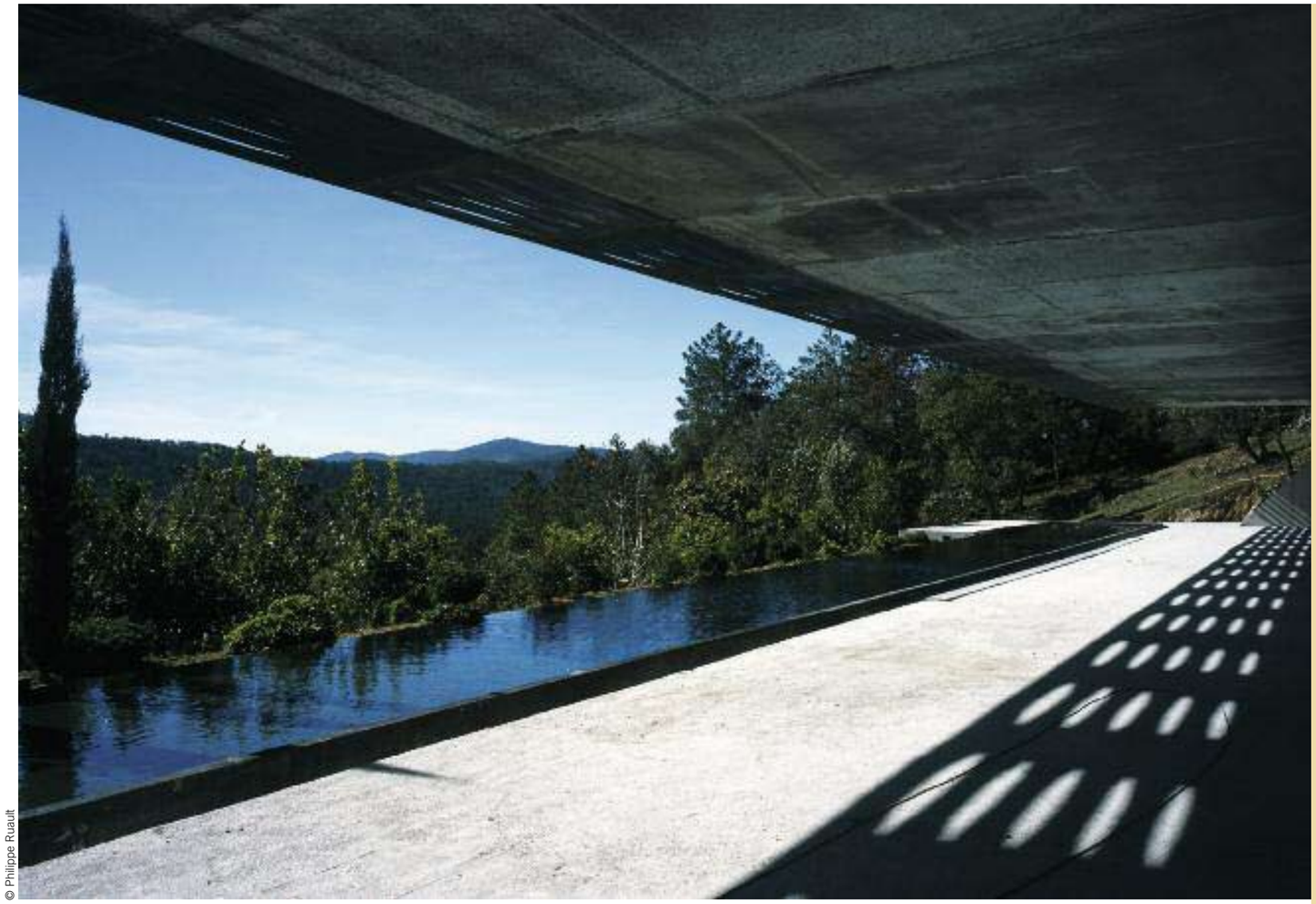
EXPLORING A WORLD ON THE MOVE

La Villa Navarra opens a new era in materials. Its roof in Ductal® concrete is a world first, the hybrid fruit of the boldness and expertise of Rudy Ricciotti*, architect and laureate of the National Architecture Grand Prix 2006, Romain Ricciotti, structural engineer, and Mouloud Behloul, Lafarge concrete engineer. They meet up for a round table to talk about this building.

The structural revolution of Villa Navarra



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RUDY RICCIOTTI

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ROMAIN RICCIOTTI

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MOULOUD BEHLOUL

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An exceptional work, both aesthetically and for its technical complexity, Villa Navarra looks like a long, furtive silhouette set on the very rock, simply laid bare. And it is around this notion of "minimal aesthetics", so dear to Rudy Ricciotti, that the discussion begins.

Rudy Ricciotti : Our intention was to limit the villa's impact on the site by blending it into the slope, without backfill, following a logic of unobtrusiveness. The outcome of this logic is its ultra-thin Ductal® roof. Can you remind us of size, Romain?

Romain Ricciotti : 40 meters long, with a 7.86-meter cantilever and edges 3 centimeters thick.

Mouloud Behloul : In terms of concrete, that's a sheet of paper! Ductal® is an ultra-high performance fibre concrete, which allows us to break away from passive structures. It opens the way to a huge reduction in material and great creative freedom in forms, which, in this case, are curved, feminine.

Romain Ricciotti : These forms were dictated by external restrictions, such as the width of the trucks used to transport materials. But also by the resolute demand for optimum mechanical yield, similar to that of steel structures. This structural roof only works in flexion, with a warp of 4 millimeters as a result of temperature variations, which is completely new. It has no incorporated waterproofing or insulation.

Mouloud Behloul : Here, the material is used in its purest expression. Its specific nature – neither metal, nor wood, nor glass, and not really concrete – forced us to re-ask all those questions that "reinforced concrete" engineers hardly ever ask these days and to re-invent design and manufacturing methods. So, at the pouring stage, we had to calculate and check the direction of the fibres, because these change the mechanical properties of the concrete.

Rudy Ricciotti : What we are talking about here is the very core of our work, which, in my opinion, is all about a choreography of efforts: an exceptional material, used in nuclear power stations, poured in aluminum moulds similar to the moulds used in the aeronautics industry, but employed with the traditional, even archaic, skills of craftsmen.

Romain Ricciotti : You mention a "choreography of efforts"… It's worth pointing out that the successive revolutions initiated by concrete have always come about through "committed" collaboration between architects and engineers.

Mouloud Behloul : As I see it, the Navarra project is the fruit of reflection on the structural properties of Ductal® concrete. It probably marks the beginning of new beliefs and new practices concerning structures.

Rudy Ricciotti : And I'm fairly optimistic about the chances of seeing the use of this exceptional material becoming very widespread.

A HOUSE-GALLERY

> Enrico Navarra's name is widely associated with Jean-Michel Basquiat, since he acted as one of his art dealers in the 1880s. He has just closed his Parisian art gallery down. He intends to make the Villa Navarra and its exceptional site into an enigmatic gallery, accessible only via a virtual visit.

> **Ductal®** is ultra-high performance concrete made by Lafarge: its resistance is six to eight times greater than that of conventional concrete and it contains metallic fibers that make it ductile. While it enables a level of finesse never before seen in classic concrete works, it is also resistant to bending. It can undergo major transformations (pressure or dilation, for example), without breaking and it is resistant to hostile external conditions, such as abrasion, pollution, bad weather and scratches.