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UK ISSUE 16

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EDITOR VIEWPOINT

Welcome to this, the 16th edition of our Formula UK magazine. I'd like to start off this issue by wishing everybody a happy and prosperous 2010.

2009 was a tough year for the construction industry, to say the very least. But despite this, globally, RMD Kwikform has had the opportunity to, and continues to work on some very exciting and unique projects.

From the worldwide spectacle that was Formula One's Yas Island Marina Hotel through to a stunning Bioframe stadium in Australia and the sheer engineering feat that is the Tyne Tunnel, our engineers have certainly had their work cut out and the whole team has delivered admirably.

In this issue we have a report from a viaduct project in Wolvercote, where a pre assembled Paraslim solution has been so successful that it has been adopted as 'best practice' for future products by developer Costain.

Further proof, if any was needed, that we really are on the right path in meeting the needs of our customers. We also have a special in depth report from the Tyne Tunnel, looking at the traveler system that is making the roof slab of the project possible. And if your eager for more from the Tyne Tunnel project we have an onsite video report showing the system in action on our Formula website. If you haven't visited the site yet the web address is www.rmdkwikform.com/formula_online

With 2010 ahead of us, the diversity of projects we've worked on in 2009 is going to be hard to beat. So, until next time, enjoy your read.

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IN THIS ISSUE

PRE-ASSEMBLED PARASLIM SOLUTION IS ON THE ROAD TO SUCCESS

RMD Kwikform supplies its Paraslim modular cantilever formwork system in pre-assembled modules for the first time on the A34 Wolvercote viaduct replacement project, resulting in the pre-assembled modules being adopted as 'Best Practice' for Costain.

RMD Kwikform's modular cantilever formwork system, Paraslim, has been supplied pre-assembled for the first time on the high profile A34 Wolvercote viaduct project, that is being delivered by Costain on behalf of the Highways Agency.

The A34 dual carriageway is a major access route for freight travelling up into the midlands from the port of Southampton and the south coast. The viaduct gives traffic passage over the Thames flood plain, a major rail line that runs into Birmingham, the Oxford Canal and the heavily used A40.

Whether the 47-year-old viaduct should be replaced or continually maintained has been the subject of much local debate.

After carrying out remedial works on the viaduct it quickly became clear to the Highways Agency that it would be more cost effective to replace the structure rather than continually maintain it.

The contract went out to tender and Costain won the contract to replace the viaduct whilst adhering to the guidelines put in place by both the Highways Agency and the local Council. The fact that the viaduct crosses a railway line, major road and canal made the project just that more challenging.

Tayo Oyetan, Costain's Structures Section Manager and Temporary Works Manager for this project talks about the viaduct and the construction programme ahead. "The challenge on this site is to replace the existing viaduct without disrupting traffic flows.

The solution that Costain has proposed entails replacing the viaduct within its existing boundary. To achieve that we are

building an offline viaduct, which will then give us the room to demolish the existing structures, build a new deck offline weighing 5000 tonnes and slide it into place during an overnight possession of the railway, road and the canal."

"The challenge on this site is to replace the existing viaduct without disrupting the traffic flows."

For a project such as this, which is under constant public scrutiny, completion within programme time is of utmost importance. This is where RMD Kwikform's pre-assembly facility helped provide significant gains in both time and budget.

Justin Bennet, RMD Kwikform Sales Representative for the Home Counties area commented, "After lengthy discussions with Costain we found that pre-assembly of the Paraslim members could offer a huge cost and time saving on this project. Additionally, safety was enhanced because the off-site assembly inherently reduces the risk of on-site accidents for the customer."

Once the decision was made to pre-assemble, the panels were assembled at RMD Kwikform's Aldridge yard. Superslim Soldier primary beams were tied to aluminium secondary beams in order to carry the contractor's plywood deck, and the Paraslim undercarriage was assembled ready for final pinning into place on site.

The 49 Paraslim units were then delivered to site and lifted on to the bridge beams and the plywood deck added.

For Costain there has been clear benefits to using RMD Kwikform's pre-assembled service, Tayo continues, "This facility provided a lot of benefits to us, particularly in terms of programme time. With the pre-assembled system we were able to have it delivered ready for the beams so we could achieve better productivity onsite."

With the viaduct running over a major road, railway link and canal, along with works taking place next to moving traffic, health and safety considerations were, as always, top of the agenda.

"For Costain it is a system we would certainly look to use again, as the benefits certainly enhance what the previous system provided for us."

Once the Paraslim sections were in place much of the work area was protected by Ultraguard edge protection and fully hoarded sections across both the A40 and the railway line.

Also, by using the pre-assembled Paraslim, access to the equipment beneath the soffit was kept to a minimum, with only minor levelling adjustments had to be made via a mobile elevated work platform rather than full in situ assembly. Ultraguard barriers can also be attached directly to the Paraslim sections.

The success of pre-assembled Paraslim on this project, will, according to Justin Bennet surely lead to further applications; "As a flagship scheme for RMD Kwikform we believe this is a real industry leap forward and we'll be rolling this scheme out on several other projects, certainly within the UK and hopefully worldwide in the future."

For Tayo Oyetan and Costain, pre-assembled Paraslim modules have been a success on all levels, resulting in Costain adopting the pre-assembled Paraslim approach as 'Best Practice' on projects of this nature. Tayo commented "For Costain it is a system we would certainly look to use again, as the benefits certainly enhance what the previous system provided for us. It is a clear improvement and the way forward, it's an innovation that we will certainly look to take across to other projects as well." Work on the A34 Wolvercote viaduct is due to finish in Summer 2010

To view a short film about this project, visit www.rmdkwikform.com and click through to Formula online.

