

# LIFETIME WATERPROOFING AND PROTECTION FOR STRUCTURAL CONCRETE

## **RADCON<sup>®</sup>** **FORMULA#7**



Dover Park View Apartments

## **GREEN ROOF TOP SITE REFERENCES**



# DOVER PARKVIEW, SINGAPORE

**Developer:** Far East Organisation  
**Architect:** Andrew Tan Architects  
**Engineer:** KTP Ho Consultant & Partners  
**Main Contractor:** Neo Corporation  
**Areas treated:** rooftops, roof-garden, planter boxes, podium deck, car park roof-deck, swimming pools, wet areas  
**Size:** 50,000 square metres  
**Representative:** Reverton Engineering

The Miami Style **Dover Parkview** is now complete in Singapore. Designed by Andrew Tan Architects, developed by Far East Organisation, built by Neo Corporation. Claimed to be the most advanced high tech condominiums in Singapore, every home is fully automated with the Proteq 8X, one of the worlds most intelligent home automation and security systems.

This system provides around-the-clock protection by constantly monitoring each apartment. Combined with this household appliances can be remotely switched on or off by simply dialling the correct code on any phone line, while heat detectors forewarn and help prevent any potential fires.

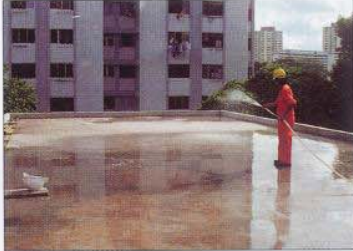


FIGURE 21 - 1ST WATERING AFTER THE RADCON #7 TREATMENT

High-tech wizardry aside, Dover Parkview also boasts one of Singapore's best private landscaped gardens designed by **Belt Collins**, the landscape architect behind the famous Shangri-La Hotel, Singapore.

As part of the resort living atmosphere, Dover Parkview has a full range of recreational facilities. These include an underwater-music swimming pool (see Figure 23), children's

play pool, jacuzzi, eurobath, sauna, outdoor fitness station, gymnasium, four tennis courts, BBQ pits and more.

The project is located off Dover Road, close to established schools, tertiary institutions and major conduits like the Ayer Rajah Expressway. In addition, residents can look forward to an air-conditioned shuttle service between Dover Parkview, Buona Vista MRT Station and the popular Holland Village.

**Radcon Formula #7** was used as the exclusive waterproofing system for this project. The product was used in applications covering everything from high thermal stress slabs to water holding vessels to rooftop gardens - totalling some 50,000 square metres of waterproofing.

## ROOFTOPS

Radcon #7 was used to waterproof all of the flat concrete rooftops on the 4 towers. Topside insulation was still required so the surface finish needed a topping that can be seen in Figure 24.

## LANDSCAPED AREAS

This site combined planter boxes and extensive landscaping over the podium level which can be viewed in Figures 22 & 25. Importantly plant roots will not attack the integrity of the



FIGURE 23 - SWIMMING POOL WITH UNDERWATER MUSIC



FIGURE 22 - DOVER PARKVIEW, SINGAPORE



## BAAN SANSARAN, HUA HIN, THAILAND

<b>Owner:</b>	Sansiri Public Co., Ltd.
<b>Main contractor:</b>	Thai Gammon Ltd.
<b>Structural Engineer:</b>	Palmer & Turner Co. Ltd.
<b>Architect:</b>	Palmer & Turner Co. Ltd.
<b>Construction Managers:</b>	Arun Chaiseri
<b>Areas treated:</b>	rooftops, balconies, wet areas
<b>Size:</b>	20,000 square metres
<b>Project value:</b>	1,900 million Baht

The competition is strong in the Thailand waterproofing industry. Out of many different systems available Radcon Formula #7 was chosen to waterproof 20,000 square metres of concrete at the Baan Sansaran luxury condominium development south of Bangkok.

In Baan Sansaran the designers, Palmer & Turner, have succeeded in creating one of Thailand's most attractive resort condominiums. Set on the beach front at Hua Hin the layout is a horse shoe pattern of 4 buildings which creates a peaceful

inner area, housing: pools, water falls and landscaping.

The front two buildings are 4 storeys high seen clearly in Figure 16, and the rear two buildings are 7 storeys high,

shown in Figure 15 during construction. There are some 310 condominiums in total. Amenities for the development include 3 large swimming pools, spa, gym, health club, squash court and underground parking.

