipedia, Amaterasu, 2016) The present buildings, dating from 2013, are the 62nd iteration to date and are scheduled for rebuilding in 2033. (Wikipedia, Ise Grand Shrine, 2016)

The shrine, therefore, exists in its present context as well as it will be forever part of a historical context of reproduction.

CONCLUSION; CRAFTSMANSHIP
The Naiku and Geku shrine in Ise, Japan, is a periodic reconstruction/relocation system based on the Shinto faith’s belief in sustainability, reutilization and life cycle. We call this process “ritual copying”.

Through the study of the shrines of Naiku and Geku, as well as the Shinto faith, we have concluded that a building or structure is about more than its physical existence. The process and the value of craftsmanship become far more important in this case than the building itself, as it becomes a way of maintaining the know-how and skills through generations.

Even though the finished result might look like an exact replica of its predecessor there will always be a layer of influence, interpretation, and history added to each new building as the hand of each builder is unique.

For the future work with the study of the Nordic Pavilion, this case study leads us to investigate the building process and the building’s technical parts in a more detailed matter, as a part of the building and its originality. It becomes important to look at how the building was constructed at its time and how long it took. How does this relate to the potential of contemporary construction? A study of the materials and where they came from will also be important as well as looking into the roof system and its details.

Original
Process and lifespan.
Layers of interpretation.

Conclusion diagram
PIRATE ARCHITECTURE?
SOHO vs. “FauxHO”, China

Zaha Hadid’s “Wangjing SOHO” had not yet been erected before an alleged copy emerged. (Holden Platt, 2012) The Guardian writes that “...a furious Pan Shiyi, the billionaire chairman of the Soho empire, has vowed to ‘bring the infringers to court’. But Chongqing Meiquan, the developer behind the building, claims innocence, insisting at a press conference that the project was inspired not by Hadid's curves but by the cobblestones on the bank of the Yangtze river by which Chongqing was built.” (Wainwright, 2013) The reaction from the architects was ambiguous: Zaha initially claimed that it “could be quite exciting” if future generations of these cloned buildings display innovative mutations, whereas the practice director Nigel Calvert stated that “We will be demanding that the copycats immediately cease construction, change the exterior of the building, offer a public apology and provide compensation”. Hadid later added that “It is fine to take from the same well – but not from the same bucket.” (Wainwright, 2013) This is an example of an alleged copy of a distinct and highly published original, where the main attention of the original-copy relationship lies within its characteristic physical form and its representation in the rendered image.

“Never meant to copy, only want to surpass”
- Chongqing Meiquan

TYPE OF COPY

The case of Wangjing SOHO and Meiquan 22nd Century is a case of alleged plagiarism, hence the title “Pirate Architecture?”, referring to a broader context of pirate designer bags and DVDs. As previously discussed, claims of plagiarism are increasingly common in our age of individualism and global media reach. In this case study, we will look more deeply into a specific case, where a praised architect was allegedly copied by an unknown architecture office. The relevant questions to this case study are many. What aspects of the architecture is it that we judge as “original”? Is it the idea? The initially published rendering? The drawings and documents approved by the governing agencies? The built object?

These questions might be discussed on a philosophical level, but in reality this issue must have a very specific answer in the legal system. The legal system has already been briefly discussed in an American context in the background chapter. The Chinese context is slightly different. In China, the complexity of architecture as a meeting point of art and engineering is highlighted. Intellectual property law professor Chen Mingtao says: “Usually, architectures are classified as works of applied art, which possess both functionalities and artistic qualities. Structures such as lobbies, windows and roofs have their specific functions respectively, and therefore can hardly be subjected to copyright protections because such protection will prevent others from adopting the same or similar structures, which will severely harm the public interests.” (Chen, 2012) He further continues: “However, it doesn’t mean that the artistic qualities of these structures could not be protected. These artistic qualities should be protected, for they reflect the unique design of the designer. At present, the functionalities and artistic qualities are often integrated with architectural designs and it is hard to separate them from one another, which should be considered in determining infringements.” (Chen, 2012) What Mingtao puts his finger on is something crucial in the copyright discussion of architecture. How should we judge technical/functional aspects in relation to artistic ones? And how should this be done in order to serve both the designer of the specific piece of architecture and the future possibilities of the discipline?

When it comes to the actual juridical process of IP (intellectual property) in general, the Chinese one is similar to the American one. The court applies the standard of “access + substantial similarity”, which means that there are identical contents in the obligee’s work and the alleged infringing work, and identical points or substantial similarities in the expression. Under this precondition, similar to the US condition, the court decides on whether the alleged infringer had access to the obligee’s work. (Chen, 2012) However, there are special conditions to consider when judging architectural works.

20. Different aspects of the architecture of Wangjing SOHO: a) the concept illustration, b) the exterior rendering, c) the drawing, d) the interior spatial experience.
This juridical process is adapted to architecture by imposing the thoughts of function vs. art described by Mingtao. This process is carried out in two steps: firstly, there is a professional judgment to eliminate unnecessary functionalities, in order to select and pick out elements that carry the artistic qualities. Secondly, there is a process similar to the American one, where the court judges the two projects’ similarities from the viewpoint of the public. An interesting aspect of the Chinese juridical process is that in order for a case to be considered, the “original” must be deemed by the court as a “work”. (Chen, 2012) That is, as a juridical “original”, with unique values. This is similar to the American process of registering the project as copyrighted, but done within the same juridical process as the plagiarism lawsuit. However, as previously mentioned, the Chinese legal system exclude certain features from the copyright law protection: features that are deemed more related to functional necessities. These features include the inside structure, necessary designs and the grains and colours generated by the building materials. (Chen, 2012)

The Chinese law also has an answer to the question of where in a project the originality lies. Of the different alternatives posted on the previous page, the applied arts copyright law only protects the architecture in its three dimensional built form, excluding design drawings and models. However, Mingdao states that these forms of architecture could be protected in other ways, under the copyright laws of engineering design, respectively works of art. (Chen, 2012) However, the basis of judging infringements of drawings or models would then be different than of built architecture. Likewise, the possibilities of judging between an original and a copy in different forms would be difficult. If the original exist only on paper and the copy is built, should the lawsuit be filed as engineering design or architecture? In the case of Wangjing SOHO and Meiquan 22nd Century, this has several implications. As the two buildings were constructed simultaneously, there was no built “original” before there was a built “copy”. According to Satoshi Ohashi, project director at Zaha Hadid Architects: “It is possible that the Chongqing pirates got hold of some digital files or renderings of the project.” He continued to say that: “[from these] you could work out a similar building if you are technically very capable, but this would only be a rough simulation of the architecture.” (Holden Platt, 2012)

Further, if the two project would be judged as models, and thus as works of art, they differ even greater. As the model photos show, the models themselves are made in different manners with different expressions. One is made in white and seems to represent three stylistic clean flowing volumes, the other is made in silver with blinking blue lights and show two ant hive-like shape. As works of art, the models are diametrically different.
If architecture is juridically split into the separate aspects of drawing (engineering), model (art) and built form (architecture), where does that leave the idea that ties all of these aspects together? Juridically, the concept behind a building is difficult to rule upon. Usually, there are no formal documents that prove the original idea behind any specific design. In this case, Pan Shiyi, Board Chairman of SOHO China, stated that Wangjing SOHO was designed to reproduce the image of Koi, which symbolizes wealth, luck, health and happiness in Chinese culture, whereas Chongqing Meiquan stated that the design of Meiquan 22nd Century was inspired by the cobblestones on the bank of the Yangtze River by which Chongqing was built. (Chen, 2012) If we trust these statements, the ideas of the buildings are unique. However, any poetic concept stated by architects and property owners alike may be dismissed as an afterthought and are hardly valid proof in a court of law.

This difficulty is addressed by Jessie Chen, who elaborates on the architectural process in relation to copyright law. She states that: “At the stages of conceptual design and schematic design, the designers will study some classic buildings or the competitors’ buildings, which can easily lead to references and imitations.” (Chen, 2012). In relation to Meiquan 22nd Century, Chen concludes that it is indeed similar to Zaha’s project, but also cites several other projects in China with a similar aesthetics. (Chen, 2012) Indeed, even though Zaha is world famous for her organic shapes in futuristic materials, this style is very popular in Chinese cities, both among architecture students and investors.

PHYSICAL RELATIONSHIP
We have already made some conclusions about the physical relationship between the two buildings. We have concluded that renderings of the two projects could be made to look close to identical, but that the models presented to the public look to represent two completely different projects. Construction photos from the two building sites also describe two very different facade constructions. Because the Zaha project is of higher international prominence, we have more information about this construction detail. However, comparing a construction diagram of Wangjing with a construction photo of Meiquan, we have one construction with semi-transparent screens over glass, and one with window strips and single metal sheets over closed concrete walls. These two constructions undoubtedly create different internal spatialities.

HISTORICAL CONTEXT
All projects discussed in this chapter are contemporary, and to a high degree influenced by both contemporary architectural styles and of the complexity of a digitalized and globalized world.

The fact that the projects have a quite new architectural style could be relevant to how we perceive it in relation to copying. We are used to seeing neoclassical
style in various contexts, and modernism declared itself an “international style”. Thus, when we encounter a new building in an established style, we read it as a project in that style. However, when we see a building in a less established style, we are more prone to relate it to the previous cases where we have seen that specific style before. Early prominent buildings of a new style are then more likely to be considered “original”, whereas later and less prominent designs of the same style could be seen as copies of these famous examples.

GEOGRAPHICAL / CULTURAL CONTEXT
This case is interesting from a geocultural perspective, as most of the media attention has been from a western perspective, alienated from context of the Chinese urban expansion. Western journalists frown upon alleged copied architecture as part of a Chinese copycat culture: “From pirated DVDs to knock-off designer brands, the country has a thriving counterfeit culture, often facilitated by local protectionism and a reluctance on the part of the authorities to enforce fledgling intellectual property laws.” (Wainwright, 2013) One can wonder how much these writers actually know about IP laws, or architecture culture for that matter, in the Chinese context. One thing that is for certain is that it has been a long time since any western city faced an urbanization of the same pace as the Chinese megacities.

Rem Koolhaas, who has designed the prominent CCTV tower in Beijing, has discussed the phenomenon of alleged plagiarism in China in his book Mutations (2001). According to Koolhaas, the fast urbanization in China is producing architects who digitally cut and paste buildings into existence. He calls these architects “photoshop designers” and state that “Photoshop allows us to make collages of photographs [...] this is the essence of [China’s] architectural and urban production. [...] Design today becomes as easy as Photoshop, even on the scale of a city.” (Holden Platt, 2012)

On the same topic, Zaha Hadid has shared a philosophical stance on the replication of her designs: “If future generations of these cloned buildings display innovative mutations, that could be quite exciting” (Holden Platt, 2012)

The representatives of Meiquan 22nd Century have released a statement saying: “Should one look down upon others only because he has invited a great designer? Can’t one see that the nature is the greatest master? Does SOHO own all Chinese land simply because it has a piece of land in Wangjing? Doesn’t it know that there is Chongqing?” It also launched a brand new advertisement slogan: “Never meant to copy, only want to surpass.” (Chen, 2012)

CONCLUSION: ASPECTS COPIED
This case is one of alleged plagiarism, hence the title “Pirate Architecture?”, referring to a broader context of pirate consumer goods. This western perspective on the Chinese market is relevant, as it illustrates the clash between the culture in which something happens, and the context in which something is discussed.

In the Chinese legal context, architecture is not judged as a whole, with all of its expressions covered. Rather, the built object, the drawing and the model are covered under three separate legal systems. Apart from obstructing a complete copyright cover of a piece of architecture, this division of architecture is symptomatic of how we view architecture in general. In the public debate of copied buildings, there are only certain aspects of the architecture that people generally discuss. It is not discussed whether two buildings have the same type of innovative construction, or identical programmatic distribution. Instead, it is mostly what we see that we judge: the exterior shape, the colour and texture of materials, what images the architecture provoke. Indeed, it is natural to judge architecture from the perspective that you encounter it. But it is not just the public debate that has this perspective, but also the legal systems, that has the potential of a more complete basis.

