

Durability Statement



For GALVSTEEL® (galvanised steel) manufactured by New Zealand Steel Limited and used for structural building elements

GALVSTEEL® material, when used for purlins, girts, battens or framing will have a durability of 50 years when used and maintained as referred to below.

Scope:

GALVSTEEL® used to manufacture building components such as wall, roof, floor and sub-floor framing; purlins, girts and battens used in buildings built in New Zealand covered by the New Zealand Building Code with a 50 year design life.

This Durability Statement does not apply to AXXIS® steel for framing used in building types and situations covered by the “AXXIS® steel for framing” Durability Statement. This Durability Statement also excludes any other building components manufactured from GALVSTEEL® or other metal-coated products including nail plates and any composite wall, roof or floor systems. Composite systems include GALVSTEEL® embedded in concrete panels.

The above statements are subject to the following:

1. Specifications

Zinc coating weight;	Z275 (275g/m ²) or Z450 (450g/m ²)
Complying with;	AS 1397:2021
Steel grade;	G250, G300, G450, G500 or G550
Steel thickness range;	0.50-2.40 mm
Bend diameter;	G250 and G300; ≥ 2t G450, G500 and G550; ≥ 6t (where t = total coated thickness)

2. Designing, Fixing, Handling and Maintenance according to the following publications:

- a) New Zealand Steel Limited, *Installers Guide*
(refer www.nzsteel.co.nz for most current version).
- b) *NZ Metal Roof & Wall Cladding, Code of Practice*, (refer www.metalroofing.org.nz for most current version and updates).

- c) AS/NZS 4600:2018 *Cold formed steel structures*.
- d) AS/NZS 2312.2:2014 *Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings. Part 2: Hot dip galvanising*.
- d) Instructions and literature published by individual purlin and steel framing manufacturers.

3. Additional Fixing, Handling and Design Requirements

- a) Bottom plate details must ensure that the bottom plate remains dry in service and is not subject to water ingress from internal or external sources. Damp-proof course (DPC) must be used and be at least 10mm wider than the building element.
- b) Separation methods as described within NZMRM Code of Practice 3.0 are required between any steel structural building element and incompatible materials which include, but are not limited to, timber treated with copper based preservatives, concrete, brickwork, copper and other dissimilar metals and also materials which may be moisture bearing during the life of the building.
- c) Subfloor framing requires a minimum finished ground level clearance of 150mm.
Ventilation must comply with the requirements of NZS3604:2011 Timber-framed buildings, including ground cover when specified. A minimum of 3500mm²/m² of floor space and a maximum of 7000mm²/m² of floor space is required.
- d) Site storage conditions must ensure that the GALVSTEEL® is kept dry when in a stacked condition.
- e) Prior to installation of external and internal lining the GALVSTEEL® must be clean, dry, free of corrosion, clear of debris and swarf.
- f) During storage and erection the material should be kept as dry as possible and the building closed in as soon as practicable to limit exposure to the elements. As a guide, this should be within 3 weeks in marine or geothermal environments and with-in 12 weeks in moderate environments from the delivery of the GALVSTEEL® material to site.
- g) GALVSTEEL® must be carried and not dragged when being moved.
- h) GALVSTEEL® must not be exposed to spatter from any welding activities.
- i) Wall wraps and roof underlays must comply with the requirements of NZS2295:2006 *Pliable, permeable building underlays* for use with steel framing.

4. Environment

Initially the macroclimate in which the building is situated needs to be determined. Table 2 is broken down into broad geographical regions of New Zealand. Within the regions the corrosivity is further defined by the distance to the nearest coast, harbour or estuary.

For aggressive industrial environments either externally or internally, or buildings subject to heavy geothermal influence, expected corrosion rates and recommended coatings will need to be determined on a case-by-case basis with a microclimate assessment using *New Zealand Steelwork Corrosion Coatings Guide* HERA Report R4-133:2011 [d], and AS/NZS 2312.2:2014 .

5. Building Types

This statement classifies six different building situations where structural steel may be used (N.B. one building may contain more than one of these situations);

a) Residential/Dry

Steelwork located in a dry internal environment, with an effective thermal break between external cladding and the structure, such as a fully enclosed office, an apartment building or a domestic house. This includes structures that are lined with building wrap and have internally controlled environments such as commercial shops and malls.

b) Internal

Steelwork located in a damp or humid environment, with no effective thermal break between the external cladding and structure. For structures such as storage sheds, garages and workshops which are typically closed when not in use. These structures are distinguished in the following two cases;

- **Damp**

Steelwork located in a damp internal environment where condensation may occur, where the structure may be in an open sunny location (i.e. when the structure is exposed to the sun and not under any form of cover). This is for structures such as exhibition halls, vehicle depots and warehouses.

- **High Humidity**

Steelwork located in an internal high humidity environment with some pollution, where the structure may be in a humid and shaded location (i.e. when the shed is under a tree shaded from the sun). This is for structures such as food processing plants, breweries and dairies. Steel in subfloor spaces is included in this building type.

c) Open Front

Steelwork located near permanent openings (such as near doors or windows that remain open under operating conditions), and may be exposed to the prevailing winds. For structures such as open front lean-to, gable structure closed in on three sides or warehouses with large openings. This building type has two options, which are only applicable to the internal steelwork close to the openings as defined in Section 6.5 of reference [d].

