

RMD Kwikform secures Stonecutters order

RMD Kwikform Hong Kong has secured a major formwork contract for the much-publicised US\$354 million Stonecutters Bridge that will be built by the Maeda-Hitachi-Yokogawa-Hsin Chong J.V. . When completed in 2008, it will be the longest cable-stayed bridge in the world. The RMD Kwikform contract is for self-climbing formwork for the bridge's ten 60 plus metre high backspan concrete piers.

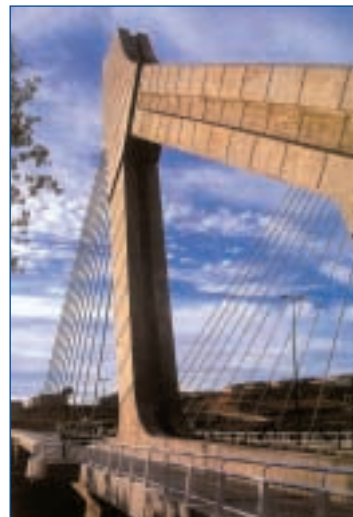
The solution was a collaborative initiative involving teams of RMD Kwikform engineers in Hong Kong and the UK, headed up by RMD Kwikform Hong Kong's General Manager – Engineering - Sales, Jeff Dibble. It utilises the company's Autoclimb self-contained, hydraulically operated, bracket type self-climbing formwork and steel formwork that was specially developed for the Stonecutters project to provide the essential versatility and durability.

Ireland

RMD Kwikform Ireland has won a major contract supplying four sections of the new Dublin Port Tunnel for contractor Nishimatsu. Each section will be utilising a specially designed shutter comprising a custom made steel dome shutter with a 6mm steel face supported with Megashor frames.

Thanks to Helena

We would like to apologise for not recognising the excellent photography of Helena Russell. Her photograph of the Valladolid Bridge, Spain (right) was used in Formula, issue 8, as part of our focus on Bridges.



Taiwan's Capability

RMD Kwikform Taiwan has produced a capability brochure detailing key experience, products and services. This is a bi-lingual brochure using traditional Mandarin and English.

If you would like a copy of the brochure, please contact our Taiwan office direct, or email

info.taiwan@rmdkwikform.com



Information Space Saver!

Do you find your office is starting to overflow with all the company information you want to keep on potential suppliers, customers or competitors?

Well RMD Kwikform may have the solution for you!

We've created a mini CD with all of our brochures – including our new Product catalogue - stored on it. The new format means you can select which brochure you would like to view on your PC, and then leisurely turn the pages – literally!

If you would like to get your hands on our space saving CD, you can either access the information through our website, within the privileged zone, or email marketing@rmdkwikform.com with your contact details.



R·M·D
KWIKFORM

formula

The Leading Industry Newsletter from RMD Kwikform

RMD Kwikform Launch new Edge Protection System

Safeguard, a new temporary edge protection system for use during the construction and maintenance of buildings and other structures, has been launched by RMD Kwikform.

In addition to being aimed at making a major contribution towards improved site safety, the low-maintenance lightweight system is 100 percent recoverable, has the minimum number of components, no loose fittings, and is designed for easy handling and the fastest possible erection and dismantling.

The solution complies with draft European safety standard, pr EN13374, Class 'A' and is based around interlocking, galvanised steel, welded mesh barriers. These are lifted into position and restrained by structural-grade aluminium safety posts held in place in socket base units by the use of a built-in locking mechanism.

The square-section socket base plates are secured at approximately 2.4-metre centres along the edge of the structure (ideally using RMD Kwikform's reusable "quick fix" Excalibur bolts) to avoid the prospect of damaging the plates when they are removed. The 48mm diameter posts are fixed into the socket bases using a spring-pin twist lock fixing that ensures fast positioning and equally swift removal. A unique anti-lifting device built into the posts keeps the barriers securely locked in place; the only way they can be removed is by disengaging the anti-locking mechanism.

Safeguard is compatible with all RMD Kwikform access and shoring systems, as well as the majority of competitors' scaffolding and shoring systems.

The 1.1-metre high by 2.55-metre long barriers have a number of important features. Weighing 18kg each, they can be handled comfortably by one man, and incorporate an integral

handrail and 190mm deep kick rail that also helps to boost the barriers' strength and rigidity. Horizontal bars in the mesh pattern prevent uplift when Safeguard is being used with system scaffolding, while the verticals in the mesh reduce the need to position the posts with excessive accuracy. In fact, the system is designed to include 100mm tolerance. The adoption of a rigid Z profile along the barriers' kick rail allows them to be nested for easy storage and transportation.