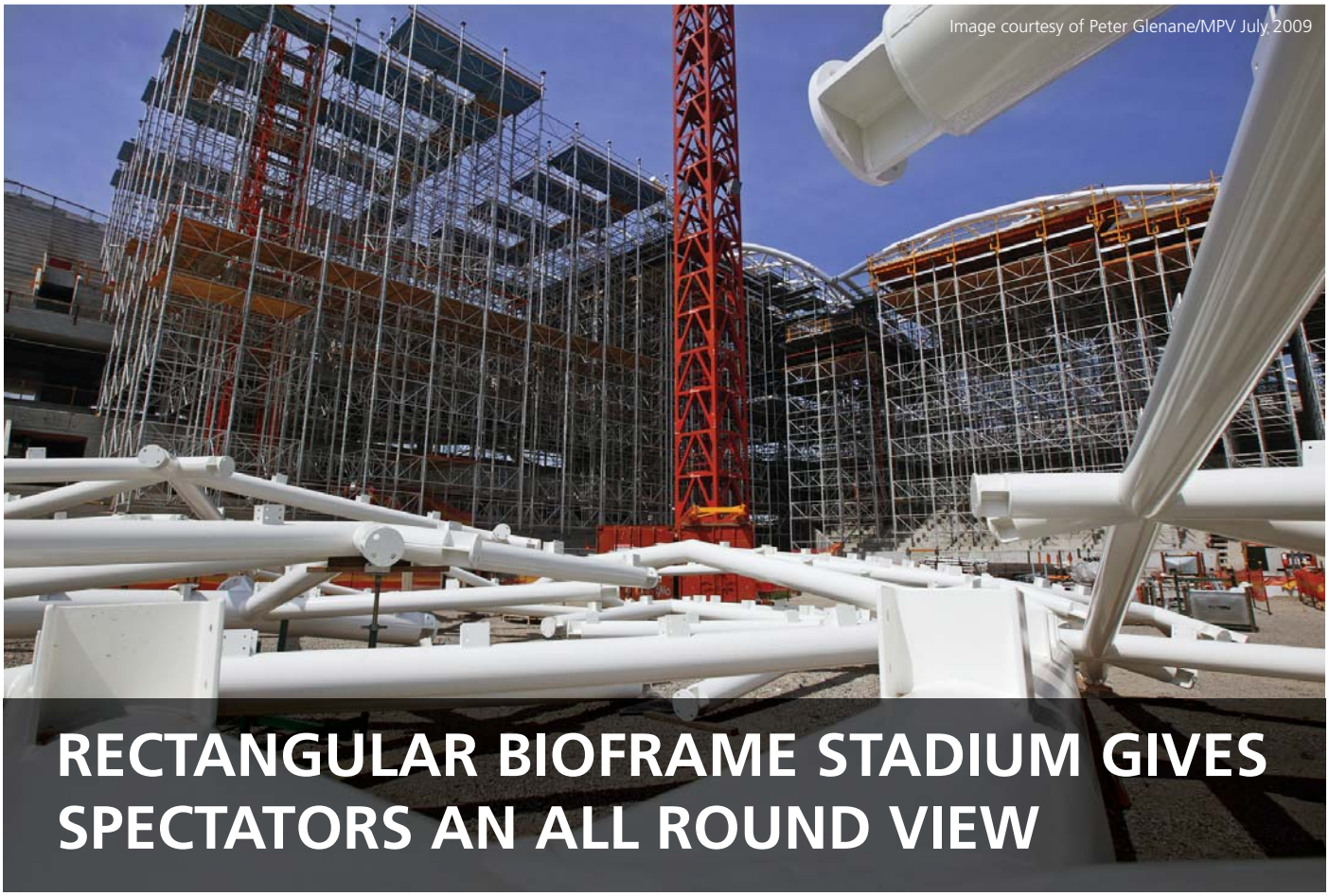


Image courtesy of Peter Glenane/MPV July 2009

RECTANGULAR BIOFRAME STADIUM GIVES SPECTATORS AN ALL ROUND VIEW

RMD Australia puts its Olympic stadium experience to the test in Melbourne, using a combination of Alshor Plus and Megashor to support the construction of the impressive Melbourne Rectangular Stadium.

With a whole range of top class sports teams in need of a world-class venue to play football, rugby league and rugby union, in May 2007 the Victorian State Government commissioned the design of the 31,000 capacity, AUD$267.5 million venue currently known as the Melbourne Rectangular Stadium (MRS).

Located in the Olympic Park Precinct, on Olympic Boulevard in Melbourne, Victoria, the new stadium will be home to football teams Melbourne Victory and Melbourne Storm.

As a key centrepiece for the development of the Melbourne Olympic Park, the MRS is set to combine cutting-edge design and architecture with practical facilities and seating that will offer an uninterrupted view for all sports matches and events. Made achievable thanks to its Bio-frame design, which incorporates a lightweight steel structure based on the inherent efficiencies of the world famous Buckminster Fuller geodesic dome, the roof will substantially cover the seating area, without the need for pillars, walls or other support structures.

Commenting on the MRS and RMD's involvement in its construction, Peter Muirhead Victorian/Tasmanian Regional Manager for RMD Australia said: "It is great to be involved with a world-class project of this kind, the bio-frame roof design itself is unique, and will give the MRS a very strong identity.

"From a design perspective, although we are dealing with supporting 50% less steel than a more traditional cantilever steel roof structure, thanks to the geodesic dome design, the strength and precision of the shoring solution is crucial. Having previously worked with contractor Grocon Constructors Pty Ltd on the Melbourne Cricket Ground Redevelopment in 2003 and 2004, the team at our Melbourne branch began looking at solutions to support the roof structure at the tender stage, using our heavy duty Megashor shoring system.

"Working together with experts at Grocon Constructors through early to mid 2007, we were able to develop a range of safe, practical and cost effective shoring solutions for the numerous challenges of the project. With the use of our Alshor Plus product, we were also able to demonstrate the lightweight but inherent strength of aluminium shoring, mirroring the benefits of the geodesic dome design itself.

"By focusing on these core deliverables, we were able to demonstrate how our equipment and design could meet the clients need for a versatile, labour saving solution. Our first challenge was to support the reinforced concrete beams ranging up to 950mm deep by 1,800mm wide in the podium slab areas.

"In turn these beams carried additional loads from precast hollowcore slabs used to form a base for the main facilities and seating areas. In order to support the installation of these slabs, we designed and supplied our lightweight Alshor Plus aluminium shoring, which was used to support our aluminium Albeam and Alform primary and secondary beams.

"Thanks to the high leg capacity of Alshor Plus, which is able to withstand pressures of up to 120kN/m^2, our design was able to

cater for the high loads, whilst providing the advantage of fast erection and safe dismantling of the falsework. As a modular system, with various leg heights, easy to use jacks and a simple one strike quick release mechanism, Alshor Plus was ideal for this application and having already used it on propping heights of around 4.5m, the client was familiar with the versatility of the product.

"It was for this reason they then decided to use it as a high level support system to provide falsework to an area of beams and slabs at level three of the stadium, approximately 18 metres high. The advantage of doing this meant that the system could be installed complete with bracing frames up to this height and once level three was completed, instead of having to take down the entire 18 metre high structure, the client was able to simply remove some of the leg pieces to take the system down to the next required level.

"By focusing on these core deliverables, we were able to demonstrate how our equipment and design could meet the clients need for a versatile, labour saving solution."