The perspective of what aspects of architecture that are mainly assessed and discussed will be important in our continued studies. As we question the focus on the exterior appearance, our copy adaptations must be made with an awareness of the different aspects and manifestations of architecture, and how they relate to the architecture as a whole.
In a similar cultural context as the pirate architecture described earlier, there are entire “copied cities”: newly built areas based on mostly European originals. A suburb of Hangzhou, China, is a copy of Paris, with its own Eiffel tower and all, while another is a copy of the UNESCO awarded Austrian lake town Hallstatt. While mostly ridiculed in western media*, some writers argue that the attitude might be quite different in the Chinese context. Archaeologist Jack Carlson argues that “The ancient parallels for these copycat projects suggest that they are not mere follies, but monumental assertions of China’s global primacy.” (Wainwright, 2013) According to the historian Sima Qian, the act of copying has historically been used to show power over land and culture. He refers to China’s first ruling dynasty, the Qin: “Whenever Qin conquered one of its rivals, it would commission replicas of its palaces and halls and reconstruct them on the slope north of the capital. From Yongmen all the way to the Jing and Wei rivers, there were replica palaces, passages, and walled pavilions.” (Wainwright, 2013)


Wukuang Hallstatt in China was initiated by the Chinese mining company Minmetals, with the intention to copy the tourist core of Hallstatt on a site extending 20 000 square meters. The Chinese developers advertised the project as “low-density, high-end residential development ‘surrounded by mountains and lake views,’ to be built ‘in a European architectural style, with a commercial street built with the characteristics of an Austrian-style town.’” (Jahn, 2011) According to the developers, the development will appeal to a wealthy Chinese audience, as well as to “Caucasian people living in Hong Kong who are homesick.” (Jahn, 2011)

According to George Jahn at The China Post, the original was studied by taking pictures and collecting data mingling as tourists, while residents and local authorities were unaware (Jahn, 2011). However, a few months after the construction started in China, a Chinese guest at a Hallstatt hotel exposed their project, showing the hotel owner Monika Wenger drawings and plans of their project. The plans were of some local landmark buildings, all mirror images of the originals. Wenger supposed that the mirroring was to avoid copyright claims, but Minmetal’s representative stated that the idea never was to copy the town to its last detail. (Jahn, 2011)

The public reactions in the Hallstatt community have been varied. Hotel owner Monika Wenger states to be “outraged - not about the fact but the approach.” (Jahn, 2011) But souvenir store owner Ingrid Janu says that: “We’re happy they find it beautiful enough to copy.” (Jahn, 2011) The mayor, Alexander Scheutz, had a similar reaction, saying that: “We are very proud.” (Wainwright, 2013) Scheutz has since then signed up to a cultural exchange with their Chinese twin town, and the number of Chinese visitors to the original Hallstatt has increased from 50 to 1000 per year. (Wainwright, 2013)
As mentioned, this case features copying on three different levels. On an urban scale, it has copied certain elements of the urban layout. On a building scale, it has copied entire landmark buildings and their position in the town. And on a detailed scale, it has copied the stylistic features of the Austrian historical buildings. This latest scale is prevalent in all copied cities. These stylistic keys are crucial to the experience of the copied cities. Bianca Bosker, author of *Original Copies: Architectural Mimicry in Contemporary China*, writes that: “...styles here functions exactly like luxury-brand logos on clothing. The architectural “tags” are as instantly recognizable as the Nike swoosh or the Chanel “C’s”, which is precisely their appeal.” (2013: 42)

However, apart from copying the built environment, many copy cities also copy cultural elements from their originals. In the case of Wukuang Hallstatt, there are souvenir stores selling Austrian style artifacts, a bookstore selling western magazines, and European style restaurants. The Lutheran Church keeps its position and prominence but has been turned into a sort of museum over the new Hallstatt and the cultural artifacts of the original. (Laowhy86, 2013) The copying of both the built environment and cultural events and consumer goods enhances the notion of these cities as live-in theme parks. But, unlike most theme parks, they are not merely tourist attractions, to be experienced as amusement, but residential areas, to be lived in. That is, the everyday lives of modern Chinese people move into the built environment of old European cities. However, despite the first houses being ready in 2012, reports from 2015 claim that no one has actually moved to Wukuang Hallstatt yet. When asked about buying a home in the village, a visitor answered that it is too far from any larger city. (Hong Kong Free Press, 2015) The building costs and the size of the homes suggest a wealthy target group, but the distance from major cities could make it difficult to attract people with high wages from companies situated in the cities. Alternatively, these people would rather go to Wukuang Hallstatt as an exotic day trip than to settle down in this exotic environment. No matter the reason, the fact remains that there is today very little local everyday life filling this foreign structure.

**PHYSICAL RELATIONSHIP**

Author Bianca Bosker discusses the physical relationship between the Western originals and Chinese copies. According to her, many of the Chinese versions are built to house a much smaller population than their Western originals, which is ironic considering the size and density of many Chinese cities. The smaller population often result in adjustments to the scale of the copies, in the sense that only a smaller part is being copied. In contrast to this, Bosker claims that the scale of the individual urban elements and buildings often appear “larger
adaptations of Western historic cities have been adapted to a contemporary Chinese context with taller buildings and wider streets. Likewise, the copies are not always precise on the scale and location of the landmark buildings that they copy. (Bosker, 2013: 72)

Studying the physical relationship between the two towns, we instantly realize that there are both almost exact similarities and brutal differences. The diagram on the previous page shows the mirrored plans, with certain key elements copied in their contexts. In Wukuang Hallstatt, the adaptation to the Chinese context is visible in the site plan. For example, if we compare the scales of the church (marked 1 on the site plans on the previous page), the Chinese copy is notably larger than the original. The building behind it is even more scaled up in the copy. The immediate contexts of the two buildings are also quite different, which becomes apparent when we study the two open spaces in front of them, marked a and b on the plans. Whereas the original a is a parking lot, with most of its values as a ferry stop with an amazing lake view, the copy b is more like a plaza, focusing on the façades of the copied buildings. The two sites are fundamentally different, with a turning away from the city towards the landscape, and b turning towards the city. Arguably they are fulfilling similar functions, both facing the tourist attractions, only that the attraction in Austria is the landscape, and in China the built environment.

The plans also show a clear border where the copy stops. Wukuang Hallstatt has made a rough copy of the original urban fabric of the Marktplatz and the curved shop street, the main tourist parts of the old town of Hallstatt. Beyond this perimeter, however, the copy stops. Where the original has another street with houses, the copy ends with a sharp edge towards a hill. Likewise, the original floats out along the main road on which it is built, but the copy is lacking this continuum, stopping sharply on both ends with local roads and palm trees sharply marking the start of the contrasting local context. As the plan show, residential areas of quite another style is found just around the corner.

Looking at the physical relationship on another scale, the construction techniques of the original buildings are not at all taken into consideration. Some buildings are copied in the sense that their volume and urban context is copied, as well as their physical appearance with the original stylistic elements. However, they are constructed almost like a movie set, with the picturesque façades detached from the actual building construction. The original building technique of the historical Austrian houses has been left out in favour of a simple concrete structure. Illustration X shows how the copy has recreated the shape of the original, with its pitched roof and wooden beams, but all in concrete.

Concluding the study of the physical relationships, it is clear that there is a great tolerance of physical differences between the copies and the originals. Even with only some aspects of the original Austrian town copied, the Chinese version seems to attract and satisfy tourists.

GEOGRAPHICAL / CULTURAL CONTEXT

The cultural context of this phenomenon becomes interesting when trying to answer why this has become common in China, to an extent that we do not see other places. When considering the extremely rich cultural history of China, the import of cultural expressions from other cultures in favour of local traditions is peculiar. Has it to do with a memory loss after the Cultural Revolution? The intent of the Cultural Revolution was to force way for a new communist culture by denouncing “bourgeois” elements of the cultural heritage. There was a call for the destruction of the “For Olds”, namely old customs, culture, habits, and ideas. (Wang, 1989: 66) Consequently, historical and religious sites were destroyed and historical writings burned, and many people turned their back on traditions. Did they, in fact, succeed enough to make local building traditions irrelevant and unattractive? Did they create a cultural insecurity in the Chinese people?

Alternatively, the copying of others could be seen as in line with a long cultural historic phenomenon described by archaeologist Jack Carlson and historian Sima Qian as an act of cultural supremacy (Wainwright, 2013). Bianca Bosker follows their argument, suggests that the phenomenon could be a sign of Chinese organs learning the hard skills of western nations by building them (2013, 76-77). As municipalities and governmental organs have been known to sponsor city copy projects, Bosker argues that these projects symbolise China’s capacity to overtake the West technically. As they construct futuristic high rises at the same time as traditional Western towns and suburban living, the Chinese prove that they could build both the future and the past faster and more literally than anyone else. (Bosker, 2013, 70-71)
A third potential answer is that it is less about the hard skills and more about soft skills, about cultural identity and aspirations towards a certain lifestyle. By living in a Western environment, people would aspire towards a western lifestyle. This argument is supported by the fact that the copied cities often come with imported cultural content: restaurants, consumer goods and culture festivals. In this sense, the cities offer not only the built environment of the western original, but also its lifestyle. Bosker writes that: “The affect of Western mannerism may itself be a kind of status symbol - a signal of having joined the ranks of the First World global citizenry” (2013: 115).

HISTORICAL CONTEXT
Assuming that there is some validity to the claim that the copied cities are a result of the strong position of western ideals in the global context, the Chinese copies are a part of a historical context. There have been numerous cases through history where aspiring parties have tried to adopt the customs of the most prominent parties. For example, during the rule of Peter the Great, Russian nobility built replicas of French châteaux and English manor houses and imported French dressmakers and speech coaches, all to manifest their cultural supremacy in the coin of the realm (Bosker, 2013: 115). Likewise, the Swedish nobility would study French and look towards continental Europe for the new styles in both fashion and manner. Thus, if we see these copied cities as a manifestation for an aspiration of a “copied” lifestyle, they could be seen as a response to the global power structures and Chinas changing role within those structures.

CONCLUSION: CULTURAL INHABITATION
The phenomenon of “Copied Cities” is widely spread in China. Numerous cities in China are, in some way or another, copies of European or Northern American originals. The aspects copied, and thus the extent of the similarities between the copies and their originals, differ widely, from merely stylistic mimicking to the import of urban layouts and building material.

In the case of Hallstatt, Austria and Wukuang Hallstatt, China, the copy has replicated both stylistic elements, specific landmark buildings and some key aspects of the urban layout of the original. A study of the two plans reveal some aspects that the copy has judged as important, mainly the traditional Austrian stylistic elements and the urban spaces of the Church plaza and the winding shop street. Allocating these copied elements in an authentic setting has not been considered important, neither has traditional craftsmanship.

Apart from copying the built environment, the Chinese version has also copied some cultural content, suggesting that the foreign environment comes with a foreign lifestyle - a sort of lived-in theme park. Indeed, the phenomenon of copied cities makes for an interesting interface of the built environment and the life that goes on in it. What happens when modern Chinese people inhabit built environments evolved in Europe centuries ago? The lack of inhabitants in Wukuang Hallstatt is telling of the mismatch between this historical European environment and the everyday life of modern Chinese people.

In our copy adaptations, we must be aware of the potential clash between the cultural values of the original and the cultural inhabitation in the contexts of the copies. Who will inhabit the copies? How are they used to interacting with their built environment? What expectations do they have on this type of building?
In our case study Study Original, we have juxtaposed our experience of contemporary architecture education to the one of the Beaux-Arts era. As earlier mentioned, during the beaux arts era, the architecture education was largely based on reference studies. This influenced the attitude towards creating new architectural projects and their position within a historical continuum. Iconic architecture was often referenced to. The symbolic value of these icons in architecture becomes apparent in the case study discussing Rebuilt Heritage. We have investigated copying of one of these icons in the case study Ideal Architecture, where we have studied Palladio’s Rotonda. The Rotonda is one of the most copied buildings in history, and when looking at several of these copies, we can make conclusions of what elements of the building it is they have copied. In the case of the Rotonda, it is a formal copy of stylistic elements and spatial sequences. By copying formal elements, the copy conveys an image of the original. Looking at a more recent case of alleged plagiarism, we recognize the focus on the image of architecture. In this case study called Pirate Architecture, we look beyond the image of architecture to find other aspects, such as concept, materiality, integration on site and the detail. We feel that these aspects all make up the original. Even if two buildings look alike, are they necessarily the same? This has been investigated in the study Ritual Copying, where the Ise Shrine in Japan is rebuilt every 20 years as part of a ritual. As reproduction is a part of the idea of the original, this raises questions about authorship in relation to craftsmanship. Even though the finished result might look like an exact replica of its predecessor, there will always be a layer of interpretation added through the process of copying, as the hand of each builder is unique. Our final case study looks at what happens after the copy is in place. How will it be inhabited? Studying Chinese copies of European cities, we can speculate on how a different cultural inhabitation can alter the meaning of the building.