A number of accessories are available, although the focus has been on making them as versatile as possible to minimise the stockholding requirement. These include a slab

edge bracket, a steel beam clamp and an aluminium/timber beam clamp. The slab edge brackets are reckoned by RMD Kwikform's engineers to be the easiest to use on the market. They can also be used for upstand beams and offer adjustment spanning up to 650mm. They incorporate a "twist lock" socket and coarse adjustment jack with a damage-preventing enclosed thread. The steel beam clamps have a variable height barrier and post adjustment, with neoprene linings to the clamps to protect the steelwork from scratching. The aluminium/timber beam clamps can accommodate beams up to 225mm deep and are suitable for use with conventional soffit formwork.



In this issue:

- Product Developments
- Taiwan High Speed Rail
- Bridge Building – Balanced Cantilevers
- Key Appointments
- Construction Industry Awards
- Should you buy on Value or Price

	Page 2 Should you Buy on Value or Price? There are many factors that influence price setting all unique
	Page 3 Middle East Construction Craze RMD Kwikform's determination to capitalise on the current construction boom is paying off
	Page 4 Key International Projects We take a look at two very different civils jobs in Spain and Australia
	Page 5 Key Appointments 2004 has been a year for change with 3 new key top level appointments
	Page 6 Recognising Excellence and Improving Safety RMD Kwikform gets involved with these two key areas of today's construction market
	Page 7 Building Bridges to Success The spectacular image of Cantilever bridge construction in practice
	Page 9 A European tour de force In the UK, Minima makes it mark, while we celebrate Euro 2004 with Stadium construction
	Page 10 Minima - Lightweight Wall Formwork System Introducing Minima - our new lightweight manually handled wall formwork system
	Page 11 Taiwan High Speed Rail The THSR has resulted in the development and use of a number of innovative formwork solutions
	Page 13 Communication Updates Further developments to the RMD Kwikform websites and literature have been taking place
	Page 14 Alshor Plus scores at Wembley The high-load-capacity shoring system is being used to provide around 40,000 square metres of support and back propping for the floors
	BC News in Brief New contracts and key communication newsbytes.

Welcome to our new, contemporary styled Formula!

After 4 years we felt it was time to freshen our image – and here it is!

Safety is now the major issue hitting the construction industry. On site safety requirements are on the increase, with no signs of abating. Understanding the importance of safety on site, RMD Kwikform have launched Safeguard – a new edge protection system, and Safe Landing System – minimising falls from height. Also recently launched is Minima, a hand set panel system, designed for forming walls under 3.9m. Minima is also soon to be launched in Australia, Chile and Spain.

Also within this edition we focus on the use of balanced cantilevers, drawing on our past experience, as well as highlighting some other key projects throughout the world.



As usual, if you have any comments, or would like further information on any of the articles within this edition, please do not hesitate to contact me at katharine.hughes@rmdkwikform.com

Katharine Hughes
Editor

Should You Buy on Value or Price?

The price we pay for goods and services is centrally important to a sustainable and successful business at the strategic level, but can become a dangerous obsession.

Price is just the tip of the iceberg - the visible 10 per cent above the water line - the value is the invisible 90 per cent below the surface.

Many companies fall into the trap of setting price either on the basis of cost or a competing supplier's offer but the key formula is price/cost/value. Price is often simply the starting point for negotiation and is likely to vary around issues that a buyer and supplier would like to achieve.

How should you value bought-in products/service correctly?

Industrial end-users buy commodity-like products according to a price list. This is a highly competitive market with a high focus on price, but how much more would customers be willing to pay for a stock of immediately available products? Key factors include the cost of stocking the products and lost production time if they are unavailable

For example a helicopter manufacturer has within his product range two helicopters appropriate to his customers needs. One is much cheaper but requires twice the maintenance. The obvious point is that over the lifetime of the helicopter the maintenance costs for the cheaper model far will outstrip the initial cost of the more expensive machine

Similarly there are competing products in RMD Kwikform's formwork and shoring ranges, where the choice is to rent or sell. The product offered may not be the cheapest, but this is balanced by reduced labour costs or construction cycles our products provide.



Guidance on setting price

There are many factors that influence price setting, all unique but the keys are

- Benefits and value gained
- Significance of the product relative to the customer's overall production cost
- Changeover cost, disposing of old products/systems, staff training, change in procedures, cost of installation

Other more complex drivers are:

- Competition – many sectors are sensitive to price and price expectations set by competitors is very hard to ignore.
- Industry profitability – an industry suffering pressure on sales margins, will focus on price much more. However this creates an opportunity for companies like RMD Kwikform to demonstrate how our products and services can improve customer's profitability, or how our offering is better than the competitors.
- Distribution channels – what are the costs of distribution relative to alternative routes? If there is a cheaper route to market it should be considered.
- Price relative to others in that product range

Perceived Value

Research has shown that industrial customers measure value by three categories:

- Product
- Service
- Image

A customer will rate these categories and compares results with price. They generally weight each category as "vital", "important" or "secondary" and score an offering with others and judge them collectively.

