



VANDEX SUPER was chosen to provide waterproofing and protection for exhibition hall and floor slabs at new Hong Kong Convention and Exhibition Centre.

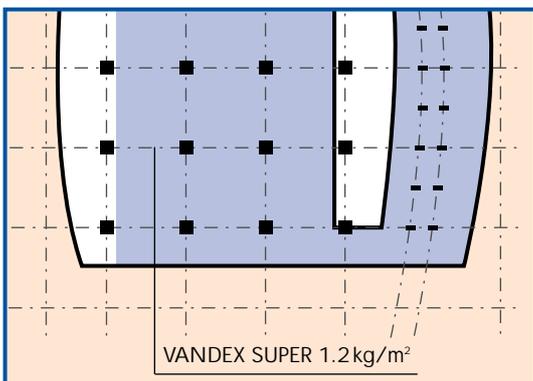
The historic ceremony marking Hong Kong's transfer to China took place in June, 1997, at the exhibition hall of the new Convention Centre. Numerous senior government officials from all over the world witnessed the historic moment.

The highly individual yet elegant structure will be a new Hong Kong landmark for both political and aesthetic reasons. The sweeping roof creates the illusion of a bird's flight against the backdrop of Hong Kong's harshly linear skyline.

To waterproof and protect the surfaces of the supporting floor slabs of the exhibition hall, VANDEX SUPER was applied on three levels (43,000 m<sup>2</sup> overall) using the dry-sprinkling method. In this process, VANDEX SUPER is sprinkled dry onto the fresh concrete and worked into the slab with a power trowel. Accuracy of workmanship had to meet very high standards as well. The tolerance limit was  $\pm 3$  mm, with bay sizes of 6 x 18 m.

The ambitious \$620-million project was completed in the record time of 3½ years from 1994 to 1997. VANDEX SUPER was applied on an area of totally 46,700 m<sup>2</sup> including the exhibition hall, floor slabs and ramps.

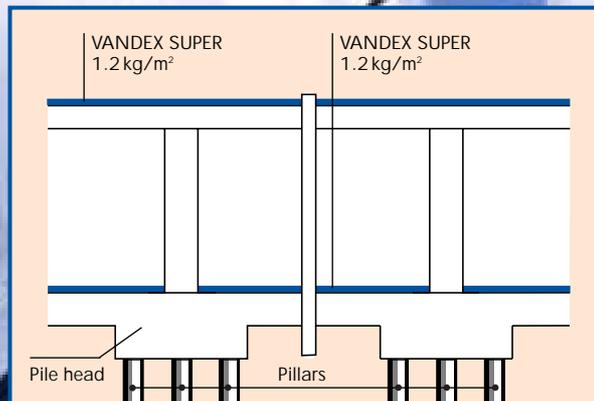
# VANDEX FOR NEW HONG KONG LANDMARK





VANDEX SUPER application wet-on-wet on base slab and concrete ceilings using vibratory beam and power trowel.

Illustration: Convention Centre, cross section of basement.



## VANDEX SUPER

### Waterproofing Slurry

- in-depth waterproofing and protection
- for concrete against active and passive water pressure

### Application

VANDEX SUPER is used on old and new, sound concrete.

### Properties

VANDEX SUPER is waterproof (tested up to 7 bars) and suitable for application on vertical as well as horizontal surfaces.

VANDEX SUPER is durable and resistant to frost and heat, but remains permeable to water vapour.

**Bulk density:** about 1.25 kg/litre  
**Setting:** 60 minutes

**Project name:** Hong Kong Convention and Exhibition Centre, Phase 2, Extension **Architects:** Wong & Ouyang (HK) Ltd., Hong Kong; Skidmore, Owings and Merrill, Chicago, U.S.A. **Main contractor** (joint venture): Hip Hing Construction Co. Ltd., Hong Kong and Dragages et Travaux Publics (HK) Ltd. (Bouygues Group) **Vandex applicator:** Erawan Co., Ltd., Hong Kong



Boston's new sewage system on Deer Island represents a 3.4 billion dollar investment and is part of an environmental rehabilitation project in Boston Harbour.

