



The Fiber Concrete Prestressed Ring of the Memorial

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Jean-Marc Weill, born 1964, is an engineer, architect and professor of various architectural schools. He is the founder and Director of C&E Engineering office based in Paris. Over the past 10 years he has developed an expertise on the design and calculation of UHPC Structures (fiber high resisting concrete). His office was in charge of the structural design of the Notre-Dame-De-Lorette Memorial.



Fig.1: The elliptical ring memorial (Source Eiffage+Jerome Pouille Photographer)

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Keywords

Ultra high performance fibre-reinforced concrete, post-tension, torsion, BSI,

1. Introduction

The international memorial built at Notre-Dame de Lorette, near the town of Ablain-Saint-Nazaire in Northern France, designed by the Philippe Prost architectural workshop (France) and built by the contractor Eiffage (France), forms an elliptical ring of 129.00 meters by 75.00 meters, located near to the existing military cemetery. The work covers a 328 metre perimeter within 600,000 names engraved on metallic panels. The ring comprises 122 segments, 49 of which form a curving 125 metre long footbridge on four supports. This paper seeks to set out and summarise the ring's design and construction process based on contributions from all of the parties involved in the project.

2. Fitting into the site, geometry and geology aspects

2.1 Historical and political context

The Notre-Dame-de-Lorette International Memorial is a Nord-Pas-de-Calais Region initiative, creating a magnificent monument by the elegance of its architecture, one that is unique in nature and meaning. Whereas the memorials built immediately after the Great War were intended to commemorate the death of soldiers who fought for the nation states, this one, for the first time, celebrates people for humanity alone, bringing together some 600,000 people from around the world. On approaching the site, only the lantern tower of the existing Memorial can be seen. It culminates 52 metres above ground and is the only vertical aspect of the site in a horizontal landscape. The choice was made to blend the memorial into the site. Anchored in the land to the North, it can hardly be seen from the existing national necropolis. On the contrary, from the South, thanks to the slope of the land, the ring is suspended between heaven and earth, as if the mark the fragility of peace... The work covers a 328 metre perimeter. It is designed as a pathway that is accessible to the public so as to move along and brush past the steel panels that the 600,000 names are engraved upon. The ring is a pseudo-ellipse drawn from two curve radius so as to limit the number of moulds used in order to rationalize the construction process. The ring is made up of 122 L-shaped segments, 49 reinforced of which form a curved footbridge 125 metres long on four supports including a 56 meters span opposite the battlefield where the terrain falls away under the memorial... Access is from the North-West side, through a U-shaped trench (visible on the left of the plan). All of the segments have ultra-high performance fibre-reinforced concrete ground slabs and are topped with a canopy overhanging from the vertical face of the footbridge.

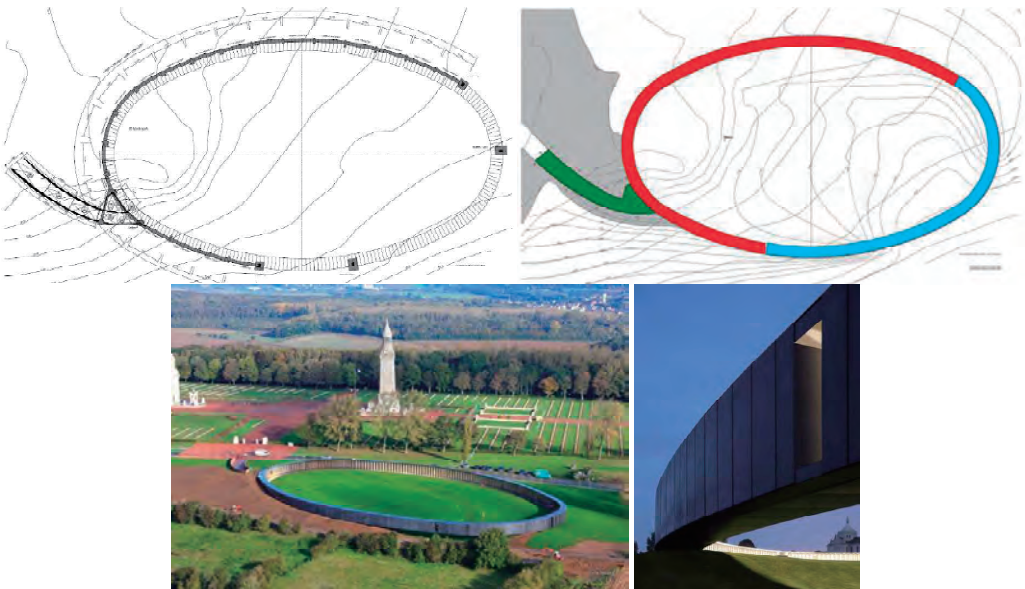


Fig. 2: Visualisation of the two supported conditions of the ring.

On the left side the ring is continuously supported (red)

On the right side the ring is a 125 meters long curved footbridge.