"In practical terms, this meant the construction phase could be reversed, installing the slabs from the 'top down' using the same system. This ultimately allowed levels two and one to be completed in just a fraction of the time, reducing equipment hire costs and labour - both important parts of the overall developments budget. Putting level three together first also gave the roof installation team swifter and safer access to the upper level to undertake critical early preparation work for the roof installation to be completed."

Following an analysis of the Alshor Plus system by the project management team, it was identified that the combination of the high leg load capacity and general 2.4m frame size of Alshor Plus would equate to less components, quicker erection and dismantling times, greater versatility, and reduced labour costs, when compared to traditional scaffold/support systems.

Thanks to this analysis and the performance of Alshor Plus for the slab installation process, engineers from RMD Australia were then asked to design solutions for the utilisation of Alshor Plus on various high-load shoring applications. These numerous tasks were located at various points throughout the construction of the substructure, concourse slabs and grandstands.

Having thousands of metres of Alshor Plus on-site at the peak of the project, the availability, cost effective use and familiarisation of the workforce with Alshor Plus led to its further use for various soffit support applications, whilst the installation of the unique roof structure which commenced during late 2008 took place. Once sections of the roof were installed, Alshor Plus was seen as the best solution to provide support and combined access for fitting roof panels.

With Alshor Plus playing an important leading role in the overall construction of the MRS, it was the use of RMD's heavy duty 1000kN/m^2 shoring system, Megashor, that enabled the safe support and installation of the roof structure itself. With Megashor Towers formed by connecting together four Megashor legs, braced with steel Superslim Soldiers, a safe and robust solution was developed to support the roof installation. Craned into position under each groin, which forms the junction of each shell profile on the bio-frame roof, the loads of the steel roof structure were able to be held into position safely using the Megashor towers.

Peter added: "As part of the safe siteing of the roof components, the Megashor Towers were engineered to incorporate special "headstock" arrangements, designed and supplied by the client. These specials enabled the precise connection of the individual steel components to the node points on the roof.


Image courtesy of Peter Glenane/MPV July 2009

"It is great to see that a project of this scale and global profile has been able to recognise and benefit from the use of two of our leading falsework products."

"With the roof construction already underway it is estimated that there will eventually be twenty Megashor Towers, one positioned under each groin when the roof is fully in place. The highest of these four legged Megashor Towers will be approximately 24 metres from its base to the underside of the roof."

Peter concludes: "Hiring Megashor has allowed the client a greater degree of flexibility in their considerations for supporting the roof compared with the alternative of structural steel fabrication and purchase. It also means that components to make up each Megashor Tower can be supplied to programme for assembly as required, so do not have to be stored on-site.

"In conclusion, it is great to see that a project of this scale and global profile has been able to recognise and benefit from the use of two of our leading falsework products Alshor Plus and Megashor."

With the $267 million Melbourne Rectangular Stadium expected to be completed for its first event in early 2010, it is not long before the crowds of supporters will be able to watch every minute of their teams' games without obstruction.


Image courtesy of Peter Glenane/MPV July 2009

RMD KWIKFORM GO TYNE TRAVELLING

RMD Kwikform pulls out all the stops to win a contract from Bouygues Travaux Publics and Dunne Building & Civil Engineering for the Tyne Tunnel, creating a unique concept for a 21 metre long, 60 tonne falsework traveller system - in just 7 days.

For formwork and falsework specialist RMD Kwikform, given 7 days to go back to the drawing board, following an unsuccessful bid for an important contract on the Tyne Tunnel, led to the conception of the company's most innovative travelling tunnel soffit support system to date.

Having secured the deal through Concessionaire TT2's main Design and Build Contractor Bouygues Travaux Publics at the final hour, engineers teamed up with North tunnel section subcontractor, Dunne Building & Civil Engineering, combining expertise to successfully utilise the unique traveller system.

Travelling on the equivalent of train tracks, the RMD Kwikform traveller used a combination of specially designed and standard equipment to create a solid yet flexible structure, capable of snaking up an incline of 6%. Withstanding loads of up to 750 tonnes the traveller was capable of supporting up to 300 cubic metres of concrete poured over 173 square metres.

As of October 26th 2009, the 21m long traveller system has been used by Dunne Civil Engineering to successfully cast six of the of nine, 1200mm thick roof slabs that make up the roof of the tunnel's North section for the Tyne Tunnel operator, TT2

who, together with Project Promoter the Tyne and Wear Integrated Transport Authority (TWITA), funded £260m project.

For RMD Kwikform Engineering Director, Ian Fryer who led the four strong engineering design team for the project, overcoming the challenges faced at both the design and utilisation stages of the project were particularly rewarding. Ian: "When you are challenged to go back to the drawing board on a project of this scale and importance, it tests all of your engineering knowledge and capabilities.

"The challenge was to deliver a whole-slab-area travelling formwork system with 2 metre height variation which could be operated without the site staff working at height.

The traveller also needed to give the users the flexibility to snake the equipment up an incline of 6%, travelling on rails whilst casting a slab that was up to 8.5 metres off the ground, at the bottom of a 25 metre deep excavation full of large ground shoring props.

"Once we had overcome the design element and been awarded the contract by Bouygues Travaux Publics, we entered the phase of taking the proposal design to the end solution. At this time, because the works for the North contract were subcontracted to Dunne Civil Engineering,

we had to deal with a new construction team to demonstrate how the system would work.

"At this stage Dunne's were able to assist the design team with suggested amends to the design in order for the system to best meet the needs of the site team. The very tight programme schedule also placed further challenges on the delivery and erection of equipment, which physically required assembling and commissioning 60 tonnes of system and special components at the base of what is effectively a large hole.

"As part of the intensive design and detailing phase that followed, the first thing the team concentrated on was the calculations, detailing, procurement and fabrication of the special items of equipment needed for the project. Shortly followed by production of the general arrangement drawings required for assembly and the detailed instructions for use of the machine.

Procurement of the special equipment, (which included the hydraulic leg components that were central to the function of the traveller), ultimately determined whether the system could be assembled and operated within the time frame required."

Having developed an assembly sequence in collaboration with Dunne's for the traveller, RMD Kwikform provided three customer service team members to assist with the erection of the traveller which as a part of the design required the support legs to always be perpendicular to the slope of the soffit.