“Pierre Menard did not want to compose another Quixote, which surely is easy enough - he wanted to compose the Quixote.”

- Jorge Luis Borges
STUDY OF THE ORIGINAL

With the theory and research as a background we continue into the more practical part of the project; a deeper study of the original that we chose. We have investigated what is important in the original both in terms of ideas for the project as well as how this is represented in the physical building.

The Nordic Pavilion, designed by Sverre Fehn is situated at the Venice Biennale but represents Nordic architecture and culture. Which are the influences of the Nordic culture and ideas in relation to the Venetian context?

CONTEXT

CLIMATE

Venice has a Mediterranean climate with warm summers and fairly mild winters. Thus, the efforts to create a pleasant micro climate differ greatly from the Nordic context. Further, the program of the pavilion also allows for minimal climate regulations.

The main climate issue in Venice is subsidence and flooding. However, there are no records of flooding in the immediate context of the Nordic Pavilion in the Giardini. Will the subsidence continue to increase, it will surely affect the Giardini and its buildings, but it has not been described as an important factor during the design and construction of the pavilion.

MATERIAL

The three most widely-used building materials in Venice are Istrian stone, wood, and brick. (University of Mary Washington, 2008) The first two can be seen in the Nordic pavilion today. Istrian stone is a local stone, quarried in Trieste, on the west shores of Istria. It is one of the most durable materials in Venetian architecture, because of its non-porous physical and chemical properties. It is technically a limestone but is as dense as marble. (University of Mary Washington, 2008) The stone is thus a well-suited option for exterior surfaces. Brick, on the other hand, is sensitive to water damage, especially from the salt water of Venice, but has still been frequently used due to its economical advantages. Despite being located on an island, there were abundant resources of wood, since many wealthy people owned land on the mainland. The most common types of wood have traditionally been alder tree, oak, and pine. Timber was used to make tolpi, piles, that were stalked vertically into the ground to create a solid foundation for building. Further, it was used to construct floors, roofs ad building details, (University of Mary Washington, 2008)

LEGISLATION

The Giardini belongs to the Venice Biennale and houses 30 permanent national pavilions. The pavilions are the properties of the individual countries and are managed by their governing organs. The Giardini is thus outside the jurisdiction of standard zoning laws. The property of the Nordic Pavilion is legally shared between Sweden, Finland, and Norway. The pavilion is managed for six years by each country's property management organ: Statens Fastighetsverk, Senatfastigheter, and Statsbygg. The ground on which the pavilion stands is let by the City of Venice for a nominal fee of 5 SEK a year. (SVF 2017)

CULTURE

The cultural context of the Nordic Pavilion is not that of Venice in general, but rather that of the specific context of the Giardini of the Venice Biennale. This is a context of an international cultural elite, strolling between eclectic buildings scattered around a rare Venetian park. The aim of a visit to the Giardini is to experience culture. Thus, the architecture of the buildings is on display per default to a higher extent than in most contexts. Further, the aim of each of the national pavilions is to showcase the architectural treasures of their nation.
THE NORDIC PAVILION

Sverre Fehn won the commission for the Nordic Pavilion in 1959 after a competition with representatives from Norway, Sweden, and Finland. His design was then refined and inaugurated in 1962.

The structure of the building consists of a rectangular grid of 3.66 meters per side, created based on an ancient Egyptian module of 52.3 x 52.3 cm. The interior exhibition space is 446 square meter, without any load bearing elements interrupting it. The room is defined by two closed concrete walls, two open walls of glass sliding doors, a closed stone tile floor and an open roof of concrete lamellae. The roof structure is constructed of two layers of lamellae, placed in 90 degrees angle against each other, thus forming a two level grid. Each beam is 6 cm thick and 1 meter tall and places in accordance with the 52.3 cm grid. The beams rest on the concrete wall on one side, and on a 2.1 meter high beam on the other side. The beam itself rests on the other wall on one side, and on thick concrete columns on the other. There are fiberglass canals between the roof beams, acting at once as protection against rain and as gutters, leading away rain to one end of the building. (Norberg-Schulz & Postiglione, 1997: 82)

A. closed walls and floor  B. open walls and roof  C. Open and closed borders

As for the materiality of the building, Fehn mixed local materials with materials native to Norway. The walls and roof are in white concrete, consisting of a mix of white cement, white sand and crushed white Italian marble (Gaudernack, 2017). The floor was originally in Norwegian slate but was replaced with the local Istrian stone in the 70’s. (Sánchez Moya, 2012)

In the book Sverre Fehn: the thought of construction, the pavilion’s relation to its immediate site is described as in union.

The building is not a body introduced by a foreign country but serves to join the city to its park. The Nordic Pavilion continues the natural route and offers no interference to its course. The building stops where the trees are too many and the hill too steep for a building to follow it naturally. (Fjeld, 1983: 112)

The park environment is rare in Venice, thus Fehn considered the trees precious and gave room for them to remain unhindered in his pavilion. The biggest tree on the site was given special attention, as the construction “gives room for its participation” (Fjeld, 1983: 112). In his early sketches, Fehn designed the two beams holding the sliding doors as straight, following the grid of the roof. Later, he rotated the outer beams 45 degrees around the tree. Looking back at this decision, Fehn concludes that “This is the place where the unity between nature and the building is at its maximum” (Fjeld, 1983: 112).

As the flooring and roof extend into the park, with only the glass sliding doors separating the interior exhibition hall from the surrounding nature, any exhibition in the pavilion have to confront both nature and the viewer. Likewise, any visitor to the pavilion has to confront both the exhibition and nature.

The layout of the pavilion, where two sides are closed and two permeable, create a condition where people can be inside or outside and move between these freely since there is no defined point of entry or exit. Thus, the place of viewing the exhibited objects is a personal choice.

The space is to a high extent defined by the roof, and the light that it creates. The roof construction is of minimal width and maximum height and distributes an even light through the building, giving equal illumination to every object. The light under the roof sets the space apart from its surrounding nature, as it transforms the warm Mediterranean light into something that many visitors experience as Nordic: shadeless, uniform and bright.

Looking up into the ceiling it tells a story of the sky to a surface that belongs to the building. The pattern of its construction is recognized by a depth of light which gives the ceiling a safety of enclosure from the elements. The light inherent to its source is calmed. The ceiling breaks the light to a silence. (Fjeld, 1983: 112)
THE NORDIC PAVILION
Section & Elevations 1:200
Situ concrete wall
200 mm
Special blend of light cement, white sand and crushed marble, cast against wooden boards.

Concrete lamella
60 x 1000 mm
Special blend of light cement, white sand and crushed marble, cast against wooden boards.

Stone floor tiles
523 x 523 mm
Istrian stone, a dense type of limestone, common in Venetian buildings.

Glass sliding doors
3660 mm to ceiling
Red oak wood and glass.

Fiberglass canals
Ø 463 mm
1.8 mm thick Fibre glass reinforced polyester resin. Mounted on wooden trims with caps.

Situ concrete stair with stone floor tiles cut to fit stair.
Istrian stone, a dense type of limestone, common in Venetian buildings.
CONSTRUCTION

The construction of the Nordic Pavilion started in 1961 with analysis of the ground conditions, before starting the in situ casting of the load bearing elements of the building. The casting was done in three main steps; the walls and pillars (up to a height of 2.4 m), the beams and lastly the first layer of the roof. All roof beams were prefabricated on site, hand vibrated and then placed in place, the lower layer being cast into the back wall and hooked to the load bearing beam (see fig. 36) before the upper layer could be placed on top. (Sanchez Moya, 2012: 83)

35. The construction site, 10th of December 1961.


The roof of the Nordic Pavilion shows great advances in technical solutions and was pushed to its limits by the engineer Arne Neegard. From having been thicker and more interwoven the beams became lamellas placed on each other with the minimum thickness the concrete would need to cover the reinforcement of each beam. (Sanchez Moya, 2012: 60) Through analyzing the joining of the roof beams in its built state, it is concluded that the lower beams every 3.66 meters are heightened. It is very probable that the upper beams are stabilized through the interlocking of these beams. If there is another connection still remains a mystery though there was at one point a drawing showing a steel connection. In an interview from 2009 with the director of work Fredrik Fogh, even he claims that he can not recall how this connection was done. (Sanchez Moya, 2012)

37. Detailed photo of the heightened beam. Courtesy of Åke E:son Lidman
ROOF AND WALL MEETING
detail 1:50

Fiberglass canals
Concrete lamella
Concrete wall

FLOOR OPENING FOR TREES
detail 1:50

Istrian stone tiles
Concrete foundation

Tree
Gravel
When we try to understand what the original is, it is important to recognize the different stages of the original: how it was thought, built and later altered. How do they relate to each other, and which one represent the original building? The diagrams below show the plan and how it has been altered between the initial competition entry, the refined plan for construction, and how it stands today. The diagrams show that the beams and columns that separate for the big tree were originally placed so that they could continue straight past the tree. When Fehn was to finalize his building for construction, he let the big tree influence the construction further, by moving the building so that the tree forces the beams to split around it. This big gesture of reverence for nature is the main difference between the competition entry and how the building was finalized. The competition entry also lacks the articulation of the large beam on the back elevation, where we see only a smooth wall.

Comparing the original drawings from the time of construction with the building as it stands today, we can conclude that it has changed mainly in regards to the natural elements of the trees. Some trees that were planned to be integrated had to be taken down at the construction site, and some of the trees that were integrated into the building did not survive long. When the trees died, the floor tiles were filled in, but the gaps in the roof beams leave a trace of their existence. The big tree was taken down only a few years ago, leaving the rotated beams like an open wound grieving the lost tree. Other changes are invisible in the drawing but effect the building. One major alteration is the change of floor tiles, from dark Norwegian slate to a light Istrian stone (Sánchez Moya 2012: 115). The fact that the floor was originally dark is unknown for most, and the idea of the original today is with its uniform materiality.
THE SWEDISH PAVILION

In 1912, 50 years prior to the Nordic Pavilion was constructed, another pavilion in Venice was built to house the Swedish art and architecture. The Swedish pavilion was designed by Ferdinand Boberg, a prominent architect at that time, and one with very good relations with the Biennale organization. Boberg had designed several interiors of the Swedish exhibitions, and his wife Anna was a frequent exhibitor with her paintings. (Walton 1994: 78)

Sweden was offered the lot at the Biennale, and a waiver of the building costs, on the condition that Sweden bought the pavilion for the price of the building costs after the first exhibition. However, after the exhibitions of 1912 and 1914, the Swedish government were reluctant to buy the Pavilion and instead sold it to the Netherlands. Ironically, a building that was designed to embody a sense of Swedishness was now a symbol for the Netherlands. The only major changes that were initially made to adjust the building was to change the engraved Svezia to Olanda. The Netherlands kept the pavilion from 1914 to 1953, when it was torn down to give place to a domestically designed building. (Walton 1994: 214-215)

Comparing the two interpretations of Swedish and Nordic architecture to each other, it is clear that they have reinterpreted the Swedishness and Nordicness through two very different stylistic ideologies. Boberg’s pavilion is an interpretation of Swedish architecture through the lens of a classicist style, whereas Fehn’s building has a clear connection to his modernist schooling. Thus, it is evident that the contemporary architectural ideologies of the two periods influenced the architect’s manifestations of the national tradition. Also, as the modernist rendition is the one that still stands, it is still manifesting and shaping the idea of the Nordic architecture.

ASPECTS OF THE ORIGINAL

To better understand the relationship between the ideas and their built manifestation we have concluded 8 main aspects that we find important in the original, and that any copy of this building would have to take into consideration. As we find it important with both the conceptual ideas and their manifestation in the built form, other aspects must also be taken into consideration: architectural expression as well as materiality and structure.

These have been arranged in a hierarchy relating to the process of design:

Reverence for nature

The building stops where the trees are too many and the hill to steep to follow it naturally

Incorporation of objet trouvé

The interior space opens up to the pedestrian path and public space

There is no defined point of entry or exit

Program as design generator

Equal illumination of every object in the pavilion

The ancient Egyptian module of 52.3 x 52.3 cm arranged in a grid of 366 x 366 cm
“The nature of Norway is nature untamed by cultivation. Here in Norway nature is the norm, whereas in many other places it is the cultivated land that people take for granted.”

