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The Royal Library Copenhagen on the harbour front

On the building of a new National Library

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I. Context and requirements

The Royal Library is the National Library of Denmark and the University Library for the University of Copenhagen in the fields of theology, the humanities, the social sciences, and law and the Danish Museum of Books and Printing. The library has three service centres: the main centre on Slotsholmen, located in the central and oldest part of Copenhagen, and, in addition, two service centres in association with the University of Copenhagen, which serve the students attached to the faculties.

The library has 135 km of books and other materials. This is the equivalent of 4.3 million books, to which must be added manuscripts, music, maps, pictures etc., a total of 20 million items. Annual usage is more than 600,000 items: 200,000 of these are used in reading rooms. The main building on Slotsholmen is visited annually by 250,000 people. The collections are built up through legal deposits, gifts and purchases. The total annual additions amount to about 2,000 metres.

The Royal Library is one of Denmark's large cultural institutions. For decades, the library has lacked proper accommodation and an effective modern framework, which permits study and concentration, while at the same time allowing everyone to get an impression of the splendid collections contained in the library.

In connection with the nomination of Copenhagen as Cultural Capital of Europe in 1996, it was decided to resolve the library's problems. The present main building is from 1906. The library is situated in a historic area, encircled by 17th century buildings. The task has thus been to create the long-needed modern framework, while conserving the old building and treating it with respect. To discharge this difficult task, the Ministry of Culture in 1993 arranged a European architectural competition.

It is not a given thing that the library is playing an active, creative-sharing role in a major building project. The aspect of cooperation is emphasised in this paper, along with other collaborative and principle aspects in the building projects. There are many interested parties surrounding large building projects like those in the project for the Royal Library in Copenhagen. The library is not the interested party of least importance. We have been allowed to play a central role from the original concept until now, when we are about to start the building phase proper of the harbour front project, and will be starting the more specific furnishing plans, and are well on the way with preparing the collections for new shelving in the new building. All members of staff are deeply involved in the process.

In the end of 1995 the project has been through a major process in connection with the first invitation to tender, where there was too great a divergence between the budget and the result of the tender. The project has therefore been subject to intensive processing in order to find savings. At the same time, it was a precondition that the functional and architectural aims were retained. We succeeded in finding very great savings within these preconditions, but at the same time, it had to be recognised that the total project could not be implemented without an increase in the appropriation. So it is with great satisfaction that we in the library have received the information that an extra 50 million kroner has been

authorized so the total project can be implemented and it is expected to be completed in September 1998.

The start in 1986

Let us go back to the starting point in 1986, when the library started a comprehensive modernisation project. The work of modernisation was based on two general strategic goals:

- (1) the modernisation of the organisation and services in the library with the greatest possible use of new technology in order to create a modern electronic library;
- (2) the provision of adequate facilities as regards buildings for collections, users and staff.

In 1992, we considered that the first modernisation goal had been achieved with a new organisation and the amalgamation of the Royal Library with the university library, 1. department. In this connection, a radical computerisation of library routines was introduced. But neither new organisation nor new technology can compensate for lack of space.

In the same year, we picked up signals that the second goal, that of new building facilities, could also be within reach. One Working Group in the modernisation project had analysed the building situation of the library and the need for extensions, and another Working Group in the modernisation project had dealt with the relationship between the university and the library. The total building concept can be summarised in three main points, consistent with the endeavour to solve the building problems of the Royal Library with a three-pronged effort:

- (1) extension on the harbour front of the main building with particular emphasis on the extension of the area for the public and the functions of the National Library;
- (2) establishment of a new library building in close association with Copenhagen University on Amager, which would combine a modern University Library/Local library for the humanities with a central stack fitted out to provide a long-term storage solution for the Royal Library collections;

- (3) modernisation of the University Library in Fiolstræde to a modern local library for the Social Sciences and Law.

All three projects are now in train, but here we will just look in more detail at the harbour front project.



Illustration 1: Site plan

New concept for the National Library on the harbour front

The task is first of all to make a new principal building for the Royal Library. The new building will double the total floor space, and it will ensure that the whole complex can function as one integrated whole.

The new building will significantly increase the public capacity of the library and open the library to the outside world much more than formerly. The areas used by the public for library purposes will be increased three-fold and the total areas for the public, which also include

the resident institutes and a multi-function room, will be increased five-fold.

