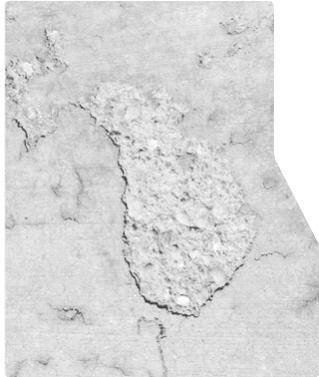


# Concrete pile repair

## 1st degree corrosion

Micro cracking and cracking of concrete pile



**2nd degree corrosion**  
Major cracking and crumbling of concrete piles



**3rd degree corrosion**  
Steel rod exposure due to long term or intensive corrosion

**Combating the effects of concrete pile degradation in wharf, bridge, pier, jetty and infrastructure assets can be managed effectively during early diagnosis by a marine specialist in structural engineering.**

## Cracking

Crack formation in concrete piles has some identifiable causes and results. Expansion and contraction of the concrete piles due to changes in sea temperatures over time can create micro cracks. If left untreated, these progress to 2nd and 3rd degree corrosion of the concrete piles.

## ASR (alkali-silica reaction)

Alkali-silica reactivity (ASR) reaction occurs between the highly alkaline cement paste and reactive non-crystalline silica in concrete aggregates; the resulting by-product is an expansive gel. Deleterious ASR expansion can inflict serious damage and expose the piles to further forms of structural damage.

## Flotsam and debris

Marine piles are subjected to wave action, salt water seas containing sand abrasion, salt spray and debris. With the high chloride laden water, piles corrode faster than in fresh water. These climatic conditions are coupled with infestations of

marine growth which speed up the deterioration process of marine piles.

## Necking in splash zones

Necking, is a mode of tensile deformation where relatively large amounts of strain localize disproportionately in a small region of the material. This occurs in the splash and tidal zones of the piles where highly oxygenated water combines with tidal rise and fall creating a constantly changing wet and dry substrate on marine piles.

## Transportation impacts

Impact on piles are also due to vessels, barges, floating equipment and mechanical impacts such as vessel fuel loaders.

## Some repair methods for 1st degree degradation include:

### Chemical grouting

Fine cracks can be filled with chemical grout.

### Epoxy injection

Narrow cracks can be bonded by the injection of epoxy.

### Routing and sealing

Used on cracks that are dormant and are of no structural significance.

### Flexible sealing

Active cracks can be routed, cleaned and filled with a flexible sealant.

## Long-term security and marine asset protection

To ensure long-term future protection of marine piles, more rigorously tested and durable solutions are required.

The PileJax rapid repair systems are cost-effective corrosion prevention creating long-term increases in the life expectancy of the pile.

PileJax systems improve outcomes and cut costs in critical areas including assembly and installation times, manufacturing and materials. They are quick and safe to assemble with intuitive designs that are proven around the world.