

## Performance of Galvanized Reinforcement Concrete

Since galvanized reinforcement was first used in the 1950's its performance has been extensively studied and documented. These studies range from fundamental scientific research to in-situ surveys of existing concrete structures, some in service for 30-40 years. These surveys have been very thorough, even to the point of periodic extraction of sample cores from structures for detailed examination. The references later cited under "Further Information" should be consulted for in-depth information on performance evaluations.

Key measures of performance are serviceability and durability. Serviceability relates to the reinforcement's ability to fulfil its intended function of imparting strength to the structure over its service life. Relevant factors here are that galvanizing has been proven to have no adverse effect on reinforcement's inherent strength nor on the bond strength with concrete. In fact, the evidence shows bond strength can be significantly higher with galvanized reinforcement. In regard to durability, galvanized reinforcement appreciably extends the service life of the concrete structure by delaying the time for corrosion initiation by a factor of 4-5 times that of unprotected reinforcement under similar conditions.



*Galvanized Reinforced Wave-wall – Port Phillip Bay*

## Galvanized Reinforcement Applications

Particular circumstances where the galvanizing of reinforcement is likely to be a cost effective engineering decision include:

- marine or coastal structures
- high risk structures in corrosive environments
- immersed or buried structures subject to groundwater effects or chloride presence (reclaimed land)
- containment structures subject to prolonged contact with water or structures subject to extended periods of wetness
- high visibility architectural facades and lightweight precast panels for buildings. For these types of applications the avoidance of unsightly staining caused by rust "weeping" from corroding reinforcement is a major concern.

The benefits of galvanized reinforcement are globally recognized and many examples exist around the world where it has been successfully used in a variety of applications. Examples include:

- seawalls, jetties, pontoons and offshore structures
- coastal bridges and roads (crash barriers, paving)
- building construction, especially in coastal areas (exterior cladding, balconies, balustrades, external staircases, porches, foundations)
- industrial sites such as chemical plants, water and sewerage treatment plants
- cooling towers
- tunnel structures both underground and submerged
- critical support structures (columns, beams, poles).

Some examples of prominent structures utilizing galvanized reinforcement are featured in this article.



*Galvanized Reinforced Sea-wall – Sydney Harbour*