The Deer Island plant handles the sewage of 43 adjoining municipalities. It is one of the largest, most modern sewage treatment plants in the U.S.A. and meets the latest U.S. standards. Started in 1989, the giant project is being undertaken in stages and will be fully operational by 1999.

In addition to sewage treatment, the plant also serves to convert sludge to fertilizer and prevents harmful emissions. The plant's effect is felt already; water quality



## VANDEX WATER-PROOFING FOR MAJOR SEWAGE PLANT IN BOSTON, U.S.A.

has improved to the extent that dolphins and seals have returned to the harbour area as regular visitors.

Throughout 1996, interior surfaces of settling tanks, secondary clarifier tanks, ceilings, and shafts totalling 42,000 m<sup>2</sup> (450,000 sq.ft) have been coated with VANDEX SUPER waterproofing slurry. Most of the surfaces were sprayed using Carrousel peristaltic pumps (daily output about 700 m<sup>2</sup> (7,500 sq.ft) per team). To prevent premature drying, the fresh VANDEX SUPER surfaces were sprayed with a dissipating resin curing agent. In addition to surface applications, VANDEX SUPER was applied in dry shake form on top of walkway slabs. About 5 tons of VANDEX UNI MORTAR 1 Z were used in substrate preparation for repair and waterproofing of cracks and honeycombs.



*Sewage plant construction site. (Photo: Kevin Kirwin; courtesy Massachusetts Water Resources Authority).*

*VANDEX SUPER application with fine-grain mortar gun. Bayport Sewage Plant, Houston, Texas, U.S.A.*

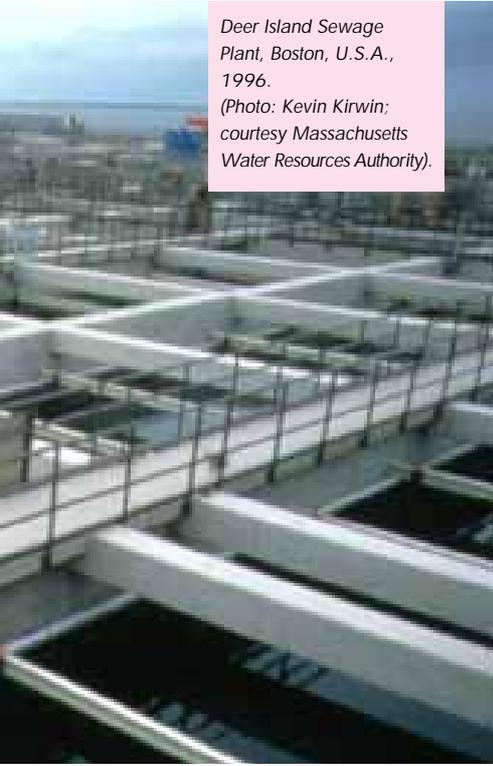


**Project:** Residuals Treatment Facilities, Phase I, Secondary A & B **General contractor:** George Hyman, Inc. (Clarke Construction), Boston, MA **Engineers:** Camp, Dresser & McKee, Inc., Cambridge, MA **Vandex applicator:** P. J. Spillane Co., Everett, MA

**Project:** Secondary Clarifier Batteries, A & B **General contractor:** J. F. White, Inc., Boston, MA **Engineers:** Malcolm Pirnie, Inc., Boston, MA **Vandex applicator:** P. J. Spillane Co., Everett, MA

**Project:** Secondary Reactor Batteries, A & B **General contractor:** J. F. White, Inc., Boston, MA **Engineers:** Malcolm Pirnie, Inc., Boston, MA **Vandex applicator:** Chapman Waterproofing, Boston MA

Deer Island Sewage Plant, Boston, U.S.A., 1996.  
(Photo: Kevin Kirwin; courtesy Massachusetts Water Resources Authority).



Located about 20 miles south east of Houston, Texas, in a dynamically growing industrial area in the U.S. sunbelt, the Bayport sewage treatment plant underwent a significant expansion in 1996.

