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PRACTICING FACADE RENOVATION OF DANISH BUILDINGS BUILT BETWEEN 1960 AND 1980

Author:
Loay Akram Hannoudi[a], Michael Lauring[a], Jørgen Erik Christensen[b]

Institution:
[a]AALBORG UNIVERSITY, [b]TECHNICAL UNIVERSITY OF DENMARK

INTRODUCTION

Modern architecture evolved less than a century ago to reconcile an idealized vision of society with the force of the Industrial Revolution. The task, then, was to rediscover the true path of architecture to unearth forms suited to the needs and aspirations of modern industrial societies.[1] In the post-Second World war era, the ambitions of the modernists and their 'strong sense of social responsibility in that architecture should raise the living conditions of the masses' seemed enormously progressive and promising.[2]

In those post-war years, a higher degree of industrialization was necessary in Denmark to meet the anticipated expansion in all sectors of society, both public and private.[3] Many advantages were gained through the industrialization of building components; for example, reductions in building cost and the reduced need for bricklayers. The traditional and individual approach to building planning was abandoned in order to make use of the advantages of industrialization through mass production, with repetition and rationalization leading to standardization and categorization[4], however, at the same time many problems occurred regarding the quality of the construction, and these must now be resolved through renovation.

The focus of this research study is on encircling how architectural firms deal with the problems facing buildings that were built between 1960 and 1980. These problems will be investigated through interviews in order to discover the ways in which they were treated during the renovation process, in addition to investigating the architectural improvement of the facades. The study provides an overview of the different approaches and strategies that were used in the building renovations. The paper goes on to discuss the design process, including potential issues with integrating stakeholders in this process.

METHOD

The work in this paper depends on qualitative research methods, namely interviews and site visits. Interviews were carried out with different architectural firms that are involved in building renovation. The interviews covered different subjects related to facade renovation, including both aesthetic and technical aspects. There were also some site visits to a number of buildings built between 1960 and 1980.

THE INTERVIEWS

Interviews were made with seven architectural firms that are involved in the work of building renovation (see Table 1). The focus in the interviews was on facade renovation of buildings built in the sixties and the seventies of the last century. The same twenty-five questions were used in the interviews with the seven architectural firms. The questions covered different elements of the design

process, such as aesthetic, environmental, technical, functional and economic aspects. The questions were divided into three groups relating to the building owner, the architectural firm and the outcome. In some of the interviews there was a focus on a single building, while others looked more generally at a number of different projects (see Table 2). The buildings investigated were categorized according to function as office, institutional and residential buildings; however, the majority of the studied cases are residential buildings.

Table 1. The seven architectural firms that were interviewed for their work in building renovation

	Architectural firm	Location	Interviewed architect
1	Vandkunsten	Krudtløbsvej 14 / 1439 København K	Søren Nielsen
2	C.F. Møller Danmark A/S	Strandvejen 17 9000 Aalborg	Christian P. Gadegaard
3	PLH Arkitekter	Vermundsgade 38K, 2100 København	Henrik Lind
4	NOVA5 arkitekter	Æbeløgade 4, 2100 København Ø	Thomas Dahl
5	Pålsson Arkitekter A/S	Svanevej 26 A, 2400 København	Karsten Pålsson
6	RUBOW Arkitekter	Bredgade 25X, 1260 København	Britt Nemmøe
7	Friborg Og Lassen A/S	Vesterbrogade 124 B, 1620 København V	Karl Huggenberger

Table 2. Different projects that were focused on through the interviews with the seven architectural firms

	Architectural firm	The renovation project	Address	Year of construction
1	Vandkunsten	All the renovation projects in general		1960–1980
2	C.F. Møller Danmark A/S	High rise building in Magisterparken	Magisterparken, 9000 Aalborg	1964
3	PLH Arkitekter	Tobaksfabrikken	Tobaksvejen 4, 2860 Søborg	the 1950s
4	NOVA5 arkitekter	All the renovation projects in general		1960–1980
5	Pålsson Arkitekter A/S	Building in Lundtoftegade	Lundtoftegade 9–81 København N	the 1960s
6	RUBOW Arkitekter	All the renovation projects in general		1960–1980
7	Friborg Og Lassen A/S	All the renovation projects in general		1960–1980

