RUSSIAN ORTHODOX SPIRITUAL & CULTURAL CENTRE

PRESS CONFERENCE

19.10.2016

A PROJECT DEVELOPED ON A LISTED SITE

The Russian Orthodox Spiritual and Cultural Centre has been built on a site previously occupied by the headquarters of Meteo France. It is situated on the banks of the River Seine, an official UNESCO World Heritage site, in close proximity to a number of very popular Parisian tourist attractions.

The development adjoins the Palais de l'Alma and is not far from the Eiffel Tower, the Quai Branly museum and the Invalides Esplanade on the left bank, and the Grand Palais and the Museum of Modern Art on the right bank.

MIXED-USE DEVELOPMENT PROVIDING AN AMENITY THAT WILL FOSTER SOCIAL LINKS

The mission of the Russian Orthodox Spiritual and Cultural Centre is to raise awareness of Russia's cultural and spiritual wealth for a broad audience, to encourage people in France to learn Russian, and to contribute to the development of Franco-Russian relations.

The development consists of four buildings designed to resonate not only with each other but also with surrounding buildings, forming a harmonious ensemble which merges well into the existing urban fabric:

- A cultural centre (the Branly building), incorporating two exhibition spaces.
- The Holy Trinity Russian Orthodox Cathedral.
- An administrative centre (the Rapp building), including a 209-seat auditorium and foyer, offices of the cultural service of the Russian Federation Embassy in France and apartments for employees of the centre.
- An educational centre (the Université building) with capacity for up to 150 students (children and adults), with classrooms and workshops, a library and indoor and outdoor play areas.

AN ECO-RESPONSIBLE PROJECT

The Russian Orthodox Spiritual and Cultural Centre is committed to an eco-responsible approach that has applied through every phase of the project, from design through to construction: osmosis of the project with its surroundings, flexibility of space, comfort of use, etc.

The project has been awarded HQE Aménagement certification and it complies with the City of Paris Climate Plan and Biodiversity Plan.

GRADUAL TRANSITIONS IN LANDSCAPING

Particular care has been given to landscaping as well as to transitions with public areas in order to ensure that the buildings are closely incorporated into their environment. This results in an open and spacious plot offering a “building + garden” typology typical of the 7th arrondissement of Paris.

From the outset, the project was conceived as an urban project. By comparison with the old Meteo France building, the new development is genuinely able to breathe: the construction of a less dense group of buildings achieves greater fluidity, create spacing that enables the cluster to merge into its surroundings.

LINKS WITH THE PALAIS DE L’ALMA

A wide drive has been created to provide a gradual transition between the Palais de l’Alma and the new buildings.

For the first time, the facades of the Palais de l’Alma, previously concealed by the Meteo France building, are revealed to the public. Part of these facades have been rebuilt according to directions given by the agency for Historic Monuments.

On the Rue de l’Université, between the Palais de l’Alma and the future educational centre, an extensive courtyard has been created, partly covered by a glass roof and concealed from the Palais de l’Alma by a curtain of vegetation.

THE USE OF BIM

From the every start of the project, Bouygues Bâtiment Ile-de-France and Wilmotte & Associés worked closely together to design the buildings. Because of the tight deadlines and the high level of quality that was sought, the team decided to work from a collaborative digital model (BIM), shared by architects and engineers. All participants on the project therefore worked on a 3D virtual model.

This innovative technique is developing very fast. It provides all the participants on the project with working comfort. It enables the architect to design his project in volume and, at the same time, the engineers to incorporate its structure and to link it to the technical networks.

The digital model is a vehicle for discussion and thought, encouraging communication between participants and promoting dialogue between the different trades.

CONSTRUCTION METHOD OF THE CATHEDRAL WALLS

The structure of the church was carried out in reinforced concrete, which was then covered with stone cladding on the exterior and plaster for frescos on the interior.

The facade walls are 17 m tall, 20 m wide and 48 cm thick. Bouygues Bâtiment Ile-de-France set a new record by pouring the concrete of the walls in a single operation for the full height. (The previous record was for the halls of the François Mitterrand Library, whose walls are 15 m tall).

To create this structure, 125 tonnes of scaffolding was erected on the interior of the cathedral, to

which the formwork (the moulds the concrete) was fixed, over a height of 17 metres. Once the reinforcements were in position, the formwork was closed and the concrete was poured in from the top.