The increase in the amount of industrial waste water in recent years made a major extension of the Bayport sewage treatment plant inevitable. In addition to technological improvements, a settling tank measuring 43 meters

VANDEX SUPER waterproofing slurry, proven in sewage systems for many years.

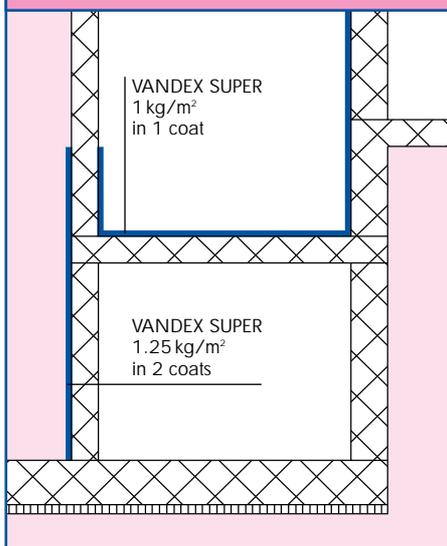
The VANDEX SUPER was applied by spray on a total of 13,000 m<sup>2</sup> (140,000 sq.ft) of internal tank surfaces, from February to July, 1996, using a fine-grain mortar gun. In addition, waterproofing reglets were provided internally on all tank floor/wall joints, with VANDEX UNI MORTAR 1 Z.

## INDUSTRIAL SEWAGE PLANT IN HOUSTON, TEXAS

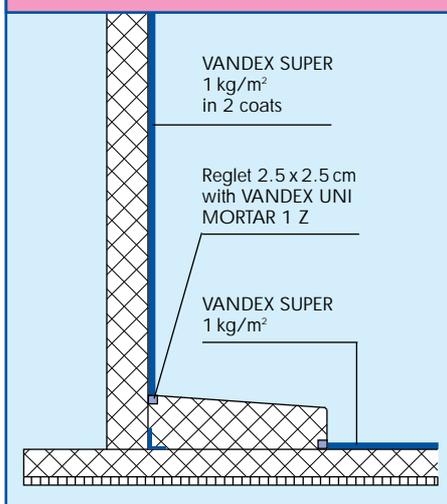


Aeration tank at Bayport sewage plant, Houston, Texas, U.S.A.

### Deer Island Sewage Plant Cross section



### Bayport waste water treatment plant Cross section



(140 ft) in diameter and a large aeration tank holding nearly 60 million litres (16 million gallons) were undertaken in an expansion program in 1995 - 96.

The open aeration tank is divided into five sections and was built in prestressed concrete construction (base slab and walls). The major part of the prestressed base slab has a thickness of 25 cm (approx. 10 inches).

For protection of reinforcement and prestressing cables, the engineers in charge specified a penetrating waterproofing and protection slurry on all internal surfaces to prevent corrosion from waste water. Chamberlin Waterproofing, Houston, waterproofing specialists, opted for

**Project:** Gulf Coast Waste Disposal, Bayport Group IB Facilities **General Contractor:** Pepper-Lawson Construction Co., Pasadena, TX **Engineers:** Malcolm Pirnie, Houston, TX; GHC Engineers, Denver, CO **Vandex applicator:** Chamberlin Waterproofing, Houston, TX

### VANDEX UNI MORTAR 1 Z

#### Waterproofing and Repair Mortar for Sewage Plants

- increased sulfate resistance
- for open sedimentation tanks and open channels

#### Application

*VANDEX UNI MORTAR 1 Z serves to repair and coat open tanks and channels in sewage treatment plants as well as on horizontal or vertical concrete surfaces subject to heavy mechanical stress.*

#### Properties

*VANDEX UNI MORTAR 1 Z is waterproof (tested up to 7 bars), resistant to frost and heat after curing while remaining permeable to water vapour. VANDEX UNI MORTAR 1 Z is resistant to residential sewage.*

#### Specifications:

Setting: approx. 5 - 6 hours  
Compressive strength: 45 N/mm<sup>2</sup> 28 days  
Bending tensile strength: 7 N/mm<sup>2</sup> 28 days  
Modulus of elasticity: 2.45 x 10<sup>4</sup> N/mm<sup>2</sup> 28 days

VANDEX SUPER see page 3

*Barcelona. Spain's New Aquarium:  
Europe's Largest and Most  
Important on Topic of Mediterranean  
Fauna and Flora*



It is also the most significant private facility for applied research and science in Mediterranean marine biology. Altogether, 4000 species from the Mediterranean and the tropics share a three-storey aquarium system.