On any flat concrete rooftop there is a requirement for mechanical and electrical services. These M&E Services normally involve drilling of holes to enable bolting down of services such as air conditioning units. Whilst there is always an intention to co-ordinate the M&E Services with the waterproofing trade this is not always a reality, particularly with time pressures at the end of a project.

When using membrane waterproofing systems it is common for damage to occur at this time from trades who drill holes after the waterproofing is finished. In the case of a conventional membrane system water ingress in one spot can lead to total system failure.

Alternatively, with Radcon #7 if any damage does occur it will only be a localised problem and repaired easily. This keeps maintenance to a minimum and provides lower risk to the owner over the life of the building.



FIGURE 15 - DURING CONSTRUCTION

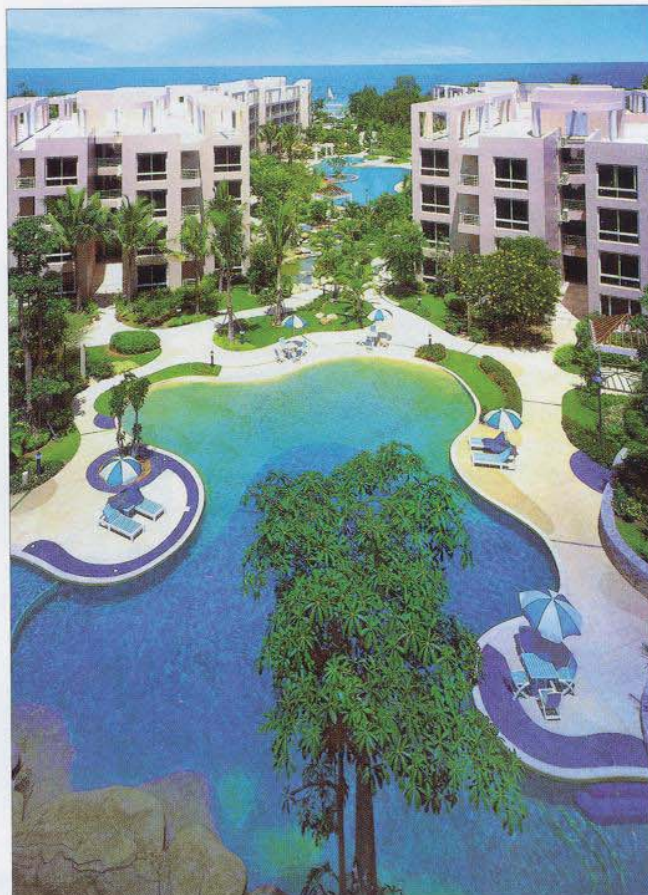


FIGURE 16 - BAAN SANSARAN, HUA HIN, THAILAND

## REWA PROVINCIAL HOUSE, FIJI

<b>Architects:</b>	Jaimi & Associates
<b>Main contractor:</b>	J.S. Hill & Associates
<b>Approved Applicator:</b>	Fiji Waterproofing Services
<b>Areas:</b>	planter boxes, plant room deck & balconies.
<b>Size:</b>	1,400 square metres

Jaimi & Associates recently specified Radcon #7 to waterproof the major external components of Rewa Provincial House. These areas included the planter boxes on the East & West balconies on the top and second floor, and also the balconies.

The building was designed to provide the best working environment with good natural light & views without problems of sunshine and glare. A careful use of durable materials was chosen for this project to enhance the building and reduce future maintenance costs.



FIGURE 17 - REWA PROVINCIAL HOUSE, FIJI



## ASTON MANSION, SINGAPORE

<b>Developer:</b>	Far East Organisation
<b>Architect:</b>	RDC Architects
<b>Engineer:</b>	Tan EE Ping
<b>Approved Applicator:</b>	Reverton Engineering
<b>Areas treated:</b>	rooftops, wet areas, entrance podium, planters, swimming pool
<b>Size:</b>	20,000 square metres

Radcon #7 waterproofs another large project for Far East Organisation in Singapore. Aston Mansions is an upmarket twin residential block with full security and recreational facilities.

The waterproofing contract provided many challenges with various areas such as rooftops, wet areas, entrance podium/roadway, planters and a swimming pool. On this site Reverton Engineering have utilised Radcon #7 as the core product to waterproof all of these areas totaling some 20,000 square metres.

