Presentation for FICCI
By

Dr Y.P.Kapoor
Managing Director
Bang Associates Bangalore
Construction Chemicals and
Protective Coatings
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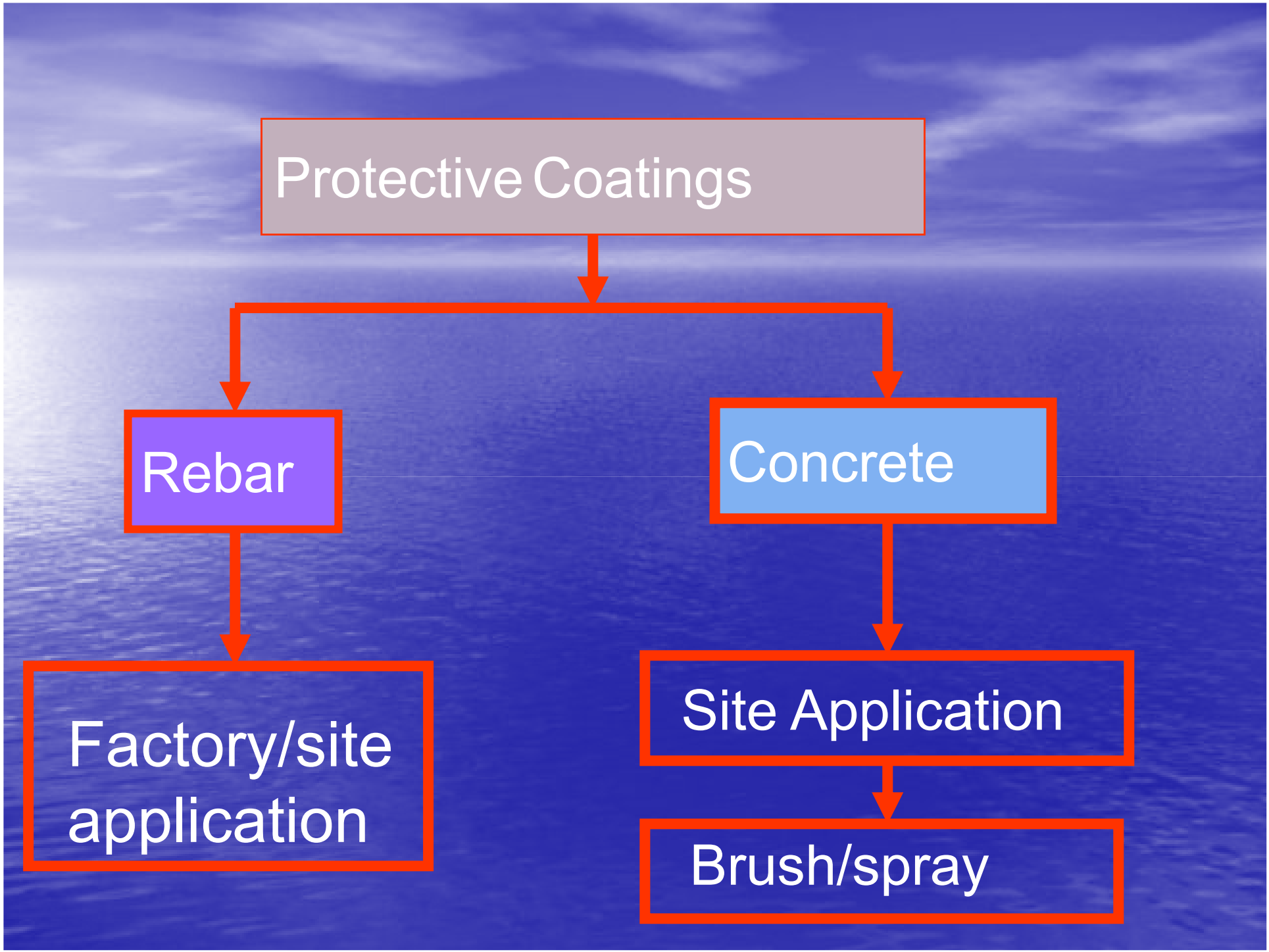
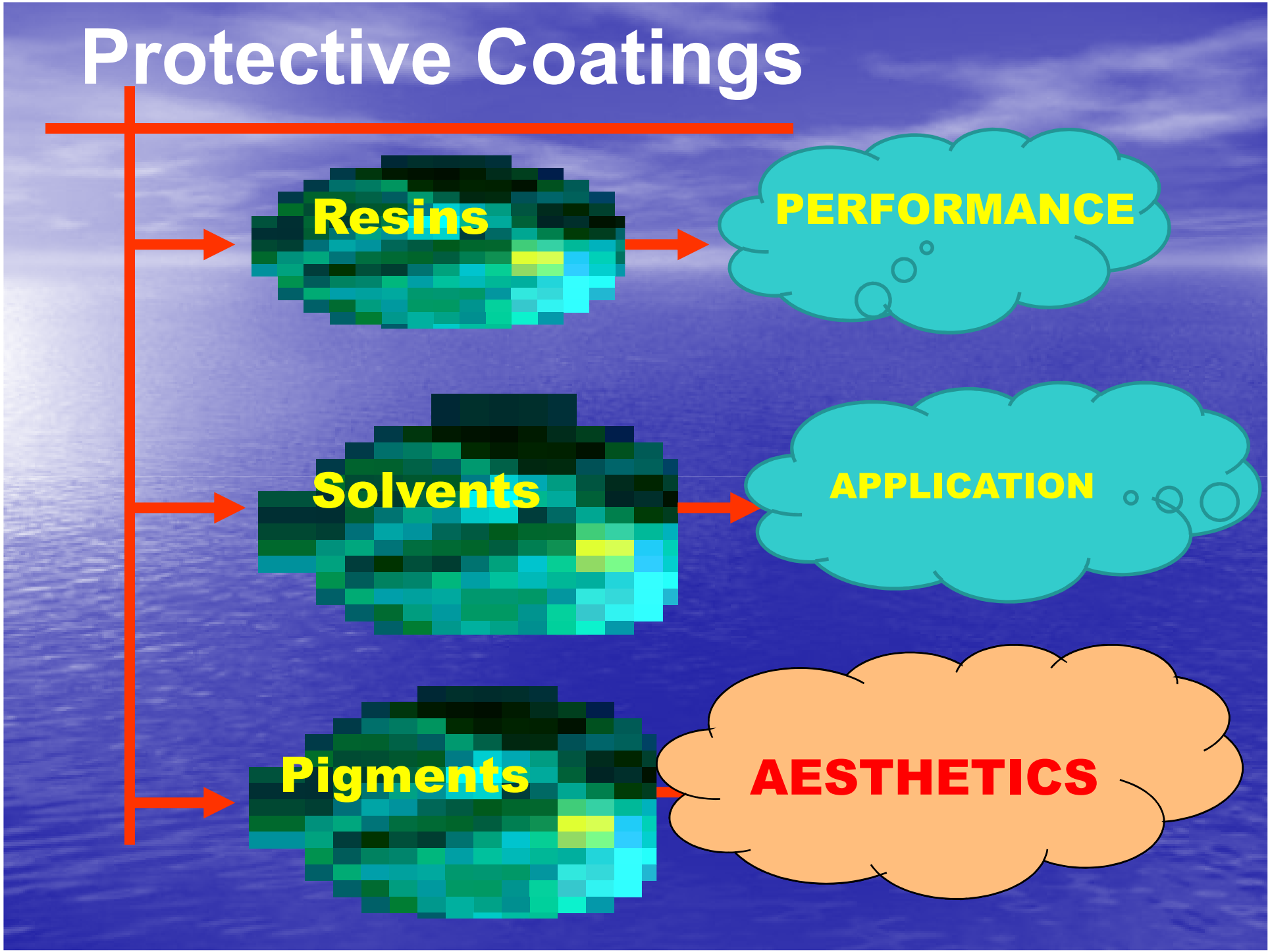