- Sverre Fehn

In Nordic culture, nature has always had a great value. Integrating architecture and adjusting it to nature has a strong historical anchor in the Nordic context: from the vernacular gårdstun to the nature emphasizing plan of Skogskyrkogården and the nature enhancing project Nasjonale turistveier.

With this cultural background, Sverre Fehn valued the rare park environment in Venice. (Fjeld, 1983:112) Therefore the building shows its reverence for nature through its adaptation to the trees on site, integrating them into the building.

The building footprint has been adjusted to the nature on site. Sverre decided not to use the full plot, but rather let nature decide the boundaries of the building. Nature, in this case, refers to topography and the density of the trees.
INCORPORATION OF OBJET TROUVE

In the case of the Nordic Pavilion, the trees found on site are integrated into the building. The base was cast in such a way to give enough space to the roots of the trees while adjusting to the grid of the building. The roof was designed to let the trees grow, and was customized during construction for each tree.

Despite Sverre Fehn’s attempt to keep the nature on site, some of the trees did not survive long in the building. After those trees have been removed the building has adjusted by filling in the floor tiles. The gaps in the roof however remain.

THE INTERIOR SPACE OPENS UP TO THE PEDESTRIAN PATH AND PUBLIC SPACE

The building consists of two closed façades and two open ones. The two closed façades are facing the topography, enhancing the natural boundary by closing it off completely. The open façades open up to the public spaces: the path and the park.

This openness creates a condition where the exhibition faces the visitors both inside and outside of the building.
The chosen site for the building was placed on a pedestrian connection between the previously mentioned park and path. Sverre Fehn’s intention was to keep this connection and incorporate it into his building. (Fjeld, 1983:112) This was realized through glass sliding doors, offering numerous ways of passing through the building.

The objective of the design competition was to create an exposition space for the Nordic countries at the Venice Biennale. The program influenced the design in relation to how art is exposed and what light conditions it is exposed in. As the Venice Biennale offers a lot of common amenities the building was designed housing only an exposition hall and a small storage. However, there has been later additions of toilets, extra storage, and electricity to accommodate demands. (Sanchez Moya, 2012:114)

Even though the building was purposely designed the building itself often overshadows the exhibitions with its iconic characteristics.
With the program in mind, Sverre Fehn had a vision of creating indirect light in the pavilion. To do so he created a roof structure adjusted for the sun angle, blocking out direct sun. (Fjeld, 1983:112) Filtrated by the trees, the light comes alive when bouncing off the uneven surface of the thin concrete beams.

Due to construction issues, the indirect light has been slightly compromised when the sun is at its highest. (Sanchez Moya, 2012: 60) Nevertheless, the light is a main characteristic of the building. Visitors describe how the roof “distil the heady, warm Mediterranean light into its ‘Nordic’ variation: at once shadeless, uniform and bright.” (Taylor-Foster, 2016) “Entering into the pavilion, one senses a change, but it is not the same as walking through the entrance door as in the other pavilions. The light changes, but it is a gradual shift and it is difficult to pinpoint when you are fully immersed.” (Neveu, 2008)

To arrange the building Sverre Fehn used the grid of the ancient Egyptian module of 52.3 x 52.3 cm. (Sanchez Moya, 2012: 141) This has affected the c-c distance between the roof beams as well as the size of the floor tiles. He arranged these in a larger grid of 366 x 366 cm that corresponds to the blue series of the Modular by Le Corbusier. (Sanchez Moya, 2012: 150) The larger grid is visible in the partition of the sliding doors as well as the structural solution of the roof.

The importance of the grid is visible in the division between the inside and outside space, where the sliding doors are separating two full grids. This results in an offset of the grid. This separation of the grid between inside and outside somewhat contradicts his idea of a fluent, open space.
THE COPIES
PROCESS

After the analysis of the Original, we started with our copy adaptations, placing the original on new sites with different geographical and cultural contexts. The idea is to work with the aspects previously mentioned in these new contexts and adjusting them accordingly.

This investigation is process-based, where we have divided the adaptation process into five steps: scale/footprint, program, building envelope, materials and lastly technical details. The order of the steps has been decided to reflect what we feel is a common design process. By organizing these steps, we create a controlled process, where the different aspects of the original in relation to contextual influences are highlighted. With the knowledge of the important aspects of the original, this process allows us to see where these aspects begin to get distorted by certain contextual influences.

1. Scale/Footprint
   - Physical size of the plot
   - Zoning laws
2. Program adjustments
   - Movement
   - Accessibility
   - Cultural context
3. Building envelope
   - Orientation
   - Light
   - Climate
4. Material
   - Climate
   - Availability
   - Cultural context
   - Construction
5. Structure/Building technique
   - Material
   - Climate and natural conditions
   - Topography and ground conditions

CONTEXT

We have chosen four different contexts to place our copies in. The aim is to highlight the different contextual influences by working with contexts that are different, both from each other, and from the original.

Our first context is Boumalne Dades, Morocco. We have chosen this context because of its desert climate and the intriguing spatial layout of the town. This context also offers a very different cultural context than the original, which affects the relation people have to their built environment. The second context that we will present is Malang, Indonesia. Contrasting to Boumalne Dades, this context can offer an investigation into a tropical monsoon climate. It also sets itself apart as a rural context in a site with a different culture than the original. We will also place the building in New York City, USA. This context is chosen as the icon of the urban context. The cultural context is also intriguing for this investigation as it has a special relation to mimesis in the built environment. Finally, we have chosen to work with Stockholm, as this is our context, as well as the Nordic context that the original is supposed to symbolise.

We strive for a broad understanding of the contexts and in what way they affect the building. Thus, we have studied the contexts in relation to aspects such as geography and climate, as well as the built environment and cultural aspects. We believe that these aspects all have the potential to influence the process of copying.
BOUMALNE DADES, MOROCCO

31°22′26″ N, 5°59′44″ E

Climate zone: Desert climate

Altitude: 1562 m

Precipitation: Average 153 mm annual, max October 29 mm, min June 2 mm.

Temperature: Average 14.7 °C annual, July 25.3 °C, min January 5.3 °C.

Sun hours: 2958 hours per annum, max July 11 hours 38 min, min December 3 hours 3 min.

Sun angle at solstice: 82.5 °

Vegetation: Oasis, date palms.

Average building height: 2 - 3 storeys

Construction materials: Traditional: Earth, masonry. Modern: Concrete blocks.

Program: Residential / commercial.

Geographical issues: Drought.
Morocco, located in North Africa, has around 34 million inhabitants over a surface of 446,550 km². The capital is Rabat and the biggest urban agglomeration is Casablanca. (UN Data, 2017)

In the Atlas mountains, at the upper outlet of the Dades valley, one finds Boumalne Dades. It is situated along the national road from Marrakesh out into the desert in the southeast part of Morocco. It is a smaller village/urban agglomeration with around 12,000 inhabitants. During high season the population increases as many tourists come here to experience the beautiful nature in the Dades valley. (Houssaine Naaim, 2013)

Boumalne Dades is said to have originated from an old way of transhumance (nomad-ism), controlled by the Ait Atta Tribe of Jbel Saghro, but it is hard to say exactly when the city started to be inhabited as there are no traceable documents. However, it is believed that the first dwellings in Dades were before the building of the Jewish Tiylit Castle at the end of the 15th century. (Houssaine Naaim, 2013)

The village is characterized by its narrow streets, lined by 3-4 story, terracotta colored houses, merging together with the topography of the hillside. A big, open square offers a place for the weekly markets and the minarets of the mosques diverge from the otherwise quite low cityscape. Dividing the cityscape in two is the river surrounded by greenery, creating an oasis in this otherwise dry climate.

With its location in North Africa, close to the equator, Morocco has a Mediterranean climate that is generally hot and dry most of the year, with cooler, yet mild, temperatures and rainfall during the winter months.

Morocco has widely varying terrain, from the seaside to the desert giving great variations in climate. Temperatures can be incredibly high in the southeastern desert areas while the temperature drops considerably in the higher lying mountain areas. (Morocco.com, 2017)

Boumalne Dades, which is located on the edge of the desert, in the Atlas mountains is characterized by a desert climate. The average temperature is 14.7 °C over the year, (Climatedata, Boumalne Dades, 2017) 25.3 °C in July and minimum 5.3 °C in January. Warm days and cold nights are common in this area. Precipitation is very low with an average of 153 mm each year, (Climatedata, Boumalne Dades, 2017) making it a very dry environment with little vegetation. The most common vegetation is the date palm and rose bushes, typical for this area.

This climate offers many sunny days, usually with high sun as the sun angle at solstice reaches 82.5 degrees, making shade important for everyday life, further affecting the built environment and traditional architecture trying to protect from the sun. Because of this buildings are quite introverted, opening up only to smaller courtyards.
For better understanding the Moroccan culture we discussed with the Islamic Moroccan Cultural Center in Stockholm about history, religion, holidays, gatherings and appropriation of public space.

Historically, Morocco is a merger of two important cultural paths: the Arabic and Berber culture. There are also strong influences from the once colonizing cultures as France and Spain, not only in language but also in everyday life, architectural expression, and crafts. Through Moroccan history, the country has also hosted many people coming from different parts of the world. This makes Morocco a home for a very vibrant and diverse culture, based in the Islamic religion.

Gatherings are usual within the family, or for holidays and events. Most of these have a religious base, but in the countryside, celebrations to honor the village saint and around the harvest are also usual. The later relates more to the Berber culture, and the different tribes within it. These communal gatherings usually take place in someone’s home and are celebrated with food and performances.

In Boumalne Dades one of the biggest celebrations of the year is held at the beginning of each new rose season in spring, gathering not only people of the village but from the closest surroundings.

Discussing with the Islamic Moroccan Cultural Center it came to our understanding that everyday meetings are more usual between men, at least in public, as women prefer to meet in their private homes.

Most public buildings are gender segregated and common places for mixed use are parks and marketplaces. The marketplace has a big role in the more rural villages, while parks are more often found in the bigger, urban contexts. The marketplace is not only for crafts but also for performances and music, some of the expressions of Moroccan culture.
MALANG, INDONESIA

7°58′48″S 112°37′12″E

Climate zone: Tropical monsoon climate

Altitude: 476 m

Precipitation: Average 2088 mm annual, max January 334 mm, min August 26 mm.

Temperature: Average 23 °C annual, max October & November 24.3 °C, min June 22.4 °C.

Sun hours: 2975 hours per annum, max August 9.36 hours, min February 6.05 hours

Sun angle at solstice: 86.2 °

Vegetation: Broadleaf evergreen forests, cultivated plants

Average building height: 1 - 2 storeys

Construction materials: Wood, masonry in concrete frames

Program: Residential, agricultural

Site specific issues: Vulcanic activities, earthquakes
URBAN CONTEXT

Malang is a city of 820,000 people on Java, the largest and most populated island in Indonesia. Malang is located between several volcanoes: Mount Bromo, Mount Semeru, Arjuno-Welirang and Mount Kawi.

Mount Kawi (Gunung Kawi) is a stratovolcano on the west side of the city. Roads from the city climb the mountain, with buildings lining the sides of the street. The buildings are mainly residential, making the streets somewhat of linear communities. The streets that extend up on the mountain are connected in some places, allowing for a connection of the different linear communities.

The buildings that line the street leading to our plot are mainly single-storey residential buildings. Many houses are built by the owners, with each building a unique version of a local type. This type is a single or in rare cases two-storey building, with a pitched roof and a veranda, facing the street with its short side. Most buildings are built with a mix of brick and concrete, with timber roofs and verandas. The buildings are set back from the street, with a small plot of land surrounded by a fence facing the street. Some buildings have extensions added, as residents build extensions depending on their needs and budgets. It is a growing area, with some plots still unbuilt, and timber and bricks are lying on the street, waiting for time and opportunity to be built. Both the unbuilt areas and the small space between the road and the buildings have a lot of vegetation. The vegetation consists of both bamboo, palm trees and broad-leaved trees. Some residents with larger plots are using their land for farming.

The street is lined by warungs, small shops selling food and drinks, that are owned by residents. Warung stalls are placed in adjacent to the houses facing the street. There are also more formal grocery and consumer goods stores.

