EUNOS TECHPARK, SINGAPORE

Developer:	**Far East Organisation**
Architect:	**TAA Architects**
Engineer:	**KTP Consultants**
Main Contractor:	**Mitsui Construction**
Areas treated:	**Rooftops & wet areas**
Approved Applicator:	**Reverton Engineering**
Size:	**15,000 square metres**

Whilst Singapore is small in size compared with its neighbours, there is always a tremendous amount of construction activity. This, combined with the fact that many multinationals have an office located in Singapore creates a very competitive environment, particularly in waterproofing.

Eunos TechPark is a fairly typical project for Radcon #7 in Singapore. Reverton Engineering, our long standing representatives for Singapore, recently waterproofed this entire project shown here in Figure 29. The principle area of waterproofing included some 15,000 square metres of flat rooftops which covered seven (7) buildings in all. Figure 28 shows one of the typical rooftop areas which are being layered with insulation and topping.

FIGURE 28 - LAYING OF INSULTATION OVER RADCON #7

FIGURE 29 - EUNOS TECHPARK, SINGAPORE

These 7 buildings formed Stage 1 of the development, and in the foreground of Figure 29 the land has been prepared for Stage 2 which will be larger in size.

Aside from competitive pricing, to secure the contract, Mitsui requested that a mock-up application be undertaken on a leaking wet area. This trial was undertaken with Radcon #7, and some of the first time users in Mitsui were impressed at the effectiveness of the product. While it's no surprise to us and our distributors we often give people who use traditional waterproofing systems a shock with Radcon #7's simplicity.

HIMDALEN NUCLEAR STORAGE FACILITY, NORWAY

Client:	**Statsbygg (Norwegian Govt.)**
Civil Engineers:	**Groner AS**
Main Contractor:	**AF Spesialprosjekt AS**
Approved Applicator:	**Betongforsegling AS (Radcon Scandinavia AS)**
Areas treated:	**All concrete storage basins**
Size:	**6,000 square metres**

Himdalen Atomic Storage Deposit in Norway is a very important project reference because it is a combined storage and deposit for low to medium level nuclear waste.

The central problem with nuclear waste is to ensure there is no radioactive health risks. The long half-life and dangers of exposure place very strict demands on technical and construction aspects of the storage facility. It must be robust and be able to withstand any conceivable contingency.

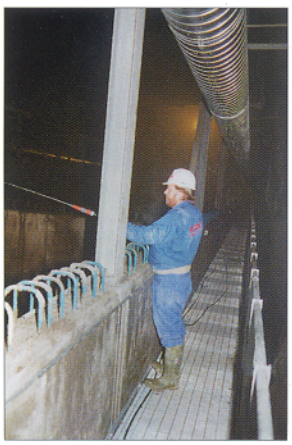


FIGURE 30 - RADCON #7 WATERING

For the Norwegian waste, the state cannot expect to control the site for more than 500 years - after that time it shall function without human control.

There have been many groups involved in the decision making process - among them the International Atomic Energy Agency (I.A.E.A.).

All building materials and products must have a near limitless life-span to ensure the nuclear waste remains stable. The construction solution chosen for this project has received positive international recognition by regulatory bodies.

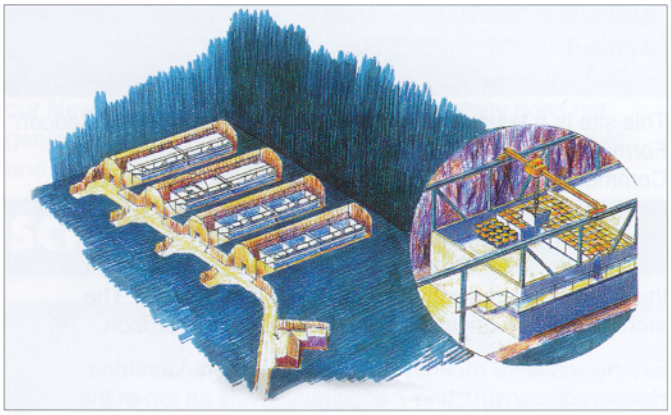
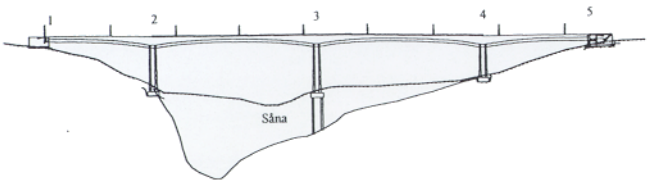