Protective Coatings
Rebar
Concrete
Factory/site application
Site Application
Brush/spray

Protective Coatings

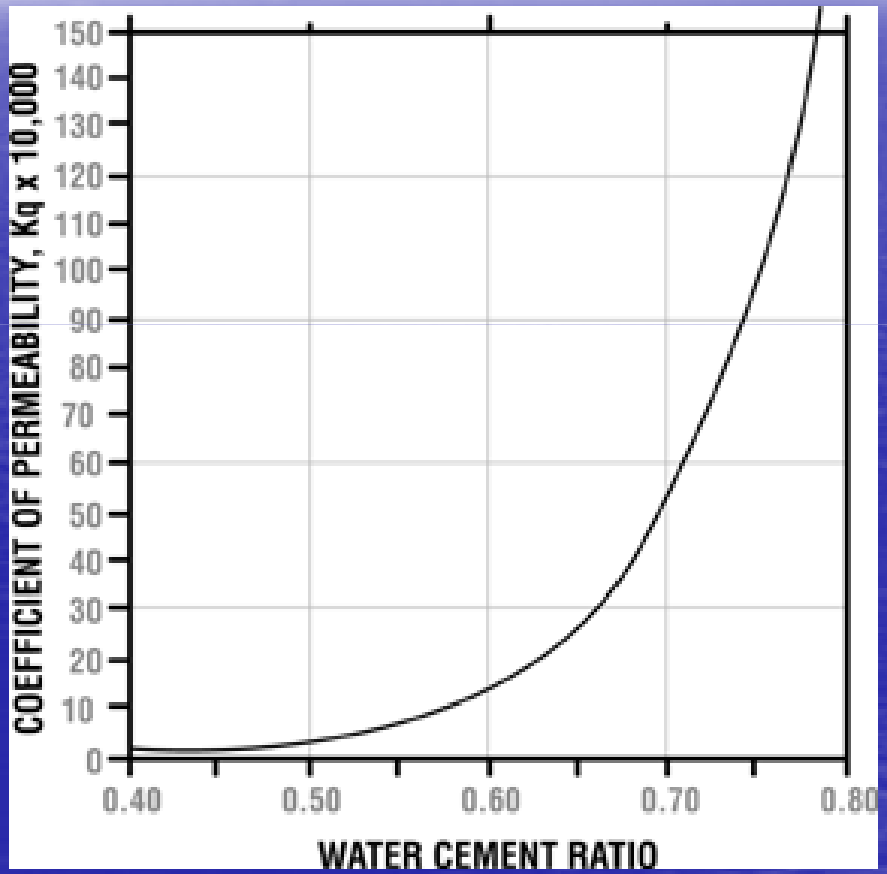


Key properties of protective coatings for concrete

- Alkali Resistance
- Water Resistance
- Flexibility
- Breathability
- U V Resistance
- Carbonation Resistance
- Cl^-, SO_4^- ion Resistance

Durable Waterproof Concrete

- Integral…such as using admixtures
  - To reduce the water cement ratio and hence the permeability of concrete
  - To use cement replacement materials which would introduce more hydration products in the capillary system of the concrete and reduce the pore size distribution in concrete