The plot that we have chosen is located at the twist of the street, where the road turns to cross a stream. The otherwise constant lining of buildings pauses for the turn, and only nature inhabits our site. There is a plantation on one side, and the slope down to the stream on the other. Where the slope begins, the vegetation densifies, to the point where the stream is barely visible.
CLIMATE

Indonesia consists of 13,466 islands of various sizes spread out over 5,120 km from east to west. The climate on these islands vary, as some areas are mountainous, and the extension of the islands move from a tropical rainforest climate, via a tropical monsoon climate, to a tropical savannah climate. (Bakosurtanal 2012)

Malang is located on the east side of Java. East Java has a tropical monsoon climate, with the monsoon season stretching from November to April. In Malang, temperatures are fairly even throughout the year, as shown in the first diagram. Temperatures are more even during the rain season, to have a greater variation during the dryer months. The monsoon period also reflects on the sun conditions. Generally, there are few completely sunny days, as the vegetation and mountains create a cloudy weather condition. However, during the dry months, most days are only partly cloudy.

The plot that we have selected is located west of Malang city, on the way up to the volcano Mount Kawi. The height moderates the temperature, which is more even than in surrounding cities on lower grounds. With its location on the east slope of the volcano, the prevailing winds are from the southeast.

Building traditions have responded to the monsoon climate in several ways, the most notable being the joglo roof, a roof structure with two inclinations and extended eaves.

50. Traditional Javanese house with joglo roof structure.

51. Average temperatures and precipitation.

52. Cloudy, sunny, and precipitation days.

53. Wind rose and speed.
As mentioned, Indonesia has a diverse culture, where Malang belongs to the East Javanese cultural context. Javanese culture has historically been influenced by Hinduism, Buddhism and Kebatinan. In the 15th century, Islam and Christianity spread throughout the island. Today, most Javanese people are Muslim, but many still maintain cultural influences from indigenous belief systems. (Embassy of Indonesia Athens 2010)

Many traditional art expressions still have a strong position in Indonesian culture. The traditional craft of batik is very popular, and there are many commercial versions of this ancient craft, as it has maintained its importance in contemporary culture. Another traditional art that has strong relevance is the gamelan music. Gamelan is indigenous music from Central- and East Java and Bali (Embassy of Indonesia Athens 2010). Gamelan music is played together as a group and emphasises community over individual values (BBC 2014). It often accompanies dance, wayang performances, or rituals and ceremonies, all events that gather communities.

Many traditional arts and customs have survived despite Indonesia’s long period of Dutch colonization. During this period, that lasted from 1602 to 1945, Malang was popular amongst European residents. This can largely be attributed to the region’s mild climate.

In 2013, Malang was spared many of the effects of the Asian financial crisis, and since that time it has been marked by steady economic and population growth. (Duncan 2013) As previously mentioned, our plot is situated on the outskirts of the city. However, with a continuously urbanizing population, the peripheral linear communities of the mountains will probably also note this increase in population.
NEW YORK CITY, U.S.A.

40°42′46″N 74°00′21″W

Climate zone: Humid subtropical climate

Altitude: 10 m

Precipitation: Average 1270 per annum, max July 116.8 mm, min February 78.5 mm.

Temperature: Average 12.6 °C per annum, max July 24.7 °C, min January 0.3 °C.

Sun hours: 2,535 hours per annum, max June 10.02 hours, min January 4.52 hours

Sun angle at solstice: 72.3 °

Vegetation: Cultivated trees

Average building height: 1 - 104 storeys

Construction materials: Steel, reinforced concrete (contemporary), masonry, stone (traditional)

Program: Commercial, offices, residential

Site specific issues: Price of land
URBAN CONTEXT

New York has one of the world’s most iconic urban layouts in its grid and the density that fills it. The built environment of New York contains a variety of styles and typologies: the brownstone tenement houses, religious buildings turned palimpsests of different waves of immigration, the world’s first skyscrapers and shiny glass towers. New York has one of the world’s highest number of skyscrapers, with 550 buildings reaching over 100 meters (Emporis 2017).

The built environment of New York City is regulated by zoning laws, establishing the grid and what is allowed to happen within it. In 1916, the Zoning Resolution required setbacks and set limits for the percentage of the lot built up by towers, in order to allow sunlight to reach the streets. In recent times, zoning laws have gained attention in how they allow for owners of neighbouring lots to “buy” height rights from each other, and for owners to gain rights to deviate from requirements by offering something back to the city, such as public art or POPS (privately owned public spaces). (Erickson 2014) Thus, the planning of the built environment is a reflection of the capitalist culture that inhabits it.

CLIMATE

The climate of New York is classified as humid subtropical. As such, the temperature changes throughout the year. The day temperature in January averages at 0.3 °C and often drop to below -10 °C. In July, the daily mean temperature is 24.7 °C, but it often exceeds 30, and even 35 °C. The night time temperature during summer months is often warm, because of the urban heat island effect. (Meteoblue 2017)

The sun conditions in New York are described in the lower diagram. There is a similar amount of sunny and overcast days, the previous mostly in summer, and the latter during winter. The most common weather condition is partly cloudy. Further, the tall buildings cause shading.

One of the main challenges in New York is to handle rainwater drainage. As the left diagram shows, there is a lot of precipitation throughout the year. Further, New York is not unfamiliar to extreme weather conditions such as hurricanes. Because of the high percentage of impervious surfaces, flooding is not uncommon.
The cultural context of New York City is as legendary as it is versatile. Its culture is often described as a melting pot of influences from all around the world, meeting in the icon of the mega city. As this cultural hub, New York is famous for many cultural expressions. It is the birth ground of hip hop and Harlem Renaissance, and has been the centre of jazz and abstract expressionism. The site where our plot is located is in the Theatre District, that is famous for the many Broadway theatres. This cultural expression is supported by the city, as the zoning laws encourage this type of program (New York City Planning, 2016).

With its diverse cultural backgrounds, this context has a high acceptance for different types of built structures. There is an “anything goes” attitude towards the built environment, that accepts a mixture of experimental high-rises, neon signs, gothic revival, palimpsest churches turned synagogues and rugged back alleys.

New York also has a special relation to copying. It is the most populated city in the birth nation of Las Vegas and theme parks. In the interface of capitalism and entertainment, a culture of copying has emerged, where iconic images are used to sell the idea of entertainment. Iconic images of architecture are copied as money-making spectacles. In 1905, “Venice of America” opened in Los Angeles as a tourist and residential getaway (Masters 2013). It copied elements of the idyllic Italian city as attractions for native tourists. Closer to New York, we have the example of “Brighton Beach”, a resort area from 1868 meant to evoke the image of the British original (Brooklyn Public Library 2005). Close to Brighton Beach, there was also the novelty architecture heaven of Coney Island. From 1885 to 1896, Coney Island boasted a 12 story commercial building in the shape of an elephant, called the Elephantine Colossus (Dunne 2015). This type of mimic architecture, where architecture often mimics a commercial program, is perhaps more common in the USA than anywhere else.

Titling itself “the land of the free”, there is undoubtedly a liberal attitude when it comes to what is acceptable in the built environment.
Climate zone: Humid continental climate.

Altitude: 52 m

Precipitation: Average 527 mm annual, max July 72 mm, min March 26 mm.

Temperature: Average 7 °C annual, max July 18 °C, min February -2.6 °C.

Sun hours: 1821 hours per annum, max June 10 hours 36 min, min December 50 min.

Sun angle at solstice: 54.1 °

Vegetation: Conifer and broad leaves.

Average building height: 5 - 6 storeys


Program: Mixed use.

Site specific issues: Snow loads, land prices.
Stockholm, the capital of Sweden, is the biggest city in the country, as well as amongst the Nordic countries. It houses over 1.5 million people in its urban area and is constantly growing.

The area has been settled since the Stone Age and was founded as a city in 1252 by a Swedish statesman, Birger Jarl.

In the latter half of the 20th century, Stockholm became a modern, technologically advanced, and ethnically diverse city. Though many historical buildings were torn down during the modernist era, some parts of Stockholm, such as the surroundings of our site survived this era of demolition.

The city centre is characterized by the mix of nature with low rising buildings from the end of the 19th century. Height regulations keeps the lower skyline of the city allowing only church towers to rise above it. Stockholm is built up by 17 islands, surrounded by water, giving an open feel to the city. It has been called the Venice of the north for this reason.

In city centre, and the area around Observatorielunden, where our site is located, buildings have 5-6 storeys. This part of the city is a mix of commercial space, shops and offices, housing and institutes of higher education, bringing life to the neighbourhood throughout the day.

Stockholm has a humid continental climate and weather is relatively mild compared to other locations at similar latitude, or even farther south.

The yearly average is 7 °C, with max average temperatures in July at 18 °C, and minimum in February at -2.6 °C. With these low temperatures in winter, it becomes important to think about insulation and eventual snow loads. Yearly average precipitation is 527 mm, including both rain and snow.

Due to the city’s high northerly latitude, daylight varies widely from more than 18 hours around midsummer to only around 6 hours in late December. With an average of just over 1800 hours of sunshine per year, it is also one of the sunniest cities in Northern Europe. Around the summer solstice, the sun never reaches further below the horizon than 7.3 degrees which give the sky a bright blue color once the sun has set. (SMHI, 2017)
Stockholm, being the biggest city amongst the Nordic countries does represent, the Nordic culture, but at the same time it has influences from around the world as it is a metropolitan area.

When purely discussing “Nordic and Swedish culture”, one immediately thinks of IKEA, Abba, midsummer and how people are portrayed as quite cold and introvert. All of this is of course part of the culture, but it goes beyond that. For instance, midsummer, celebrated on the 24th of June, every year, still celebrates and gathers people around one of the main cultural traits - the fascination for light. This celebration has, become one of the most important cultural events. Because of the geographical location of all Nordic countries the light conditions vary along the year, further it also becomes possible to see the spectacular Northern lights. Nordic culture has therefore, traditionally, evolved around the very dark winters, and long summer days. Even with the arrival of electricity, the natural light is still highly appreciated, and celebrated, not only through festivities but also through art, design and architecture. Together with nature, light is one of the bases for many architectural projects. In new, small scale projects, like villas or the traditional summer houses, this usually becomes apparent through the often light, clean spaces opening up towards the nature. In a bigger scale, just looking at the cities in Sweden, they usually allow for a mix between the urban fabric and the surrounding nature.

It is true to say that people from the North are more introvert than in other ends of the world. In Sweden people gather for planned events in the assigned location. Space is rarely claimed and used in spontaneous ways. How does this introvert culture then affect such an open building?
SCALE / FOOTPRINT

The first step in our copy adaptation process is scale/footprint. This is the building’s first interaction with its new context, and the immediate issues of the context that question the building is related to the physical size of the plot, its topography and vegetation, what else exists on the plot today, as well as any local zoning laws.

How the buildings interact with these aspects of the context is affected by how the original does so. In our analysis of the original, several of the aspects mentioned relate to these questions. We have put special attention to the first four aspects. As for reverence for nature, we must analyze the nature in the different contexts, to see what reverence for nature can mean in the different cases. The aspect that determined that the building stops where the trees are too many and the hill too steep to follow it naturally can be translated quite directly into our new contexts. The steepness of the hill is understood as any type of topography and is even extended to include the topography of the built cityscape. The aspect of objet trouvé relates to trees found on site in the original. In our new contexts, the objet trouvé can either be vegetation found on site, or other physical elements that we deem worthy to keep and integrate. The last aspect that relates strongly to this step is the one saying that the interior space opens up to the pedestrian path and public space. This aspect determines the placement on site in relation to surrounding spaces. The buildings seek to open up to any street or public place, and will thus be rotated, mirrored or in other ways adjusted to do so.

This step has been investigated through site models, with 1:400 models of the sites and how the building first situates itself in them.
Our first copy, located in the small town of Boumalne Dades in Morocco is placed in a very different climate. Further building traditions and urban layout also differ from both the Venetian and Nordic context.

Our plot is situated along one of the main roads of the village, leading from the square to the river and oasis. It is a narrow street lined by 3-4 story buildings. The site is integrated into the topography of the village as there is a drop of 5 meters to an open space, where our plot meets the street.

Placing the building on our site, letting the topography and surrounding buildings set the boundaries and orientation, forces us to create two levels in order to connect and bridge the street and open space. Further, we have decided to mirror the two levels to enhance the openness of the building, similar to the original, towards the street on the upper level and the open space on the lower level. The connection between these two levels is done by an interpretation of the stair in the original, designed to bridge the topography on site. Our stair, keeping the proportions of the original one, is once again mirrored and placed centrally in the building to allow for a diverse flow. The open space on the lower level gives a more direct connection to the river and oasis, allowing for the building to enhance the pedestrian connection between the street and the rare green areas in this dry climate. Because of this dry climate and lack of vegetation the structure of the building, which in the original is adapted to integrate the trees found on site, changes. Where the beams in the original open up to integrate the trees, in this context we chose to continue the beams straight as there is no vegetation to take into consideration or integrate into the building.
In Malang, our site is located on the slope of a volcano, where the plot is placed between farmlands and the slope down to a stream. The site is accessed from a single road, leading down to the city.

