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The Wanda Metropolitano Stadium in Madrid as an example of an international architectural project

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The Spanish football club Atlético Madrid will move this year to the Wanda Metropolitano Stadium, which is currently under construction and was originally conceived as a venue for the Olympic Games. The stadium architecture with its highlight - the unusual roof construction - is without question impressive; but the following article is not intended to focus on that, because it is concerned with another part of the complete project: the design of the stadium's exterior layout.

Quadro Outdoor Pavement

With its broadly diversified portfolio of high-quality products, Quadro Outdoor Pavement is one of the most interesting con-

crete block manufacturers in the Madrid region. Managing director and joint-partner Luis Miguel Valle Pompa heads the company in the third generation and has made a decisive contribution to the expansion of the company's product range. From a single product in the first years following the establishment of the company, the portfolio has expanded continually, resulting in today's wide range of different concrete blocks and stone systems. The company manufactures a variety of concrete block products for urban and rural spaces that are often part of large architectural projects. Within the framework of its Smart City division, Quadro has provided the concrete block with a variety of technical and product-related features that allow its use in large national and international projects.



Wanda Metropolitano Stadium - rendering

source: Quadro Outdoor Pavement



Wanda Metropolitan Stadium - aerial view

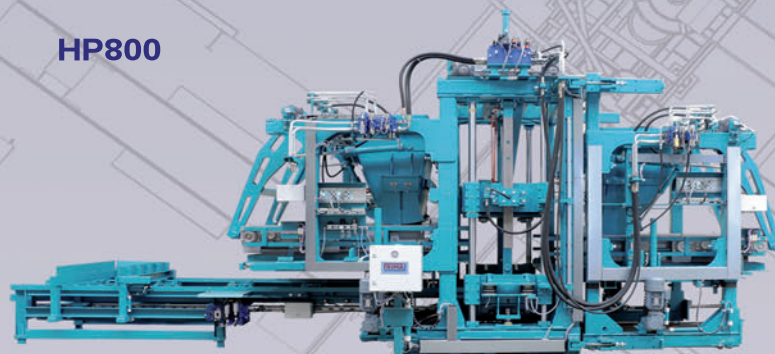
A current example is the production of pavers in different formats and shades of colour for the car parks and exterior layout of the Wanda Metropolitan Stadium with a total area of around 74,000 m².

The relatively simple geometry of the rectangular block, used primarily for practical reasons, made less severe through the combination of different formats in a mixed installation, giving it a very modern and dynamic look. In addition, the products feature the "Fit-Block" self-locking shift protection used specially by Quadro for the project and have achieved very good infiltration values. They therefore meet the high standards of the SUDS (Sistemas urbanos de Drenaje Sostenible [Sustainable Urban Drainage Systems]), which are a prerequisite for the design of the entire external facilities of the stadium.

Much more than a concrete block

Quadro has aligned all of its processes to the manufacture of sustainable concrete products and is certified according to the SLCA procedure (Social Life Circle Assessment) in the context of EN ISO 14040. Taking into account defined criteria such as the consumption of energy required for the production, the proportion of recyclable constituents in the product, carbon dioxide production, water consumption, the reduction of waste and residues as well as the social and health-related aspects of the company's employees, the procedure entails a systematic analysis of the environmental impact over the entire life cycle of the concrete blocks.

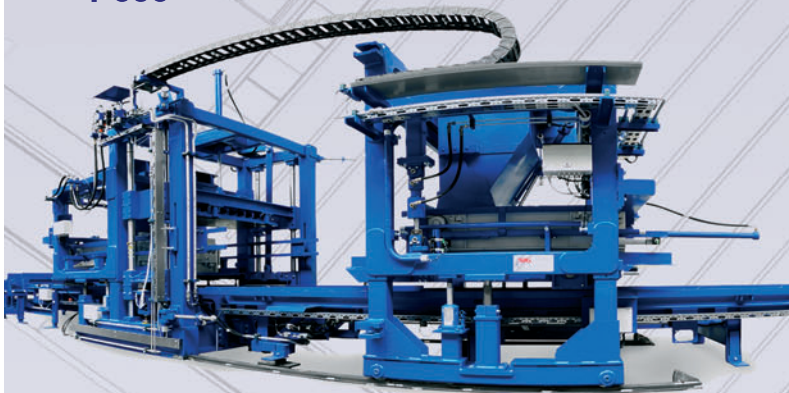
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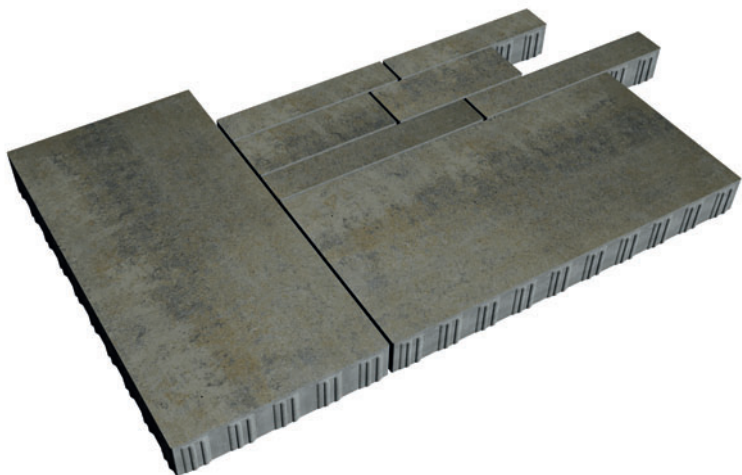
P650