FIGURE 31 - ARTISTS IMPRESSION OF HIMDALEN NUCLEAR WASTER STORAGE DEPOT

The construction is a tunnel into the mountain, 200-300 m long of which the primary rock is amfibolittisk gneiss. Then 4 equal sided chambers were excavated. In each of these chambers there are 4 basins of concrete 12m by 12m, height 5m each with a total length 55m. The distance between side chambers is 15m. An artists impression is shown here in Figure 31.

The atomic waste arrives in drums and is lifted in by traverse cranes and placed in the basins. Then each basin is cast in concrete with a roof being built on top afterwards. Radcon #7 was chosen due to its chemical nature to protect and seal the concrete in all chambers, floors and walls. Figure 30 shows Radcon #7 receiving one of its' 3 waterings.

HOLENDALEN RAILWAY BRIDGE, NORWAY



MAIN DATA	
Length	416m, Span width 80-128-128-80
Width	11.5m
Height	50m
Client	NSB (Norwegian State Railway)
Main Contractor	Skanska (Sweden) & Ragnar Evensen AS (Norway)
Consulting Engineer	John Holt AS
Applicator	Radcon Scandinavia AS / Minihaller AS
Concrete	9,000m^3 c70/C55 MA
Area	6,000 square metres Bridge Deck and Edge Beam
CONCRETE MIX DESIGN	
Cement HS-65	410kg
Silica Fume	15kg
Water (total)	164kg
Natural Gravel 0-8mm	890kg
Gravel 8-16mm	221kg
Gravel 16-27mm	708kg
Additives, Water and Air	0.6%
Water/Binder	0.38

The Holendalen bridge forms part of the main railway between Oslo and Sweden. Norway is often regarded as the home of concrete technology and high performance concrete. This bridge is no exception and the bridge deck and pillars were design strength of C70, the actual strength is >90MPa. The Cement is HS65 and had a water/cement ratio of 0.38. To keep the temperature below 60°C the builders SKANSA (Sweden) and Ragnar Evensen AS (Norway) used cooling pipes in the formwork with liquid nitrogen tails.

FIGURE 15 - BRIDGE DURING CONSTRUCTION

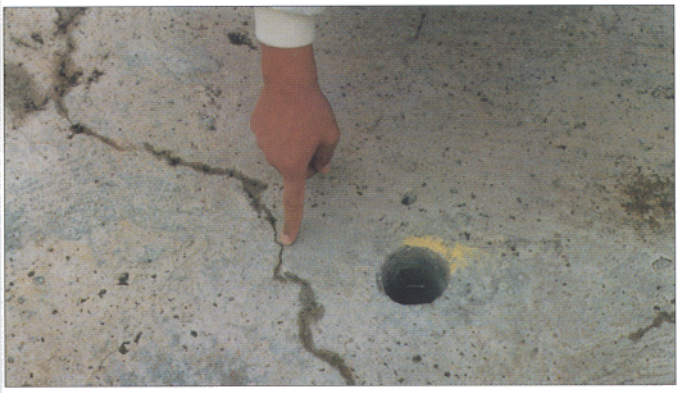


FIGURE 16 - CRACKING IN CONCRETE

Radcon #7 is approved and recommended by NSB (Norwegian State Railway Authority) and was applied to the deck and edge beams seen in Figure 15. The total area was approximately 6,000 square metres. The applicators were Radcon Scandinavia AS in association with Minihaller AS. The NSB recognises Radcon Formula #7's unique ability to reduce the ingress of chloride ions in both the matrix and more importantly maintaining a seal and highly alkaline environment in cracks to protect the steel.

The mix design of the bridge is now the standard for such structures in Norway. Silica Fume content is 3.5%.

FIGURE 14 - HOLENDALEN RAILWAY BRIDGE, NORWAY

KVERNDALEN BRIDGE DECK, NORWAY

Name of section:	**Arteid Bridge - Kverndalen**
Bridge:	**Kverndalen**
Owner:	**NSB Gardermobanen (Norweign State Railways)**
Main contractor:	**AP Spesialprosjekt/Skanska**
Applicator:	**Minihaller AS**
Area:	**Bridge deck**
Size:	**1,500 square metres**

The Arteid Bridge located forms part of the New Fast Train to Norway's new airport just outside Oslo. The railway project includes several major bridges, of which Radcon Formula #7 has been applied to three - to the deck and culvert. One of the bridges, Kverndalen, can be seen in Figure 29.

