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Solutions for Coastal Engineering

COASTAL STRUCTURES



Excellent Wash-out
Resistance



Non-Hazardous,
Water-Based Products



Rapid Setting, High
Strength Mortars

The Rigorous Demands on Coastal Structures

Marine environments impose unique challenges for coastal structures. High chloride levels, combined with the aggressive action of waves and currents, push structural integrity to the limits, whilst at the same time offering only fleeting opportunities for repair.

Structures in service, such as wharfs, jetties, piers and coastal defences also need to withstand extreme loading variations from wind and water movement, as well as abrasion damage from waterborne debris.

Aggressive Attack on Concrete and Steel

Reinforced concrete structures in coastal environments are highly susceptible to attack from chlorides due to their constant submersion in saltwater and the regular exposure to airborne sea spray. Chloride ions will readily penetrate even the densest concrete to initiate corrosion of the reinforcement. Ultimately, spalling will occur, necessitating major and costly repairs.

Meanwhile, coastal steel structures and those in a saline location are particularly prone to corrosion, due to the aggressive nature of the environment, often exacerbated by a lack of preventative maintenance. There are many products available for remedial works, although a high level of

surface preparation is generally needed. This includes the removal of all contaminants and corrosion by-products back to bright metal, a scenario often impossible in marine environments with restrictive tidal windows.

The Optimum Solutions from Flexcrete

Flexcrete offers technologically advanced reinstatement mortars specifically for marine use and cementitious coatings to provide long-term protection in hostile coastal environments.

Proven worldwide, Flexcrete mortars and coatings are resistant to early wash-out and afford optimum performance in wet, chloride-laden environments. Suitable for both remedial works and new build projects, application requires minimal preparation and can be undertaken on damp substrates between tides. Flexcrete products will cure normally under water to form an abrasion resistant, impenetrable barrier to chlorides whilst also preventing the ingress of oxygen and carbon dioxide in reinforced concrete exposed to the atmosphere.

Fighting the threat of ALWC

Accelerated Low Water Corrosion (ALWC) is an aggressive form of corrosion found on sheet piled quays and steel coastal structures. If left untreated, concentrated corrosion rates can dramatically reduce the design life, potentially leading to catastrophic, sudden failure.



Flexcrete's Cemprotec products provide a highly effective defence against ALWC:

- E942 can be spray or brush applied direct to steel substrates in tidal zones. It rapidly stabilises to form a dense barrier coating that protects from water, oxygen and chloride ions
- Clutch Filler seals the surface gap at the interlock, effectively protecting these vulnerable areas.

Typical Problems and Challenges in Coastal Engineering

Used in some of the world's most hostile environments, Flexcrete products offer outstanding protection for coastal structures:

► Corrosion Protection

PROBLEM:

Steel and reinforced concrete structures require protection from the corrosive effects of chlorides found in seawater. Any coatings used must be applied in wet environments with less than ideal surface preparation.

SOLUTION:

Cementitious Coating 851 is easily applied to damp concrete with excellent adhesion. It cures to form a dense coating with high levels of protection from water, oxygen and chloride ion penetration. **Cemprotect E942**, a cement and epoxy modified polymer coating, can be successfully sprayed directly onto steel substrates in damp conditions. Its impressively high resistance to the ingress of the fuels for corrosion and inherent alkalinity will ensure it provides stand-alone anti-corrosion protection.



Substrates treated with E942 only need to be cleaned using UHP techniques.

► Splash Zone Repairs

PROBLEM:

Corrosion of steel reinforcement and spalling of concrete in splash zones due to continual wetting and drying of surfaces and the action of salt spray.

SOLUTION:

Monomix can be hand applied to re-profile small areas of damage and a special grade **Monomix WS**, is available for application by wet spray process in larger areas. **Cemprotect MCI® 2020** can be applied to concrete faces and it diffuses through the structure to form a mono-molecular layer on the reinforcement that protects it from corrosion.



Flexcrete's water-based products are non-hazardous & completely safe to apply.

► Repairs to Coastal Defences

PROBLEM:

Jetties, harbours and sea walls can erode due to continual onslaught from waves and waterborne shingle. Stone and concrete structures require superior pointing and bedding to ensure long term structural integrity.

SOLUTION:

Fastfill, a rapid setting mortar can be applied into voids and joints to provide a resilient, durable repair solution with excellent abrasion resistance. **Monolevel 844SP** and **Polymer Admixture 850** can be combined to provide a high strength pointing and bedding mortar with excellent waterproofing and wash-out resistance properties. **Marine Mortar S** with the addition of washed shingle improves impact strength from waterborne shingle and can be hand applied to re-profile damaged areas.



Fastfill can be quickly & easily applied to both horizontal and vertical surfaces.

► Tidal Zone Repairs

PROBLEM:

Corrosion of steel reinforcement and spalling of concrete in tidal zones due to continual pounding and erosion from wave action. The opportunity to carry out repairs is limited to tidal windows.

SOLUTION:

Marine Mortar S is a specially formulated repair material that is perfectly suited to areas subject to early immersion, providing excellent wash-out resistance against wave action. **Cementitious Coating 851** is easily applied to damp concrete, curing to form a dense coating with high levels of protection from water, oxygen and chloride ion penetration.



2mm of 851 provides water permeability equivalent to 1m of quality concrete.



- Concrete Repair & Protection
- Protective Coatings
- Structural Waterproofing
- Enhanced Durability for Concrete & Steel
- Waterproofing of Roofs & Floors

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