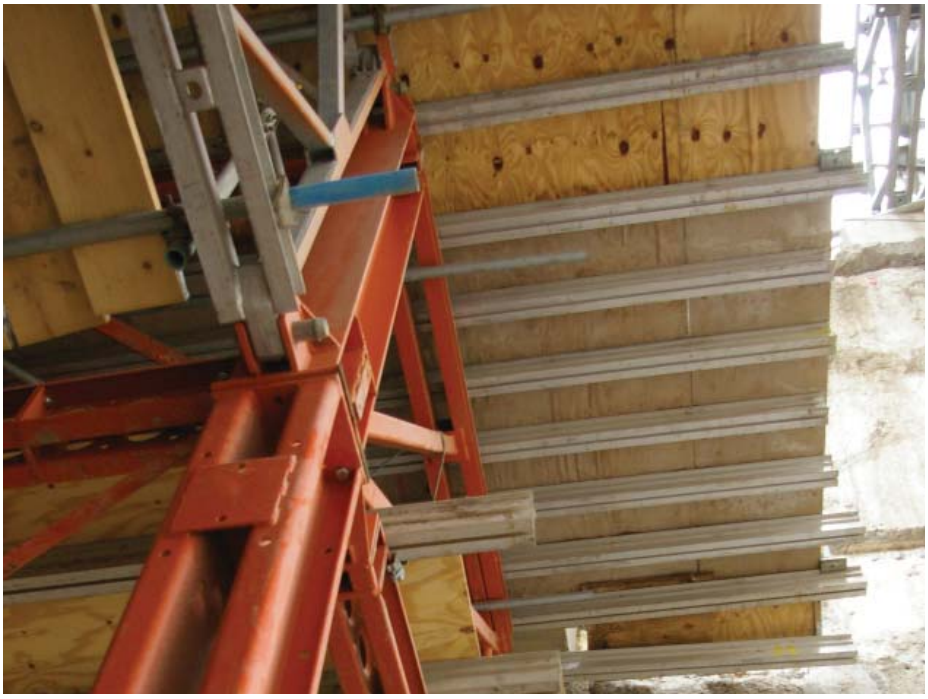
"Once the traveller is lowered onto the rails, the whole unit can be advanced by simply using a pair of three tonne hydraulic Tirfor units attached to the front of the traveller legs using standard equipment."

Commenting on the soffit pours and the traveller system Philip Beausang, Project engineer for Dunne Building & Civil Engineering said: "Whereas the base slab rises at a continuous 6% incline, the height of the tunnel changes multiple times throughout its length, so at some time the soffit slopes by up to 12%.

"With all the challenges we faced on the project, it was actually the very first pour that had the most severe soffit slope. We were therefore tasked with setting up a unique never-before-used system in the hardest possible arrangement!

"We had just three weeks to complete the assembly and commissioning phase of the project and were pleased to have the support of three of RMD Kwikform's customer service team for this phase and for subsequent coarse level adjustments.

"Although we had a challenging start to the project, by working through the early stages with RMD Kwikform, our team were able to carry out all of the required operations without the need for further assistance. As we have grown in confidence with the system, we have been able to



benefit from the speed and simplicity the traveller offers us and have been impressed with its performance."

Unlike previous travellers designed by RMD Kwikform, which incorporated structural steel work at the soffit level, the RMD Kwikform engineering team recognised the opportunity to adapt its R700 truss girder panels for use on this project. By adapting the R700 girders with specially fabricated cantilever frames at the ends, the units were used to span across the tunnel whilst still maintaining sufficient headroom beneath to accommodate site traffic, such as concrete mixers and scissor lifts.

Ian: "In using the R700 girders this had the effect of simplifying and speeding up detailing, whilst increasing the proportion of standard hire equipment of the traveller, making it commercially more attractive to Bouygues and Dunne. Having said this, the special parts that had to be added to the R700 girders were challenging within themselves. "The tunnel is being constructed between deep diaphragm walls and due to the tolerances in the vertical alignment of these walls, the width of the tunnel structure can vary significantly. What this meant in layman's terms was the design of the traveller had to be such that it could accommodate a width of tunnel soffit varying by a maximum of plus or minus 600mm.

"In order to accommodate this, sliding sections of formwork were developed and incorporated into the special cantilever frames, which were then attached to the ends of the R700 girders. These frames also acted to connect the R700 girders to the supporting Megashor and special telescopic legs." Advancing up to 21 metres in about an hour, the RMD Kwikform traveller system has reduced the time for slab pouring significantly when compared

"We had just three weeks to complete the assembly and commissioning phase of the project and were pleased to have the support of three of RMD Kwikform's customer service team for this phase and for subsequent coarse level adjustments."

with traditional methods. This in-turn has allowed this section of the project to be on-schedule for completion by the end of November 2009.

Ian " The most labour intensive part of the project was dealing with course level adjustment. This refers to a section of tunnel where the level of the soffit has to change, either upwards or downwards. In this case the use of the six hydraulic legs, one set on each of the three table sections played an important role.

"Once the traveller is struck by taking the pressure off the Megashor jacks, the specific Megashor legs that require adjustment can be dismantled by simply raising the hydraulic rams to relieve the load. Because Megashor is a standard RMD Kwikform product, there are a range of standard leg length sections from as small as 90mm that can be used to adjust the size of each leg, with the Megashor jack allowing for fine adjustment.

"Once the pressure is removed from the leg it is a simple process of removing four pins in each leg that help fix it to length. These pins can then be driven out and the rams activated to raise the equipment to the correct level. The pins can then be reinserted through the leg sections and the

"In using the R700 girders this had the effect of simplifying and speeding up detailing, whilst increasing the proportion of standard hire equipment of the traveller, making it commercially more attractive to Bouygues and Dunne."

four non telescopic Megashor legs on each table can then be adjusted manually.

"With each pour section mapped out on a programme schedule the Dunne's team were able to refer to detailed support drawings and guidance notes for the whole process."

To view a short film about this project, visit www.rmdkwikform.com and click through to Formula online.

RMD KWIKFORM MIDDLE EAST ROLLS OUT AIRODEK ON ABU DHABI'S ICONIC ALDAR HQ BUILDING

ALDAR Properties' new HQ building is perhaps one of the most unique designs in the world today, and RMD Kwikform Middle East is supplying its Airodek soffit support system for the construction of the basement car park slabs.

The impressive structure stands in the luxury Al Raha Beach development in Abu Dhabi. Having already picked up an award for the 'Best Futuristic Design' it will make a fitting headquarters for one of the region's most inventive developers.

RMD Kwikform Middle East's involvement in the project comes with the buildings fully serviced car park, namely providing the formwork for the slabs across five floors, each consisting of 2400 m2.