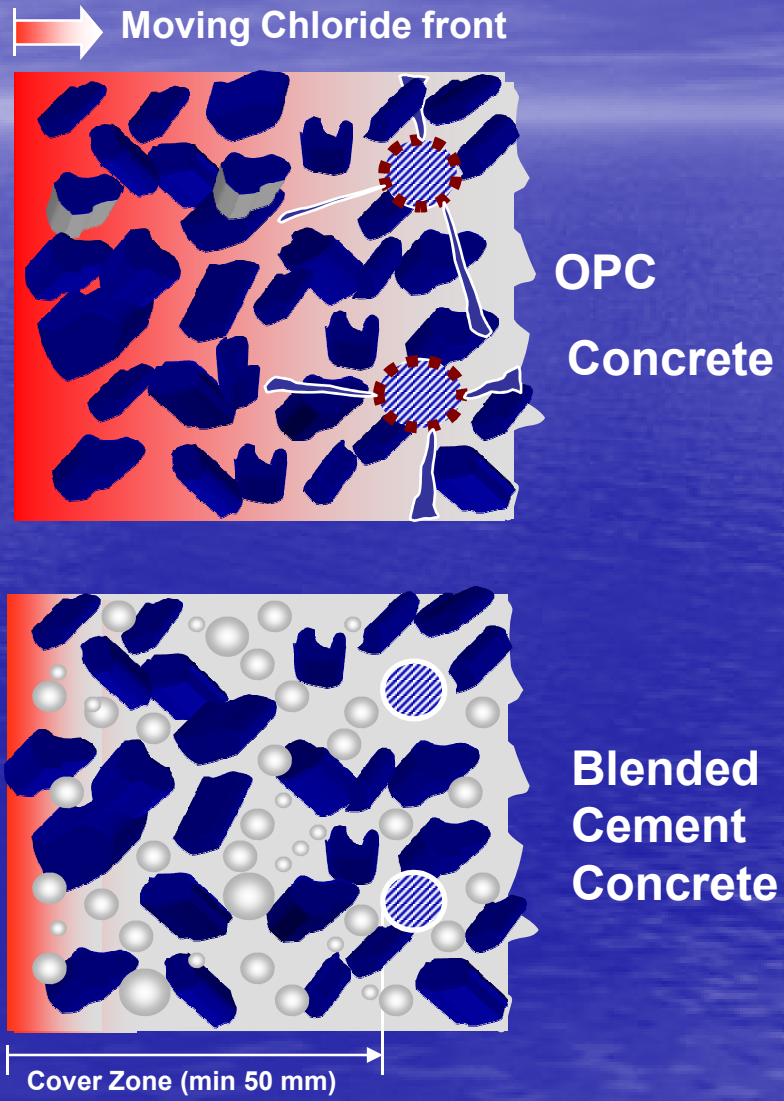
Cement Replacements

- **As strength development in OPC is limited to primary hydration products, it is a necessity to increase ultimate strengths by use of good quality cement replacements having high pozzolanic activity such as:**
  - **Fly ash (ASTM C 618, BS 3892, etc.)**
  - **GGBFS (BS 6699, etc.)**
  - **Silica fume (ASTM C 1240, etc.)**
- **The use of cement replacements in the Gulf region is a common practice to eliminate problems resulting from high temperature and humidity, high thermal differentials within concrete, loss of workability, pumping at very low w/c ratios.**
- **Additionally the following stringent criteria for durability have to be met (very typical of the UAE market):**
  - **RCP < 800 – 1000 coulombs; (AASHTO 277 or ASTM C 1202)**
  - **Water absorption < 1.0 - 1.4% (BS 1881)**
  - **DIN permeability < 8 – 10 mm (DIN 1048)**

Cement Replacements Helps "Chloride Ion Resistance"

- Highly permeable,
  -higher chloride ion ingress
- Higher rate of chloride diffusion
- Chloride ions available to attack steel

- Less permeable,
  -lower chloride ion ingress
- Lower diffusion of chlorides
- Chloride binding,
  -chloride ions not available to attack steel



Case History – (Basement Water Tank)

- Project : 3B + G + 25 Floors
- Consultant : Gulf International
- Contractor : Al Hamed Contracting
- Location : Sharjah, (UAE)
- Products : Hyperplasticiser
- Execution date : January 2002

Mix Design Details

Cement and Microsilica	= 430+40 Kg
Free W/C Ratio	= 0.30
Hyperplasiciser @ 4.5 ltrs/m3 of Concrete	
Slump Cone Spread at 60 minutes	=670mm

Durability of Concrete Achieved

Water Absorption	=0.85%
Din 1048 Pressure Permeability	= 5.5mm
Rapid Chloride Permeability	= 187 Coul.