A common thread that a run through this very complex but highly important area of pricing is that there is no single driver influencing price, it is a composite of many factors and therefore is complex.

At RMD Kwikform, we understand the importance of competitive pricing but more importantly we believe our product and service offers our customers the greatest added value. Contact at us through your nearest RMD Kwikform branch and let us explain how you can benefit by buying the whole iceberg!



Middle East Construction Craze

Construction seems never ending in the Middle East. From new residential villages to industrial plants, the landscape seems to be changing daily. RMD Kwikform Middle East is a tour de force at the moment, capitalising on all this activity.

The Middle East has never been a quiet market. In the past, RMD Kwikform has provided support to some major projects, including the luxurious Jumeirah Beach Hotel, the 1270m long Wadi Muddiq to Gillay Tunnel and the impressive Mall of the Emirates shopping and entertainment centre.

More recently RMD Kwikform has been working with contractor CCIC Oman LLC providing formwork and Shoring solutions to the Oman-India Fertiliser Project near Muscat. Three areas required RMD Kwikform's engineering expertise. For the receiving basin, Super Slim Soldiers and Alform Beams are being used to construct the 15.9m high walls in 3 stages.

Super Slim Soldiers are also being used as a mobile tower for the construction of the Urea Storage area, which required the support of the table during the positioning and securing of the precast concrete beams. The inverted 'V' shaped beams required 3 towers – two at a height of 6m and the main central tower 18m. RMD Kwikform is also providing Super Slim Soldiers and Alform Beams for the construction of 8.2m high columns.

Mall of the Emirates ▼

Due to this being a sale of equipment, CCIC preferred the option of using standard items, which could be reused on future projects. RMD Kwikform were described by CCIC as providing 'a well engineered and effective solution'.

Other key contracts occupying our time in the Middle East include the Chabrouh Dam, the Gardens Shopping Mall and Jebel Ali Power Station.

The Chabrouh Dam is set high in the mountains of Lebanon, close to the popular ski resort of Faraya, overlooking Beirut, some 2000m below. RMD Kwikform UAE were chosen as the preferred suppliers on this project ahead of stiff international competition, for their innovative and simplistic designs in regards to the various tunnel forms required. Four different types of tunnel forms were provided for this project, ranging in size from 2.3m wide x 3m high to 4m wide x 4.5m high. These forms were able to be pulled along by means of Skates which ran on rails.



Oman India Fertiliser Project ▲

The Gardens Shopping Mall, once completed in late 2005, will be one of the largest in Dubai, with an overall length of 1.5km. RMD Kwikform are providing Kwikstage Propping and Decking for the general construction of slabs (both in situ and pre cast), as well as Rapidshor towers for the construction of the car park. Further amounts of Kwikstage is about to be delivered on site to be used in a birdcage application for the installation of the air conditioning.

At the opposite end of the spectrum, a special column traveller with columns attached has been supplied for the construction of the Jebel Ali Power Station – a water reservoir – measuring 240m long by 120m. Kwikstage tables are also being provided for support to the slab roof. 80 tables are being provided in total, which are easily relocated using castor wheels.

Boadilla Tunnel Reconstruction

When disaster struck the newly-constructed Boadilla Tunnel outside Madrid, Spain, the contractor needed a fast, high-quality and cost-effective way of rebuilding it. RMD Kwikform provided the solution.

The M50 motorway will, when complete, circle Madrid. A section of this outer ring road passes through the residential community of Boadilla, some 9 miles to the west of Madrid. In order to maintain the community's integrity an artificial tunnel, 225 metres long and designed to carry three lanes of traffic, was constructed by excavating the ground, creating a tunnel shell and finally covering the shell with soil. It was during this last stage that things went wrong: part of the tunnel collapsed under the weight of the earth on top of it.

The contractor, a joint venture of the four biggest Spanish construction companies, called in specialist engineers from RMD Kwikform to devise a method of rebuilding the damaged section. RMD Kwikform's design offered significant savings in construction time compared to the alternatives considered. It involved building a falsework frame outside the tunnel, then placing curved formwork panels on top like a lid, on lengthways steel beams.



The whole structure was towed into the tunnel in modules and the new section of tunnel shell was then created by pouring concrete around the form in three carefully-controlled operations, the equipment being moved along the freshly-created tunnel between each pour.

This approach, using largely standard materials and avoiding the need for a rail-mounted system, reduced the amount of equipment needed and saved the team valuable time on site – with the result that this section of the M50, carrying approximately 80,000 cars a day, will be open some two-to-three months earlier than would otherwise have been possible.

