

Transforming a building to prevent risks: the case of the National and University Library Strasbourg (France)

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Abstract:

Built between 1889 and 1895, internally fully transformed in the 1950s, the main building of the National and University Library Strasbourg was in 2004 diagnosed with a major potential risk. In case of a fire, the whole building would collapse and destroy all its remarkable collections in less than 15 minutes. Still traumatised by the complete destruction of the Strasbourg library in 1870, local, regional and national authorities decided to create a fully new and safe library within the original walls of this historical building, one of the architectural landmarks of the city. Between 2010 and 2014, four years of moving collections away and in again, of destructing all inner structures, of building new spaces for the users and for the collections, have led to one of the most beautiful libraries in France, joining original elements to modern facilities.

Preventing risk was the core of the decision to launch this 65M€ project. The new library now responds to antisismic norms, has a relatively good inner climate stability due to new windows completing restored original ones, has climate control in all stacks and special fire security measures in two historical ones, even has a cold room for storing photographic documents. Cost issues were dealt with from the beginning, leading to some compromises on climate control. All stacks are free from any water pipe, smoke evacuation facilities have not been forgotten, and exhibition areas respond to all official norms.

Four and a half years after the completion of the project, it is possible to draw an assessment of its successes and shortcomings. If the overall situation is nowhere close to comparable to what it was before, communication issues, compromises to reduce the costs, constraints of the original building, but also things not as well planned as they should have been, have however impacted the final result. And new themes have appeared since, linked to sustainable development and – very sadly – to security against terroristic acts, that had not been so actual 15 years ago and need to be addressed today. The improvement of the building is a continuous process that is included in the institution's strategy; reducing risks still is an essential part of it.

Keywords: Risk management; Preservation; Architectural Heritage;

On the night of the 24th to the 25th August 1870 in Strasbourg (France), in the midst of the war between France and Prussia, a bomb fell on the Temple where 300 000 books, among which nearly 3500 medieval manuscripts and 7000 incunabula representing one of the richest book collection in Europe, were housed. The temple and the whole 300 000 books were completely destroyed, causing a trauma not only within the local population but also worldwide, Strasbourg being one of the earliest cities of the book, the city where Gutenberg studied before inventing the print technique in Mainz. Soon after, Strasbourg and the Alsace-Moselle region having become German, a call for donations was made by Karl August Barack, the director of the new Imperial University and Regional Library in Strasbourg (*Kaiserliche Universitäts- und Landesbibliothek zu Strassburg*) created following the will of the German Emperor. In less than two years, 200 000 volumes had been sent to Strasbourg, stored in a palace near the cathedral. Between 1889 and 1895, a new building was erected on the imperial square, opposite the imperial palace, to host what was then in the process of becoming the third largest library in Germany. Some years after Alsace and Moselle became French again at the end of WWI, in 1926, the library got its current status of National- and University Library (*Bibliothèque nationale et universitaire*, or *Bnu*). It is currently the second or third largest library in France, with nearly 4 million items, from Mesopotamian cuneiform tablets to contemporary digital archives, and is an institution placed directly under the Ministry for Higher Education, Research and Innovation (as a comparison, the National library of France is placed under the Ministry for Culture and Communication). If it has since expanded into two other buildings, its main building is still the one opened in 1895. Partly protected as a historical monument in 2004, it is one of the architectural landmarks of the city area classified as a Unesco World Heritage Site in 2017.



Source www.numistral.fr / Bibliothèque nationale et universitaire de Strasbourg

Pic. 1: The Library Strasbourg in 1895

During WWI, part of the building was destroyed by a bomb again, but fortunately, the losses were not as fatal as 70 years before. A complete renovation was then conducted in the 1950s that transformed the interior places and doubled the length of stacks for the storage of books. These new stacks were supported by metal pillars that went through the 6 levels of the building. These metal pillars were hollow: this fact would be of major significance 50 years later. In fact, in the early years of the new millennium, the library looked like what it indeed was: a library of the 1950s. Reading rooms and furniture were outdated and not so comfortable, some of them

were organised from former storage rooms with these metal pillars everywhere between the tables, social and exhibition places were small and impractical, the building was very badly isolated from the outside, with no climate control at all except for a special reserve for the manuscript and incunabula collections. In short, the library really needed to be modernised to enter the 21st century properly. The triggering factor for launching the needed renovation was security. Following a visit, the City's fire department concluded that, in case of a fire, the fire would rapidly spread into the whole building through the hollow metal pillars of the stacks, weakening all floors and leading to an internal collapse and the destruction of the library in less than 15 minutes.