This technique called for the development of a specific concrete formulation by the cement manufacturer, Lafarge. The key property of the mix design was gradual hardening that began immediately after pouring in order to avoid huge pressure forming at the base of the walls, which could have caused the formwork to distort or even to burst.

This construction method enabled the site teams to work in complete safety, with shorter construction time, achieving a structure of high quality, without cracking.

WHITE MASSANGIS STONE

The choice of natural Massangis stone, quarried in Burgundy and supplied by the Rocamat quarrying company. The material, which faces the Pont d'Iéna, the Museum of Modern Art and the buildings of the Trocadero, serves to strengthen the Russian Orthodox Spiritual and Cultural Centre's Parisian identity.

Thanks to no fewer than 12,000 elements with numerous different profiles, including 72 unique profiles for the Cathedral and 25 for the Branly, Rapp and Université buildings, the facades of all the buildings are constituent dynamic, playing with the light and creating subtle variations of colour.

THE DOMES OF A RUSSIAN ORTHODOX CATHEDRAL

Onion domes are characteristic of Russian religious architecture. Although the number can vary, there are generally five of them, as there are on the new Holy Trinity Cathedral. The large central dome and the four smaller ones symbolise Christ and the four evangelists, Matthew, Mark, Luke and John.

A WORLD FIRST

Onion domes traditionally consist of a timber or metal framework covered with leaves of gilded copper, slate or ceramic, generally with a multi-faceted surface.

The totally smooth domes imagined by architect Jean-Michel Wilmotte would have been very difficult to achieve using traditional techniques. Bouygues Bâtiment Ile-de-France decided to meet the challenge by using composite materials, and called in Multiplast, a Vannes-based company which specialises in constructing racing multihulls.

Widely used in the aviation and shipbuilding industries, composite materials are virtually absent from the construction sector. The use of this technology to create the cathedral's domes is a world first.

This technique had the twin advantages of considerably reducing the weight of the domes (the central dome would have weighed 42 tonnes in traditional materials but actually weighs only 8 tonnes) and shortening the construction time, because the domes could be prefabricated as the structural works were being executed.

A 9-MONTH MANUFACTURING PROCESS

The process of producing the five onion domes began in June with the manufacture of the specific casts for each petal. The large central dome consists of eight lower petals, four upper petals and a top cone that supports the cross. The four smaller domes consist of three petals and a top cone.

To produce a petal, three thicknesses of glass fibre were placed in the cast, then thermoplastic foam 50 mm thick and finally three more thicknesses of glass fibre.

Using a technique known as infusion, the whole thing was placed under vacuum before epoxy resin which spread over all the fibres was injected. After curing, the casts were struck from the petals, which were assembled to check the fit and then prepared for gilding in the workshop.

Once the gilding was complete, the onion domes were dismantled and transported in a special convoy to the Paris construction site, where they were assembled at ground level.

90,000 GOLD LEAVES

The five onion domes are gilded with a gold-palladium alloy, Moon Gold, a matte-finish gilding, different from the bright gold of the Invalides dome, for instance, or the statues on the Pont Alexandre III.

It required three months and no fewer than 90,000 gold leaves, each measuring 8cm x 8 cm, to gild the five domes, an operation performed at Multiplast's premises by a specialised Parisian company, Gohard.

DIMENSIONS OF THE HOLY TRINITY CATHEDRAL

[Attention : remplacer la virgule dans les chiffres par le POINT décimal.]

TECHNICAL DATA

Address

2 Avenue Rapp, 1-5 Quai Branly and 192 Rue de l'Université

75007 Paris

Development

A cultural centre

A Russian Orthodox cathedral

A parish centre and auditorium

A primary school

Timeline

Land purchased by the Russian Federation: 28/01/2010

Planning permission granted: 24/12/2013

Beginning of demolition: 17/01/2014

Duration of demolition: 6 months (including 3 months for removing asbestos and cleaning)

Start of construction: 15/07/2014

Blessing of the site: 12/02/2015

Foundation stone of the cathedral: 14/04/2015

Blessing of the crosses and raising of central dome: 19/03/2016

Blessing of the bells : 05/07/2016

Raising of the four small domes: 23/08/2016

End of construction: 31/08/2016

Handover: 18/10/2016

Key figures

Land area: 4,240 m^2

Built surface: 4,655 m^2

Height of buildings: 17.55 m

Height of highest cross: 36.20 m

Ceiling height under the large dome: 24 m

1,600 m^3 of Massangis stone from Burgundy quarried (4,000 tonnes)