The Westlink M7 Motorway

The Westlink M7 motorway is currently Australia's largest urban infrastructure project.

It's a 40km electronic toll-way in Western Sydney being constructed by a joint venture between Leighton Contractors and Abigroup Contractors on behalf of Westlink Motorway Ltd.

RMD Australia's role in this massive project is to provide some design work for the bridge designs and technical information about the RMD equipment supplied for the production of the 146 bridges, which are of various design types.

The main two types of bridges being constructed are Segmented Box Grid and Precast Plank bridges. For the Segmented Box Girder Bridges, RMD Megashor towers are being used as falsework to support the 2,800 bridge segments that are being utilised on the

146 bridges. The segments range in weight from 50t to 100t and are being used on 30 different sites on the 40km motorway. The Megashor towers range in height from 2m to 10m. A pair of Megashor towers, as pictured, are being used per bridge.

RMD's Rapidshor modular steel shoring system and lightweight Albeam primary bearers are being used as falsework to support the many hundreds of headstocks, which vary in height from 1.5m to 11m on the precast plank bridges.

Super Slim Soldiers incorporating access walkways are being used to provide cost effective access ways along the various headstocks during the placing of the precast planks and other

associated works. The many bridge column forms are being supported with Slimshor and push pull props.

A massive casting yard, purpose built for the M7 is been utilised to cast the huge bridge segments. RMD Australia is supplying some of the formwork for this aspect of the project and massive amounts of consumables.



RMD Kwikform's new Managing Director



Steve Dance

RMD Kwikform has a new man at the top.

Steve Dance has been appointed as the new Managing Director, overseeing all business activities throughout the world.

On joining the company Steve stated "RMDK Kwikform is an excellent business, a trusted international brand with a solid business performance, but in the ever demanding environment of business, we can't afford not to develop and grow. The important and exciting part of my role is to pick up the pace of our business and to make it more successful. This will involve everyone who works for the company, especially me, in gaining not only a greater knowledge of how we conduct our business and service our customers within our existing markets, but also seek out and assess opportunities in new markets."

Steve joins RMD Kwikform with a wealth of experience from a variety of business sectors. He has had wide international exposure delivering and servicing industrial business in the Middle East, Australia, The Americas, Continental Europe and the UK. More recently Steve has been working within construction, servicing electrical fixtures and fixings and the supply of rebar couplings for reinforced concrete buildings.

All this experience is supported with a Science and Engineering degree from Oxford University and an MBA gained at the London School of Business.

Steve will be based at RMD Kwikform's Head Office in Aldridge, UK.

Success at QiC Awards

RMD Kwikform sponsored the 'International Project' category at the recent Quality in Construction Awards held in London, UK.

The Awards, attended by around a 1000 members of the construction industry, recognise and promote exceptional contributions within the industry to make it more profitable, healthy and efficient.

There are 13 award categories recognising areas including safety, technology, innovation and environmental considerations.

Key customers were the guests of RMD Kwikform and they included a representative from Kier, who were the

overall winners of the best International Project category.

Tom Ainscough, Managing Director, RMD Kwikform UK commented "The QiC Awards are a great way of promoting the best of the construction industry and recognising those companies who have excelled – both in general and in specific areas. By sponsoring the best international project, RMD Kwikform is showing its commitment to understanding best practice within the international arena."



Safe Landing System



RMD Kwikform has added to its fast-expanding selection of construction site safety products with the introduction of the Safe Landing system.

further reducing the likelihood of serious injury.

The bags weigh less than 7kg each so are easily manhandled and, once positioned, they are clipped together to avoid the risk of their separating, should anybody working on site fall onto a junction between two bags. They can be compressed sufficiently to allow them to fit any plan shape and yet are robust enough to withstand the rigours of a building site. A highly robust and hard-wearing covering ensures that their performance and durability are unaffected by adverse weather conditions, and removing any build up of mortar with a stiff hand brushing is about all the maintenance they need.

Designed to reduce the number of deaths and injuries resulting from falls from height, Safe Landing is a simple, fast, inexpensive and versatile way of complying with the current requirement to limit working at height to below two metres.

The Safe Landing system comprises a number of reusable, interlocking "safe bags" that are each 0.55 metres high, thereby reducing the working height on a conventional storey height dwelling – normally somewhere between 2.3 metres and 2.5 metres – to less than two metres. The cushioned bags, which are filled with a 'memory' foam that enables them to maintain their original shape, also provide a more yielding surface on which to fall,

According to RMD Kwikform's Building & Safety Products Director, Mike Easdon, Safe Landing is the most cost effective way of reducing the working height to under two metres on many building sites. He said: "A simple 'foot test' is all that is necessary to verify that the installation is effective. The installer just has to ensure that it is not possible to push his foot between the bags." He continued: "If the fall height exceeds two metres, a second layer of Safe Landing bags can be added, and when the bags are no longer required they can be used elsewhere on site or stored ready for the next project."