It is wished to utilize the siting on the harbour front, with the Harbour Promenade, for public-oriented purposes. The means of access will be designed in such a way that the activities addressed to the public will be directly accessible from the entrances and partly visible from street level.

The main idea in the new library is to combine the general public-oriented activities with the specialised areas for research in a new way. This will permit greatly improved service for the specialised research and a significant improvement of the general communicative and cultural activities that create a modern culture centre, where the public, as well as being able to study and read, also have the opportunity to experience the splendid collections of the library. This will be realised by combining special centres for research purposes with modern reading rooms and open public areas, which also include facilities for exhibitions, meetings and concerts.

The design of the new library will create integration and cohesion between the functions while enabling a differentiation of the service to the public and safeguarding the assets of the library on the basis of different types of needs.

The areas for the public include the information room, reading rooms and exhibition rooms. This makes it possible to have a number of large and small exhibitions, where the rare treasures of the library can be presented and enjoyed in attractive and secure conditions.

Other important elements are a multi-functional room with a capacity of up to 600 seats for meetings, lectures and concerts. In addition there will be conference and class rooms, a restaurant, cloakrooms and library shop.

Both the exhibition areas and the multi-functional room will have a considerable degree of flexibility.

The special centres will have a more unobtrusive position, so that it will be possible to meet the particular needs for service and working conditions of these collections. The special centres will have the three main elements: users, professional personnel, and collections, in close

physical proximity. This gives, at one and the same time, the best possible conditions for providing rapid and efficient service to the users and achieves the best possible functional and secure conditions for the collections.

A special center is made up of related special collections with a joint reading room as the core. Grouped around this are the service and stacks of the collections, research rooms as well as offices and work rooms for the personnel of the centre.

Within the joint exhibition area on the Gallery for the national collections, there will be exhibition facilities that are suitable for presenting the activities and collections of the centres to the general public.

The housing of related external institutes is also an important part of the Culture Centre idea.

Requirements to the organisation of the building

The complex is planned to include the 11,200 m² (net) of the existing building + a new building with 12,500 m² (net). A total of 23,700 m² (net).

The building complex will have a clear main plan, so that it is easy to find one's bearings in the whole building complex. A library environment that is vital, eventful and friendly to the public will be created, with comfortable facilities for users and a view over the harbour.

In the new building on the harbour front, the axis that goes from Christiansborg through the library garden and the present building will be emphasised. The axis will mark the central connection between the old building and the new construction. The main entrance to the library is expected to be on the harbour front with secondary access on the garden front. The new building will give access to all the public areas of the library.

The building complex has a large spectrum of uses, and it is anticipated that in peak periods the complex will hold more than 2,500 people, apportioned between 500 staff and up to 2,000 users and visitors.

It must be possible to differentiate and limit surveillance and control according to purpose and the section of the building.

Areas with access to library materials are subject to a checking system with control of staff and guests at the exit. The other sections have no checks but physical or electronic surveillance.

The new library is thus more than a library. It is also a Culture Centre. The requirements to the new complex on the harbour front mentioned here are contained in the requirements to be met in the architectural competition in 1993, and they also give a good characterisation of the winning project.

Function diagram

A function diagram was drawn up for the architectural competition to illustrate the main functions and the way they are connected to each other. The function diagram also shows the position of the single functions in relation to the line of the checking system, that is, whether there is access to the rooms in question without having to pass a check line, or whether access means that this line has to be crossed. With the present checking system, everyone who visits the Royal Library must pass through the check system on their way out of the library. In the new library, this is the case only for the users who visit the library proper and have access to the material there. The library exhibitions, restaurant, café and multi-functional room can thus be visited without the visitor being checked.

II. Organising the building project

This section will give a brief account of how the construction is organised, the organisational position of the Royal Library and how it has built up its project organisation. The actual technical organisation of the construction is not dealt with here.

State building projects in Denmark

With state building projects in Denmark such as the Royal Library, the responsible Ministry is the client, that is, the Ministry of Culture. In addition, all state building projects have a specialist building consultant. Ministries with many buildings, such as the Ministry of Education and the Ministry of Defence, have their own construction services, which other ministries can use. The Ministry of Culture generally uses the Building Directorate of the Ministry of Education, and did so in this case too. The third partner is the institution that will use the building.