12,000 stone elements worked for the facades

150 tonnes of stainless steel for the facade

Large dome: 8.2 tonnes, height: 11.5 m, diameter: 11 m, cross: 3.3 m

Small domes: 2 tonnes, height: 6 m, diameter: 5.8 m, cross: 2.3 m

Gilding: Moon Gold (gold/palladium alloy)

90,000 leaves, 88 mm square and 80 µm thick

On site:

- 135 partner companies
- 160 site workers
- 400,000 hours of production work

A 209-seat auditorium

The auditorium is located in the administrative centre. Its foyer, entirely glazed, looks out over the southern esplanade that gives onto Avenue Rapp. The control room is on the first floor.

The semi-circular auditorium has 209 places (including 10 reserved for people with reduced mobility). It can host a wide variety of events (conferences, lectures, concerts, films, etc.).

The shell of the auditorium is a particular technical exploit: it not supported by any pillars at all, but is a suspended structure.

The auditorium was designed in partnership with the scenography consultant, Scène, and the acoustics consultant, Lasa. It employs the most recent technologies and top-of-the-rang technical equipment, providing the space with optimal acoustic comfort.

All the interior walls have been fitted with microperforated acoustic panels and smooth reverberant panels in wood. The ceilings have also been treated for sound absorption and reflection (back of the auditorium, BASWA Phon sound-absorbent surface, plasterboard above the stage).

The seats, which have been produced by the exclusive Italian furniture-maker, Poltrona Frau, are covered in fabric to further optimise acoustics.

The range of species planted

Inspiration for the species planted comes from the Plains of Russia:

School playground

Mongolian limes / Montpellier maples

The orchard (south enclosure of the Palais de l'Alma grounds)

Oriental hawthorns / Medlar trees / Evereste, Japanese, Red Siberian flowering and Yellow Siberian ornamental apple trees / Caucasian elms / Pear trees

Garden adjoining Avenue Rapp

Black alders

Esplanade surrounding the cathedral

Tatarian maples

PARTICIPANTS

Owner

The Russian Federation

Architect

Wilmotte & Associés

Contracting authority, design and construction

Bouygues Bâtiment Ile-de-France

Prime contractor

Bouygues Bâtiment Ile-de-France

Landscaping

Louis Benech

ENGINEERING CONSULTANTS

Facades: VP & Green

Structure: Ceba (Bouygues Bâtiment Ile-de-France)

HVAC, plumbing, high- and low-voltage electricity: Arcoba

Environment: Green Affair

Acoustics: Lasa

Fire safety: Apex Incendie

Scenography: Scène

Surveying: Geoperspectives

Roads and utility networks: OTCI

Restoration: Convergence

Lighting: Speeg + Michel et Associés

H&S Coordinator: Comet

Site inspection: Bureau Veritas

BIM consultant: Atelier Juno

BEFORE - AFTER

NOTES FOR EDITORS

About Bouygues Bâtiment Ile-de-France

BOUYGUES BÂTIMENT ILE-DE-FRANCE, the Bouygues Construction subsidiary in the Paris region, offers comprehensive know-how for new build and renovation projects in four primary areas of expertise: public facilities, private commercial structures, housing and industrial civil engineering. It delivers a comprehensive offering to its customers through the specialities of its operating units and subsidiaries. Specialisation enables Bouygues Bâtiment Ile-de-France to attain the level of expertise required to bring an appropriate response to the expectations of all its customers.

www.bouygues-batiment-ile-de-france.com

About Wilmotte & Associés Architectes

Founded by Jean-Michel Wilmotte in 1975, WILMOTTE & ASSOCIÉS ARCHITECTES is an international design practice that provides urban planning, architecture, interior design,

museography, and product design services from offices located in France, the United Kingdom, Italy and South Korea. The firm's 225 staff are involved in a wide variety of programmes and projects in 27 countries. In 2005, Jean-Michel Wilmotte created the Wilmotte Foundation to raise young architects' awareness on the problem of the graft of contemporary buildings on patrimonial heritage.

www.wilmotte.com

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Légendes :

Digital model © Bouygues Bâtiment – Construction Privée

Construction of a wall © Cyrille Castel

Detail of the facing stone © Wilmotte & Associés Architectes

Ground plan © Wilmotte & Associés Architectes

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