The introduction of Safe Landing follows hard on the heels of the launching of RMD Kwikform's new Safeguard temporary edge protection system for use during the construction and maintenance of buildings and other structures. Both systems are low maintenance and 100 percent recoverable and reflect RMD Kwikform's commitment to improving safety standards in both the building and civil engineering industries.

Our New Man in Manila

We would like to introduce Steve Phillips, who has been appointed Managing Director of RMD Kwikform Philippines. Steve has extensive experience of the construction and formwork industries having worked with a number of international companies in the UK, South Africa and the Middle East in the mid-1990's.



Steve Phillips

UK Introduces new Managing Director



Tom Ainscough

Tom Ainscough joined RMD Kwikform at the beginning of the year as Managing Director, UK. Tom has a strong technical and sales background supported by many years general management experience gained within a variety of industry sectors including manufacturing, construction and consultancy.

Since joining the company, Tom has implemented a number of initiatives that not only provide a better service to our customers, but also enhance the

working environment for those working for the UK business.

On his initial few months with the company, Tom reflects "RMD Kwikform is a leading international brand in formwork and shoring solutions, and by continuing to strive to create greater value for our customers through the introduction of more effective products and enhanced service levels, RMD Kwikform will maintain this privileged position."

Building Bridges to Success

Picking up from the last edition of Formula, this time round we are taking a look at bridge building.

Of course, there are as many ways to build a bridge as to cross one, in situ using conventional shoring systems- precast segmented; precast beam and in situ slab; and longitudinally or transversely launched bridge decks from casting beds. However, the really spectacular bridges are those constructed using the balanced cantilever method.

This technique is particularly suitable where the bridge has to clear water, existing structures or other major obstacles and where it is impractical or uneconomical to use other building methods. The majority of the decks constructed by this system are concrete box girders that essentially involves a rectangular or trapezoidal voided box with cantilevered side decks.

RMD Kwikform first became involved in this type of bridge construction in 1995, when we won and order to provide a system for a bridge in a relatively remote area of Taiwan.

Normally the principle of bridge building using this method is to first cast the column and then construct the column and pier head. This is a short section of the bridge deck and it is also usual for this deck to be supported by bearings and be stabilised by a temporary frame.

Next, the balanced cantilever travellers and formwork are installed on top of the bridge deck (this short section of the bridge deck is required to support one or two balanced cantilever travellers). A short section of the bridge deck is poured – usually no more than 5m long - on one side of the column; cure, and if necessary, post tension. Then a similar short section is poured on the opposite side, again cured and post tensioned.

Finally, after the previously cast segment has been post tensioned, the balanced cantilever formwork system can be moved forward to the next pour.

The depth of the bridge decks normally varies, being thickest at the columns and gradually reducing towards the centre of the span. Consequently the length of the section is generally shortest nearer the column which equalises the weight of the section. By alternating the pouring of the sections on each side of the column, the forces in the column can be minimised or at least balanced.

The balanced cantilever formwork system is made up of a traveller made from a set of triangular frames located to support an internal soffit and wallform; external wallforms; cantilever slab soffit forms and the base slab soffit forms using suspension ties.

The traveller frames are located on the previous pour with the leading end cantilevered over the new pour, and the trailing end projecting back as far away from the new pour as practical. The traveller includes screw



The close centres of these suspension rods allowed for a relatively light formwork and traveller system, and in general, this type of system is approximately 50% lighter than some competitor systems supporting the same weight.

RMD Kwikform's lighter structure also allows the formwork and traveller to be moved forward using a low capacity chain block or similar inexpensive method, ideal in remote areas.

The balanced cantilever formwork systems so far designed by RMD Kwikform incorporate an integral beam that is locked into a set of rollers and secured to the bridge deck, which stabilises the rear of the traveller as it moves forward. Alternatively, stability is provided by counter weights at the rear of the traveller. The configuration and operation of each of the system is basically the same; the only subtle differences being the cross sectional shape of the decks.



jacks, front high capacity wheels and a rolling beam system at the trailing end that stabilises the traveller in its rolling operation. To prevent overturning during the placement of concrete, the trailing end of the traveller is secured through the top slab by large diameter reusable anchors.

Some of RMD Kwikform's competitors construct their travellers using only 2 support frames supporting the formwork system through a series of large beams and trusses.

The problem with this method is the large forces and moments that are induced in the support beams. These create a need for large structural sections capable of withstanding the forces and minimising their deflection. These travellers are expensive and heavy and also require relatively sophisticated methods to move the traveller and formwork from one pour to the next. It is not unusual for powered hydraulic or electric motors to be required.