On a site such as this a lot comes down to project management of the waterproofing contract. Each area must be carefully prepared, waterproofed and supervised to ensure there is no leakage today or in the guarantee period. Whilst this is the case with every large sub-contract it is particularly important in waterproofing due to the potential consequential damaged associated with water leakage.



FIGURE 35 - INSULATION AND TOPPING OVER RADCON #7

A key to achieving consistent performance in waterproofing is maintaining limited supply and controlled installation which for Radcon #7 is managed by one company in each



FIGURE 36 - ASTON MANSION, SINGAPORE



FIGURE 37 - RADCON #7 WATERPROOFS ENTIRE PODIUM LEVEL INCLUDING POOL, DECK, CLUB HOUSE AND TENNIS COURT

country. These companies are always detailed on the back of our Newsletters. This quality focussed strategy does not generally deliver quick sales but it does provides a reliable and guaranteed result to build upon.

## TRINITY GRAMMER SCHOOL, SYDNEY

After successfully using Radcon #7 to waterproof a 6,500 square metre Sportsfield at MLC School back in 1995, Woolacott Consulting Engineers specified the product again for this suspended Sports Field at Trinity Grammar.

Builders, Kell & Rigby won the job to construct the post-tensioned slabs which are suspended over a car park. Figure 39 shows the site under construction after it has been cleaned for the application of Radcon #7. The Sportsfield is mainly used for outdoor basket ball courts. The site has now been backfilled which has resulted in part of structure being covered with soil and turf.

The two important factors for successful waterproofing of this



FIGURE 38 - RADCON #7 APPLICATION

project were: Radcon #7 will maintain a watertight result beneath landscaping. And secondly, sports field finishings such as artificial turf and other coatings can still be fully bonded to Radcon #7 treated concrete.



FIGURE 39 - SPORTSFIELD UNDER CONSTRUCTION

Kratrim, one of our Approved Applicators can be seen here in Figure 38 applying the product using a low pressure motorised spray unit. The application is being overseen by a Radcrete Technical Representative and the total area treated was 3,000 square metres.

The architects were Collard Clarke & Jackson.



## VERSATILE RADCON #7 SOLUTIONS FOR SINGAPORE



STERLING CONDOMINIUMS, BUKIT TIMAH, SINGAPORE

**Main Contractor:** Dragages Singapore Pte Ltd  
**Architect:** D.P. Architects Pte Ltd  
**Approved Applicator:** Reverton Engineering Pte Ltd  
**Area Treated:** 26,200 Sqm

Radcrete's Singapore representative, Reverton Engineering, recently completed Radcon #7 waterproofing to "The Sterling" luxury private condominiums in the upmarket Bukit Timah district.

The areas treated included the rooftop swimming pool, covered link way and wet areas.

Reverton Engineering has, time and time again, demonstrated the multiplicity and flexibility of Radcon #7 applications within a single building structure. In turn, this highlights the shortcomings of tedious specialised approaches and materials for different applications - when the use of Radcon #7 achieves cost-effective lifetime waterproofing on every occasion.

## RADCON #7 WINS AT NEW 'AUSSIE' SPORTS STADIUM

**Builder** Abigroup Contractors  
**Architects** Scott Carver  
**Project Manager** Incoll Management  
**Applicator** Kratrim Pty Ltd  
**Area** 1,300 Sqm

Located in the north of the greater metropolitan area, this new sports stadium complex is some 80 kilometres from Sydney's CBD at Gosford on the Central Coast.

This type of structure is ideal for pre-cast panel construction and will perform faultlessly provided no structural volatility is present under full loading. Radcon #7 waterproofing was applied to a structural topping slab that was emplaced over pre-cast panels.

The completed Grahame Park Stadium now provides the local community with an excellent venue for sports events and spectators alike.



GRAHAME PARK STADIUM, GOSFORD, AUSTRALIA



## MEMBRANE WATERPROOFING MUST FAIL

Sad but true, more membranes must ultimately lead to more landfill as their lifecycle expires requiring removal, dumping and replacement.

The small site photographed demonstrates just how much bulk material must be taken away and dumped prior to membrane re-application.

Every lifetime waterproofing application undertaken reduces the ultimate pressure on landfill sites globally.

With Radcon #7 reducing landfill whilst delivering a 0% VOG product that is both non-toxic and non-flammable, it is no wonder we are becoming good friends with EPA's (Environmental Protection Agencies) the world over.