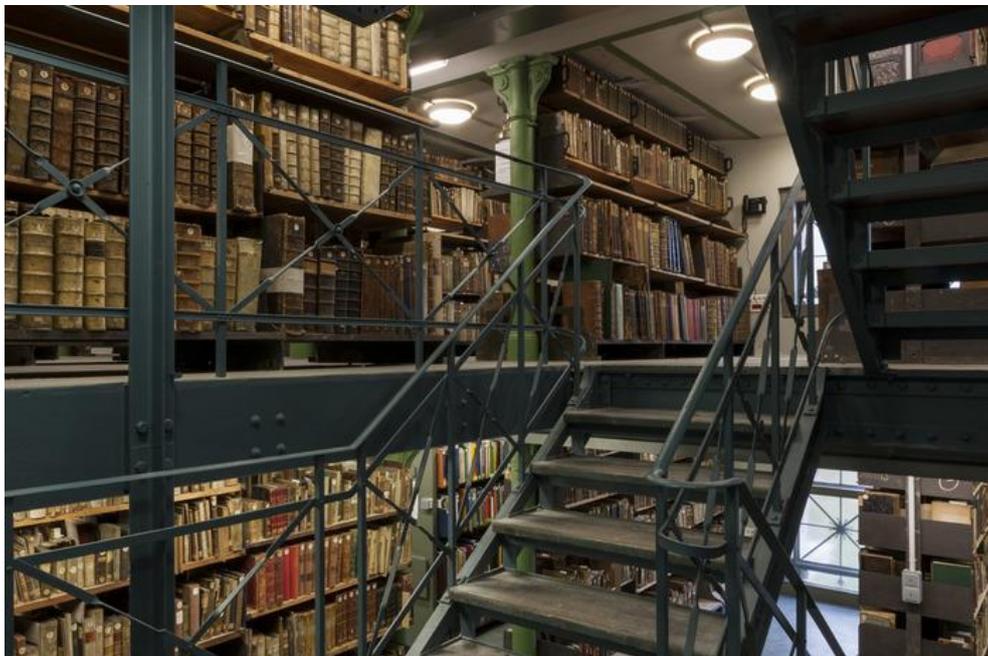
A decision had to be made: either closing the library definitely, erecting a new building somewhere else in the city, or renovating the historical building. The latter was the obvious decision, because of the strategical location of the building in the city centre and the fact that it had been registered on the national list of heritage buildings by the Ministry of culture in 2004 for its external architecture. In 2006, an international architecture contest was launched. Among the 67 candidates who applied, it was the Nicolas Michelin Architects agency from Paris that was chosen. Luckily, the time coincided with the launch of a governmental programme intended to finance large infrastructural and building projects throughout the country. Since the project for Bnu was already finalised on paper, it was among the first to be included in this government funding policy. Due to the major significance of the library not only in Strasbourg but also in the Alsace region, for the preservation of regional documentary heritage especially, local administrations accepted to contribute to the funding. In the end, the 65 million € of the project were financed by the State for 2/3 and by local administration for 1/3.

Many principles guided the conception of the project. First, it had to preserve as much of the original parts as possible, among which of course were the outside walls and the central cupola, landmark in the city, but also parts of the inner architecture. The services of the historical building administration were therefore deeply involved in the architectural conception next the architect Nicolas Michelin. Second, it had to be a modern library, with new social and cultural areas, more and better places for the public, the staff and the collections, and responding to the current accessibility norms for people with disabilities. Third, it had to be an efficient building, both for the preservation of the collections and the consumption of energy. And last, it had of course to be a safe space, for people and collections. It would imply to close the library, empty it completely, destroying nearly all inner architecture while at the same time preserving the outside frame and its remarkable sculptural figures and the 400-tons cupola standing above the building's heart, erecting the new internal structures in alignment with seismic, accessibility or storage norms, then reintroducing the collections in the reading rooms and the storage areas, then the staff, before reopening it to the public. Four years were planned for this, from autumn 2010 until autumn 2014.