When RMD Kwikform was asked to supply a balanced cantilever formwork system for the Chi Mei bridge in Taiwan, one of the main design criteria was that the system be relatively simple to operate. This was necessary because of the unskilled labour used and to reduce the potential for problems developing through lack of maintenance.

This first balanced cantilever formwork system was also designed to incorporate as much standard equipment as practically possible, providing flexibility for the customer's formwork needs later. This was made possible by utilising RMD Kwikform's 1,000kN Megashor intermediate units and jacks within the traveller. These were complemented by Super Slim Soldier accessories for the main formwork elements.

The traveller was made up of four triangular support frames, from which were suspended a grid of 20mm bar ties. These ties acted as suspension rods and passed through the pour to support the underslung formwork.



M60

The Manchester Orbital Ring Road carries both strategic long distance and local traffic. For many years now traffic on the motorway has been significantly greater than it was designed to take and this has resulted in severe congestion at peak periods. The widened section of the motorway will improve the free flow of traffic on the M60 itself and ease pressure on local roads often used to avoid the delays on the motorway.

RMD Kwikform was awarded several areas of work by contractor Amec / McAlpine J.V. For access scaffolding, Kwikstage Access was used - a system tried and tested by the customer on many previous projects. RMD Kwikform's new hand set panel wall formwork system Minima was chosen for all the footbridge abutments and small retaining walls. This was perfect for the contractor's man-handling requirement and its versatility was ideal for the transfer between structures.

Maxima has been used on the larger abutment pours due to the increased

concrete pressures applied with the size of structure and the fact that the concrete finish was an F2 because of brickwork cladding to be carried out at a later stage using our Kwikstage Access.

RMD Kwikform was awarded the contract because of our reputation for being able to design and supply material to suit a hectic programme, and our close customer relationship with both companies involved in the joint venture.

The project is due for completion by Spring 2006.



Euro 2004 Kicks Off!

For Europe, Summer 2004 heralded another major footballing event. With memories of the 2002 World Cup still fresh, it's been an interesting few weeks, with all of Europe's focus on Portugal, football and some impressive stadiums as the backdrop.

Not one to be left on the sidelines, RMD Kwikform has been involved in the construction on one of the key stadiums used during the EURO 2004 competition.

The Estadio Jose de Alvalade was completed in 2003, utilising RMD Kwikform's Megashor Towers for the construction of the permanent lattice girders. Kwikstage Shoring and Super Slim Soldiers were also utilised for shoring and scaffolding requirements. But this is not the first successful stadium project undertaken.

RMD Kwikform has built up an impressive portfolio of successful stadium construction projects. In preparation for the 2002 World Cup, RMD Kwikform Korea supplied a variety of equipment, including Megashor, Super Slim Soldiers, Alform Beams and Rapidshor for two key Stadia - Teagu Stadium and Suwon Stadium, both hosting key games during the tournament.

In Australia, RMD Kwikform impressively supplied Megashor Towers during the lifting of the massive arches spanning the length of the Sydney Olympic Stadium.

RMD Kwikform's stadium experience continues in the UK, with new shoring system Alshor Plus being used in the construction of a variety of concrete structures on the new Wembley Stadium development, due for completion later this year.

The key underlying success of RMD Kwikform's involvement with all these projects is a determination to provide the optimum solution for our customers - in terms of engineering design and support and lowest in use cost.



New Lightweight Wall Panel Formwork System from RMD Kwikform

RMD Kwikform has launched a new lightweight wall panel formwork system - Minima, which is the only manually handled system of its type currently available. Weighing only 30kg/m², the modular system can be set by hand and yet is robust enough to withstand single tie concrete pressures of 60kN/m² and height extended form concrete pressures of 55kN/m².

The 120mm thick Minima panels consist of a galvanised steel frame with a perforated edge profile and a 14mm coated plywood facing to ensure a good quality finish to the concrete. RMD Kwikform believes that Minima offers more panel size options than any competitive system on the market, with 15 panels varying in size between 1.2 metres by 300mm and 2.7 metres by 900mm, the smallest of which weighs just 22.6kg.

This range of panel sizes minimises the need for traditional make-up pieces, plus there are a number of internal and external corner panels, some of which are hinged. This further adds to the new system's versatility and the ease with which it can adapt to most building shapes.

Special corner clamps, adjustable aligning clamps and aligning panel clamps make for swift and easy panel-to-panel connection, requiring no more than a single blow from a hammer to fix them. The system is compatible with RMD Kwikform's 15mm Rapid Tie high load capacity tie system.