Smooth Surface

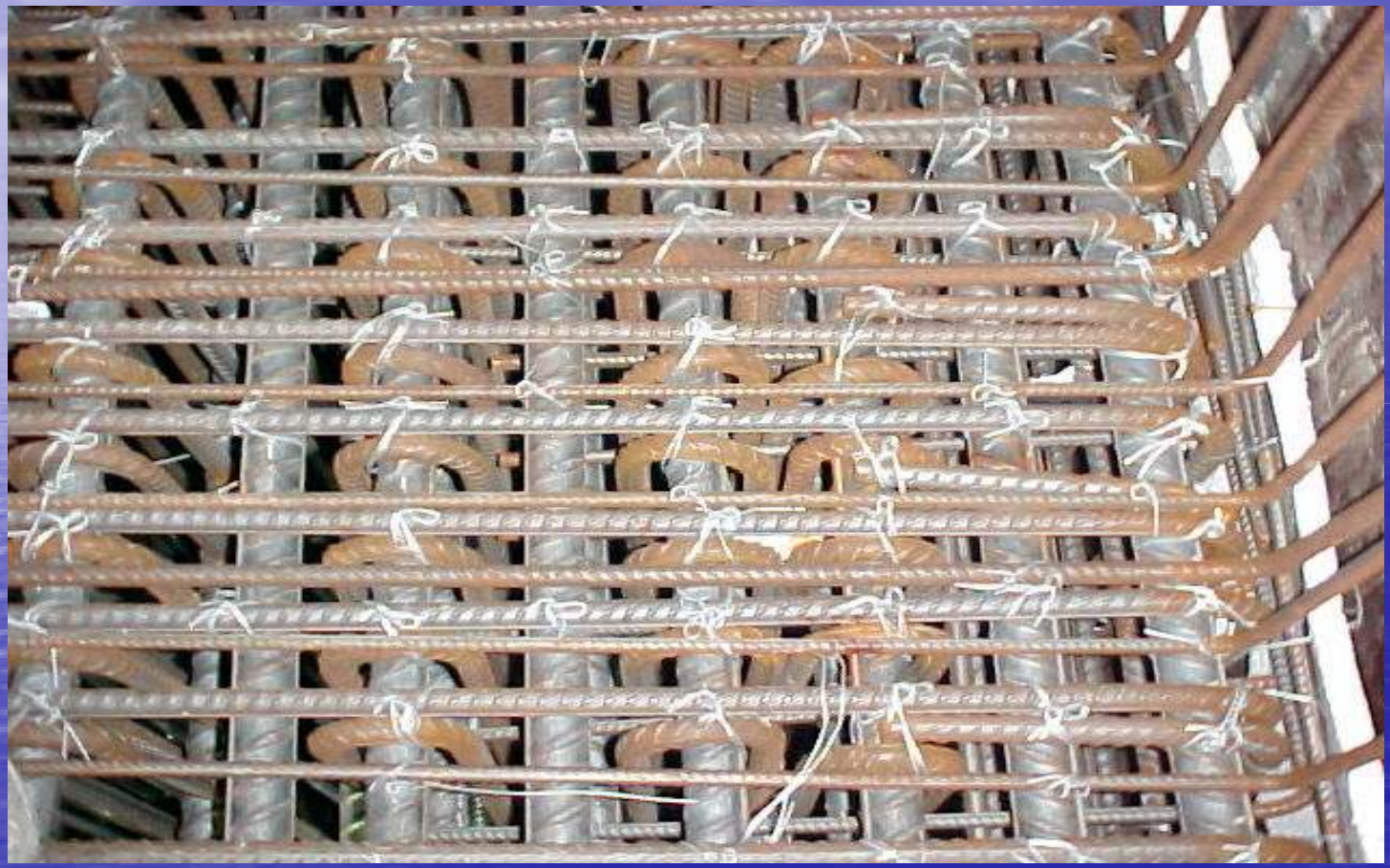
Shangri-la Hotel - Dubai

Case history - 2

- Project : Shangri-La Hotel & Complex
- Client : Shangri-La Hotel & Resorts
- Consultant : NORR Consultant
- Contractor : Al Habtoor Eng./ Murray & Roberts JV
- Project Mgmt. : Mace International
- Location : Dubai, (UAE)
- Products : Hyperplasticiser
- Execution

  Date : September 2002

Reinforcement Details



Reinforcement Details

Workability-
“Slump Flow spread”

Surface Finish

Fair-faced concrete

Case History - 3

- Cement (OPC) = 330 kg
- Fly Ash (PFA) = 100 kg
- Microsilica (Densified) = 20 kg
- 20mm Coarse Aggregates = 380 kg
- 10mm Coarse Aggregates = 380 kg
- 05mm Crushed Sand = 350 kg
- 05mm Crushed washed Sand = 350 kg
- Dune Sand = 440 kg
- Free W/Cementitous ratio = 0.36
- Hyperplasticiser @ 4 ltrs/m3

Pre Cast Concrete Girders

Pre Cast Concrete Girders

Pre Cast Concrete Girders

Beirut Tunnel

Beirut Tunnel

Bahrain – Saudi Causeway – Under Construction

Bahrain Saudi Causeway – Precast Girders Placement

Creek Golf Club, U.A.E.

