

Steel - Grades

ASTM A 572 Grade 50 (350 MPa)

- Most common applications
- Up to Grade 65 can be supplied

ASTM A 690

- Grade 50  Copper added to slow corrosion process
- Only advantage in Salt Water splash zone

NZASTM 60 (415 Mpa)

- Grade 50  Copper added to slow corrosion process
- Only advantage in Salt Water splash zone

Corrosion Rates in Soil EURO Code

Table 4-1: Loss of thickness [mm] due to corrosion for piles and sheet piles in soils, with or without groundwater

Required design working life	5 years	25 years	50 years	75 years	100 years
Undisturbed natural soils (sand, silt, clay, schist,)	0,00	0,30	0,60	0,90	1,20
Polluted natural soils and industrial sites	0,15	0,75	1,50	2,25	3,00
Aggressive natural soils (swamp, marsh, peat, ...)	0,20	1,00	1,75	2,50	3,25
Non-compacted and non-aggressive fills (clay, schist, sand, silt,)	0,18	0,70	1,20	1,70	2,20
Non-compacted and aggressive fills (ashes, slag,)	0,50	2,00	3,25	4,50	5,75

Notes:

- 1) Corrosion rates in compacted fills are lower than those in non-compacted ones. In compacted fills the figures in the table should be divided by two.
- 2) The values given for 5 and 25 years are based on measurements, whereas the other values are extrapolated.

Corrosion Rates in Water EURO Code

Table 4-2: Loss of thickness [mm] due to corrosion for piles and sheet piles in fresh water or in sea water

Required design working life	5 years	25 years	50 years	75 years	100 years
Common fresh water (river, ship canal,) in the zone of high attack (water line)	0,15	0,55	0,90	1,15	1,40
Very polluted fresh water (sewage, industrial effluent,) in the zone of high attack (water line)	0,30	1,30	2,30	3,30	4,30
Sea water in temperate climate in the zone of high attack (low water and splash zones)	0,55	1,90	3,75	5,60	7,50
Sea water in temperate climate in the zone of permanent immersion or in the intertidal zone	0,25	0,90	1,75	2,60	3,50

Notes:

- 1) The highest corrosion rate is usually found in the splash zone or at the low water level in tidal waters. However, in most cases, the highest bending stresses occur in the permanent immersion zone, see Figure 4-1.
- 2) The values given for 5 and 25 years are based on measurements, whereas the other values are extrapolated.

Other Corrosion Rates

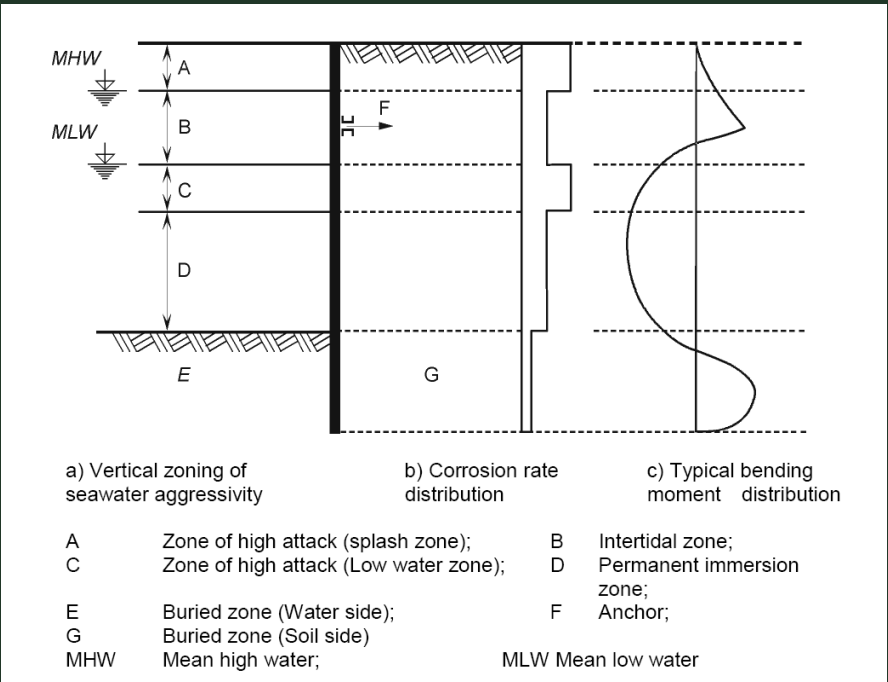
- CALTRANS

- Soil Embedded Zone 0.025mm (0.001in) per year
- Immersed Zone 0.100mm (0.004in) per year
- Scour Zone 0.125mm (0.005in) per year

- FDOT

- Slightly Aggressive 0.025mm(0.001in) per year
- Moderately Aggressive 0.051mm(0.002in) per year
- Extremely Aggressive 0.076mm(0.003in) per year

Corrosion Zones



Durability (Design Life)

- Major Influences of corrosion Rates in soils
 - Type of soil
 - The variation of ground water or sea level
 - Presence of oxygen
 - Presence of contaminants (PH Level < 5.5)

Increasing Durability (Design Life)

- Increase of steel thickness
- Increase of steel grade
- Plating the area of maximum bending moment.
- Adjust the anchor location
- Cathodic protection
- Coating
- Marine grade A690