While intended primarily as wall panel formwork, RMD Kwikform also expects Minima to be used for:

- columns
- buttresses
- culverts
- abutments
- piers
- service cores
- basements

It is available with an extensive selection of accessories including walkway brackets and an adjustable strut.

Minima complements RMD Kwikform's other wall panel formwork systems, most notably the Maxima large panel system.

RMD Kwikform Resolves High Speed Rail Bridge Formwork Challenges

Taiwan's new High Speed Railway has resulted in the development and use of a number of innovative formwork solutions. RMD Kwikform has been awarded several of the most prestigious contracts on the railway, and one of the current projects – Contract C230, which involves the construction of a Warren Truss Bridge over a live railway line – is involving pooled experience and expertise from RMD Kwikform Korea, RMD Kwikform UK and RMD Australia. Here Paul Williams of RMD Kwikform Korea describes how several of the company's formwork and falsework systems are being successfully utilised.

Taiwan's new US\$15 billion HSR [High Speed Railway] runs for approximately 345km along the South China Sea coast, from T'ai-pei in the north to Kao-hsiung near the southernmost tip of the island. On its way it passes through 14 major cities and counties, and 77 townships and regions. The route involves the construction of more than a dozen stations and a similar number of depots.

Bridge number DU77 is being built by the Korean contractor, Hyundai Engineering and Construction Company Ltd, at the town of Feng-fu for the Taiwan High Speed Rail Corporation [THSRC], the company assigned to construct and operate the railway. It is a major part of Contract 230, which is a 23.4km section of the rail corridor between Miao-li and Hsin-chu stations, towards the northern end of the HSR. It calls for the construction of the concrete deck for a Warren truss

bridge involving RMD Kwikform's Megashor towers that are being used to support the Warren Trusses during their erection and launching over existing live railway lines.

Other elements of the contract include the provision of a working platform utilised beneath the Warren Trusses to enable RMD Kwikform's Webtie to be installed to support the bridge's in-situ concrete deck. Webtie is an RMD Kwikform soffit formwork suspension system designed to be used between steel girders of composite construction bridge decks.

Webtie had been used on another part of the HSR project – Contract C220, which included the construction of the Hsin-chu station - and its success was used to demonstrate to Hyundai the

system's ability to be quickly and safely erected, its high load capacity and that it required no expensive and time-consuming making-good of the tie holes. Another major consideration in RMD Kwikform's favour was the contractor's desire to let the formwork and the platform as a single-source, single-responsibility contract.

WARREN TRUSS SUPPORT

The Warren Trusses on the 108-meter long bridge will ultimately be supported on concrete piers. However, the Megashor towers are being used to support the trusses while they are being assembled to the left and right of the live railway lines and while they are being launched out over the rail tracks.

The Megashor modular propping system was selected for its 1,000kN

high load leg capacity and because the system has been successfully used for any number of similar high load shoring applications throughout the world. Megashor legs are formed into support frames around the concrete piers, some of which are up to 17.34 metres high and incorporate 140 Megashor legs. Where these frames are positioned to one side of the concrete columns they are supported off special restraint beam anchorage that spans between the piers, or by special struts and raking shores attached to the piers.

Super Slim Soldiers are being used as horizontal members, and bracing is in the form of diagonal ties. Additional special bracing and stiffening is included at critical points on the towers. Each Megashor leg is supported on a screw jack resting on a base plate to allow fine height adjustment and levelling. Special spreader beams are incorporated at the head of each tower that support special bearer beams that, in turn, carry the rollers on which the Warren Trusses are manoeuvred into their final position.

DECK SOFFIT FORMWORK

A particular attraction of Webtie is that it can be preloaded, which virtually eliminates deflection and grout loss. This is achieved by torquing the nut on the Webtie tie rod to 120kN with an air tool or torque wrench prior to pouring the concrete. There are two types of Webtie, and both are being used to great effect on the DU77 contract.

The Webtie Delta technique is typically used on bridge edge beams, where the Webtie is attached to shear connectors fixed to the top flanges of the beams. Webtie Saddle is commonly used on internal bridge beams and achieves support by straddling the top flanges of the bridge girders, which in the case of the DU77 bridge are 5.17 metres apart. In both cases, the 30kN capacity Webties are used to support RMD Kwikform Super Slim Soldiers that in turn support 130mm by 65mm structural laminated timber GT Beams that are used as secondary bearers for the plywood soffit formwork facing.



Webtie Delta consists of a short loop of polyester webbing sown around a triangular steel delta link. This link fits over the shear connector and allows the webbing to act as a hanger strap bolt fixed to a Webtie tensioning fork. This is attached to an adjustable Waler plate - using a 200mm long M20 tie rod - that supports the Super Slim Soldiers. Webtie Saddle utilises a longer loop of polyester webbing than

Webtie Delta, supporting Super Slim Soldiers on either side of the bridge's beams.