In fact, the work began over one year before the date of the closing. The major task was to prepare the nearly 42 km of books to be removed to an external temporary storage area. Twelve people were hired to clean and dust the books during a year, so that they would be moved out as clean as possible. In parallel, since the secured reserve for manuscripts and incunabula was in the main building and was to be destroyed, a new one had to be built in the second building belonging to the institution, just across the street. This new reserve was equipped with a performing climate control and fire security installation. All the precious books were then transported from the old reserve to the new by staff of the preservation and heritage collections department, for security reasons. The rest of the 42km of books were then moved out to another

location by an external contractor, during 6 months, under supervision of the library staff. Those books would stay available for the public by providing two small reading rooms and a lending service throughout the four years of closure of the main building. It took 6 more months to get the books back in place before the reopening in November 2014.

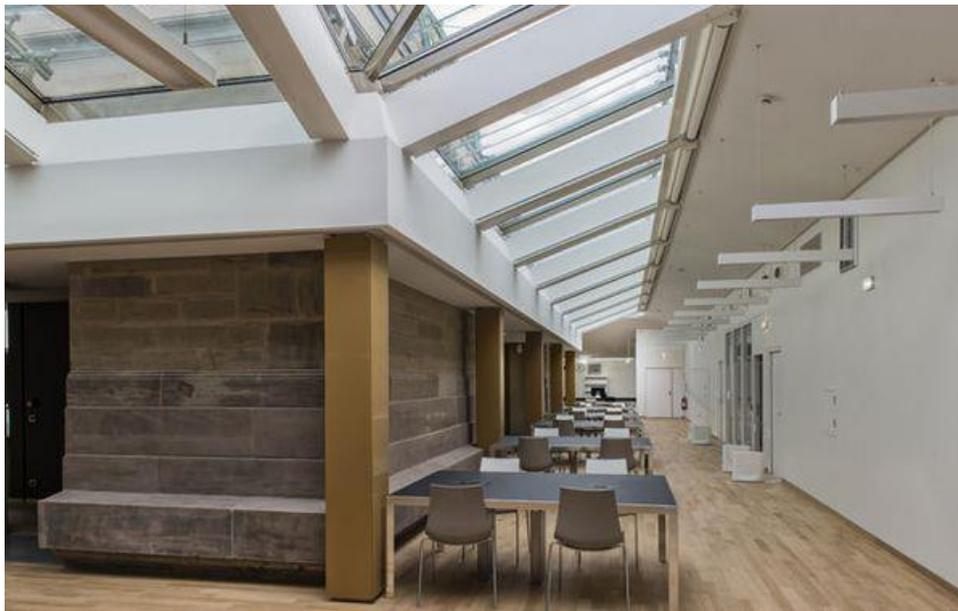
Let's now focus more specifically on security and risk prevention issues that conducted the whole project. As said before, preventing fire risk was the triggering factor that led to the initial decision and even more important, to the funding of the project. All floors that were crossed with the hollow metal pillars were destroyed, and replaced with stronger structures able to support modern mobile stacks. Fire detectors were installed everywhere, with a central command room and an alarm system directly connected to the City fire department. In the two historical stacks that were preserved for memory purposes, a direct fire extinction system with gas was put in place to reduce oxygen levels in the air and prevent the fire to burn. No water pipes in the storage areas was also a principle that was applied following demands by the library. A better isolation of the building, with the creation of an internal row of windows that double the original windows, led to an immediate better climate stability in the storage areas; nevertheless, a ventilation system was put in all storage rooms to assure a good air circulation and control of air humidity as well. A stricter climate control – as well as a special access control – was installed in five specific rooms where the most precious items of the library (the papyrus and ostraca collection, the manuscript and incunabula ones, and many other remarkable objects and documents) are now not only stored but also presented to the public during guided tours. These five rooms presented very specific challenges and difficulties that required more time to fix than initially planned. Another room was planned to become a cold storage room, for photographs and other similar documents.



Pic. 2: The historical stacks preserved in the renovated building

Concerning the broader architecture, 120 pillars were cast throughout the building to support the floors, the historical wall being judged insufficient to support them, especially in case of an earthquake. The 400-tons cupola had to be treated as well, put on rest on four massive concrete pillars instead of brick walls; this was the most remarkable technical feat of the whole project.