The Royal Library, with the backing of the Ministry of Culture, has played a very active role during the planning and engineering work and has participated in the decision making in all phases of the project.

Preparation of the building project

In November 1992, when the Folketing (the Danish parliament) approved money for the architectural competition for a new, enlarged Royal Library on the harbour front, it was the culmination of six years' intensive preparatory work. In continuation of the report on the physical planning of the Royal Library, which analysed the hopeless problems with accommodation in the library and indicated models to solve them, further work was done, with the backing of the Ministry of Culture, on more detailed planning, leading to a thoroughly worked-out building programme, where actual costs calculations by professionals were made. So all was ready when the government, with broad political support, in 1992 approved money for an international architectural competition on an extension on the harbour front. On account of the thorough preliminary work, the Royal Library and the Building Directorate were quickly able to draw up a brief for an architectural competition in the winter of 1992/93, which could be approved by the Ministry of Culture. The international competition was won by the architectural company, Schmidt, Hammer and Lassen in the summer of 1993. After this, adaptation of the winning project was begun.

Steering Group and Building Executive Group

The Ministry of Culture, as the relevant ministry and as client, has contact with the Ministry of Finance and the Finance Committee. It is the responsibility of the Ministry that money for the building activities is approved in the proper tempo. Under the Ministry of Culture on one side is the Building Directorate, which is responsible for financial control and professional advice and control of the building project, and on the other side, the institution, the Royal Library.

After the architectural competition had been decided, the Ministry approved the allocation of money for a Building Project Secretariat at the library. This is a temporary administrative unit immediately under the board of directors of the library. The secretariat has a staff of three and coordinates all the library building projects, organises the moving of the collections, the re-location of staff etc. The secretariat also participates in all internal working groups that are concerned with the building activities, and publishes an internal periodical with news about the building projects.

The leading body for implementation of the building project is the Steering Group, which has three members: the Head of Division in the Ministry of Culture, Poul Bache, who is chairman, the director of the Building Directorate, Lars Ole Hansen, and the director of The Royal Library, Erland Kolding Nielsen. The three members each have two consultants. All major decisions are made in the Steering Group.

Under the Steering Group is the Building Executive Group, which has eight members. Of these, the Royal Library has three members and chairmanship: deputy director Steen Bille Larsen, deputy director Karl Krarup (chairman) and the leader of the Building Project Secretariat, head of department Charlotte Rohde. The two last-mentioned participate in the meetings of the Steering Group as consultants for the director general of the Royal Library. Architect Bjarne Hammer and the consultant engineer Chr. Listow Saabye are part of the Building Executive Group. Apart from these, the Building Directorate has two members, a lawyer, Ulla Skall Joensen, and an architect Peter Birk Hansen, who is project leader. Both participate as consultants in the Steering Group. Finally there is a

representative for the four cultural institutes that are to be housed in the harbour front project, administrator Iver Kjær, the Danish Language and Literature Society.

The Building Executive Group is responsible for coordinating the decision making in all the practical aspects of the building project, including the engineering work and design of the building, drawing up controlling budgets, and preparing time schedules. Each time the project faces a crucial phase, a recommendation is prepared, which is submitted to the Steering Group. The Building Executive Group meets once or twice a month. The Steering Group assembles at intervals of one or two months.

Independent technical consultant

The Royal Library, besides, has had the British architect, Harry Faulkner-Brown, as consultant, who is the greatest contemporary authority on library buildings. We met Harry Faulkner-Brown at the LIBER Architecture Group seminar on library buildings in Barcelona in April 1993. We had some interesting discussions during the seminar, which had the result that the Royal Library retained Harry Faulkner-Brown as its own independent consultant. With his particular expertise, Harry Faulkner-Brown has been invaluable in judging the significance for library functions of architectural details, both during the architectural competition and the later engineering work, and has contributed to a large number of technical and functional improvements in the building projects of the Royal Library.

The internal building organisation in the library

The planning work has been done by a number of working groups: a small number of primary groups and a larger number of specialised working groups, who have specified the content and functional aspects of the project for each of their special areas within the library.

To ensure coordination and control of the many working groups, the Building Project Secretariat has had members in all the working groups

and has handled the secretarial work. Minutes have been taken of all the meetings and all the groups have been sent round to the library staff via the internal Building News. As an important steering instrument, the Building Project Secretariat has maintained a detailed "Room database" with the many single rooms in the building project.