FIGURE 28 - BRIDGE DECK

A strong reason for choosing Radcon #7 on these bridges is due to the crack sealing performance of the product. Any concrete protection product will provide some protection to the structure by protecting the general matrix of the concrete, but Radcon #7 can address cracks which may be present or develop in the structure. Local testing has been undertaken through SINTEF for chloride ingress and permeability.

FIGURE 29 - KVERNDALEN BRIDGE, NOOSDLO

By sealing cracks in the concrete as well as the matrix, Radcon #7's performance is greatly enhanced offering superior protection for concrete exposed to freeze-thaw attack, chloride ingress and other air borne pollutants.

Also a major consideration on this civil project was the extensive use of heavy balustrade (stones) along the rail tracks. Although Radcon #7 is a spray applied liquid it penetrates the concrete without leaving a surface film. The product works by reacting with the free Calcium Ions within the concrete to form a sub-surface waterproofing barrier. Therefore the placing of heavy balustrade onto the treated concrete does not damage the Radcon #7 treatment.

ITALIAN SWIMMING POOL

Main Contractor:	**Genio Militare - Ing. Tornabene**
Application:	**Maffei Company - Mirandola, Modena**
Pool Dimensions:	**25m x 12m (up to 4m deep)**

The Military Academy in Modena, Italy is the Training Base and home for the Italian equivalent of the Marines. Their swimming pool was built in 1950 and is suspended on beams and piers. The pool was leaking profusely producing 300mm calcium stalictites as seen in Figure 31. Traditional repair methods were more expensive than completely re-building the pool. Radcon Italia provided an alternative method to try to resolve a difficult problem.

The empty pool was washed and mortar joints in poor condition were re-grouted. Then the whole tiled internal area of the pool was treated with Radcon #7 with the first watering using a 3% calcium solution to help trigger the reaction in the older mortar joints. The pool was filled. During the first week there was no significant improvements. After 10 days large saturated areas started to dry. After 2 weeks, 70-80% of the problem was resolved.

The remaining problem was a construction joint running horizontally around the pool. A unique and untried method was put forward to seal this joint from the outside. Firstly the leaking joint was ground out 40mm deep and 20-30mm wide. A PVC tube of 15mm diametre with regular holes was placed in the cut-out. The tube was covered in a quick setting mortar. After 8 hours the tube was sealed at one end and injected with Radcon #7 at 2 atmospheres pressure. The Radcon #7 displaced the water and reacted with the calcium in the joint creating a watertight seal.

This methodology proved successful and was thought to be miraculous by the Military Engineers. The pool has been given a new lease of life at an exceedingly low repair cost.

FIGURE 30 - SWIMMING POOL RE-FILLED AFTER SUCCESSFUL REPAIRS

FIGURE 31 - SOFFIT WITH 300MM CALCIUM STALICTITES

BREMSA BRIDGE, NORWAY

Client:	**Jernbaneverket Utbygging (Norwegian State Railway)**
Civil Engineering:	**Arild Berg AS**
Main Contractor:	**PEAB**
Approved Applicator:	**Betongforsegling AS (Radcon Scandinavia AS)**
Areas Treated:	**Bridge Deck, edge beams**
Size:	**5,300 square metres**
Length of Bridge:	**381m**
Width:	**13.6m**
Concrete:	**C45**

Radcon #7 is now included in the standard specification on railway bridges built for the Norwegian State Railway. The principle advantage of using the product is that no protection toppings, screeds or mats are required to protect the waterproofing treatment. This not only saves time and money, but also lowers risk.

In these applications, ballast is placed over the concrete prior to installation of the railway tracks. During the life of the structure many trains rumble over the track vibrating the ballast that is in contact with the concrete.

FIGURE 24 - RADCON #7 APPLICATION

FIGURE 25 - BREMSA BRIDGE, NORWAY

This vibration causes severe abrasion between the ballast and the structural concrete such that it will damage any unprotected membrane system.