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Installation example of the concrete blocks used in the outdoor area - rendering

The Wanda Metropolitano Stadium serves Madrid's municipal administration as a pioneer project for the application of sustainability and accessibility as criteria for a future-oriented urban development.

For the manufacture of the large number of pavers required for this project, Quadro chose to use concrete block moulds from Kobra Formen GmbH, since their bolted construction combines several advantages.

Dimensional stability

Boltline1™ and Boltline3™ moulds were used for the Wanda Metropolitano, both of which are distinguished by Kobra's proprietary individual part concept.



source: Quadro Outdoor Pavement

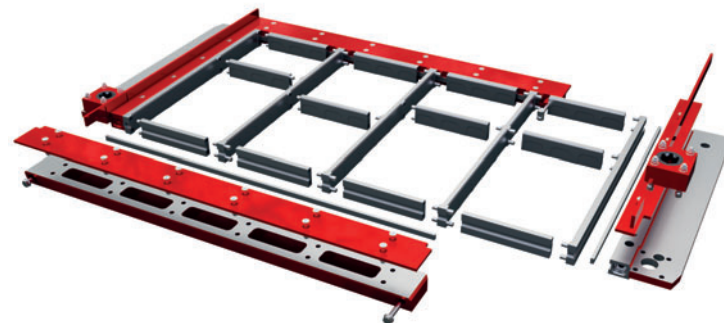
Installation of the concrete blocks used in the outdoor area - photograph

Boltline3 is used for the manufacture of large paving stones, while Boltline1 is mainly used for higher products. In both cases the mould insert consists of fully milled, plugged/



source: Quadro Outdoor Pavement

Production in the Quadro concrete block plant in Madrid



Exploded view of a Boltline3™ mould bottom

Technology Symposium

Interested parties can also get an impression of the concrete block products used, the dimensions of the project, and its current status at Kobra's Technology Symposium. Interesting products will be on display in a show garden and their possible uses documented in an exhibition. Under the motto "Design through Form", architectural projects from Germany, the USA, Canada and Russia amongst others will be presented along with international block trends. In addition to numerous other lectures, technology workshops will take place in the Kobra production halls.

13th September 2017

International architectural projects

- Germany
- USA
- Canada
- Russia

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Requirements placed by international architectural projects on the mould manufacturer

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bolted individual walls that are particularly resistant to wear with a hardness of 68 HRC. The dimensionally accurate assembly of the individual components makes production of concrete blocks with a tolerance of a few tenths of a millimetre possible and thus allows their precise installation.

Furthermore, additional equipment – Singlebolt™ and Flexshoe™ – was installed in the mould upper part, which further enhances the product quality. The brand name Singlebolt describes the use of single tampers that are individually replaceable in case of repair, since they are bolted to the tamper head. Flexshoe refers to rubber-mounted tamper shoes that optimise the compaction process to ensure constant stone heights and smooth surfaces. Furthermore, the damping effect associated with this feature provides for greater stability of the tamper head.

Simple replacement of wearing parts

As with every tool, continuous use of the concrete block mould results in wear. Although this can be countered by the high degree of hardening described above and the precise alignment of the mould bottom and the mould upper part, various other influencing factors, such as machine settings or the quality of the aggregates used, generate typical wear patterns that make it necessary to replace the affected components. Thanks to the bolted mould construction, replacement of worn parts is not a problem for Quadro and can even be done in the plant by the company's own employees.

For this project Quadro has taken out a premium partnership for both moulds, which enables the manufacture of spare parts within preferred delivery times.

Operate Premiumpartner is an instrument for the flexible planning of production processes, since it guarantees fast delivery of wearing parts for concrete block moulds. On conclusion of a Premium partnership, Kobra customers acquire preferential treatment of their spare parts orders and their prompt use on and in the mould. A premium partnership is a meaningful approach for individual production planning, in particular for project-related orders with large lot numbers. If deterioration in the product quality becomes apparent over the course of production, the planned replacement of the wearing parts affected is possible without endangering the delivery times stipulated by the customer.

The completion of the Wanda Metropolitano Stadium and the relocation of Atlético Madrid to their new home field are planned for the next football season. The renowned Madrid-based engineering office IGB Ingeniería básica is responsible for the management of this large-scale project. The building contractor is Fcc Construcción.

Quadro offers its express thanks to the Department of sustainable Urban Development of the City of Madrid, to IGB Ingeniería básica and to Fcc Construcción for their good cooperation as well as for the provision of public documents and photographs.



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