For ALDAR Laing O'Rourke the challenge was to find a formwork solution that could meet the exacting requirements of this build. The fact that the perimeter of the basement slabs are fully enclosed by retaining walls, combined with the irregular geometry of the slabs themselves, meant that an easy to erect, versatile soffit support system was needed.

After considering many competitors systems, Temporary Works Coordinator Lee Richardson, recommended the Airodek system to the HQ Project Management Team. "With the slabs having few internal and no external drop beams, the Airodek Prop and Panel system seemed the perfect solution to me. Once RMD Kwikform Middle East came in and demonstrated the efficiency and safety benefits of the system it also quickly became clear to the rest of the Project Management Team that Airodek was perfect for this project."

The collaborative approach that has been used and encouraged on the Aldar HQ project has been key in the successful solution of the Airodek system. This allowed adequate time to fully understand the system and have a demonstration of the benefits of the system in use.

The Airodek Panel and Prop system consists of lightweight aluminium framed plywood panels and adjustable props. Each prop then has a crown at the top capable of safely locking into place four of the aluminium panels to form the soffit. Each floor was split into four pours covering approximately 600m2 per pour. Due to the nature of Airodek the soffit support formwork was quickly in place, erection of the system is incredibly simple and all work is carried out at ground level, eliminating any risk of leading edge or working at height safety issues.

"When a customer you've worked with on previous projects gets to know your product and highly recommends it on new jobs you know you're doing something right."

Once erected, the concrete could be poured; after curing, the entire soffit support formwork was dropped by striking the quick release pins on the props and moved to the next section. This system has allowed for a finished deck cycle time of 100m2 per day, allowing steel fixers to come on to the deck and work safely.

This project represents a continuation of the successful relationship between RMD Kwikform Middle East and ALDAR Laing O'Rourke, working on several other projects throughout the Al Raha Beach development, including both the Interchanges and Precinct bridges.

Andy Teesdale, Key Account Manager at RMD Kwikform Middle East comments, "When a customer you've worked with on previous projects gets to know your product and highly recommends it on new jobs you know you're doing something right. The Airodek Prop and Panel system has performed excellently on this site, giving a fantastic cycle time from slab to slab, which has had a positive impact on the builds overall schedule."

The whole ALDAR HQ development is due to complete in December 2009 and takes its place on the evolving Abu Dhabi skyline.

ANOTHER WORLD BEATER FOR MEGASHOR

RMD Kwikform Iberica delivers bespoke formwork and falsework solution to construct the world's widest, single pylon, concrete cable stayed bridge.

Increasingly, the ability to engineer challenging formwork and falsework solutions to visually stunning projects with global recognition is becoming the forte of not just RMD Kwikform, but in particular its Iberica division. Like recent projects that have gone before it, such as the Princess Letizia Congress Centre, or the Basagoiti viaduct, this latest project from RMD Kwikform Iberica does not disappoint, aesthetically or technically.

Developer UTE RONDA SUR DE TALAVERA, a joint venture between Sacyr, Aglomancha and J. Barcenas, awarded the contract to RMD Kwikform Iberica for the execution of the formwork and falsework for the cable stayed bridge structure and two viaducts (page 17) along the Ronda Sur road in Talavera de la Reina, situated in the province of Toledo.

The 316-metre cable stayed section of the bridge reaches across the widest part of the river Tajo in a single span. Composing of a 36 metre wide deck anchored to a single 190 metre tall pylon by 38 cables on each side of the deck, this is the widest, single pylon, concrete cable stayed bridge in the world today.

Before work could even begin on this project, the river itself had to be channeled and an artificial peninsula created to provide adequate access to the site. Upon completion of the bridge the river will be returned to its normal course and natural state. Temporary piers were then built along the artificial peninsula to support the ongoing construction of the bridge. Once the cables are in place and tensioned to take the load of the bridge the piers will then be demolished.

"As a team, we have a reputation for creating innovative formwork and falsework to meet customer demands. This project also represents the continuing relationship we have with the developers on previous projects such as Menorca Airport and more recently the TVG line in Barcelona."

The creation of the peninsula, while giving access to the site is still liable to flooding in adverse weather conditions, this combined with the ground surface not offering adequate support for the Kwikstage shoring you would normally see on a project such as this meant an alternative shoring system had to be implemented.

Megashor towers, while having more than enough capacity to shore the bridge, required foundations to be anchored to, but given the ground surface this was not possible. Instead, RMD Kwikform Iberica engineers on the project decided to use the foundations of the temporary piers to anchor the Megashor towers.

While providing the solution needed, the temporary piers were not of an adequate width to shore the full span of the bridge deck. To overcome this the Megashor towers were arranged in a 'W' shape and anchored at the pier foundations (see image 1). This solution allowed the Megashor towers to be securely anchored against potential flooding and still provide a wide enough platform to support the three 12 metre RMD450 beams joined together with a specially designed bolt on strengthening plate, reinforcing the joins between the beams to create the 36 metre wide deck formwork.

In forming the deck there are a number of curves and polygons in the design of the bridge. Special parts were designed and created for different parts of the deck to achieve the client's desired angle and shape for the concrete. The need for specials on this project didn't end there.

A number of special components, developed by RMD Kwikform Iberica engineers,

have been used in the construction of the bridge's superior deck. The key to delivering the superior deck was to ensure it could be poured and cast all at once, this meant accommodating formwork for the bridge's four internal cavities and accommodating the all important transversal bars that stiffen the deck preventing any distortion once the pylon's 76 cables are attached.

Julio Merino, from the engineering department at RMD Kwikform Iberica describes how the special solutions were implemented on this project. "To accommodate the transversal diagonal bars we developed a metallic mold that would create the concrete block that would receive these bars. Once the mold and the bars were in place this would allow the superior deck to be created in a single pour.

The 76 cables that support the bridge need to run through the bridge to concrete blocks that receive them on the underside of the deck; here we had to pass a tube through the deck at a very precise angle, different for each cable. To ensure the angle was perfect an auxiliary structure was created from Superslim Soldiers, allowing us to make precise adjustments in height, angle and length and then lock the position of the tube ready for pouring with the cables in situ."

Julio continues, "The superior deck is angled on each side, to create this geometry with the formwork we adapted the standard IPE80 beam. We cut the beams to size to adapt them to the geometry of the deck and we added mounts for props on its underside that allow it to connect to telescopic props. At this stage of the project it's also important that the equipment is lightweight and versatile, as we have to move it out of the cavities through a worker access opening into the next section and so on. The lightweight construction of the IPE80 beam meant it was light, easy to move and relatively quick to assemble."