As nature is prevalent on the site, we have worked with the placement of the building in a similar way as the original: letting topography and trees set the boundaries for the building. Likewise, trees found on site have been incorporated into the building. However, the trees in Malang are very different from the ones in Venice. In the original context, the trees that existed on site were a part of a park, and placed relatively independent from each other. In Malang, most of the site is a sloping field of grass and plants. There is a sharp edge to the steeper slope that is covered with trees and bushes. As the edge of the dense trees is sharp, the building can only integrate the trees into its own borders. Instead of the original relationship, where trees exist outside of the building and then passes through it to continue on the other side, the relationship between trees and building in the copy is that of two entities that integrate at their borders.

As in Venice, the building opens up to a road, and where the original has a public space to relate to, our building offers a relation to wild nature. Unlike the Venetian park, the overgrown slope to the stream is not a place where people go. Though, with the Venetian public space in mind, the copy offers a connection to its nature. It does so both by opening up to it and integrating the trees, as well as by offering a path into nature, down to the stream.
Step 1, section, 1:500

Step 1, plan, 1:500
In New York City, the topography that sets the boundaries of the building is made up of the built cityscape. The plot is delimited by surrounding buildings and the sidewalk. Amazingly, the footprint of the original was almost a perfect fit. By only removing one row of 523 mm (that is, one row of floor tiles and one roof beam), the building fits on the depth of the plot and leaves room to its side for a potential small public place. This place has been adapted to a New York version of the Venetian park: a pocket park with an open relationship to the interior of the building.

One of the governing aspects in this first step is the idea of reverence for nature. An analysis of the nature in New York City concludes that nature in this context is man made. Many blocks are devoid of nature, and the trees lining some streets are consciously put there as amenities. The largest park Central Park, a New York icon, was planned and designed by city officials and landscape architects and is carefully maintained by man. To create the park was a huge operation: houses were demolished and people relocated, soil was transported from New Jersey, artificial lakes were installed and vegetation was transplanted to the park. (Rosenzweig & Blackmar, 1992)

The creation of a new (man-made) park relating to the Venetian park is thus an act of reverence for nature in this context. Further, as nature in New York is man-made, we have decided to copy even the trees of the original. Nature found on the original site that has become an integral part of the original is now copied together with the building. Again, showing reverence for nature by re-creating it.

The main change that the building had to make in this step to fit in its new context was to rotate the roof 90°. The this is to accommodate water drainage, as the original roof would let the water drain either on the facade of a neighbouring building, or out on the sidewalk. This rotation changes the image of the building as the load-bearing elements connected to the roof have rotated with it.
In Stockholm, our exact site is located in the city center, in the borough of Norrmalm, southwest of Observatorielunden, at the top of Drottninggatan. Surrounded by commercial buildings, institutions, housing and parks this site is used throughout the day.

Placing the building along Kungstensgatan we needed to take into account a height difference of 1 meter up to the street. We elevated the building to the street level, transformed the original stair and inverted it to accommodate the height difference between the entrance of the building and a potential public space. In doing so the building in this step relates more to the street than the potential new space. This gives the stair more importance than in the original, something we realize we will have to look more closely at in the coming step, discussing movement and program. The exact placement of our building and its boundaries were set by this height difference in relation to the street as well as the surrounding plots and green area. The building fits in its original proportions without disturbing surrounding constructions and activities. The trees lining the street are integrated into the building, acting as a filter between the building and the street. Though the incorporation of the trees is done in the same way as in the original building, their placement along the street gives a different impression than one of the more flowy and randomly placed trees of the original.
PROGRAM

In the second step, we question the existing program of the pavilion. Even though the large open space is designed to house exhibitions, the architecture itself often overshadows the art. Further, we must also question the relevance of the program in the new contexts. How will the building be appropriated?

It is important to study the cultural contexts, to speculate on how the building could be used. Our aim is to use the qualities of the original to gather people around culture. Thus, we investigate how people meet around culture in relation to space in the different contexts. Depending on what we find in the different contexts, the building is allowed to be deformed in accordance with the new program. This relates to the original aspect of program as design generator.

We also study the movement to and through the building. This relates to the aspect of the original stating that there is no defined point of entry or exit. The open flow through the original relates to existing flows on site. How do the flows in our new contexts relate to the new programs?

In all of our contexts, we have found a need for some amenities or other functions that are not existing in the original. Also, the placement of these types of spaces under the stair can not be copied into or contexts, as the topography does not allow for copying the stair. However, we have chosen to implement a similar way of adding our new program. Instead of extending the space under the stair, we have extruded a back wall, to fit the program inside it. The wall is extruded to create a space corresponding to the grid of 366 cm. This method of adding modern functions to a historic original relates to our case study Ideal Architecture, with examples of how functions are added by carefully manipulating the original structure.

This step has been investigated through plans and is represented in drawings with the scale 1:200.
Speculating on the cultural inhabitation of our building, we discussed with the Islamic Moroccan Cultural Centre (2017) in Stockholm about the appropriation of public spaces. Our conclusion from this meeting was that gender segregation is common in most built structures. Spaces allowing for equal use and gatherings are often open spaces, such as market places, squares, and parks. Marketplaces and squares, with one of the most famous being Djemaa el Fna in the Medina (old town) of Marrakesh, attracts not only vendors and artisans but also performers and artists, gathering people around culture. Though often designed as open spaces, it doesn’t take long before these squares are covered with umbrellas, shielding from the sun.

With this in mind, we decided to transform the building into a covered square, allowing not only for cultural gatherings but creating a place shielded from the sun. With this covered square, we bridge between the public path and space by tilting the floor plane, allowing a variation of the continuous flow of the original as well as enhancing the relationship between the two levels, merging them into one open space. By creating this open space we avoid a spatial and possible gender segregation of the building. In practice, the floor plane becomes a big staircase for sitting, walking and even putting up stands for market days. It also becomes a great place to gather for performances and town events. While the floor plane has tilted, the back wall is extruded to fit amenities such as toilets, storage, and some administration space. The extruded wall only opens up at the ends, allowing access to these functions, similar to the way it is done in the original. Thus, the closed expression of the wall is intact. Under the stair we also allow for a new, common space, an interior gathering space supporting the exterior one.

In this context, the program allows the building to remain completely open with only the roof remaining as the main spatially defining element. Allowing for a shaded square not only makes the interior space contrast to its surrounding but also provides a space that could be used throughout the day, even when the sun is at its highest.

Through moving the building somewhat from its position in the first step, we keep the characteristics of the broken road, not lining it with its neighboring buildings. This move also welcomes people in towards our building, while following the movement of the road. The more generous space in front of the building symbolizes the public character of the program.
64. Covered public space, Metropol Parasol, Sevilla.
The cultural inhabitation in Malang has been fueled by a strong tradition of community gatherings. As mentioned, several traditional art forms still attract large crowds and are natural parts of celebrations. One of the most important events is when gathering for wayang performances. Wayang is a collection of theatrical performances, the most popular being shadow theatre: wayang kulit. They are popular events in relation to weddings and various holidays. These performances have a tradition of appropriating different types of spaces. We, therefore, feel that it’s reasonable to assume that this cultural expression will appropriate our space.

Studying the program of wayang in closer detail, we reveal that the relationship to space is at once general and very specific. The performance space is usually either a formal theatre or an informal large space with loose seating. The former is more common in relation to public events where a famous dalang (master puppeteer) is invited. The latter is more common for private events, such as for weddings. In the cases of private events, the space is adapted to fit the specific occasion. For wayang kulit performances, the guests of honour usually have a special place in front of the screen, and a selected few are even invited to enjoy the show from behind the screen, sitting next to the orchestra. However, even for private events, the whole community is often invited. People can sit on the floor in front of or to the side of the guests of honour, or on chairs behind them. The event usually attracts food vendors, that keep people satisfied during the several hours long performances.

With wayang appropriating different types of spaces for different occasions, our building can offer a middle ground between the formal and informal. It offers a dedicated space for the performance but still offers the spatial flexibility for the whole community to come along and enjoy the performance as they please. The large exhibition space of the original can transform into a performance space.

Apart from the main room for performance, the extruded back wall offers space for workshops manufacturing the wayang puppets. Making wayang puppets is a time-consuming craft, where the artists work together in groups. The puppets are cut out of cow’s skin by one artist and then refined and painted by another. The workshop allows for a shared space for the craftsmen in a context that displays their craft in relation to its use.

The meeting of wayang arts and the interior expression of the original allowed for reflections on how they meet architecturally. There is a similar relationship between the flat light surfaces of the walls and floor of the original and the contrasting expressive trees as in the flat light surface of the wayang screen and the contrasting shadows of the wayang puppets. To enhance this connection, and to make the walls themselves act as a backdrop for the performances, the walls have been kept empty. The door to the workshop is placed outside the sliding doors, where there is a door in the original as well. The placement of the door does not jeopardize the delicate puppets or gamelan instruments, as the gutters of the roof extend well out above the door.

In relation to movement and program, we have further studied the original stair. In the previous step, we kept the stair as it corresponded with the topography on site. However, as we study the space in relation to other aspects, we conclude that the space that it leads up to is not like the original public nature path, but rather a private farmland. Therefore the stair has no legitimacy and is removed.

Endang Purwanto, (2017) who grew up in a town close to Malang, says that her favourite thing about wayang kulit performances is to sneak around and peek behind the curtain, at the dalang himself and the gamelan players surrounding him. Our building allows for this special treat, as the glass sliding doors offer the dalang some privacy but still allows for viewers to see what is going on behind the scene.
Step 2, section, 1:500

Step 2, plan, 1:500

67. Contrast: walls / trees. Courtesy of Åke Eson Lidman

68. Contrast: screen / wayang
New York is described as the icon of the mega city, the birth nation of Las Vegas and theme parks. In our opinion, this is a context that welcomes the original without culturally questioning it. Therefore we chose to keep the program and believe that it will be appropriated as such.

In this context, local building regulations require certain amenities. In the New York City Building Regulations, exhibition spaces are classified as “Assembly Group A-3” (New York City 2014). For this type of building, there are requirements for technical systems, such as sprinklers and HVAC, that require space. There are also requirements for 1 toilet fixture per 70 male visitors, and 1 for every 35 female visitors. 1 toilet for each sex needs to be accessible. Because of the low number of in-house staff, there is no requirement for a separate staff toilet. (New York City 2008) However, we have decided that the program in this context would require some staff amenities that are not there in the original. The original building is placed in a context that supports its program with storage and both staff and visitor amenities. Placing the building and its program in New York, it would benefit from extra space for both the required amenities and additional space for staff and storage. As mentioned in the study of the original, even the original has had complaints of insufficient storage space, and thus added extra later. We have therefore decided to include space for both required and non-required extra space.

These new spaces have been placed in the extruded back wall. To fit the new programs in the extrusion, it has been divided into two levels. To maintain the expression of the interior exhibition space, and to not let the new amenities interfere with the exhibitions, the entry to the public toilets is placed outside of the sliding doors, in a similar position as the entry to the storage under the stair in the original. Thus, the impression of the space is that of a wall that has moved 3660 mm into the space, but not in any other way altered it. The staff entrance is placed around the corner, relating to a back alley serving the buildings on the block.

As we copy the program of the exhibition space together with the building into a new context, we must reflect on what this program can mean in the building on its new site. As an exhibition space, the original has been critiqued for taking too much attention. Instead of admiring the art exhibited, visitors admire the art of the light on the impossibly thin roof beams. By copying this awe-inspiring icon in architecture, we recreate an exhibition space where the space itself is the main thing exhibited. In the architecturally eclectic city, we believe that a space for art considered art itself will be welcomed. The challenges of exhibiting in it, and to relate to its aura, can be inspiring for curators.