The Building Owner

The type of communication between the architectural firm and the building owner as an important stakeholder differs from case to case. Almost all the renovation projects by the architectural firm *Vandkunsten* were based on competitions, while for the other architectural firms interviewed there was direct contact with the building owners at early stages of the design process. In many of the interview cases, the building owner complained about things, which can be seen and sensed, such as mould and also cracks in some concrete components, where they showed their worries regarding the durability of these components. There were other complaints regarding lack of insulation and ineffective windows, but they don't go to more abstract level of talking about indoor climate and energy saving, when discussing residential buildings. Some of the building owners' wishes were to raise the standard of the building to look like a new building to attract new tenants, as with the buildings renovated by *C.F. Møller A/S* and *PLH Arkitekter*. Most of the building owners did not ask for a specific expression for the facade and left that to the architects, but they did have a desire to improve the visual appearance of the facades. In many projects the building owner asked for a low-cost solution, but as expensive as was required to achieve the purpose intended.

The Architectural Firm

This group of questions investigates the role of the architectural firm in the design process. In general, the work has been done in close co-operation, as reported by almost all the interviewed architects. There were some issues with the engineers because they start late in the process, according to the understanding of *Vandkunusten*. This delay of starting in the process might mean that they are not really integrated in the design process, but otherwise there were site visits and common work with the engineers to analyse the projects and brainstorm in a collaborative way. According to *PLH Arkitekter*, there are sometimes different approaches with different focus areas when working with the engineers, and there was always a need to balance the input data from all parts. The same firm also mentioned that there were workshops from the beginning of the projects to make a common plan. Referring to the different focusing areas by the firm might show that it is a sizeable aspect and it can be challenging for the firm to create a correct balance in the input data from all parts leading to an integration and a harmony between the different areas. *NOVA5 arkitekter* reported that the engineers gave the architects some limits, and *RUBOW Arkitekter* mentioned that there were some problems related to different way of thinking from the engineers; nevertheless, the two firms agreed the work was done via an integrated method and the architects were able to describe their wishes and discuss them with the engineers.

Different architectural approaches were discussed with the architectural firms. How to deal with a building when it is considered an architectural success was a topic that *Vandkunsten* focused on. This consideration is made according to different qualities such as rhythm, facade expression and architectural elements of the facade. As a result, the facade might not be changed significantly but the renovation may implement other strategies, like adding some shades or new canopies. *C.F. Møller Danmark A/S* discussed an aesthetic approach to how to bind a group of buildings together by using similar materials in an aesthetic way. The firm also focused on creating different levels of scale to influence how observers understand the buildings when approaching them. Keeping the expression of the facade as it was originally with minimal change was an approach taken by *PLH Arkitekter* when renovating a building in a low conservation category. In such cases, only the outside parts are considered and internal re-insulation is implemented. *Pålsson Arkitekter A/S* focused on transparency and how to make the inhabitants feel safe, and there was an approach of creating something to enhance the whole street image, encouraging the building user to feel proud about the area. The expression of one facade took inspiration from an old stream alongside the building to inform young people about

the location's history and create an identity for the building. *RUBOW Arkitekter* focused on the relation between the old and the new style, and how to support the old style by giving it a 'twist' so it looks like it has a relationship with the original period, but still has a contemporary expression. There was an agreement between almost all the architectural firms regarding the importance of the old style and how to deal with it when renovating the buildings.

The technical element of the design has a high priority in defining the choice of renovation strategy and the properties of the building components, especially the windows. External re-insulation was the ideal strategy for renovation, as expressed by almost all the interviewed firms. Internal re-insulation is, according to *Vandkunsten*, considered to be very complicated, risky, and hard to suggest even when it makes sense. In Spite of this compilation, *PLH Arkitekter* has successfully used internal re-insulation to retain the expression of a building which has a low conservation category. Demolition of non-load-bearing facades was a decision taken by *NOVA5 arkitekter* in some renovated buildings in conjunction with adding lightweight prefabricated elements, which is a concept that *Vandkunsten* has also proposed in some projects. Using prefabricated facade elements transported to the site and fixed there is frequently used by *RUBOW Arkitekter* and *Friborg Og Lassen A/S*, where the last layer of cladding is added on site.