MUSSAFFAH BRIDGE Abu Dhabi, UAE

GHANTOOT - INTERCHANGE,

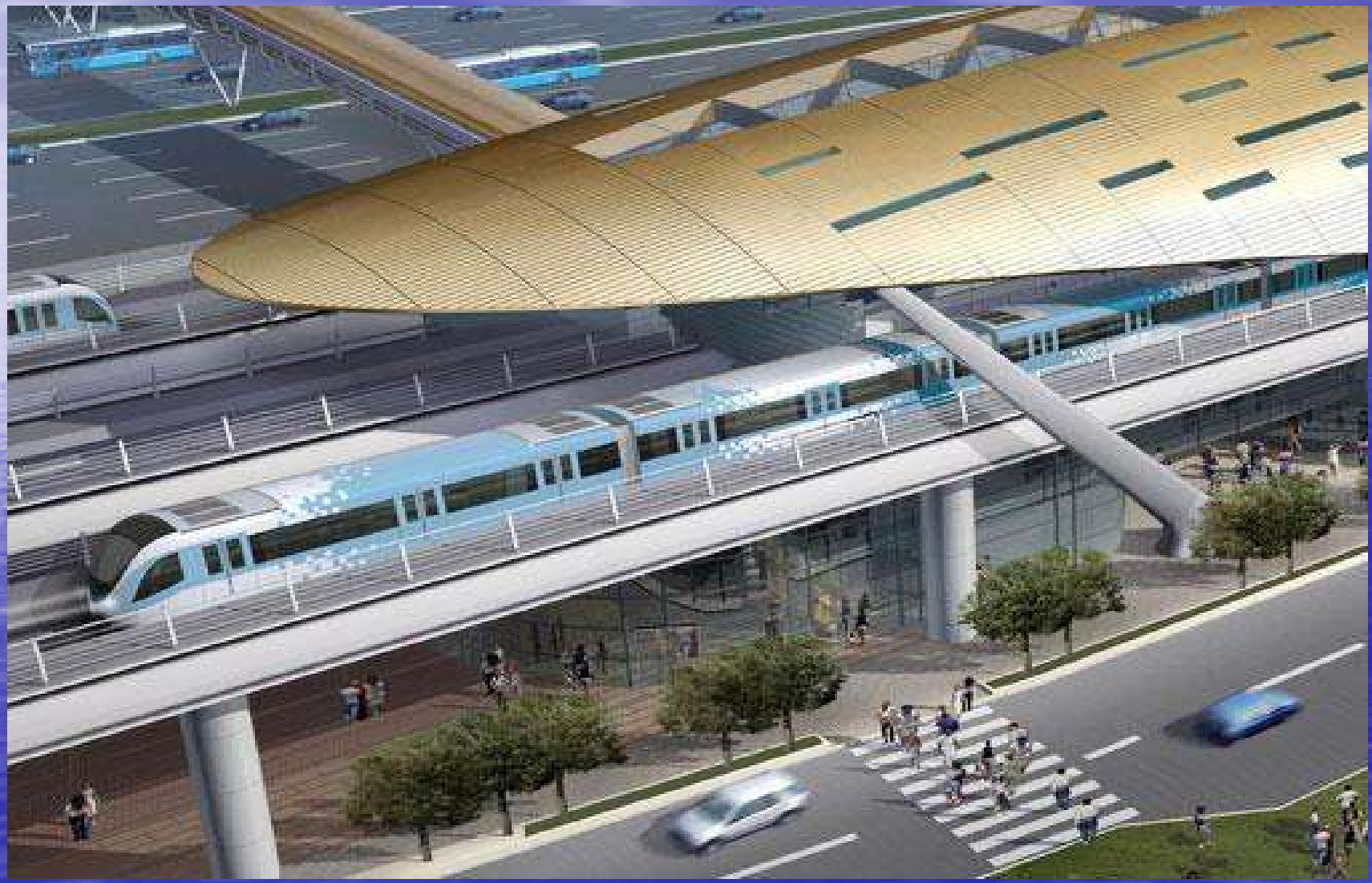

ابوهيل
الكورنيش
Abu Hail
Corniche

EMIRATES GOLF CLUB, DUBAI

MOSQUE IN ABUDHABI

Al Barsha Bridge

Dubai Metro



Dubai Metro

Burj Al Arab


141-T-101A
141-T-101B


Thank You!