Designed by architects Esteban & Roberto Terradas, the aquarium is one of the largest works in post Olympic Barcelona. The project was built on a trapezoidal property of 6,300 m<sup>2</sup> area in Barcelona's "Centre de Mar." It is part of the waterfront reclamation for leisure space and represents one of Spain's most prominent recreational projects.

#### **Oceanarium at the Centre**

An immense sea water tank measuring 40 meters in diameter and 5 meters in height, the oceanarium forms the centre. Its dimensions allow keeping large species and give the viewer a sensational

underwater experience by means of transparent tunnels.

#### **1.3 Million Visitors Annually**

The aquarium complex accommodates various marine biology areas that are presented in 21 separate tanks. Sharks, the most conspicuous species, peacefully share the oceanarium with others.

A large exhibition space and a 200-seat auditorium for seminars are additionally integrated into the aquarium system, which hosts 1.3 million visitors annually.

#### **Vandex Waterproofing for 21 Sea Water Tanks**

Serving as man-made living space for animals and plants, the sea water tanks in reinforced concrete construction must meet stringent requirements in terms of biological compatibility, operating safety and durability.

For waterproofing and protection of the internal surfaces of all



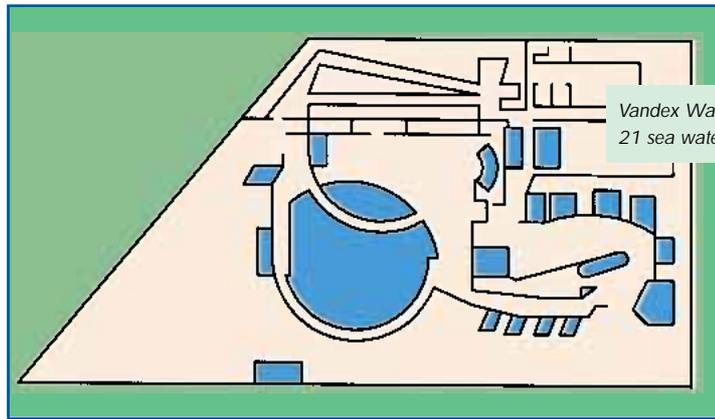
reinforced concrete tanks, as well as for the foundation slab and elevator pits structures, the design team's choice was VANDEX SUPER cementitious waterproofing slurry.

A total of 5,000 m<sup>2</sup> of reinforced concrete surfaces of the above systems and structural segments was coated with VANDEX SUPER. The dosage was 1.2 kg/m<sup>2</sup> on horizontal surfaces, 1.5 kg/m<sup>2</sup> on walls.

**Builder:** La Sociedad Mundo Submarino, S.A.  
**Architects:** Esteban & Roberto Terradas Muntanola, Barcelona **General contractor:** U.T.E. Entrecanales y Cubiertas **Vandex applicator:** Francisco Betrián Travería, Barcelona