Daylight was an important factor and taken into particular consideration when renovating schools and residential buildings. However, *Vandkunsten* revealed that this is not significant when renovating residential buildings built between 1960 and 1980 where there is adequate daylight. Instead, the focus is on the social element through directing the windows toward the entrance of the building.

Figure 1 Different levels of scale to understand a renovated residential building in Aalborg, when approaching to it, designed by C.F. Møller Danmark A/S. The view breaks down into smaller parts and there are always new things to see when approaching to it.

Source: C.F. Møller Danmark A/S.[5]

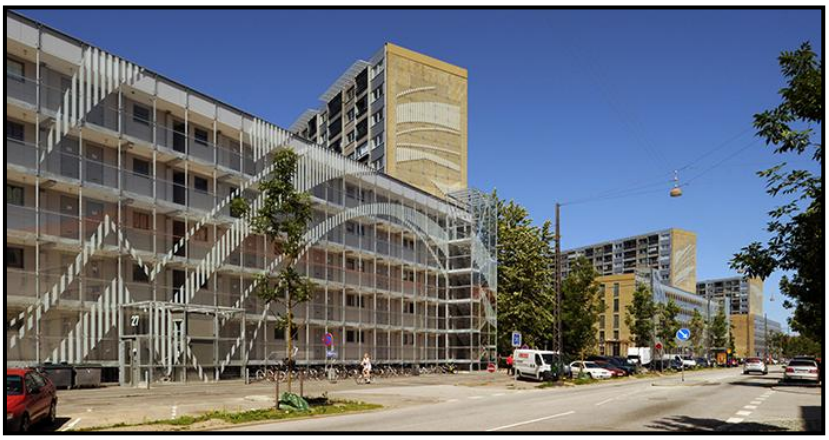

Figure 2 Focus on transparency for the renovation of a residential building in Copenhagen, by Pålsson Arkitekter A/S, and making the inhabitants feel safer (by using stair towers covered with glass) and proud, where the street picture is improved. The glass facade is historically inspired from an old stream that was in the area.

Source: Pålsson Arkitekter A/S.[6]

Environmentally, there were many concerns among the firms regarding the correct choice of materials and recycling the old ones. The average lifetime of the materials was an important parameter used by *Vandkunsten*. As an example, slate, which has a lifetime of about 120 years, is good environmentally and can be used again. The firm was also keen on using wood, which is a renewable resource and can also be recycled. *C.F. Møller Danmark A/S* focused on sorting the old materials so that they can be used again, especially metallic materials, but they were not concerned about the impact of new materials on the environment. *PLH Arkitekter* takes this impact into consideration only when the building owner demands it. Brick and slate are typically used by *NOVA5 arkitekter* because they can be reused or recycled.

The Outcomes

The results of renovating these building facades are varied. Regarding cladding materials, *Vandkunsten* usually uses lightweight ones, and sometimes the firm uses hard insulation with reinforced plaster. In general, the firm does not paint the facade, but it uses different materials which have their own colours. *NOVA5 arkitekter* sometimes uses fibre cement panels for the facade cladding or plasterwork incorporating insulation, while *Pålsson Arkitekter A/S* prefers not to use these materials because they attract dirt. *Friborg og Lassen A/S* uses metal panels, but they are not frequently used by *RUBOW Arkitekter* because they do not give the building a 'natural' feeling. Ceramics are durable, as pointed out by *Pålsson Arkitekter A/S*, but *Vandkunsten* does not use them because of the high price.

Three-layer glass windows are usually used by *C.F. Møller Danmark A/S* and *Pålsson Arkitekter A/S*, while *Vandkunsten* prefers not to use this type of window because they need more maintenance, are heavy, absorb a lot of light and, since there are two chambers, there is also an increased risk of damage.

External shading devices are used by almost all the interviewed firms; however, *NOVA5 arkitekter* observed that it is not good to use movable ones in schools. *Vandkunsten* occasionally uses awnings, while *PLH Arkitekter* sometimes uses roller blinds.

It can be noticed that the architects speak a lot about materials, not so much about indoor climate and energy savings. These issues may be a bit too abstract to the architects too as to the building owners.

The architects like to focus on the aesthetic potentials of materials, and maybe they sometimes use environmental arguments for the choice of materials though having aesthetic agendas.