This is yet another bridge where Radcon #7 has been used to waterproof and protect the concrete without the need for any topping slab. The reason for this is that the product functions by penetrating and hardening the concrete, not just forming a surface film.

The Bremsa bridge is the first steel/concrete composite bridge built for the Norwegian State Railway and forms part of a new high speed rail link that connects the new Airport at Gardemoen to Oslo.

The structure is composed of a large steel box section on top of which is a flat concrete slab. The thickness of which is only around 200mm.

Radcon #7 was treated to some 5,300 square metres of this bridge deck seen here in Figure 24. This is one of many bridges that are now being protected by Radcon #7 against deterioration.

FASHION CENTRE, JAPAN

Client:	**Shimamura Co. Ltd.**
Architect:	**The Sigmasystem Architect**
Area treated:	**Rooftop car park**
Main Contractor:	**Fukuda Corporation**
Size:	**1,500 square metres**
Approved Applicator:	**Rad Japan**

Fashion Centre is a delivery and logistic centre for the Shimamura company located in Okegama-shi Saitama prefecture. Radcon #7 was used to waterproof the suspended loading dock seen here in Figure 27. This is a typical critical Radcon #7 application because of the office facilities located below.

FIGURE 26 - INSPECTION OF APPLICATION

Normally a membrane and a topping slab or wearing course would be needed to isolate the waterproofing membrane from traffic and potential damage. This usually has structural implications because of the extra weight of the topping slab.

FIGURE 27 - FASHION CENTRE, JAPAN

Radcrete Pacific's Managing Director, Mr Edward L Byrne can be seen in Figure 26 with Mr Hideoshi Itoh of Rad Japan. Mr Byrne was present during the application and was impressed with the Rad Japan's attention to detail and efficiency. The circular stamp seen in both photos provides additional grip to the trucks in slippery conditions.

GARDEMOEN AIRPORT, NORWAY

Client:	**OSL (Oslo Lufthavn)**
Civil Engineering:	**Bonde & Co**
Main Contractor:	**Backe Entreprenor AS**
Approved Applicator:	**Betongforsegling and Bemo Overflateknikk**
Area Treated:	**All parking areas + access Bridges**
Size:	**56,000 square metres**
Time of Application:	**September 1997 and July 1998**
Concrete:	**C45**

Oslo's international airport is to move from Fornebu to Gardemoen in October 1998. The new Airport is located 50 km from the city centre and is connected by high speed rail link and freeway.

The car-park was originally specified as a pre-cast structure using double-T elements with a mastic asphalt topping wearing course. The main contractor, Backe, changed the specification to steel pan, post-tensioned, cast in-situ concrete.

FIGURE 13 - RADCON #7 APPLICATOR

The total area of the parking house is 95,000 square metres with ground level being asphalt. Backe waterproofed all leaking points/joints including cold joints with Radcon #7 plus the access bridges and some rooftop areas. Other areas of the car park were treated with Radfloor,™ a silicate-based floor hardener acting as a concrete hardening and dust-binding material on internal floors.

The application was unique since it was the first time agricultural equipment was used to facilitate that application process. Labour rates in Scandinavia are high so application efficiency is paramount. Rates of 5,000 square metres per hour were achieved using a small tractor, 300 litre tank and 6m spray boom seen here in Figure 13.

FIGURE 14 - GARDEMOEN AIRPORT UNDER CONSTRUCTION

The application was completed in 4 days with total area treated with Radfloor™ being approximately 54,000 square metres. The total area treated with Radcon #7 was 2,000 square metres.

ONE PLACE, BANGKOK

Architect:	**Palmer & Turner**
Engineer:	**Palmer & Turner**
Main Contractor:	**Thai Gammon**
Application:	**Radcon Thailand Co. Ltd.**
Area treated:	**stepped rooftop, balconies and podium**
Size:	**3,500 square metres**

Another significant project waterproofed by Radcon Thailand in the Bangkok city centre. One Place is a combined retail and residential building.

The site is located on the famous Wireless Road where Radcon Thailand has also waterproofed All Seasons Place and Wave Place. Interestingly these two sites can been seen in the back-ground of Figure 16.

FIGURE 15 - ROOFTOP OF RETAIL LEVEL

As with a number of CBD developments in Bangkok this project remains unfinished. The structure and external envelope has been completed but the internal fit-out of the upper residential floors have been put on hold.