Webtie edge protectors are positioned underneath the polyester webbing where it runs over the edge of the top flange. When the deck has been cast and the formwork removed, Webties are severed and sealed at the concrete soffit using a hot knife.



Internet Update

All RMD Kwikform websites have recently undergone a major overhaul. Not only do these fully reflect the RMD Kwikform brand identity, but the redesign has also made navigation around the sites a lot more user friendly.

New key features include more project information, segmented by sectors, with easy view project photos; a full breakdown of company locations, contact information and key personnel; and more product information – including the new wall formwork and safety products available.

A new privileged zone has been launched within the website, allowing registered users access to information not available on the website before – particularly Technical Data Sheets and the newly formatted electronic brochure suite which includes the new Product Catalogue.

As a thank you for registering access this new section, we are offering the chance to win US\$500 – but you must register within three months of the launch.

Visit the RMD Kwikform website at www.rmdkwikform.com

More country specific sites have also come on line – including Philippines (www.rmdmanila.com) and Taiwan (www.rmdkwikform.com.tw).

Linked to this new area are our E-zines – emailed newsbytes of new RMD Kwikform international activities – including new products, projects, initiatives and availability of new product information. E-zines are sent every six weeks, allowing readers to be

the first to know what's going on at RMD Kwikform throughout the world. These are linked to the new privileged section of the website, where further information on everything within the E-zine can be found.

If you would like to register to receive E-zines in the future, please send an email to ezine@rmdkwikform.com with your name and company details.



Recoded Brochures

As you know, RMD Kwikform is in the process of rolling out a new back office system throughout the world. Some of the impact of this is obvious – clearer invoices, more detailed reports on request and more.

But there is a less obvious benefit – we are reworking all our products codes to ensure wherever you are in the world, if you requested an SSX13600 (Super Slim Soldier 3600mm), you would get the same thing in every country.

This roll out is being reflected within our literature – all brochures within Europe now carry these new, consistent codes, and they will rollout to the rest of the world as they come on line.

We have tried to ease this transition for you by introducing flyers detailing both old and new codes with this new literature.

We have also launched a Product Catalogue. This fantastic pocket sized ring-combed catalogue details all of RMD Kwikform's major product lines, categorising them into formwork, shoring, access and safety products. Each product is shown with a photo or illustration of the product components to allow easy and quick identification of products on site.

For a copy of this valuable new catalogue, please contact your local branch or email marketing@rmdkwikform.com



RMD KWIKFORM'S NEW SHORING SYSTEM SCORES AT WEMBLEY STADIUM

RMD Kwikform's new lightweight aluminium Alshor Plus shoring system is being used on the new Wembley National Stadium in London to support all of the 250mm to 2400mm thick in-situ reinforced concrete slabs. The second and final phase of this part of the project commenced last November and is due for completion in May.

The high-load-capacity shoring system is being used by P C Harrington to provide around 40,000 square metres of support and back propping for the floors, which take up approximately one third of the Stadium's one kilometre circumference.

The equipment is being used to produce a series of mobile tables that – despite the awkward shape of the building – is dramatically increasing productivity, reducing site labour costs and hence minimising the amount of equipment required. According to P.C. Harrington, this has resulted in substantial savings in construction time and a reduction of the company's site labour by around 20 percent.

By the completion of the project, around 30 different sizes and configurations of tables will have been used. The largest Alshor Plus table

measures 7.2 metres by 6.0 metres and weighs approximately two tonnes, while the smallest table is 3.6 metres by 3.2 metres and weighs one tonne. All are around seven metres high.

Infill areas between the tables and adjoining stairwells, columns and beams are being completed using site-assembled "static" sections of the shoring system. Each floor, which has around 300 table positions, supporting approximately 75 percent of the total slab area, is being completed in up to 32 pours – the largest of which is approximately 1,200 square metres.

The primary bearers at soffit level are 225mm deep RMD Kwikform Albeams, chosen for their high bending, low deflection and concentrated load capacity. These are bolted to U-heads at the top of each Alshor Plus leg. RMD Kwikform's 150mm deep Alform

and Alsec beams are incorporated as the secondary bearers, fixed to the Albeams using wedge action clamps.

Alshor Plus components are stored and tables are assembled in a secure area adjacent to the slabs under construction. Once assembled, the tables are craned into approximate position and are then manually and efficiently manoeuvred into their precise required location by a team of just two men using the innovative and smooth acting Alshor Plus Castor Units.

The same system is also being used on another major stadium project. Australia's biggest builder, Grocon, is using Alshor Plus to provide soffit support during the construction of the new \$430 million four-level Northern Stand at Melbourne Cricket Club.