DISCUSSION

The design process, in general, has been done in close co-operation rather that as a fully integrated design proces, where technical considerations are included from the very first sketching phase thus working as design drivers. There was co-operation between the architects, engineers and the building owner, who described his wishes and demands in the early stages of the design process. The building owners usually complain about things, which can be seen and sensed, such as mould, but they don't go to more abstract level of talking about indoor climate and energy saving. Regarding the architects and engineers, there was a possibility of some disagreements or problems between them due to different priorities, perception of limitations, and approaches that have different focus areas. The architects also had their own objectives, but there was an attempt to solve these problems for the sake of the final goal. In some cases, claiming that the work was done via an integrated method, might not be a real integration when referring to the very different way of thinking from the engineers. In some other cases, the delay of starting in the design process by the engineers might mean that they are not really participating in the actual design, but rather doing calculations and verifications on finished designs. There were no problems regarding communication with the construction companies.

The interviews showed that the technical and economic aspects have high priority. The building owner had a focus on economy and what might be gained from constructing a new facade, by adding insulation to the facade or choosing new energy-efficient windows. The building owner wanted the renovation to end with a more contemporary façade, but he didn't go to more abstract level of talking about indoor climate and energy saving. There was also focus on the durability of the materials and solving problems with mould or cracking in some parts of the facade.

Different architectural approaches were discussed through the interviews. There was a focus on when to consider the existing building architecture as successful, and therefore when to preserve the old style of the building. However, maintaining the old style did not preclude giving the facade a contemporary expression.

Environmentally, there was a focus on the choice of materials including their average lifetime and also the opportunity to recycle the old materials. There were always environmental arguments for the choice of materials, but on the other hand, there are so many different environmental arguments for using materials that there is almost always an argument that can fit to a specific material.

CONCLUSION

Almost all the renovation projects were able to use a method involving co-operating all the stakeholders in the design process from the early stages without any major problems. This reflects the importance all the different architectural firms place on implementing this method in the design process. This co-operation was successfully implemented in spite of differences in the focus areas and priorities among some of the stakeholders. The most used strategy in the renovation projects was external re-insulation, and where this was the case, technical and economic aspects had high priority. However, in some renovation cases, internal re-insulation was also a successful strategy. Different architectural approaches were followed in the cases discussed by the interviewees according to the building requirements, or the need to preserve an existing style and the surroundings. There was a focus on evaluating the old style of the building and how to give it a contemporary expression. There was also a focus on daylight in the renovated buildings, with the possibility of enlarging the windows.

Environmentally the focus was on the lifetime of the materials and the possibility of recycling the old ones.
The interviews were only with architectural firms to show their meanings of different topics. It might potentially be a very good idea also to interview engineering firms to have their meanings on the integration of the design process and to have more focus on the technical part of the design.

REFERENCES

1. W. J. R. Curtis, *Modern Architecture since 1900* (Phaidon Press Limited, 1996).
2. Hayley A. Rowe, *The Rise and Fall of Modernist Architecture* (Newcastle, 2011).
3. K. Dirckinck-Holmfeld, *Guide to Danish Architecture 2: 1960-1995* (Copenhagen: Arkitektens Forlag, 1995).
4. Susanne Mørch Flagstad and Susse Laustsen, *Kontormiljøets Historiske Udvikling* (SBI, 1983).
5. Ibid.
5. C.F. Møller Danmark A/S.
   http://www.cfmoller.com/ (accessed February 2016).
6. Pålsson Arkitekter A/S.
   http://www.paalsson.dk (accessed February 2016).

BIBLIOGRAPHY

C.F. Møller Danmark A/S.
http://www.cfmoller.com/ (accessed February 2016).
Curtis, W. J. R. *Modern Architecture since 1900*. Phaidon Press Limited, 1996.
Rowe, Hayley A. *The Rise and Fall of Modernist Architecture*, Newcastle, 2011.
Dirckinck-Holmfeld, K. *Guide to Danish Architecture 2: 1960–1995*. Copenhagen: Arkitektens Forlag, 1995.
Mørch Flagstad, Susanne and Susse Laustsen, *Kontormiljøets Historiske Udvikling.* SBI, 1983.
Pålsson Arkitekter A/S
http://www.paalsson.dk (accessed February 2016).