FIGURE 16 - ONE PLACE, BANGKOK

Fortunately the lower retail level is operational providing some financial return for the project. The roof of this retail area is shown here in Figure 15 during construction. After the Radcon #7 was completed to this podium level it was completely insulated with foam material, then tiled and landscaped.

RADCON #7: THE ULTIMATE ANSWER FOR TAIWAN'S FREEWAYS

Site: Dual raised freeway
Location: Wuku to Sitchu, Taipei
Client: Ministry of Transportation & Communication, Taiwan Area National Freeway Bureau
Consultant: TY Lin Engineers
Concrete: 4000psi
Application: Kingal Trading Co., March 1995
Size: 65,000 square metres (2km parallel - total 4 km)

Some 4 years of on-site product tests and evaluation led to our Radcon #7 waterproofing treatment to the New Taipei Raised Freeway as photographed.

The first Radcon #7 trial areas for Ministry of Transportation & Communication ~ Taiwan Area National Freeway Bureau were applied in 1992. Approximately 500 square metres was treated to Sanchung Bridge in Taipei. The success of this treatment & numerous other waterproofing works around Taipei led to the product's acceptance.

Taking into account the sheer cost and maintenance of such infrastructure, the engineers considered waterproofing important to increase the structure's serviceable life. Also when considering the amount of structural steel present in these raised freeway sections waterproofing protection is all important.

Prior to utilising Radcon #7, the freeway bureaus of Taiwan were specifying both Japanese and US manufactured membranes which were suitable for accepting a bituminous topping after application.

In striving for the very best construction and structural protection methods available, these membrane approaches proved to be extremely problematic. Even though the membranes themselves and the application of same were of the highest quality, the very high and consistent rainfalls experienced in Taiwan meant that latent moisture trapped in the slabs caused the membrane to delaminate. This lead to pot holes forming as chunks of bitumen were gorged out of the road surface in the delaminating areas.

Radcon #7 offered the ideal solution to these inherent problems. The product could be quickly applied during short dry spells, with the knowledge that Radcon #7, as a breathing material will allow for out-gassing of entrapped moisture vapour, thus eliminating any potential delamination problems.

Kingal can be seen in Photo 10 applying Radcon #7 with 4 motorised spray units enabling an application rate of approximately rate of approximately 4,000 square metre per hour.

PHOTO 8 – FINISHED FREEWAY COVERED IN ASPHALT TOPPING

PHOTO 9 – UNDERSIDE OF RAISED FREEWAY

PHOTO 10 – RADCON #7 APPLICATION

Furthermore, our 'Effect of Out-gassing on Concrete Slabs', 'Effect of Placing Hot (160°C) Asphaltic Concrete' & 'Asphaltic Bond Tests' performed by the US Department of Transport[1], demonstrated that there would be no significant loss of adhesion by the bituminous topping.

Both Radcrete Pacific and Kingal Trading Co., were pleased to have completed the project after the four years involved to demonstrate to the Taiwan Freeway Bureau and T.Y.Lin, the very best technology available to meet their freeway waterproofing and protection needs.

1. "Low Cost Bridge Deck Surface Treatment", US Department of Transport - Federal Highway Administration, Report PB84-238740, April 1984, pp. 15-16

RADCON #7 PROTECTS HONG KONG OVERPASS

Contact No.	**21/HY/95 W/O D029793-2**
Location:	**K11A - Prince Edward Road West**
Client:	**Hong Kong Government**
Engineer:	**Hong Kong Highways Department - Structures Division**
Main contractor:	**Chiu Hing Construction & Transportation**
Area treated:	**existing raised freeway**
Size:	**15,150 square metres**
Application Date:	**April 1997**

Radcon Formula #7 has been utilised by the Hong Kong Highway Department to protect its' civil structures numerous times over the past decade. This project shown here is a typical example of the scope of work that Radcon #7 is specified for.

All engineers are faced with the challenge of addressing the durability of a structure when it is located near to marine environments. Inevitably chloride ions penetrate the matrix of the concrete eventually corroding the reinforcement which reduces the serviceable life of the structure.

This particular section of raised freeway shown in Figure 12 is located in the Kowloon area of Hong Kong near the famous Kai Tak Airport. After many years of service and with proximity of less than 1 kilometre to the ocean there were signs of durability concerns in the form of cracks and small amounts of spalling.