The primary working groups

The primary, inter-departmental planning has been done by the following working groups.

- (1) The Royal Library construction management, which plans and coordinates all the library building projects. The group has five members and is made up of the board of directors and the leader of the Building Project Secretariat. Director general Erland Kolding Nielsen is the chairman.

The other four working groups handle the following subjects seen from an overall point of view, which includes all the library functions:

- (2) The electronic library
- (3) Preservation, security and transport
- (4) Stack planning
- (5) Work environment

Working groups during the harbour front project

There have been eight working groups during the harbour front project. They have dealt with various subjects and areas:

- (1) The exhibition areas
- (2) The general areas for the public (information, reading rooms, lending, etc.)
- (3) The special centres
- (4) The multi-function room
- (5) Restaurant, café / canteen
- (6) Technique and operations
- (7) Administration, including conference rooms

(8) The library shop

The working groups have been made up of employees from the departments involved. They have prepared draft papers and reports, which have been regularly discussed with the board of directors. The working groups have had consultations with the architect and engineer and have thus had the opportunity of directly affecting the design of the various sections of the construction.

In this way, the library has ensured the commitment of the staff and has been able to utilise their knowledge and expertise, while progress was strictly controlled.

III. Examples of the influence of the library in the choice and adaptation of the winning project

The following section will go over some of the main areas where we from the library have helped to adapt the building project.

Architectural competition

The project was chosen on the basis of a European architectural competition and the library was represented on the jury. Apart from the functional requirements, we had a number of qualitative demands:

- clearness in the master plan
- practical location of the main functions in the building
- good working conditions for the staff and users
- good internal transport lines
- good as regards preservation
- good operational economy

Three examples:

Good lines of communication. Simplicity in the connection between the new construction and the existing building had to be ensured.

It had to be possible to open the windows. We ascribed great symbolic and psychological importance to the question of whether the windows could be opened or not, because it is important that we are not cooped up in a building with purely mechanical ventilation.

Not too much glass. Modern architecture is characterised by large expanses of glass. Air-conditioning must not be used in public buildings in Denmark for reasons of energy conservation. It can be very hot in the summer in Denmark and we had to avoid getting a building where people and materials suffered from the heat of the sun for one half of the year.

We succeeded in arguing for these views so that the other members of the jury understood the importance we ascribed to these issues, and they were taken into account in the selection of the project.

Master plan

After the choice of project, collaboration with the architects was started. In the first phase, some important adaptations were decided:

- Establishment of a centre in the library:
The bridge between the old and new buildings was changed from a connecting walkway to a broad issuing bridge. In this way, a centre was established in the building with the lending desk as the heart of the library;
- Clearness on arrival at the library:
The functions should be clearly located in relation to each other so that visitors can get their bearings easily;
- General information counter:
A general information counter will be set up in the center of the arrival area;
- Clear division into a general cultural section and the library proper:
The general cultural functions will be gathered on the ground floor, the basement and the first floor, namely: exhibition rooms, conference rooms, the multifunctional room, the library shop, restaurant and café. There is a clear separation between these

sections. The library proper begins on C floor, second storey, which is reached via the moving walkway. At the foot of the walkway on the ground floor is general information and the checking system;

- Acoustic damping for the sake of the reading rooms:
Glass walls have been made between the vestibule and the reading rooms to protect them from noise from the large open areas in the atrium.

Flow of people and materials

In order to be able to determine the dimensions for transport and walkways, a flow analysis for people and materials was made on the basis of these three assumptions:

- Lending is expected to be increased by 50%;
- the number of reading room places will be increased five-fold from 92 to 456, but usage per place will be the same as today;
- the general cultural activities will attract visitors, corresponding to comparable Danish museums.

To determine the load on the single functions, the visitors' purposes were divided into primary and secondary purposes. For example, a visitor's primary purpose can be to use the reading room and the secondary purpose to use the library café. By determining the ratio between primary and secondary purposes for the single functions, the total load on these could be calculated.

Example with the library café: it is calculated that 60 people daily will come with the primary purpose of visiting the café. The number of other café customers is calculated as a percentage of visitors to other functions. For example, 20% of the users of the reading room are expected to use the café, etc.