# VANDEX WATER-PROOFING FOR EUROPE'S LARGEST AQUARIUM

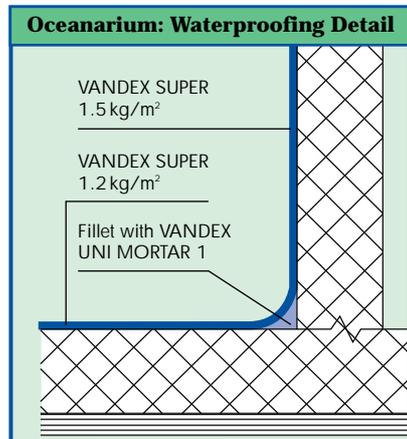
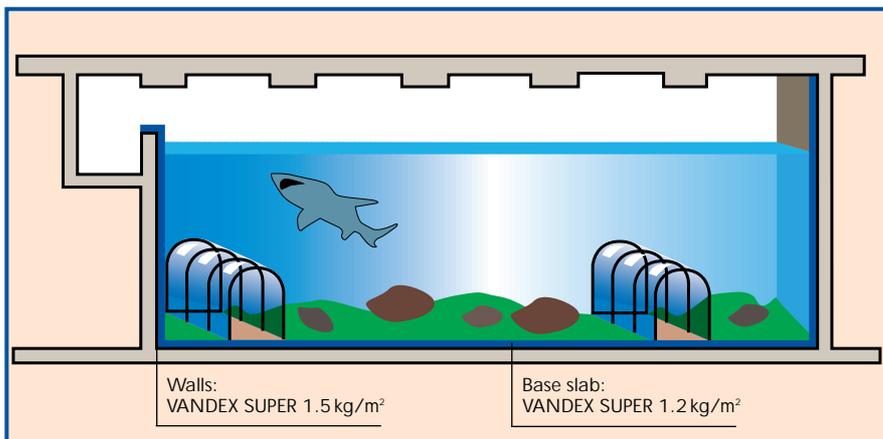


Vandex Waterproofing for 21 sea water tanks.



4000 species from the Mediterranean live in 21 sea water tanks in the Barcelona aquarium.

Picture left: Underwater trail in the oceanarium.



# GIESSEN POOL REFURBISHMENT IN BELP-BERN, SWITZERLAND



In January, 1996, the City Council of Belp, Switzerland, commissioned Zeltner & Maurer AG, Construction Engineers, to prepare a refurbishment concept for the three pools. To all of those concerned it was important to arrive at a low-cost, ecological solution to meet current needs.

The first stage included visiting several public pool facilities which had been restored using various products. After carefully weighing up the pros and cons of the products reviewed, it was decided to undertake the refurbishment with Vandex.

## Original Condition

With time, the surface of pools and water channels had become abraded. The pools were very



*The pool after its refurbishment in spring 1997.*



rough, giving rise to increased growth of algae which entailed the heavy use of chemicals and increased cleaning costs. The use of acidic cleaning agents reduced the alkalinity of the concrete, weakening the protection of the reinforcement steel. Also, the rough surfaces were unpleasant for swimmers.

With few exceptions, the reinforcement steel showed no corrosion. The timing of the work was ideal for restoring the pool to its original state at a reasonable cost.

## Refurbishment Concept

**Substrate cleaning:** The walls were sandblasted and the floors shotblasted. Larger irregularities and voids had to be levelled first and repaired with VANDEX UNI MORTAR 1.

**Coating:** The slab, walls and channels were sprayed with VANDEX BB 75 (6 kg/m<sup>2</sup> = 3 mm layer thickness), producing a smooth waterproof surface which inhibits algae growth and prevents corrosion of reinforcement steel. A fillet was made with VANDEX UNI MORTAR 1 in the area where the slab and the wall meet.

The coat quality is directly dependent on the preparation, climatic conditions and curing. This was achieved by using temporary roofs.



## The chosen system excels with the following properties:

- Water impermeability
- Frost resistance
- Compatibility with concrete (cementitious and without polymer additives)
- Protection of concrete
- Resistance to abrasion
- Water cannot track along interface
- Ease of cleaning

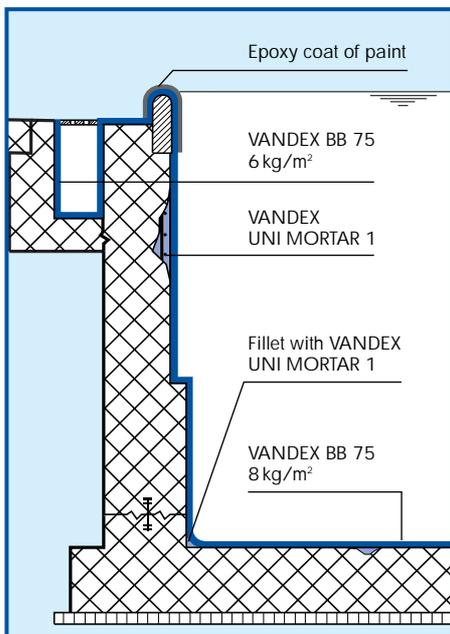
## Remark

Vandex technical documentation offers standard specifications for waterproofing and refurbishment of swimming pools.



