Structural Innovation and the Stakes of Heritage: The Bellini-Ricciotti Louvre Dpt of Islamic Arts
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More than 20 years after the pyramid built by Ieoh Ming Pei in the Napoleon Courtyard of the Louvre, which was inaugurated in 1989, and the annexation of the Richelieu wing, formerly occupied by the French Ministry of Finances, the Louvre has just been given a new extension. On the 18th of September 2012 indeed, President François Hollande officially opened the new department of Islamic Arts, of which the Louvre has one of the largest collections in the world.

It is situated in the Denon wing of the Museum and underneath its Visconti courtyard. The project had been initiated in 2002 under President Jacques Chirac, and after an international competition in which Zaha Hadid, Herzog & de Meuron, Himmelb(l)au and Francis Soler took part, Italian designer and architect Mario Bellini (with Giovanna Bonti) and French Architect Rudy Ricciotti (with Gilles Rachidi) were selected to work on the integration of the new structure in the middle of the existing buildings, all of high historical relevance and protected by heritage laws. With this new project, almost 3000 square meters of new exhibition spaces were created, which 3000 of the 18200 artefacts representing the historical, geographical and stylistic diversity of Islamic arts the Louvre are presenting. With its current nef and the undulations of its façade, the veiled, the iridescent and golden skin of which is an invitation to metaphor, this cloud floating in the middle of the classic architecture of the Louvre therefore represents a genuine architectural challenge, both on the aesthetic and technical points of view. As the Louvre can’t expand outwards, its walls and all its historical wings have now been reconquered and modernised, the architect’s available spaces are the courtyards and the underground. But the risk was to spoil the architectural identity of the whole complex. In order to create space in this museum, instead of building a glass roof covering the whole courtyard, it was decided to excavate. On a technical point of view, the challenge was to dig into the courtyard without disrupting massively daily operations in the museum and without introducing a structural risk on the old building. The new structure does not touch the old, constructed in the 19th c. by architects Louis Visconti (1791–1852) and Hector Martin Lefuel (1810–1880) on the basis of previous elements dating back to the Renaissance and the age of King Henri IV. The Renaissance and Neo-Renaissance façades remain visible inside from the new structure, which also provides a regulation of light. For the excavation of the courtyard, down to a depth of 12m, thousands of cubic meters had be evacuated through the narrow passageway which connects the Louvre to the banks of the Seine river. The foundations were extended down to the cavernous layers thanks to the technique of jet grouting, with the use of pressures up to 400 bars in order to densify and amalgamate the soil.

The 48x32m structure of the undulating roof was conceived through computerised modelling, the thickness of the veil being calculated according to the specific structural needs of each part. It is made of 2590 (550x150mm) triangles of 2x1m2, assembled together thanks to the 8000 tubes. 45 partial compositions of triptychs were pre-assembled in the factory in Krauss and then taken to Paris for the final assembly. The triple layered glass body of the structure is wrapped into two metallic sheets of bronze and steel, a fact which gives this multilayered skin its aesthetic identity and provides both the necessary rigidity and the wanted effect of undulation. The internal skin is composed by a series of panels in form of honeycombs. Thanks to this complex tridimensional geometry, the 3,2m long structure gives the impression of floating inside the courtyard, 0,5m to 4m above the level of the former pavement, B bearing, rounded and circular pillars of 30cm of diameter provide the support. Among the numerous firms which participated in the construction, Solitanche, Lainé Delau and Waagen Biro were the most important and were associated very closely to the work of architects and consultants in the reflection about technical innovations needed in order to respect the context and the need for combined solidity and lightness. Raffaele Opolita was in charge of the conception of the roof structures and of the glass façades and Benin Consulting worked on the question of the structural engineering. Berlin, together with REA (Hugo Dutton Associates) were also consulted on the question of the roof structure.

Inside, blaks paving stones with inlays of brass chips provide a dark atmosphere for the display of artefacts. The museography, by Renauld Pernard and Mario Bellini, is articulated around display cases conceived by Gaspion and inratis on a non linear conception of the visitor’s experience. Although the distribution of artefacts is chronologically delimited between the two levels of exhibition, visitors are explicitly invited to follow a more complex journey through time and space.

The structure, which was defined as a golden cloud, by the former and future museum directors, Mario Bellini (the French press insisting more on the From the floating carpet) was built at cost of 500 million euros, by public and private sponsors (the Total and Lafarge foundations, but also Prince Awayed bin Talal Al-Saud, King Mohammed VI of Morocco and the Republic of Azerbaijan). In spite of critics on the invasive nature of the project, the museum is a great success. The营业额 is on the rise. The Mayor of Paris, Bertrand Delanoë declared that “the Ricevit-Ricciotti veil will acquire the status of iconic of the Pei pyramid now has reached.”
Фрагмент волнообразной крыши с радужной золотистой оболочкой

Визуализация золотистой «вуали»

Детали волнообразной крыши

объект / object
Отдел исламского искусства Музея Лувр / Department of Islamic Arts at Musée du Louvre

адрес / location
Лувр, 75001 Париж, Франция / Musée du Louvre, 75001 Paris, France

архитекторы / architects
Марио Беллини Аркитектс, Руди Риччотти / Mario Bellini Architects and Rudy Ricciotti

проектная группа / project team
Марио Беллини, Джованна Бонфанти, Раффаэле Чиполлетта, Руди Риччотти, Жерар Ле Гофф, Эди Гаффулли, Эле де Лука, Сириль Эммануэль Иссаншу, Лиа Сильва / Mario Bellini, Giovanna Bonfanti, Raffaele Cipolletta, Rudy Ricciotti, Gerard Le Goff, Edy Gaffulli, Egle de Luca, Cyril Emmanuel Issanchou, Lia Silva

художник / artist
Рей Наито / Rei Naito

заказчик / client
Музей Лувр / Musée du Louvre

конструкции / structure
BERIM

конструкции крыши и стекла, фасады / roof structure and glass, façade engineering
HDA

освещение / lighting
L’OBSERVATOIRE 1

общая площадь здания / gross floor area
4.610 m²

окончание строительства / completion
2012

бюджет / budget
€ 37 000 000

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10/2013 speech:

mario bellini et rudy ricciotti
department of islamic arts at musée du louvre, paris
speech: объектив object
4 Монтаж «вуали» во дворе Висконти

5–10 Этапы строительства

Construction snapshots

6 2008

8 2010

7 12.02.2011

9 03.04.2011

10 24.08.2011

11 25.11.2011

12 Продольный разрез

13 Поперечный разрез

Аксонометрическая проекция

© M. Bellini – R. Ricciotti / Musée du Louvre
Undulated roof with the iridescent and golden skin.

© M. Bellini – R. Ricciotti / Musée du Louvre / Philippe Ruault
15–17 Exposition spaces of the New Department of Islamic Arts

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106

объект

107

object
18 «Вуаль» выполнена из 2350 равнобедренных треугольников (длина каждой стороны 1,2 м).
The veil is made of 2350 isosceles triangles of 1,2m of side.

19 Внутренняя бетонная лестница, соединяющая два экспозиционных этажа.
Internal concrete stair connecting two exposition floors.