In addition, an estimate has been made of the number of people who will be in the building, hour by hour, from 7.00 to 23.00, so that the peak load is known. As far as the books are concerned, the amount of transport is calculated on the basis of an expected increase of 50% in the number of

issues. In the flow diagram, the number of books and other materials that will have to be transported daily between stacks, reading rooms, etc., has been estimated. Likewise it has been calculated what the capacity of the lifts should be.

One of the conclusions was that an automatic transport system would not be rational. Instead, an internal messenger service is planned with fixed collection and delivery times, which will be harmonized with a circular transport service between the library's four addresses. Today circulation loan books from all collections can be issued and returned at all three service centres. This policy will continue in the future.

Preservation

Because of a law on the protection of the Royal Library collections from theft, it will only be possible to leave the library section via an exit control, where a guard will check the books and bags of the borrowers and staff. In the future, this will be solved by borrowers not being allowed to bring bags into the library and by the staff having to leave the library through a special exit where their bags will be checked.

All exhibition rooms are located in areas without daylight. This means that books and other materials will be protected from daylight when they are exhibited. In addition, the exhibition areas are located with their own entrances so that they are easier to supervise. The open shelves in the new reading rooms are arranged in the middle of the building without direct daylight.

The possibility of regulating the micro-climate of the stacks has also been discussed. Only special boxrooms for treasures will have proper micro-climate regulation. There will not be long-term storage of books in the building on the harbour front, but in a special storage building that is being constructed at Copenhagen University on Amager. This building will be fitted out to fulfill the necessary climatic requirements and it will be possible here to ensure long-term storage of low-frequency collections, that is, collections with few issues.

New technology

New technology has been discussed particularly in cooperation with the engineers. A new total solution will be implemented for future data communication and other communication for telephone and alarm systems, which includes not just the whole building complex on the harbour front, but the whole library with its four addresses. These will be joined by one common data network with a joint telephone system and a joint alarm system. The library will function as an integrated whole through the joint communication system, across the different addresses.

A structured cable routing was therefore made, with an optical fibre backbone and transmission capacity that enables transmission of motion pictures over the net. It is the plan that modern work-stations can be set up at all staff work places and all reading places, with the possibility of access to the library's own information systems and digital document servers, as well as to Internet. The net is also expected to be security segmented, so that users can bring in their own transportable work stations and plug them into the net.

Capacity in the public-oriented functions

As has been shown, the goal has been to create significantly improved conditions for the public in the new building. Below are some figures for the improvements that are expected for the public-oriented functions in 1998:

	Present situation	Planned figures
Exhibition areas (m ² net)	60	1.475
Places in reading rooms and special centres	92	456
Places in the Information room	46	70
Terminals accessible to the public	32	200
Books on open shelves (physical units)	45.000	230.000
Microfilm on open shelves (shelf metres)	0	1.100
Number of visitors	200.000	800.000*

* calculated for a whole year

IV. Master plan - a cultural power center

The project is based on the terms in the competition that the extension of the Royal Library should be part of a master plan, covering the stretch between the two bridges: Langebro and Knippelsbro.

The library and the possible future concert hall make up two of the walls in a three-wing composition, where "Tøjhusmuseet", (Christian IV's bryghus and Lange Tøjhus), make up the main wall. The historic profile on the harbour front is thus retained, as the historic buildings are laid bare.

The visual corridors from Slotsholmen (the city) towards the harbour, and from the library garden on either side of "the Diamond" are kept, facing the festival square and the passage under the "Fish" to the east.

The future milieu and urban perception of the area as a cultural centre are absolutely dependent on continuous activity.

As a further cultural dimension to reinforce the synergistic effect, it is suggested that there is a natural addition to the area: Copenhagen's new festival square. "The festival square" can give Copenhagen a long-wanted urban element, where cultural and recreational activities, among other things, can take place, examples familiar from such places as St. Mark's Square in Venice. Physically, it is bounded by Frederiksholm Canal, the harbour, and a cascade at the western side of the library.

The cascade will be made as a minor depression in the paving, with the primary aim of creating a stimulating sound picture as a contrast to the traffic noise on Christians Brygge, and of visually underlining the shape of the square.

Every form of "outdoor event" will here have dignified and orderly surroundings.

The edge of "the festival square" towards the water will be designed as simple steps down in the water. Floating pontoons can make up the opposite side of a "water arena".