Built in 1979/80, the Giessen pool was presented with a new look at the opening of the 1997 season.

Photographs bottom centre: VANDEX BB 75 application using fine-grain mortar spray gun.



**Builder:** Municipality of Belp **Engineer:** Zeltner & Maurer, Belp **Vandex Applicator:** Iso-San AG, Steffisburg

## VANDEX BB 75

### Waterproofing Slurry

- no efflorescence
- for concrete, masonry and render
- can be used against active or passive water pressure
- application by machine

### Application

*VANDEX BB 75 is applied on concrete, masonry and rendered surfaces requiring protection from the effects of water and moisture.*

### Properties

*VANDEX BB 75 is waterproof (tested up to 7 bars) and may be applied onto vertical as well as horizontal surfaces. VANDEX BB 75 is durable and resistant to frost and heat after curing, but still permeable to water vapour.*

### Specifications:

*Setting: approx. 2-4 hours*

*Compressive strength: 40 N/mm<sup>2</sup> 28 days*

*Bending tensile strength: 6 N/mm<sup>2</sup> 28 days*

*Modulus of elasticity: 2.14 x 10<sup>4</sup> N/mm<sup>2</sup> 28 days*

# CONVERTING INDOOR POOLS TO LEISURE CENTRES.



In Senftenberg - at the heart of Germany's Lausitz coal-mining area - an existing swimming pool was remodelled to a Leisure Centre.

Being an existing structure, using current construction techniques is not always possible. This meant that for many problems custom made solutions had to be found.

Compared with the former rectangular shape, the various installations, from slides to saunas, were intricately shaped and involved a great many engineering details. This called for the careful planning and design of various special waterproofing details.

In particular, the construction joints - partly recessed in floor channels - required a great deal of planning and executional knowledge. VANDEX DILA JOINT TAPE was used, applied



Marktöglitz open-air pool: Restoration of joints using VANDEX DILA JOINT TAPE bonded with VANDEX BB 75 E.



with VANDEX BB 75 E waterproofing slurry.

Surface restoration of the swimming pools was carried out following the rules of concrete repair, using the products VANDEX UNI MORTAR 1 (reprofiling) VANDEX BB 75 (surface waterproofing).

At the municipality of Marktöglitz, a concrete swimming pool measuring 37x20 meters was built in the 50's near the creek flowing through town. In keeping with the then construction practice, the pool was divided into 3x5 m sections. Flowing beneath the pool, however, the creek regularly leached out the joints. Leaks increased in recent years to the point of requiring closure of the pool activities.

In 1997, in conjunction with an overall reconstruction of the swimming facility, elimination of the leaks started. It was carried out with a new VANDEX technology using VANDEX DILA JOINT TAPE.

By forming a waterproof bond with VANDEX BB 75 E waterproofing slurry, the VANDEX DILA JOINT TAPE was laid in such a way that a slip joint was created across the areas of movement. (A slip joint is created where the VANDEX DILA JOINT TAPE is not bonded over an area of substrate movement, so that elastic deformation can occur when required.)

**Builder:** Municipality of Marktöglitz, Marktöglitz **Planning:** Engineering Bureau Rainer Wohlfarth & Neumann, Gräfenhain **Building materials + special consultation:** Vandex Isoliermittel-Gesellschaft mbH, Hamburg **Contractor:** Rickowski & Apel, Bau- und Bautenschutz GmbH, Saalfeld

**Builder:** City of Senftenberg, Building Dept., Senftenberg **Planning:** Bauplanung Bautzen GmbH, Mr. Hinz, Bautzen **Building materials + special consultation:** Vandex Isoliermittel-Gesellschaft mbH, Hamburg **Contractor:** Rickowski & Apel, Bau- und Bautenschutz GmbH, Saalfeld