Once the bridge deck was in place, RMD Kwikform Iberica's engineering team turned its attentions to the concrete bulkhead that would provide the stage for the bridge's single 190 metre pylon. Here, the challenge was that the bulkhead is built on a structure called pier 0, which in itself is four metres high.

This meant that to form the rectangular 4.5 metre high, 22 metre deep and 16 metre wide bulkhead it had to be poured four metres above ground level, needing formwork to accommodate a height of 8.5 metres, and withstand the pressure of enough concrete to cast the bulkhead in a single pour.

The final solution consisted of formwork panels using Superslim Soldiers as primary vertical beams, and secondary T200 timber cross beams. These are then supported with adjustable Superslim Soldier props called push-pull props, which are adjusted between its axis. This incredibly versatile system combined with the inherent strength of the 150 kN Superslim Soldiers allowed the structure to withstand the load produced by the sizable auto compactable concrete pour.

Antonio Vázquez, Sales Manager at RMD Kwikform Iberica commented on the success of the solution delivered on this project. "When we tendered for this project with UTE Ronda Sur de Talavera, we new our success in winning this contract would be our engineering expertise in delivering specialised formwork and falsework applications and solutions to improve build efficiency and meet deadlines.

As a team, we have a reputation for creating innovative formwork and falsework to meet customer demands. This project also represents the continuing relationship we have with the developers on previous projects such as Menorca Airport and more recently the TVG line in Barcelona."

TOUCH DOWN FOR ALSHOR PLUS WITH THE TEXAS LONGHORNS

Alshor Plus makes a successful College Football debut in America with its use in the construction of a new stand as part of a multi-million dollar development for the University of Texas .

Now watched by over 98,000 supporters, thanks to the development of a new stand using RMD Kwikform's Alshor Plus lightweight shoring system from American formwork specialist CMC Construction Services, the Texas Longhorns football team can now enjoy support from one of the largest crowds in college football.

The project itself involved the infilling of one end of the stadium known as the 'North End Zone' with a new stand that increased the seating capacity of the whole ground for the 2009 season from 75,000 to 98,638. With the current attendance record at 98,053 as of May 2009, the success of the new stand has already enhanced the spectator and players experience.

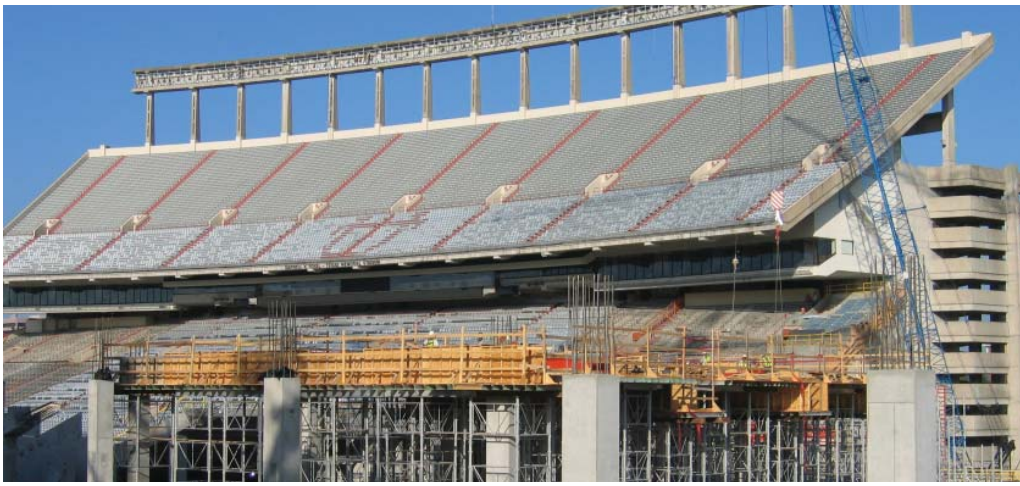
For RMD Kwikform's Business Development Director Roger Smith, the use of Alshor Plus for the project in itself broke the sports traditional mould, as he explained to Formula: "Traditionally in the American market stadia developments of this nature tend to use steel shoring and timber based formwork systems. The use of Alshor Plus was therefore a complete change for the industry, replacing heavy steel and timber with lightweight aluminium, almost like putting a tailback behind the offensive line!"

But for contractor Rago meeting the short deadline of just 6 months to complete the lower deck of the stand before the first game of the season in August required the use of a proven system that could be erected and dismantled quickly and efficiently.

Roger: "When you are helping a well established company like CMC Construction Services bring a new product and therefore new working methods to a nation as vast as the USA, it is important to make sure you provide the support needed to enable a smooth transition from traditional techniques to a system approach.

"The beauty of this project was its modular style build and symmetry as a number of Alshor Plus towers could be assembled at the same time and then just moved into place."

"Although Alshor Plus is itself a successful global product, that has been used on some of the most impressive projects in the world, like the Dubai Mall and the Worlds largest Hospital in Qatar, its use for the Texas Longhorns stand development was really made possible thanks to its successful application in the construction of a water tank in Albuquerque.



"It was working in partnership with CMC Construction Services on design and equipment erection training on-site by our engineering team that made the Albuquerque project such a success and gave CMC Construction Services the confidence to sell Alshor Plus for additional projects."

Having undertaken this training and purchased a large amount of Alshor Plus equipment, the CMC Construction Services team were able to demonstrate the flexibility of the system to Rago and working with the RMD Kwikform design team, develop a simple solution to the shoring needs of the project.

The construction of the structure itself involved the formation of a 10 level stand with a precast concrete slab used to form the seating area, ultimately supported by a number of concrete columns and 6ft thick in situ concrete beams. The role of Alshor Plus was to shore up the Aluminium primary and secondary beams supporting the plywood face for the in situ beams.

Because of the tiered nature of the structure a range of Alshor Plus legs sizes were used with the adjustable jack and in-built quick release mechanism also used to obtain the exact levels required for the design. With frames used to stabilise the legs, which have a capacity to withstand loads of up to 120kN the tallest Alshor Plus tower reached up to 22 metres.

Roger: "The beauty of this project was its modular style build and symmetry as a number of Alshor Plus towers could be assembled at the same time and then just moved into place. What we also discovered is that the traditional method of constructing shoring in America tends to be based around constructing towers in the horizontal on the ground and then lifting into them up into place using cranes. Having tested this approach with the Albuquerque water tank we were able to give this additional option to the erection team enhancing the safety aspect of using Alshor Plus still further."

With CMC Construction Services now using Alshor Plus for jobs in numerous states, its touchdown in the USA has certainly proved a crowd pleaser.