The visual scale

The harbour front: the historic buildings have been kept clear as regards scale and the new buildings will be subordinate to these.

The harbour: as regards scale and volume, the new buildings have reference to many buildings on either side of the harbour. For example, the Ministry of Foreign Affairs, and also the buildings on Appleby Plads.

In the complete picture, the familiar sky-line is retained.

Main structure - a compact library centre

(Illustrations 2-4)

The present building volume appears as compact and homogeneous. The extension is added to this in concordant scale and texture, which identifies a complete compact library centre.



Illustration 2: The Diamond in the evening light

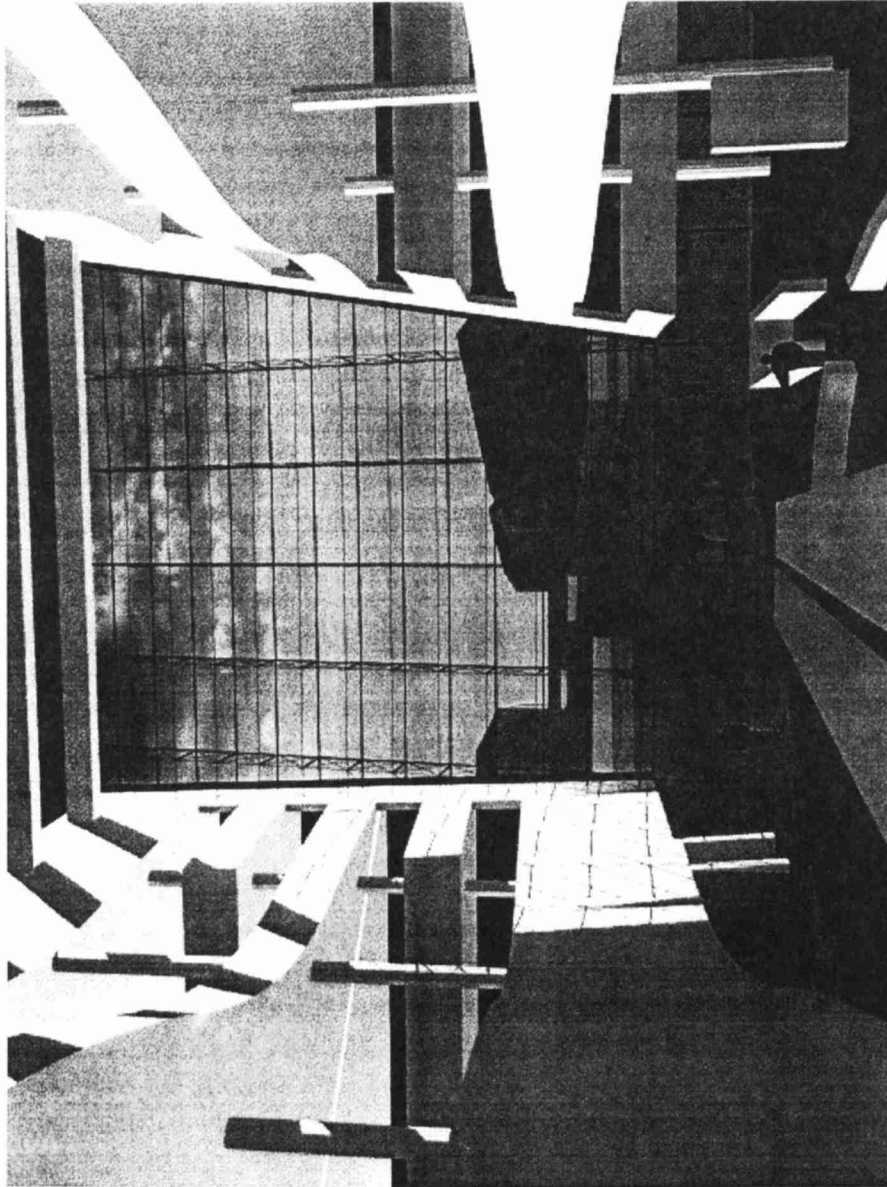


Illustration 3: The atrium and the moving walkway

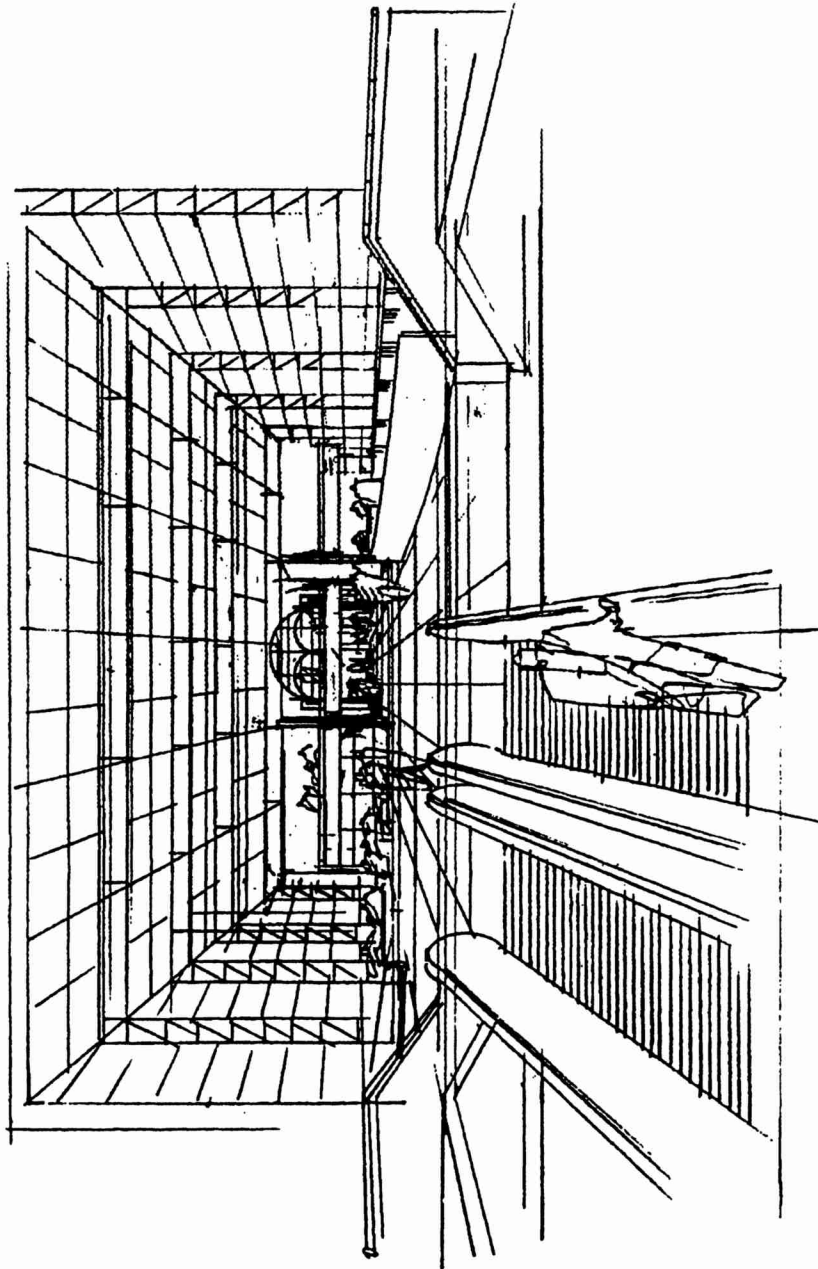


Illustration 4: Lending area at the bridge between old and new building

The new building structure will be seen as a re-arranged continuation of the block structure of the present building from a negative form to a positive form, in as much as the present main axis (north-south) reflects the massiveness of the present building, while openness is the key word in the new building.

The whole complex consists in all of two construction elements: one of them, the present "Holm" building, the other - the new one - the "Diamond and the Fish" and the present "Hansen" building. The Holm building will be preserved unchanged in principal, while the Hansen building will assimilate the facade tilt and surfaces from the Diamond, to which it will thereby be visually linked. Physically, the Hansen building and the Diamond will be connected by a large footbridge over Christians Brygge.

The new main building, the "Diamond": The main approach is in principle of equal importance, whether from Christians Brygge, or over the square, or from the harbour promenade. From a distance, there is already visual contact to the life and activity of the centre - visible under the persistent facade of the "monolith".

There is direct access to all the main sections and functions of the library from the foyer area. The foyer will give an intense experience by virtue of its volume and the "diffuse" light radiating from the large glass roof.

