

SPECIFICATION FOR

HPI Reinforced System

Grades of HPI Reinforced System:

- **3CC PB(B) System**
- **AQUAPEL10 PB System**

REQUIREMENT:

Heavy-duty and permanent Hydrophobic Pore-Blocking Ingredient (HPI) waterproofing of all exposed superstructure, without application of membranes, polyurethane, tanking or separate surface-treatments and screed protection. Substantial reduction of shrinkage cracks and voids by combining with 3 other Cementaid concrete enhancing products. Suitable for use in all waterproof concrete at superstructures subject to weather exposure and/or severe damp/wet conditions. Protection of concrete against sulphate attack and steel reinforcement against chloride penetration / corrosion in marine environment.

PRODUCT TO USE:

HPI REINFORCED SYSTEM (AQUAPEL10 PB /3CC PB (B) REINFORCED SYSTEMS)

HPI Reinforced system is developed to provide permanent solution to waterproofing problems at trafficable roofs and decks, roof deck, podium deck, suspended swimming pool, pool deck, helipad, roof garden and other exposed concrete in superstructures. The conventional good quality surface applied waterproofing membrane requires 100% success rate of application but it is difficult to achieve particularly at larger area (roof area of more than 100 m²). When leaks appeared underneath the roof, it means that there are holes and/or joint failures in membrane. Even if warranted, repairing of membrane is impossible as there will be no access to rectify the membrane itself, because it is placed in between concrete and screed protection. Most surface treatment being used as temporary waterproofing treatment such as membrane has a limited service life of about 10 to 15 years. Better surface applied waterproofing made of polyurethane can last 15 to 20 years. It means that surface applied waterproofing material deteriorates and will require replacement every 15 to 20 years. If surface applied waterproofing is used at Roof Garden and Swimming Pool, the area should be temporarily closed down for about 2 to 3 months during membrane replacement. The building owner will have to engage a new contractor to remove the trees, soil, ceramic tiles, screed protection and the deteriorated membrane, then need to re-install everything again. This process is complicated, expensive and will entail down time losses.

HPI Reinforced System is a complete combination of Hydrophobic Pore-blocking Ingredients (HPI) which are dosed at 10 and 15 litres per m³ of concrete, producing a completely DRY, non-absorptive, hydrophobic and permanently waterproofed concrete, thus will not require continues repair neither further replacement and therefore is sustainable. The HPI material as the most important part of the system is combined with 3 other CEMENTAID enhancing products which will greatly reduce concrete shrinkage cracks and voids.

HOW TO SPECIFY:

"All concrete such as:

1). Slab and beam of Superstructures above non-habitable areas(i.e. Car Park) such as exposed Ground Floor above basement(podium area) and Roof Deck of Car Park Building, shall be permanently waterproofed by the addition of Cementaid HYDROPHOBIC POREBLOCKING INGREDIENT (HPI) named AQUAPEL10 PB REINFORCED System, in such a way that the concrete shall have a corrected 30 minute water absorption of not greater than 1.75 % as measured by BS 1881:Part 122:1983 except that the age at test shall be 7 days or 28/56 days when clay/silt content of sand is more than 5% and shall be complying with the AQUAPEL10 PB REINFORCED System minimum requirement stipulated below. The dosage of AQUAPEL10 PB shall be at the rate of 10 liters per cubic meter of concrete.

2). Slab and beam of Podium Deck, Roof Deck, Roof Garden, Helipad, Pool Deck as well as slab, beam and wall of suspended swimming pool and Balancing Tank; all above habitable areas, shall be permanently waterproofed by the addition of Cementaid HYDROPHOBIC PORE- BLOCKING INGREDIENT(HPI) named 3CC PB(B) REINFORCED System, in such a way that the concrete shall have a corrected 30 minute water absorption of not greater than 1.50 % as measured by BS 1881:Part 122:1983 except that the age at test shall be 7 days or 28/56 days when clay/silt content of sand is more than 5% and shall be complying with the 3CC PB(B) REINFORCED System minimum requirement stipulated below. The dosage of 3CC PB(B) REINFORCED shall be at the rate of 15 liters per cubic meter of concrete.

Furthermore, HPI Reinforced concrete structures shall strictly comply with the minimum top steel requirement using hard rib deformed (h.r.d). 12 mm diameter, continuous both ways, at 300 mm on centre, with concrete cover to steel not less than 25 mm, nor greater than 40 mm. Equivalent steel of 10 mm bars at 200 mm centre is recommended to be used if available or welded wire-mesh at 8 mm diameter spaced at 150 mm spacing. This minimum temperature "grid" steel may be included in the Engineer's structural requirements, but must be continuous in both directions.