MEMBRANE RUBBISH

## RADCON #7 – HOUSING DEVELOPMENT BOARD – SINGAPORE

**Client:** Housing Development Board (HDB)  
**Main Contractor:** Pillar Corporation (Contracts 3, 11 & 12)  
Hong Lai Huat Construction (Contracts 1 & 2)  
Tong Hup Seng Constructions (Contract 9)  
**Area Treated:** Podiums, 16,000 sq. metres  
**Applicator:** Reverton Singapore.

Yet another landmark application for Radcon #7 in Singapore.

This development is a new construction project known as "Ponggol 21".

Radcon #7 waterproofing was applied to four landscaped deck areas above car parking, involving some 16,000 sq. metres of treated areas.



PONGGOL 21

Certainly as a small island country Singapore never ceases to amaze with

regard to the major size of projects that continue to be undertaken.



## RADCON #7 - GRAND HYATT - DUBAI

Project: Hotel & Residence  
 Consultant: Arkitek Int. (Engineers)  
 Contractor: Ssangyong Engineering & Construction Co. Ltd.  
 Application: Substation / Roof Car Park.  
 Area: 900 sq. metres.

The Grand Hyatt Dubai is located just off Bur Dubai on the south bank of the Arabian Gulf's most exciting city.

When the Grand Hyatt opens in late 2002 it will represent one of the Middle East's largest and most luxurious conference hotels.

The area treated was a Car Park above the hotel sub-station.

The Middle East represents a new region for Radcrete so this small part of the Hyatt project is fairly typical in start up territories.

Put simply we were handed the



GRAND HOTEL DUBAI



GRAND HOTEL DUBAI

smallest yet highest risk waterproofing for the entire site.

That is an electrical sub-station with vehicular loading from above.

## RADCON #7 - GETTING IT RIGHT FOR AUSTRALAND

Developer: Australand  
 Builder: Australand / Walker Design & Construct Project.  
 Applicator: Kratrim Pty Ltd.  
 Area: 2945 sq. metres.

Rhodes Corporate Park Complex. Radcon #7 was used to waterproof podium slab over Car Parking area which incorporated Stage 1 of the commercial building complex, being the main entrance to Building C.

Possible water leakage through the concrete podium slab top, the parked vehicles below would be a major concern for the owner, especially with the area being tiled and landscaped to include a café for public use.



RHODES CORPORATE PARK COMPLEX.

A combined Radcon #7 (applied to the slab) and Radmyx (to the underside) system approach waterproofing gave full peace of mind to the builder and owner.

The fast application technique of Radcon #7 highlighted the advantage over traditional membranes to assist with the construction program without any delays.



# SITES OF INTEREST 2008

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**FIGURE 1. & 2.**  
One Leicester apartments  
in Singapore.

### SITE DETAILS:

COUNTRY - Singapore  
SITE - One Leicester  
TREATED AREA - Podium deck, landscaped  
areas and swimming pool

## New luxurious condominium in Singapore opts for RADCON Formula #7 protection.

One Leicester is an 18 storey, ultra modern complex of exclusive apartments recently opened in Singapore.

It offers its residents 194 stylish urban design units surrounded by an elegant glass facade and stunning views of the surrounding area.

RADCON Formula #7 has been applied to the podium deck, protecting the entrance drop off section and the adjoining water feature.

Radcrete's Singaporean applicators had all the 'aces' in their hands when meeting with the One Leicester specifiers.

RADCON #7 had been widely used on condominium complexes throughout Asia including Singapore.

It is also specifically designed for long term protection of exposed trafficable areas by re-sealing any future hairline cracks. Potability and unlimited hydrostatic pressure characteristics proved to be beneficial for protection of the water feature.

Some other features at One Leicester include tennis courts, landscaped rooftop garden, outdoor pool, tai chi corner, multiple gardens and fitness centres.





## RADCON #7 FOR SUSPENDED SPORTS FIELD

**Site:** MLC Sports Field, Burwood  
**Engineers:** Woolacotts Consulting Engineers  
**Architects:** Bowden Design Partnership  
Robert Lee Architects  
**Builder:** Austruc Pty Ltd  
**Applicator:** Kratrim Pty Ltd  
**Size:** 6,500 square metres

Radcon Formula #7 was recently used to waterproof this fully suspended sports field built for MLC School in Burwood. Kratrim, one of our approved applicators, applied Radcon #7 to approximately 6,500 square metres of structural concrete.