HOLDING EVERY DROP
WATER TANK SUCCESS FOR ALSHOR PLUS

Challenging Albuquerque water tank project sees Alshor Plus tables raising high above water level for the first time in the USA, reaching over 12 metres to shore up a complex curved roof design.

Bringing a new product or system into any country for the first time is always a challenge, but when USA formwork specialist CMC Construction Services teamed up with RMD Kwikform's export team to bring Alshor Plus over to America, the complex nature of its first project was to prove a perfect test for the system.

"So having proven the capabilities of the Alshor Plus system and explained the efficiency and health and safety benefits associated with it, the customer opted to use it for the job."

Here Roger Smith, Export Director for RMD Kwikform explains how working together CMC Construction Services and RMD Kwikform were able to secure the job and see it through to its successful completion: "The project itself was to build a 12.2 million gallon water tank with a dome roof that reached up to 12 metres from the ground at its highest point. The reason the project was highlighted as a potential job for Alshor Plus was the requirement to provide a shoring solution to support the construction of the 3,850 square metre curved roof.

"The roof itself was to be supported on skinny round columns with down stands at the top, on a chequerboard square column grid. The main challenge was the 2% radial fall of both the base and the roof slab from the centre to the perimeter edge and the requirement for a table style soffit support approach, that could be simply moved into place from one pour to the next.

"In order to prove that Alshor Plus could not only provide the relevant structural support for the task at hand, but that the solution designed would be easy to use and support the tight programme time for the construction, we had to invest significant time in the design and training process.

"The first thing we had to do was show how the system could work, a process that involved the erection of Alshor Plus tables in the standard arrangement. Then because the angles involved required the table to be moved at 1.5 degree to the vertical, in order to support the dome shape, we had to prove that with the use of Alshor Plus jacks, the tables could be erected into the correct position.

"By working with the erection team onsite we were also able to develop an new innovative approach to the erection procedure. Unlike the rest of the world, in America this type of shoring solution is first erected in the horizontal and then raised into the vertical and craned into position.

"Thanks to the modular nature of the Alshor Plus system and the use of bracing frames to ensure Alshor Plus tables are correctly supported, the inherent leg strength of Alshor Plus that can withstand leg loads of up to 120kN could support and withstand the pressures associated with horizontal erection and crane movement.

"So having proven the capabilities of the Alshor Plus system and explained the efficiency and health and safety benefits associated with it, the customer opted to use it for the job."

With the water tank now complete, the Alshor Plus system has proven its worth in American and is already being used on other projects thanks to its adoption by CMC Construction Services as its shoring solution of choice.

For further information on Alshor Plus visit www.rmdkwikform.com or if you are in the USA contact CMC Construction Services www.cmcconstructionservices.com

SLIDING WALL DESIGN PROVIDES SAFE AND SWIFT TOP DOWN TYNE TUNNEL SOLUTION

Ceiling mounted runway beam design helps Dunne Building & Civil Engineering slide a huge sixteen tonne RMD Kwikform wall formwork system safely into place, beneath a 1.2m thick roof slab, minimising work at height inside the tight confines of the new Tyne Tunnel.

Appointed by TT2's Design and Build contractor Bouygues Travaux Publics, (see pages 8 to 10) to build the North approach structure to the new £260m Tyne Tunnel, Dunne Civil Engineering has become the first UK contractor to combine the simultaneous use of large scale travelling wall formwork with a soffit traveller system.

Working in the tight confines of the covered tunnel section itself, complete with its 1.2m thick concrete roof, the wall formwork system, designed by formwork and falsework specialist RMD Kwikform, had to be assembled inside the tunnel and lifted into place in a very confined space.

Constructed using steel Superslim primary and Alform aluminium secondary beams with a plywood face, the eight metre tall by six metre long panel sections are almost as tall as the tunnel itself. Weighing a total of sixteen tonnes, the safe movement of the four panels along the length of the tunnel was made possible by an innovative ceiling mounted runway beam and trolley system, pulled along using a hand operated Tirfor.

Commenting on the solution devised for the escape tunnel formation, Ian Fryer, Engineering Director for RMD Kwikform UK said: "The solution that we proposed was to mount full size formwork panels to suit the wall on beam trolleys, which would run on steel runway beams fixed to the previously cast tunnel roof slab.

It was this innovative solution that ticked all of the boxes for the main contractor Bouygues Travaux Public, who specified this approach for the project."

Using MEWPs Dunne staff were able to fix the rebar steel reinforcement into place for the wall to be formed, skilfully adding in the boxout void forms that will allow pedestrians to have easy access to the escape tunnel if an incident was to take place once the tunnel was operational. Commenting on the project Philip Beausang, Project engineer for Dunne Building & Civil Engineering said: "Creating the dividing walls for the escape tunnel was not a simple process, as we were dealing with complex geometry. The formwork sections themselves had to be made up as parallelograms to suit the tunnel profile, whilst providing vertical construction joints to suit the reinforcement and multiple door opening box outs. A great deal of work to the initial design had to therefore be completed before we were satisfied with the solution.

"Crucial to the success of the system however was the ability for our Dunne staff to move the wall formwork along the runway beam, whilst still being able to achieve strong and secure connectivity between the two wall forms. Being able to lift the wall formwork up and down therefore was essential. Here chain pull lifts mounted between the beam trolleys and the formwork were used to effect vertical adjustment.

"When working with any solution of this type, dealing with variations in height, the gaps left between sections at the top of the formwork have to be filled in for the concrete to be poured successfully. In this case, safe access to both sides of the formwork was essential in order for any makeup required at the top of the formwork to be completed. This was achieved by cantilevering Alform beams and plywood sections.

"Crucial to the success of the system however was the ability for our Dunne staff to move the wall formwork along the runway beam, whilst still being able to achieve strong and secure connectivity between the two wall forms."

"Because we were able to use MEWP's to access the open side of the formwork it was the enclosed side section inside the escape tunnel, between the main outside concrete wall and inside escape tunnel wall, that required its own safe access and egress system. Here we asked RMD Kwikform to incorporate a system into the design, which they did very effectively."

With work on the escape tunnel continuing the North approach will be handed over to main contractor Bouygues Travaux Publics by December 2009.

SNAPSHOT

We take a look at more RMD Kwikform projects around the UK...

NEW MD TO TAKE ON SOUTH AFRICAN CHALLENGE

RMD Kwikform has announced the appointment of Keith Offord as the new Managing Director for its South African business. Having previously lead a construction company working in central Africa on mining and important infrastructure projects, coupled with a construction background in the South African region with Group Five, Keith brings a wealth of experience to the business.