Then, if the outside walls could collapse, it would be expected that the inner structure would stay intact. Geothermal heating and cooling was introduced as well to reduce energy costs, by pumping water 80 meters in the ground on the front side of the building, letting it circulate through kilometres of pipes, and putting it back 50 meters deep in the groundwater at the back of the building. Solar panels were however not installed, because of norms related to the protection of historical buildings. Some inner walls from the original 1895 building were kept as a memory, as well as two already mentioned storage rooms that draw surprise and excitement by the public at every open visit that is organised.



Pic. 3: View of the level 6 reading room. To be seen: preserved historical walls, anti-seismic pillars.

In the choices that were made in the course of the project, the Bnu had a voice. A senior staff member, placed directly under the director of the institution, was charged with the mission of supervising it all and with being the day-to-day partner of the architect agency on one hand, of the representative of the State on the other. Many meetings were organised between this three main stakeholders, and the Bnu could express its views, concerns and even solutions. The staff of the preservation department were consulted most of the time, and entrusted with leading some sub-projects, like for instance the conception of the new reserves or the new preservation workshop. However, when the norms for temperature and humidity in the storage areas had to be fixed, the director decided to allow a broader range and a greater flexibility than what the preservation staff would have recommended; this decision was made based on the wish to reduce the costs of energy which, even with a geothermal system, were bound to increase with the new building. Another choice made by the director was the location of the five reserves rooms, where the most precious items would be stored and exposed to visitors. He decided to have them on the fifth floor, just under the roof, in order to be directly next to the special collection reading room. The argument was made that this place just under the roof might not be the most stable and risk-free in the building, and that it could also be better to have these more accessible to the public if one aim was to show our treasures more openly.

These put aside, we can consider that, nearly five years after the reopening, risks for the collections are much less than they were before. Prevention and security procedures have been put in place, exercises and simulations are regularly organised with the City's fire department, a majority of staff members have been trained in emergency intervention on collections. The

large exhibition room has been linked to the national security network of the national museums, with stricter security conditions. Climate control in the stacks is processed regularly, the library has a permanent contract with a company that can follow the climate conditions in the reserves in real time and intervene in less than an hour if necessary, controls of the installations are organised twice a year in every special collection storage areas. There have been not damage due to water, insects or any other cause since the reopening, and one can say that the collections are much better preserved than before. There is nevertheless a new issue of concern, consisting in energy costs that are climbing regularly. A study of the sustainability of permanent ventilation or climate control in the storage areas will probably be conducted in the months to come to evaluate the costs savings that could be made without endangering the collections.

However, the attention to these questions had shrunk among some colleagues in the past two or three years, because there had been no real issue there. In this regard, the recent burning of Notre-Dame de Paris acted as an electroshock for them. Following this, an internal meeting was organised under the supervision of the Secretary general of the institution, first to evaluate the risks again, then to reactivate and develop an emergency team within the library staff, and finally to organise an even closer collaboration with the City's fire department around the salvation of the collections and not only the people. Another electroshock in the months before had been caused by the terror attacks in Paris in 2015, and in Strasbourg itself during the 2018 Christmas market. Security against terror attacks has since then been a priority for the French government. Security checks have been organised at the entrance of the library just following the attacks in January 2015, and have been maintained since. A training was organised for the whole staff, led by a counter-terrorist expert from Paris in autumn 2018, and a complete re-evaluation of the building in view of the terrorist risk is planned for the months to come with cooperation from the police and specialist services from the Ministry of the interior. This has already led to the finding that the entrances of the building might not be secure enough, and that the accesses to the storage rooms should be much more controlled.

If we can draw an appraisal of the situation, we could arguably say that the concept of risk management has entered the institution's state of mind. Collections in the renovated building are now at a low risk of damage, staff is better trained and the City's fire department is well aware of the treasures hosted by the library. Within the institution's strategy for the management of its three buildings, risk management occupies a central place in great part because the two other buildings, which also preserve collections, do not present the same kind of stability, isolation or security conditions as the renovated one. A swift and complete renovation of one of these two other buildings should be necessary, but after having invested a lot of money in the main building, state and local administrations are reluctant to invest again in a less spectacular one. This situation makes the strategic security policy that was designed for the period 2018-2022, even more important. The improvement of the buildings is a continuous process that is included in the institution's strategy; reducing risks is an essential part of it, more than ever before.

Acknowledgments

Pictures by Jean-Pierre Rosenkranz, photographer at the National and University Library Strasbourg

References

Information about the National- and University library can be found on the library's website (www.bnu.fr), or on Wikipedia (https://en.wikipedia.org/wiki/National_and_University_Library).