From Photo 3, Radcon #7 can be seen being spray applied to the clean, dry concrete surface. On a slab this size, Kratrim are using a motorised spray unit that enables the product to be applied at a rate of up to 1,000 square metres per hour.



PHOTO 3 - RADCON #7 APPLICATION

In a matter of hours after the application, the treated slab can be exposed to traffic (tradesmen etc). This is due to the nature of Radcon #7 penetrating into the concrete, rather than being a vulnerable surface coating. This trafficability enabled Austruc, the builders, to continue working over the finished treatment, adding to their site time efficiency.

The architects and engineer evaluated many waterproofing systems, from admixtures to membranes and it was decided that Radcon #7 would offer the best solution for this particular application. Some of the key performance benefits that led to this conclusion were: tanking ability, complete trafficability, no

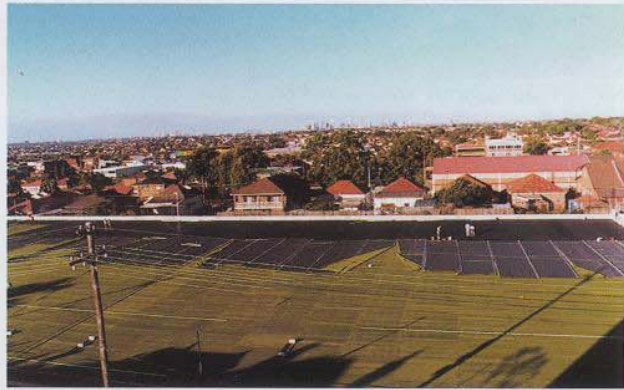


PHOTO 4 - SLAB BEING COVERED WITH ARTIFICIAL TURF



PHOTO 5 - SUSPENDED SLAB DURING CONSTRUCTION

bond loss to artificial turf & researched performance on large suspended slabs exposed to maximum thermal movement.

The MLC Sports Field, being completely suspended, is the only one of its kind in Australia and can be seen before and after the artificial turf has been laid in the above photos. A number of different sports will be played, primarily hockey, but also tennis, netball and soccer.

When the treatment was completed the site was pond tested to confirm a seal was achieved.

## 3RD LARGEST TELECOMMUNICATIONS TOWER IN THE WORLD

With the waterproofing for the Telecommunications Tower in Kuala Lumpur now complete, following are some finished photographs that show the Radcon #7 waterproofing in more detail. Green East Enterprise, completed the application to some 750 square metres of these exposed levels shown in far Photo 7.

Radcon #7 was chosen for this site, due to its absolute resistance against UV exposure and the increase in concrete durability from airborne pollutants. The accurate, metal-like finish of the concrete was achieved using metal formwork.



PHOTO 6 - MENARA KUALA LUMPUR, 421M IN HEIGHT



PHOTO 7 - LEVELS 9 & 10 OF THE TOWER HEAD



# RADCRETE



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## EDITORIAL

After the distribution of our first "Newsletter" some recipients did query the value of some of our article inclusions.

As we all know, the Architectural, Construction and allied fields represent an extremely large and somewhat fragmented industry.

The purpose of our "Radcrete Newsletter" is to better inform the marketplace about our Radcon #7 sealing product and its scope of use.

Due to the immensity of our marketplace, we also hope to give our industry some insight into our company's commitments, communal activities and social events.

To ourselves, the social activity contents are all important in that it allows us to meet with industry personnel who we otherwise may not have had the opportunity of meeting personally.

We do hope that you will wish to remain on our mailing list by returning the mailer printed in this edition of our "Newsletter".

*(Continues Next Page)*

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*Dainford (Before)*

## Dainford Constructions

The photo appearing above shows a Radcon #7 sealing treatment to a 1500 sq. metre artificial lake for Dainford Construction's "Resort Motel Project".

Situated directly below the lake is the car parking area for the 230 unit motel complex. The lake sealing required a Radcrete System approach incorporating joint seals to the slab and slab/wall interfaces.

The slab surface and all lake walls were treated with Radcon. All ancillary joint sealing work was performed by our Approved Applicator, Armstrong Duggan Pty. Ltd. The photo below shows the Lake Project near completion.

The Radcon #7 approach was chosen due to its non-toxic nature, having regard to the flora and fauna in the lake. The Radcrete sealing system for this area of the project costed out at \$14.00 per sq. metre.



*Dainford (After)*

OFFERING A NEW & PROVEN SEALING TECHNOLOGY FOR AUSTRALIA & SOUTH EAST ASIA