Further, the interface of the exhibition space and its immediate context offers new potential in this urban situation. Instead of the Giardini road, we have W 44th St, a car road with double sidewalks, lined with bars, hotels and theatres. The openness towards this street has the potential to offer a different art experience than its Venetian original. Further, the densified New York pocket park has a more direct relationship to the exhibition space. The Giardini park is a large open space facing many directions. Here, similar to the building itself, the park has two back sides, facing building walls, and two open sides: one facing the street and the other facing the exhibition space.
Step 2, section 1:500

Step 2, plan 1, 1:500

Step 2, plan 0, 1:500

70. Lina Bo Bardi Exhibition

Sketch of possible exhibition module
Unlike the other cultural contexts, we believe that the appropriation of the space in Stockholm would benefit from an institutional actor. The chosen area of Stockholm has a strong historical connection to institutional buildings relating to education, as one of the first institutions of this kind was built in Observatorielunden in the 18th century: the Stockholm Observatory. (Samfundet S:t Erik, 1995) Our new building, with its placement in the city center, and proximity to Stadsbiblioteket and several, modern, institutions of higher education, would, therefore, be well suited for a literature center.

When this new program inhabits the building, questions arise about how to function in this open space. To maintain the qualities of the interior expression of the original, we refrain from dividing the space, keeping the visual continuity of the roof, as in the original building. The main space of the program becomes the reading room of the entrance level of the building. It is not dividing the space, although it creates smaller, more intimate zones through seating constellations, change in materiality, different light zones and lower bookshelves. Furthermore, the changed program requires new, supporting amenities such as toilets, elevators, offices, administration spaces as well as storage to function properly and to follow building regulations. The smaller parts of this new program together with the vertical circulation have been placed in the extruded back wall of the building. With many openings, to stronger connect the different parts of the program, both visually and physically, the wall becomes much more perforated, giving an impression of an interior wall rather than an exterior one. The additional storage is placed in an underground floor. This allows us to keep the openness of the upper room that can function purely as a reading and study room. This feels like a reasonable move since most buildings in Stockholm have a basement. Furthermore, it is a way to utilize the space between the two levels on site.

As mentioned in the previous step, the height difference leaves us with questions about how to approach the building, not only from the road but also from the potential public space. To create a more generous variation of movement to and through the building, we chose to transform the stair, extend it and allow it to bridge the height difference in a more public manner, also tying the building together with the topography of the city. The new stair in itself, with its southwest orientation, becomes the perfect complement to the indoors reading space, opening it up to the new public space and keeping the idea of how the original building opens up to the public.
72. Spatial division
For our third step, we look at the building envelope. Here, the building must adapt to the context’s climate. Governing aspects are orientation, temperature, precipitation, and light. The aspect of the original that has the main influence in this stage is the idea of equal illumination to every object in the pavilion. Even though this idea was derived from the program, we believe that it is now a major part of the iconic experience of the space. Thus, it is an important part of the original even if we change the program.

To us, the original light is an even diffuse light, that defines the space and separates it from the surroundings. As the original works with both direct and diffuse light, we must investigate what these aspects of light mean in our different contexts. To study the direct light, we have worked with the solar angles of each context, similar to the way Fehn did in his original. We have tried different ways to adjust the roof beams to the different solar angles. These studies are shown in each context. Further, we have studied the diffuse light resulting from these different adjustments with a software for light analysis called VELUX Daylight Visualizer.

With the result from these two studies, we have weighed the different results together to find adjustments that answer to the light conditions as a whole. In doing so, we have taken into account the different light conditions in our contexts. Because our context has varied geographical locations, altitude and different types and amounts of vegetation, they have very different light conditions. In Boumalne Dades, there is a high amount of direct irradiation. Thus, direct light is the main aspect to consider. In Malang, on the other hand, there is mostly diffuse irradiation. Despite its even steeper sun angle, indirect light becomes the most interesting aspect. A reason for this condition is the dense vegetation in this area. The foliages filter the light on its way to the ground, but more importantly, dense vegetation causes evapotranspiration that results in high humidity and creates clouds. (Anselmo, Mardaljevic 2013) In New York, there is less vegetation than in Malang. However, other aspects decrease the importance of direct irradiation. On a larger scale, light is slightly diffused by fine particulates in the air. Today, air pollution in New York has decreased and was in 2013 on a level of 16.9, while Beijing measured 161.9. (Anselmo, Mardaljevic 2013) More directly affecting our plot are the tall high-rises surrounding it. Even though local legislation tries to minimize the shading effect, surrounding buildings undoubtedly shade our plot, but also increases the diffuse light when light is reflected of their façades. In Stockholm, there is prevalently diffuse

The diagrams above do not account for the fact that there are large seasonal variations, but still, show that indirect light is the most important factor.

Apart from light, there are other aspects of climate that the roof needs to respond to, such as temperature and precipitation. The new roof must thus be constructed to solve these aspects as well. Finally, we have also considered the appearance of the roof, both its exterior and interior expression. Because the roof is such an important part in conveying the iconic values of the original, our alterations must be conscious.

This step has been studied mainly through section and digital modeling and is represented through a section of 1:200, here represented in 1:400.
In Boumalne Dades, the indirect light is given a new meaning in a context where shade is crucial for everyday life. To accommodate both the climate and program the roof becomes an important factor when protecting from the sun.

The steep sun angle in Boumalne Dades, reaching 82.5 degrees at solstice requires the proportions of the roof to adjust quite drastically to block out the direct sunlight. Using the sun angle to calculate the dimensions of the roof, we decided on proportionally increasing the width and height of the roof beams, leaving us with a 5-meter thick roof. Though, one might think that this would change the expression of the roof completely, the new dimensions worked quite well with the double height space created through the stair. Also, as the roof in our building is purely self-bearing the structure would not be impossible to imagine.

Looking more closely at how this would affect the diffuse light and general lightness of the space we were pleasantly surprised to find it a very light space. Although the light has a longer way to travel through the dense roof, the double height and openness of the space allows enough diffuse light in, to not darken the space completely, while still letting the roof do its job in protecting from the direct sun.
With Malang’s tropical monsoon climate, water drainage is an important factor when looking at the roof. To handle this better than the original gutters could, we opted to create an inclining roof that leads the water down to the stream. Thus, the first tests in our study of the direct light were discarded, as they did not respond for this new need. We also discarded different attempts to rotate the roof, as we think that it has a negative effect on both the interior and exterior expression. Finally, we decided on an option where we create an inclination by a gradient scaling of the upper roof beams.

The sun angle in Malang is much steeper than in Venice, which can be seen in the extreme proportions that the roof takes trying to answer to it. Because of this, our initial thought was to scale the roof down, starting with the original density of the beams and then scale it down so that they become closer and closer together. However, when we tested the indirect light in this version, we realized that the space became too dark. Because the beams became so tall and so dense, the indirect sun would not reach down into the space. While this version responds better to the direct light, the light conditions as a whole was not satisfactory. Instead, we decided to leave the direct light as a major influencer. This decision is in accordance with the local sun conditions described earlier, that states there is mostly diffuse irradiation in this context. With this in mind, we decided to scale the beams up rather than down. This leaves larger gaps for the diffused light to get into the building and lets it in without bouncing too many times against the beams. With this new roof solution, we have a light condition often, but not always, similar to the original.
The plot in New York is shaded by surrounding high rises and little direct light reaches the building. Diffuse light is thus the most important factor for designing the roof. Adjusting the roof beams for the sun angle, we found that a proportional scaling was preferred, as it maintained the expression of the roof. However, when we analysed this solution in relation to diffuse light, we concluded that the space became too dark. Instead, we let the diffuse light govern and maintained the original proportions of the roof. With this solution, the light conditions in the space are more similar to that of the original.

Apart from light, the building must also conform to local regulations on indoor climate. To achieve this, the original gutters are changed into an atrium style roof. This change opens up for questions on how to achieve this new roof in more detail, which has influenced our continued work with the next steps.

In this stage, the entire building envelope has been insulated, affecting the detail of the walls and the sliding door. Because of the increased wall thickness, the building protruded out on the sidewalk. Therefore, another roof beam and row of floor tiles have been removed. Compared to the original, the exterior space covered by the roof is now considerably smaller.
With the great fascination for light in the Nordic culture, it becomes important to be aware of the light conditions in the building throughout the year. Therefore we aim to create a light space, as these are highly appreciated in this context.

Because of the low solar angle, the roof must be adjusted to let even enough diffuse light in, while taking into consideration the low temperatures and snow loads that the roof needs to respond to. Testing this in our first round, focusing on the direct sunlight as Fehn did in his original, we realized the only reasonable solution, considering the climatic factors would be the 50/50 solution. Lowering the beams for the sun angle, while widening the structure to hold for the loads. However, we came to realize that the space was not only too dark, but also lacked the expression of the original, both in the interior and exterior.

Testing new solutions lead us to make the decision of removing every other beam, allowing us to keep the original height of the beams while widening them, to carry the loads. This allowed more light into the building while remaining much closer to the expression of the original roof.

With the cold, nordic, climate affecting the envelope, it becomes crucial to think about insulation. Therefore, all building element are insulated. However, this is done in such a way as not to leave any visible marks.
MATERIAL

In our fourth step, we look at materials. As the materiality of the building is important for the experience of the space, as well as the expression of the building it becomes important to discuss whether one should change the materiality in each context or not.

As previously mentioned, the Norwegian slate floor of the original was soon changed into a local Istrian stone, better suited for the context. The use of local, and available materials, therefore, becomes part of the original. Further, we look at building traditions and try to use the techniques and materials of the specific context to create well-integrated buildings. When looking at these local materials and techniques, we try to see the potential of refinement and high-tech solutions. Similar to the original roof construction, we push the materials to their limits to create innovative structures.

When changing materials questions arise about the experience of the space and how it relates to the original. Materials have a close relationship to light and the temperature of a space, directly influencing the experience of it. However, changing the materials in our contexts may help maintain other qualities of the original.

This step has been studied through the making of images, showing the new materialities of each context.
In a context where building traditions and local materials play a big role in architecture, changing materials for all elements of the building feels natural. The Drâa valley, where Boumalne Dades is located, is in the southeast of Morocco, near the Sahara desert and houses one of the greatest treasures of earth architecture in the world. (Baglioni et al. 2013:79)

In the traditional buildings, a major role is played by the earth material and palm wood is often used for horizontal structures. All these materials are usually available on site in good quantities. (Baglioni et al. 2013:80) Slowly becoming more common in these areas are buildings made out of concrete blocks and then covered in plaster or earth on the outside.

The most common masonry techniques for the traditional buildings are rammed earth and adobe. Although these techniques are known, their implementation demonstrates local intelligence that permits the people to adapt and protect themselves against the aspects of the pre-Saharan climate. (Baglioni et al. 2013:79) As the interest for earth buildings has spread, new techniques allow for beautiful rammed earth walls in many new projects, not only in Morocco. It, therefore, feels like the obvious choice for our building.

For the roof structure, we chose to work with the vernacular palm tree wood. Traditionally the palm tree wood is used for roof constructions, floor structures and stairs. Roof and floor structures would be built through a wooden structure, integrated into the load-bearing walls, covered with panels of tataoui made with canes and a layer of palm leaves. Traditionally this would then be covered with a layer of clay. (Baglioni et al. 2013:86) Our roof becomes divided into two parts: the sun protection and the roof terrace above the extruded wall. The sun protection needs to be able to carry its self-load and span over the width of the space. To do so, the palm tree wood can be refined into cross laminated beams in a factory nearby the Moroccan coast and then shipped to site. The beams would then be integrated into the extruded wall, also giving the base structure for the roof terrace which would be covered in the traditional way.

The change of these materials undoubtedly changes the expression and temperature of the space but feels important not only to integrate the building in its new context but also to be able to preserve the distinction between the feeling of interior space and its surroundings. It is also becomes a way to show reverence for nature, as the building is cast out of natural materials instead of being cast in the natural setting.
78. Rammed earth wall

Making a rammed earth wall

Step 4, Section, 1:500

Step 4, Plan 0, 1:500

Step 4, Plan -1, 1:500
In Malang, we have chosen to implement a local material for the new roof construction. When adapting to the local climate, the roof has changed proportions. To maintain the original material would thus provide us with great difficulties. A material with a better performance in relation to its weight is, therefore, more suited for this construction. Further, as the roof beams become higher while still slender, material properties in relation to bending and shear loads become more relevant. We look for a local alternative that would better answer to the roof's demands.