- **Protected**

Structures that are protected from the wind coming off the closest sea.

- **Open**

Structures that are open and exposed to the prevailing wind coming off the closest sea.

d) Awning

Steelwork that is exposed to the wind but is protected from the rain located in an open sided structure such as carports or structures closed in on one side only. The equivalent reference [b] designation is “Sheltered”. The corrosion rate of this building type and that of “Open Front; Open” are identical.

6. Maintenance

Maintenance is necessary when the galvanised coating ceases to provide sacrificial protection to the steel base, or where the appearance is no longer aesthetically acceptable to the owner.

Rust staining or the growth of rust spots usually indicates the breakdown of galvanised coating. At the first sign of breakdown, the surface should be treated with an appropriate maintenance coating system. All maintenance should be carried out in accordance with AS/NZS 2312.2;2104 [c] and HERA Report R4-133:2011 [d].

Regular inspections of the steel work and maintenance at the first signs of a breakdown in the galvanised coating will extend the durability of the sections.

7. Recommended minimum coating weights to achieve 50 year durability.

Table 2 shows the recommended minimum coating weights to achieve 50 year durability for the different building conditions in the various marine environments throughout New Zealand.

8. Contacting New Zealand Steel

It is important you contact the Customer Care Team at New Zealand Steel on 0800 100 523 if you require specialist advice, clarification or assessment in relation to the use of GALVSTEEL® within the scope of this Durability Statement. If you believe there is an issue with the durability of GALVSTEEL® used for a project within the scope of this Durability Statement, you are urged to advise New Zealand Steel as soon as you become aware of the issue and before proceeding with any project still under construction.

9. References

- a) El Sarraf, R. and Hicks, S. – *Extending the Durability Performance of GALVSTEEL® using a Protective Coating System*, (HERA) Structural Systems Technical Report SSTR-001 2008.
- b) NZS 3404 Part 1, *Steel Structures Standard 2009*; Standards New Zealand.
- c) AS/NZS 2312.2;2014, *Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings. Part 2: Hot dip galvanising*.
- d) Clifton, G.C. and El Sarraf, R. *New Zealand Steelwork Corrosion Coatings Guide* (HERA Report R4-133) 2011.
- e) Compliance Document for New Zealand Building Code – Clause E2 – External Moisture

Disclaimer

With New Zealand Steel Limited's commitment to continuous improvement, information provided in this Durability Statement may be subject to modification. At the time of publication, we believe the information contained in this document is the best available. Nonetheless, we reserve the right to modify any product, technique equipment or statement to reflect improvements in the manufacture and application of GALVSTEEL®. The information is supplied without prejudice to New Zealand Steel Limited's standard terms and conditions of sale. In the event of any conflict between this information and the standard terms and conditions, the standard terms and conditions shall prevail.

This edition of the GALVSTEEL® used for structural building elements Durability Statement supersedes all previous editions. It is important to check you have the latest edition of the Durability Statement by referring to www.nzsteel.co.nz or contacting New Zealand Steel Limited on 0800 100 523.

Corrosion map to NZS3404.1	ISO 9223	Typically	Location	Characterised by	Residential/Dry	Internal		Open front		Awning
						Damp	High humidity	Protected	Open	
Sea spray	C5	Within 200m of breaking surf	West coast, South Island	Heavy salt deposits, almost constant smell of salt spray in the air.	1	3	3	3	3	3
		Within 100m of breaking surf	West coast, North Island		1	3	3	3	3	3
		Within 50m of breaking surf	Other coasts		1	3	3	3	3	3
		200m up to 500m or more inland from breaking surf. In the immediate vicinity of calm salt water such as harbour foreshores.	West coast, South Island	Medium salt deposits, Frequent smell of salt in the air.	1	3	3	3	3	3
	C4	50m up to 500m or more inland from breaking surf. In the immediate vicinity of calm salt water such as harbour foreshores.	All other coasts	Little salt deposits, occasional smell of salt in the air.	1	1	3	3	3	3
		500m to 1km from breaking surf. In the immediate vicinity of calm salt water such as estuaries.	West coast of both islands and South coast of South Island.		1	1	3	3	3	3
Zone 1	C3	500m to 1km from breaking surf. In the immediate vicinity of calm salt water such as estuaries.	East coast of both islands, South coast of North Island and all harbours.	Minor salt deposits, no smell of salt in the air.	1	1	2	3	3	3
		1km to 20 km from salt water	West coast of both islands and South coast of South Island		1	1	3	3	3	3
		1km to 5km from salt water	East coast of both islands, South coast of North Island and all harbours.		1	1	2	3	3	3
Zone 2	C2	20km to 50km from salt water.	West coast of both islands and South coast of South Island	No marine influence.	1	1	1	2	3	3
		5km to 50km from salt water	East coast of both islands, South coast of North Island and all harbours.		1	1	1	2	3	3
Zone 3		Inland more than 50km from salt water.	Both Islands		1	1	1	1	1	1

Note; all environments may be extended inland by prevailing winds and local conditions.

Key

1	Z275 minimum
2	Z450 minimum, or contact coating specialists for advice
3	Additional coatings required to achieve a 50 year durability, contact coating specialists for advice.