In this situation, Radcon #7 was applied to the concrete road surface. The end benefit is that Radcon #7 reacts with Calcium Hydroxide in the concrete to create a gel which sets up a sub-surface barrier. The gel fills pores and capillaries significantly reducing the concretes' permeability. Equally as important the gel will seal cracks up to 2.00mm, and it is the cracks which provide a direct path for pollutants and chlorides to the reinforcement.

FIGURE 11 - CLOSE UP OF OVERPASS

When the application is complete it is important to understand that there is no film or coating layer on the surface which can be damaged. The product functions by penetrating into the concrete.

To treat such an old and busy freeway section caused a few logistic issues. Firstly, this section of freeway can only be shut down for very short periods of time during the evening. Secondly, after many years of service the road surface was contaminated with airborne pollutants, tyre rubber deposits, oil and fuel.

Therefore, part of the Method Statement included light acid etch and high pressure wash prior to the Radcon #7 treatment. After this preparation was complete and the road surface was dry, Radcon #7 was applied utilising motorised spray units. Each unit has the capacity to spray 800 square metres per hour enabling very fast application rates.

Radcon #7 requires three waterings to facilitate penetration and the products' reaction with the concrete. The specification states that the waterings should be spaced at approximately 24 hour intervals: Day 1, Day 2 and Day 3. The first watering must commence as soon as the product becomes touch dry, in this situation it was as little as 1-2 hours.

FIGURE 12 - K11A - PRINCE EDWARD ROAD WEST, KOWLOON

On this project, the waterings were simply a matter of having the water truck drive along the freeway at a controlled speed flood spraying water. The freeway was closed until the completion of the first watering at which time it is safe for vehicular traffic without affecting the integrity of the treatment.

The second and third waterings were undertaken without closing the freeway at all. The trucks were again driven along the freeway at controlled speed, watering the road surface whilst it was open to traffic.

As part of Quality Assurance for this project, the Hong Kong Highways Department specified that post-application tests be undertaken to confirm the product had been applied correctly and penetrated sufficiently into the concrete.

Specific areas were nominated on the structure and cores were taken for analysis. The Australian government owned C.S.I.R.O. (Commonwealth Scientific & Industrial Research Organisation) was commissioned to determine the penetration of Radcon #7 into these cores. The reaction products of Radcon #7 are a close cousin to the naturally occurring C-S-H in concrete, so determining depth of penetration is difficult.

The investigation techniques selected for this work were Scanning Electron Microscopy (SEM) and X-ray Microanalysis (EDS).

The recorded depth of penetrations of Radcon #7 were:

Core 1	2.5mm	road surface
Core 2	4mm	road surface
Core 3	10mm	road surface
Core 4	12mm	road surface
Core 5	8mm	road surface
Core C121	8mm	column
Core C122	14mm	column

Overall the penetration results were acceptable. It should be noted that road surfaces (particularly old ones such as these) can be contaminated with many forms of pollutants from those that are airborne to vehicular oil, grease and petrol. These contaminants are impossible to completely remove from the concrete thus reduce the ability of Radcon #7 to penetrate concrete as shown in Core 1 & 2. Fortunately this is normally isolated to areas of heavy contamination only.

STAR - LRT (LIGHT RAIL TRANSPORT), MALAYSIA

Client:	**STAR (Sistem Transit Aliran Ringan)**
Turnkey contractor:	**Taylor Woodrow International AEG Westinghouse**
Consultant:	**Robert Benaim & Associates**
Sub-contractor:	**John Holland Construction & Engineering**
Approved Applicator:	**Brunseal (M) Sdn. Bhd.**
Area treated:	**rooftops of 13 LRT stations**
Size:	**13 x 1,000 square metres**

In the past decade Malaysia has made enormous economic progress despite recent currency problems that have crippled the Asean region. With this progress, as an exporter to Malaysia we have seen similar growth in traffic which has been strangling the country particularly Kuala Lumpur.

As part of a strategic effort to resolve this common problem, the government of Malaysia has embarked on an ambitious programme of public transport infrastructure, concentrating especially on new railway construction.

In accordance with the national privatisation policy, the majority of these projects are privately funded and typically consist of Build, Own, Operate and Transfer (BOOT) schemes.