"The Fish": the external institutions that are housed in the library will be located in the two-storey base building to the east. Access to this section from the foyer is by stairs and footbridges on level B, but there is also independent access from street level. The individual institutions are "assembled" in independent wings and situated around a garden area, which opens the view to the harbour.

The inner space

In contrast to the outer space, the inner space expresses openness and the dissolution of the rigid and/or stringent. The large central foyer area is

bounded by the wavelike balcony edges. It will be possible to experience this freedom of form from all areas in the building.

The connection between new and old will be established with the visual linkage on the main level (level C). Here, the transitions in the original glass section in the Holm building will be exposed and be seen in relation to the new footbridge, the undulating foyer space and, at the opposite end, the classic column room.

The "cleft" where Christians Brygge cuts through the building (the "Diamond" and the Hansen building) conveys understanding of "being" in the building and at the same time expresses an inner openness. The facades in the "cleft" with open, transparent glass facades allow the passer-by, both driving and walking, to "have the feeling of being in the building".

The bridges are the connections from the present building and to the Hansen building, which, figuratively speaking, "holds on" to the "Diamond", which, with its integrated tilt, leans towards the future and new horizons.

The levels of the building alternate between single and double-storey spaces. These are cut through some places by bounded volumes, for example, the multi-functional room and the photo gallery.

The double height in the reading room in connection with the central foyer space allows the users to see across the building, as well as having a view over the water and the harbour.

Textural quality

Texture differentiates and makes clear. Harmony is achieved through the colour palette - deep red brick on the Holm building - dark granite on the new main building.

The contrast is experienced in the difference. A matt surface on the Holm building in contrast to a shining and reflecting surface on the new main building.

The square and the "Fish" will have a homogenous appearance with their smooth concrete surfaces, signal the harbour front and make a transition to the neighbouring buildings and the bridges.

The form

The form is the captive image of an imaginary monolith. An image of sublime solidity which also expresses wisdom and dignity. A contrast between open and closed, which reflects the inner functions of the complex and the directions of movement.

The cleft along the floors of the square and the foyer emphasizes the horizontal movement along the harbour front as a public area and allows an insight into a living organism and from inside provides a panoramic view.

The vertical slit registers the north-south axis of the library centre and is an image of the entrance to the library. Christianshavn Canal can be seen as a prolongation of the axis to the south.

The slit "divides" the main building into two formations. Not to separate, but on the contrary to state that, in spite of the varied functions of the complex, the image of a vital and lively coherence is completed - not just for the visitor, but also for the staff in the building.

Lighting and architecture

In the hours of daylight, the facades reflect the light because of their shiny surfaces - they mirror the movement of the water.

The visual depth of the building can be seen in the cut clefts and slits.

The drama of the foyer is reinforced by the light from the high glass roof, which articulates the movement in the form of the foyer and the storeys.

In the hours of darkness, the form will be experienced as a silhouette. Light streams out of the clefts in the building and guarantees a visual fixed point in the night-dim townscape, especially seen from the bridges. From the foyer, light streams welcomingly over the square and along the promenade. In order to keep the form of the "Diamond" and the "Fish" in the hours of darkness, the vertical building surfaces will be illuminated by evenly diffused light.

The Diamond: the continuous horizontal cleft will be illuminated by built-in lights to underline its "floating/open character". Likewise, the large vertical cleft will be pinpointed by the interior lighting of the foyer, which will be reflected out through the glass facade. In the same way, the form of the bridges will be marked.

The Fish: the same principles will be used, but unlike the "Diamond", the lighting will emphasise the bastion-like character of the "Fish".

The purpose of the built-in lighting is to underline the visual depths of the building in its clefts and slits.

The lighting of the building will be seen as several "pictures" with varied emphasis on the lighting forms, but with the purpose of underlining the form of the space, and its aesthetics, colour, materials and function.

Time schedule for extension to the Royal Library

The competition was decided in September 1993. Subsequently, the engineering phase was started and planning proposals were submitted in June 1994. Finally, the main project are submitted in October 1995. The design has begun in June 1995. The finishing building complex will be put into service September 1998.

Conclusion

The finished project, which is now being built, lives up to the requirements in the competition brief and in the competition entry on all important points, and many of the solutions are far better than we had imagined. The collaboration between architects, engineers and the library has thus been very successful.