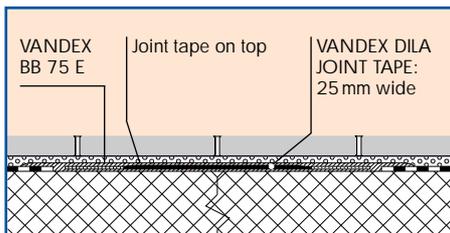
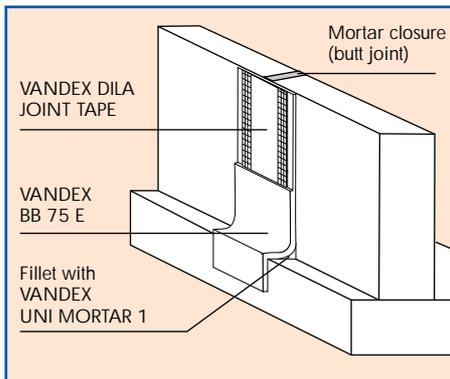


Top: Senftenberg, Germany, recreational pool facility after conversion in 1996.

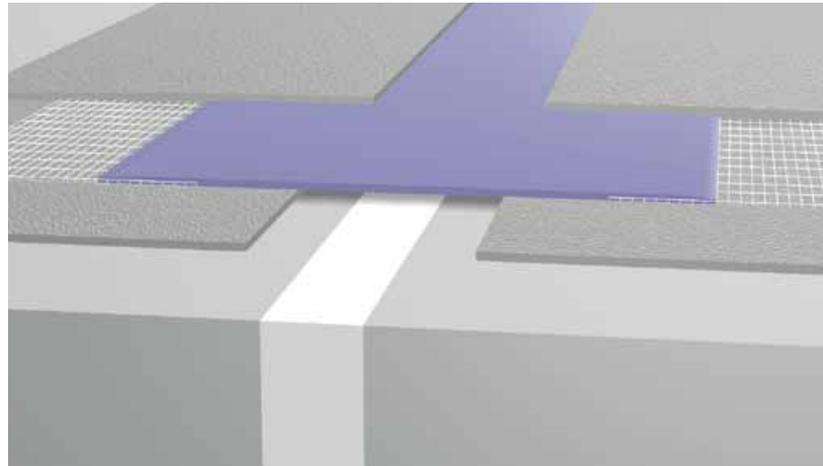
Bottom: Open-air pool in Marktöglitz, Germany, after refurbishment in '97.



Abutting tape ends, corners and intersections were immediately glued using VANDEX DILA JOINT TAPE ADHESIVE. The strips of VANDEX DILA JOINT TAPE were embedded completely in VANDEX BB 75 E. Surface coating was carried out after reprofiling with VANDEX UNI MORTAR 1 and VANDEX BB 75 E. Watertightness tests were successfully undertaken.



# VANDEX DILA JOINT TAPE



- can be applied on a damp substrate
- resistant to hydrostatic pressure
- allows movement up to 10 mm
- fixed with VANDEX BB 75 E

### Application

VANDEX DILA JOINT TAPE was developed specifically for durable waterproofing of movement (up to

+10 mm) and construction joints together with the elasticized waterproofing slurry VANDEX BB 75 E. The concrete surface may be damp, but must not be wet.

VANDEX DILA JOINT TAPE is resistant to pressure on the positive side of a structure and, with appropriate support, on the negative side as well.



**1** Apply first coat of VANDEX BB 75 E (3 kg/m<sup>2</sup>, 1.5 mm) at least 2 cm beyond width of VANDEX DILA JOINT TAPE.



**2** Place VANDEX DILA JOINT TAPE, followed by working fabric edges on both sides into waterproofing slurry.



**3** Embed fabric edges in second coat of VANDEX BB 75 E (3 kg/m<sup>2</sup>, 1.5 mm) and smooth surface with wet brush.



**4** Final state: Mechanically protect installed tape, if necessary.



**A** Bond abutting tape ends (mitred, T-joints etc.) with instant VANDEX DILA JOINT TAPE ADHESIVE.



**B** Shapes can be cut out and glued quickly and safely.