In Indonesia, vernacular architecture has a long tradition of building with bamboo. Bamboo is a fast-growing material and has in recent years gained attention as a sustainable building material outside the vernacular context. Compared to spruce forests, bamboo forests have up to four times the carbon density per hectare, because of its fast growth rate. (Bock et al. 2015) The fast growth cycle also helps the material to become cost-efficient. The raw material is essentially giant grass with a hollow culm and longitudinal fibres aligned within a lignin matrix, divided by nodes along the culm length. The raw material is processed in two different ways to make scrimber or laminated bamboo. Bamboo scrimber consists of crushed fibre bundles saturated in resin and compressed into a dense block. The process maintains the longitudinal direction of the bamboo fibres and has the advantage that it is materially efficient, using approximately 80% of raw inputs. Laminated bamboo, on the other hand, maintains both the longitudinal fibres as well as a portion of the original culm matrix. In the process, the bamboo culm is split, planed, processed, laminated and pressed to form the board product. The orientation of the strip within the board is randomly placed, which diversifies the direction of the radial fibre density. This process is less materially efficient than scrimber, using only approximately 30% of raw material input due to large losses of material when the strips are planed to form the rectangular section. (Bock et al. 2015) In a study conducted at the University of Cambridge, these two types of engineered bamboo have been tested. In the study, it is concluded that engineered bamboo products have properties that are comparable to or surpass that of timber and timber-based products. Comparing the two bamboo types, the result shows that they are very similar in tension, compression and shear parallel to grain. However, the laminated bamboo has increased post-peak load deformation capacity, because of the compressibility of the matrix. Perpendicular to the fibre direction, the materials are also very similar, with the exception of compression where the bamboo scrimber has approximately twice the compressive strength of the laminated bamboo.

Overall, bamboo scrimber has slightly higher strengths in all properties with the exception of shear parallel to grain. (Bock et al. 2015) With these test results, we have decided to use bamboo scrimber. This decision is also influenced by the aesthetic appearance of the two types, where scrimber has a more organic look, closer to that of untreated wood, and that relates to the uniformly uneven surface of concrete.

Apart from its application as roof material, bamboo can also be weaved to panels. Traditionally, this has been used as both interior and exterior walls. In our building, bamboo weaves are used for the sliding doors dividing the space in the workshop. The intricacy and tactility of the weave suits the craftsmanship of wayang making.
80. Traditional Indonesian bamboo house

81. Contemporary bamboo construction
MATERIAL: NEW YORK CITY

As concluded in our previous step, the roof in New York should maintain the original proportions. However, the original construction is already pushed to its limits and can not handle the extra loads of a climate envelope, that is required in this context. Therefore, we are forced to look for a different material in order to maintain the proportions of the roof.

We consider steel a suitable option for the new roof. Steel is a common building material in the American context and performs well in both compression and tension, even with this high and narrow profile. Further, steel beams can be easily joined together, allowing for the minimum joining area of 60 x 60 mm. The mounting of the atrium roof is also helped by a steel construction. Because steel requires a fire protecting coating, the steel is painted in a light colour, to maintain the uniform colour contrast of the original. Painted steel has of course a different tactility than concrete, and light bounces of it differently. Therefore, the appearance of the roof and the light will differ from that of the original. However, we believe that it is closer to the experience of the original light than it would be had we kept the materiality and been forced to alter the proportions of the beams.

For the other building elements, we have maintained the original materials. Because attaining land and building upon it is so expensive in New York, we have not spared any expenses in creating our building. Therefore, the exclusive concrete mix with white marble is kept.
Building traditions in Stockholm have changed over the years. As the city was founded during the stone age most traditional homes were built in stone and brick. Modernism and industrialization made the easiest available material to be concrete, still used today.

Though it would be possible to change materials of the building in Stockholm, there are few contextual influences that suggest doing so. Therefore the materiality in our building stays the same. When one suggests the same material, concrete, it becomes important to understand the characteristics concrete can have depending on its mix, what it is cast against and what surface treatments one chooses to use (see fig. 82). The concrete cast in the original, is quite an unusual mix using light cement and white marble as its aggregate, cast against a wooden form-work, without any further surface treatment. Once again relating to the local availability it becomes clear that the tone of the concrete might change in our context when using a local stone for the aggregate of the mix. This small shift might not be clearly noticeable and would keep the expression of the building, strongly related to its original.

82. The possibilities of concrete.
TECHNICAL DETAIL

We try to materialize the aspects we have discussed through the process and look at what the changes mean for the details and construction of our buildings. As the new materials and different climates influence our building, it becomes important to understand what it means for these new details.

We have studied the details of our buildings with the help of engineer Peter Törnblom, from Tyrëns, and drawn details explaining the most complex parts of each building. The details were drawn in 1:50 but are represented as 1:75 in this book.
The new materials and lack of climatization in Boumalne Dades presents us with a few, quite simple details of construction.

The rammed earth walls are quite easy to build after a framework has been put up. They do not need any reinforcement, and for the height of our building, the thickness should be around 40-50 cm. (Baglioni et al. 2013:82) Though the building technique is simple it is time requiring as the walls should dry at least a week to be stable enough to not collapse. (Baglioni et al. 2013:81)

The wooden structure of the roof needs to become a more integrated structure to work as a whole system. To stabilize the 2 meter high beams, the two layers of the roof are woven together and attached with angular steel plates. To prevent the beams from bending and breaking they are stabilized at the top by wooden supports.
After the adjustment of the roof to its new site, it has become something quite different from the original. Therefore, have had to create a new detail to solve its construction. As previously mentioned, wooden constructions work best as integrated systems. The new roof detail answers to this demand brought on by materiality by integrating the two layers of beams and by adding a third structural layer.

The upper beams are interlocked with the lower beams at each intersection. There are supports placed between each of the upper beams, in order to handle shear loads and tipping in the taller beams. At the top of each upper beam, there is a third layer of narrower boards, where fibre glass sheets are fastened. There fibre glass sheets take the place of the original gutters. At the top of each board, where the fibre glass sheets meet, there is a cap that protects the construction from leaking.
1. caps
2. fibre glass sheets
3. bamboo scrimber boards
4. bamboo scrimber beams with supports
5. bamboo scrimber beams & concrete beams
New York has a more varied climate than Venice, and buildings have interior climate regulations that require the building to be insulated. The literary copy of the original and its trees forces us to make further changes to the building. Integrating the trees in a context with different microclimate requirements results in a more intricate roof detail. The original plastic gutters are changed into an atrium-style roof. The trees that go through the roof are integrated to the climate envelope of the roof. Metal sheets are custom welded to fit around the trees and cover the holes in the glass. Space is allowed for the movement of the trees, and the sheets can be adjusted for the tree’s growth.
In Stockholm, the main issue for the structure becomes insulation as this increases the dimensions. Adding to this are the snow loads that need to be taken into account, at least for the roof structure.

To allow for the load-bearing structure while having enough glassed surface to create a light space, we have worked on technical solutions for the roof. Dimensioning the beams to a width of 20 cm, with a height of 100 cm makes room for enough insulation, while not affecting the load-bearing qualities. Reinforcing the walls and pre-stressing the roof beams allows us to cover the spans without any problems. The roof beams would, as in the original be stabilized through the heightening of the lower beams every 366 cm. Further, the new width of the beams would help with this stabilization.

As it becomes important with insulation in this context, creating a good atrium roof becomes crucial. It needs to not only insulate but be able to carry the snow loads during winter and handle the water drainage off the roof.
In our process of copying the original, we have brought out the tensions between the ideas and formal composition of the original, in relation to contextual influences. In our contexts, we have seen that the buildings have distorted differently, depending on to what extent the context can accept the original, as well as how different the new context is to that of the original.

Looking at our buildings, we can conclude that physical changes are necessary to maintain the qualities of the original. At the same time, the existing qualities can get a new meaning in a new context.

Considering this, it is our opinion that when faithfully copying an original into a new context, one becomes an important actor in the transformation into the copy. Interpreting the original and how its different aspects relate to context, and then adapting these into a new context, is a creative act that highlights the relationship between ideas and their physical manifestations. While interpreting these aspects, one is forced to negotiate and make decisions. Like the craftsman’s hand, each interpretation is unique and adds a layer to the copy. Therefore, all faithful copies are unique, making them original copies.

We will now introduce the final buildings in each context.
In Boumalne Dades, our building bridges between two public places by functioning as a covered square. By tilting the floor plane, the building allows for a variation of the continuous flow of the original. Other qualities of the original also have great value in this new site, such as the indirect light, that is given a new meaning in a context where shade is crucial for everyday life.

The building has gone through several stages of drastic changes. At the first step, the building adapted to a height different on site by adding another floor. This change instantly alters the building a lot. The aspect of the site that forced this alteration is not unique to this specific context. Plots with two different levels can be found in many different contexts and would provoke the same reaction from their copies. Other changes are more specific to this context. In relation to the Venetian context, Boumalne Dades is different both culturally and in relation to climate. Both of these aspects have had a big impact on the process of copying. Because the cultural aspects have spatial dimensions and govern how people appropriate built structures, our response to this deformed the building at an early stage. The different climate also continuously affected the process of copying, causing major deformations in all steps.

Looking at the deformations brought out by the context, the image of the building has changed. However, the alterations have been made to keep the qualities of the original. Without allowing for these changes, the qualities that make up the original would be lost. To us, that would be a bigger betrayal on the original than altering its physical aspects.
Our building in Malang sets itself apart from its surroundings, at the same time as it abides its nature. With its cultural program and placement along a growing linear community, it has the potential of becoming an important space in the community.

Looking back at the process, we can conclude that both cultural and geographical aspects have had an impact on the building. However, the cultural aspects have to a large extent been able to appropriate the architecture without deforming it. The local climate, on the other hand, challenges the physical aspects of the original. Because the climate is so different, the building must change to maintain the major qualities of the original and even to function at all as a building. The major alterations of the building thus occurred in the third step, dealing with building envelope, and the fourth step, following up with materiality. This is where the image of the building changes mostly: in relation to the roof and its new materiality. Other visual aspects remain close to the original. However, the reading of these aspects change with the contrast of the roof and its apart placement in this rural context.
On our plot in New York, surrounded by closed brick walls, our building has created an art oasis. The building’s horizontal expression is amplified by the tree crowns sticking up from the roof, forming a unity with the trees in the miniature park. The open nature of the walls opens up the exhibition to anyone who happens to pass by and diffuses the exhibition space into the park.

Here, the building was faced with a context that in many ways did not question the original. The size of the plot was almost perfect, the culture accepts its form and program and the climate needs only small regulations. Because the context allows for a strong influence of the original, the process of copying and adjusting has been steady.

As the visual aspects are clearly alike, it is easy to miss the underlying changes that have kept them that way. In this context, the adaptation became more about fine-tuning aspects than distorting them.
STOCKHOLM

In Stockholm, the building meets the Nordic context, which the original is supposed to symbolize. As such, the original is culturally accepted to a large extent. The biggest clash is found in relation to how the building will be appropriated.

In our process, we found that in order for the building to be appropriated, it would have to show its public value through its program, but also through having a clear actor supporting it. Therefore the biggest change in this context became the second step, when changing the program, and how it uses the space. The other changes were made in such a way to support the new program, and allow it to work in this open space.

As a public building, the architecture of the original suits well in this context. The scale of the building and its openness to the city separates it from the urban fabric and acts as key to its public function. Further, the style of the building evokes connotations to other public buildings.

Even though the ideas of the original are anchored in the Nordic context, their built manifestations are designed for a Venetian climate. Therefore, when implementing these ideas in Stockholm, the built form is distorted, but not to the extent that the visual expression changes.
“Good architects borrow, but great architects steal.”

- Le Corbusier
ATTRIBUTIONS

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**EXHIBITIONS**


**LECTURES**

**INTERVIEW**

Purwanto, Alex, Sentot Purwanto, Adriaan, Werdningsih Purwanto, Endang, Stockholm, 23 April 2017

**CORRESPONDENCE**
Gaudernack, Ole Høeg, curator education at Nasjonalmuseet for kunst, arkitektur og design, email correspondence, 6-7 February 2017.

“Even the most perfect reproduction is lacking one element: a piece of art”
- Walter Benjamin
ILLUSTRATIONS


Right: Silva, Jaime, 16 August 2008 [CC BY-NC-ND 2.0 (https://creativecommons.org/licenses/by-nc-nd/2.0/) via Flicker [web: https://www.flickr.com/photos/20792787@N00/3123287004/] Accessed 17 May 2017.


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29. Detail of Meiquan 22nd Century.

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52. Cloudy, sunny, and precipitation days.

53. Wind rose and speed.

54. Girls performing at angklung festival on Java.

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Dinu, Beatrice, 2017

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83. Timber frame construction.

84. Bamboo constructions.


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