Based out of RMD Kwikform's Pretoria office, Keith is looking forward to the challenges this position and South Africa offers, commenting: "My goal here has to be first and foremost to grow the business and make sure that the South African construction industry understands what RMD Kwikform equipment can bring to their projects. With the clearly committed and talented team here in South Africa and the global support available able, I'm very optimistic about the future of RMD Kwikform in South Africa."

TWIN SUCCESS FOR RMD KWIKFORM IBERICA

As part of the Ronda Sur Road project in Talavera de la Reina, Toledo, featured on pages 12 and 13, RMD Kwikform Iberica has also been involved in the construction of two connecting twin viaducts.

Supplying 772 tonnes of formwork and falsework to the project, each of the viaducts is constructed in nine spans, covering 408 metres. The deck, constructed as a box section to create significant weight savings, is 16.5 metres wide and 2.5 metres deep. RMD Kwikform Iberica has supplied to the project 55kN Kwikstage, Superslim Soldiers, T200 and IPE80 beams, Heavy-duty Megashor Towers and R700 and RMD450 beams.

The construction of these viaducts provided a number of challenges for RMD Kwikform Iberica's engineers, including crossing a second branch of the river Tajo with high levels of fast moving water and an unstable ground surface. But the challenges didn't stop there. RMD Kwikform Iberica's engineers had to maintain traffic flows from an existing road by constructing a temporary underpass, and bridging steep terrain at the viaducts abutment. You can find out how RMD Kwikform Iberica overcame these obstacles with standard RMD Kwikform equipment by visiting www.rmdkwikform.com/global

WIN ME!

COMPETITION - WIN AN iPOD NANO

RMD Kwikform is giving one lucky reader the chance to win a fantastic iPod Nano, preloaded with a selection of the best RMD Kwikform onsite video reports from around the globe.

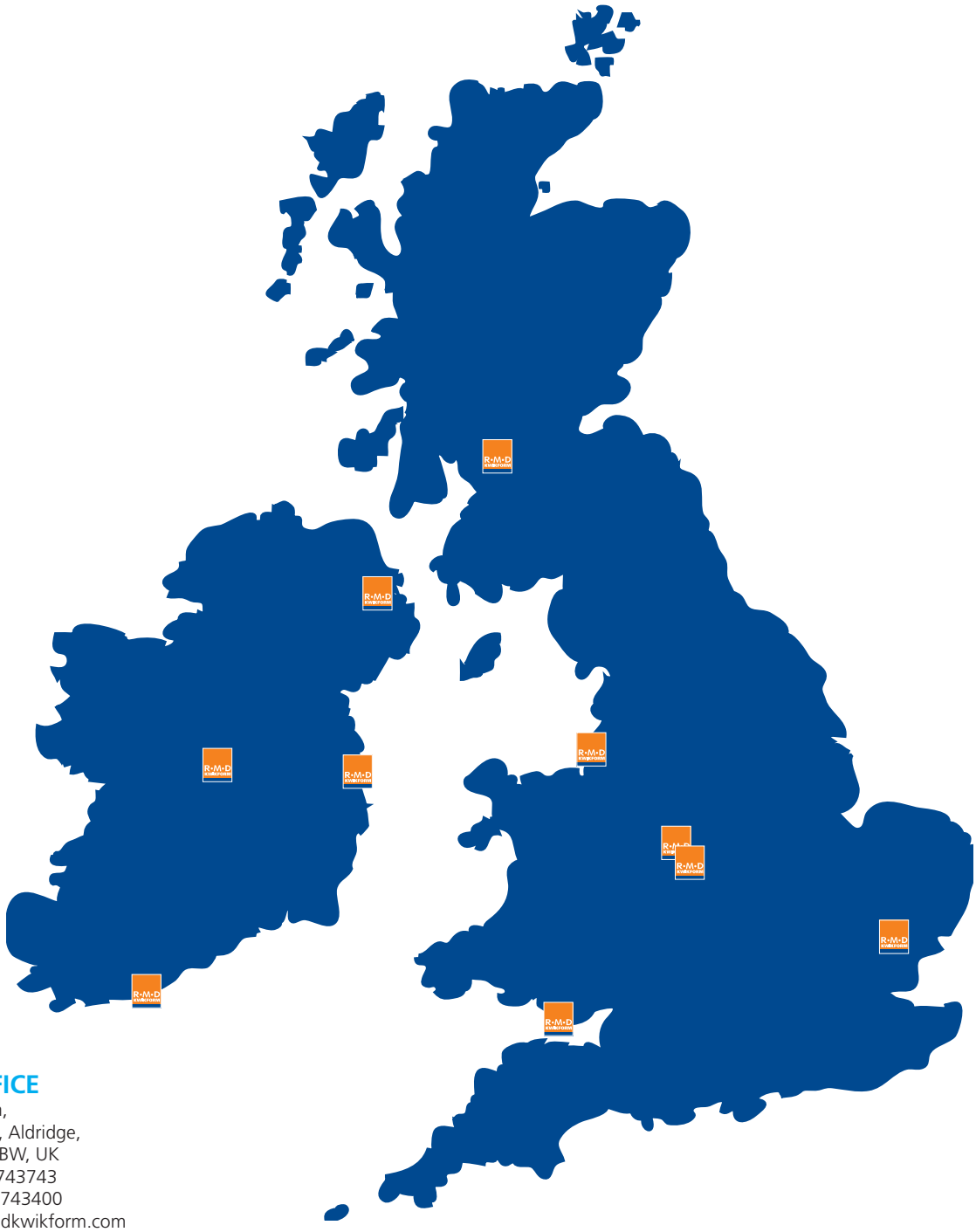
All you have to do to be in with a chance of winning the iPod is subscribe to Formula Magazine, free, online at www.rmdkwikform.com/formula_online and provide the answer to the following question in the comments box.

Q: What project is featured on the cover of this magazine?

A) Tyne Tunnel **B)** Wolvercote Viaduct **C)** Aldar HQ

The competition closes on the **31st March 2010**, the winner will be drawn and notified directly by RMD Kwikform.

TERMS AND CONDITIONS: The closing date for entries is the 31st March 2010. All correct entries will be placed in a draw for the iPod Nano with the winner notified by RMD Kwikform in April 2010. This competition is open to all readers of Formula UK. Only one entry per person will be accepted. In accepting the prize the winner will agree to participate in the promotion of future competitions, allowing their name to be used in promotional activity. For full terms and conditions please email marketing@rmdkwikform.com.



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So if you have a challenging project, why not contact RMD Kwikform today and see how we can help you create.

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