"The STAR LRT System I is one of these schemes. Phase 1, mainly in the city centre, was opened to the public in the 1996, and Phase 2 was recently completed by: Taylor Woodrow Projects (Malaysia) and AEG Daimler Benz Transportation (Adtranz)." (1)

Phase 2 involved 3.1km of extension to the north of Phase 1, and 11.8km of extensions to the south.

"Ove Arup & Partners International Ltd. and Arup Jururunding Sdn. Bhd. were appointed lead consultant for all civil and structural work in Phase 2, with Arkitek Kitas Sdn. Bhd. appointed as architect for the stations. Robert Benaim Associates were sub-consultants for the northern viaduct, and DE Consult for the track works." (2) The construction group also sub-contracted Australia's John Holland Group for civil engineering works.

FIGURE 21 - GANTRY TRANSPORTED FROM AUSTRALIA TO MALAYSIA

FIGURE 22 - COMMONWEALTH STATION, STAR-LRT

FIGURE 23 - LIGHT RAIL TRANSPORT STATION

"Planners decided to use a travelling gantry to lift the deck units, or segments, each weighing 40-50 tons, by crane from street level. The gantry works well in a straight line but not around the many corners and s-bends along the track. Out of 6 companies tendering for the gantry work, the French-designed gantry seen here in Figure 21 was readily available from Australia where John Holland had used it to build overhead roadways in Victoria and Queensland; so this became the chosen machine and was shipped to Malaysia after some minor modifications." (3)

Now complete, this light passenger metropolitan railway will be the longest fully automated driverless LRT system in the world. Another record set by Malaysia, which is true to their ambitious character.

Brunseal (M) Sdn. Bhd., the Radcon #7 representative for Malaysia was sub-contracted from Teamwork Corporation Sdn. Bhd. (a division of Taylor Woodrow Group). In all they were contracted to waterproof the flat concrete rooftops of 13 stations of the LRT systems.

The 13 stations waterproofed were: Seri Mas, Ampang, Tasik Selatan, Chan Sow Lin, Taman Mulia, Sentul, Sentul Timur, Commonwealth Games Village, Sg Besi, Sultan Ismail, Bandar Baru Sentul, Tun Razak, Putra World Trade Centre Stations.

Two stations are picture here in Figures 22 and 23, the former being the station for the 1998 Commonwealth Games to be held in September.

Reference: (1) & (2) "Concrete Engineering International", January/February 1998, Emap Construct, London, UK, p. 6
(3) "Construction & Public Works", June 1996, Primedia Co., Essex, UK, p. 18 - 20

MEEKONG RIVER BRIDGE

John Holland Constructions recently completed the construction of the Meekong River Bridge, officially known as the 'Friendship Bridge'. The 1.23km bridge spans the 700 metre wide river between Nung Khai in the north east of Thailand and Tha Naleng in Laos.

The bridge superstructure was built by the balanced cantilever method, due to the difficulty of constructing temporary supports when the river level is high. Each span starts at the pier and progresses in both directions until the cantilevers are joined at the mid-span section. Radcon #7 was treated to the surface and construction joints of this mid-span section which was poured in-situ. There was some 21 mid-span sections in total.

Radcon #7 provided a cost effective alternative to the original membrane specification and was accepted by Maunsell Engineers. John Hollands were happy with the performance of the product particularly taking into consideration the ease of application and unlimited shelf-life of the product in such a remote area.

The bridge will carry two lanes of traffic on a single carriageway and has provision for a future railway down the centre. Because the Lao and Thais drive on different sides of the road there is a traffic change-over on the Lao side.

This is now the second time John Hollands have utilised Radcon #7 in offshore work. The former application being in the construction of an airport hanger in Bangladesh.

Radcrete Pacific, now active in some 25 countries around the world are happy supporting Australian companies remain competitive in the international marketplace.

RADCON #7 IN NAURU

Radcon #7 was chosen to protect the new concrete tank walls formed against the existing walls. The existing tank walls were suffering as a result of chloride ion related corrosion.

The tanks themselves hold sea water for the sanitation needs of the islands inhabitants. In the foreground some of the locals have found another more enjoyable use for an already completed tank.

Given the ease of application and non-toxic nature of Radcon #7 the product is ideal for shipping to remote areas for application by relatively unskilled labour.