APPLICATION: CONTACT CEMENTAID FOR SUPPLY AND APPLICATION SERVICE

PT. CEMENTAID SALES AND SERVICES INDONESIA

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HPI Reinforced System

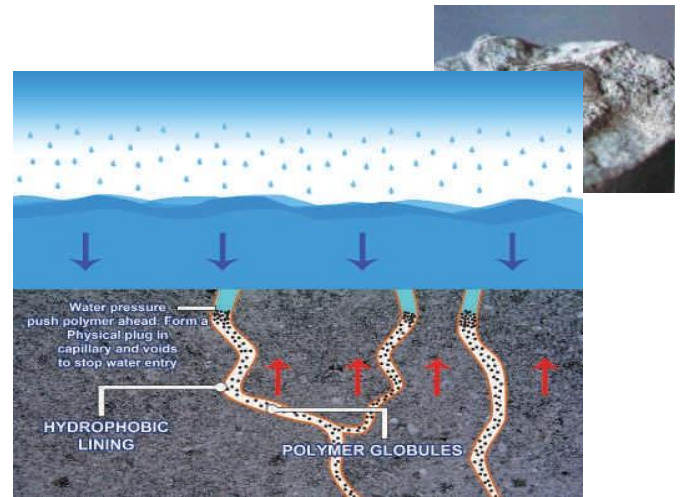
All HPI Reinforced concrete shall be constructed in accordance with the Main Specification and drawings and strictly in accordance with the current Cementaid AQUAPEL 10 PB Reinforced & 3CC PB(B) Reinforced Systems Detailed Technical Specification, using only Cementaid added ingredients and concrete containing not less than 370 kg of cement per cubic metre or cement at 317 kg/m³ of concrete plus Fly Ash at 85 kg/m³ concrete when using Fly Ash which can achieve the specified water absorption when mixed with HPI Reinforced System, in conjunction with structural reinforcement grid and other details conforming to current recommendations and requirements of Cementaid.

All construction joints, pipe projections (penetrations) and tie rod points in the HPI Reinforced concrete must be formed and constructed strictly in accordance with current approved Cementaid recommended details and materials, attached and available from your Cementaid Representative.

All Construction Joints, Pipe Projections, Floor Drains and Tie Rod Points shall be using Cementaid Everdure Waterstop, a controlled expansion waterstop, an active butyl rubber based waterstop which activates after approximately 5-10 days of constant exposure to water. The waterstop material should not expand prematurely and should not absorb water from the fresh concrete poured against it.

WHERE RECOMMENDED:

AQUAPEL 10 PB and 3CC PB(B) reverses concrete normal capillary "wicking" absorptive action, producing instead concrete with a uniformly Hydrophobic matrix and capillary pore-blocking components throughout. These combined effects expel water and any contained salts or acids, and prevent their re-entry, including under water pressure. The hydrophobic interior of AQUAPEL 10 PB & 3CC PB(B) concrete controls transmission of dampness without applied membrane, polyurethane or barriers, and is unaffected by acidic or salt solutions in contact with its surface. The action of aggressive salts or acids is confined to the extreme outer surface, where only minor wear can occur.



HPI Reinforced system concrete allows the construction of fully and permanently waterproof/corrosion-proof habitable structures, including trafficable roofs and decks, suspended swimming pool, helipad, roof garden and other part of the superstructures that require waterproofing, without the past need for applied polyurethane, tanking or waterproofing membranes. This results in very substantial time and cost savings, as well as eliminating long-term maintenance. The unique hydrophobic Matrix allows damp-free rectification of placement flaws (e.g. construction joint, shrinkage crack, etc.) by simple grout or polyurethane injection.

WHERE RECOMMENDED:

Trafficable roofs and decks, roof deck, podium deck, suspended swimming pool, pool deck, helipad, roof garden and other exposed concrete in superstructures including those near shore line or reclaimed land which are exposed to acid and harmful salts; environment where long maintenance-free service life is required; where transmission of dampness or absorption of water and moisture containing salts and acids are undesirable.

The information and recommendations herein are, as result of experience and testing, accurate to the best of the seller's knowledge. However, as the proposed use and the circumstances surrounding such use are not known to the seller, it does not guarantee or warrant the product's suitability in any particular instance and shall not be liable for any loss or damage consequent upon any use whatsoever unless the seller otherwise stipulated the product's suitability for a particular use in writing signed by a Director of the seller.

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