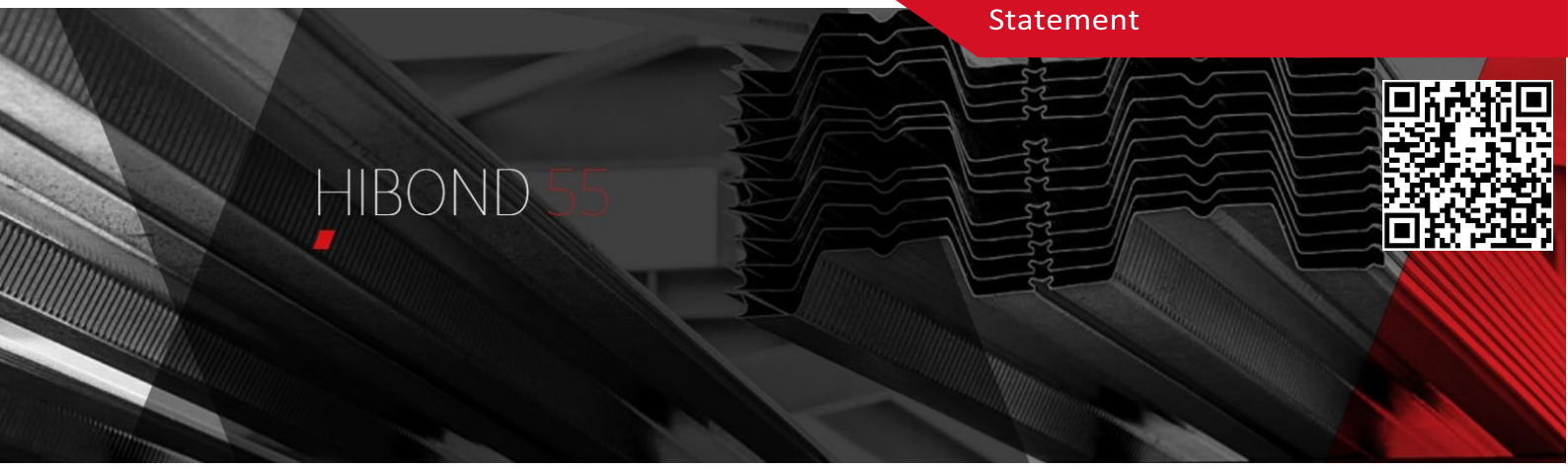
Dimond Structural

CLASS 1

Product Information and Technical Statement



Dimond Hibond 55 Flooring System

Supplier

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Place of Manufacture

Aotearoa New Zealand

Structural Systems Manual

https://www.dimondstructural.co.nz/structural-design-manual#flooring

Product Description

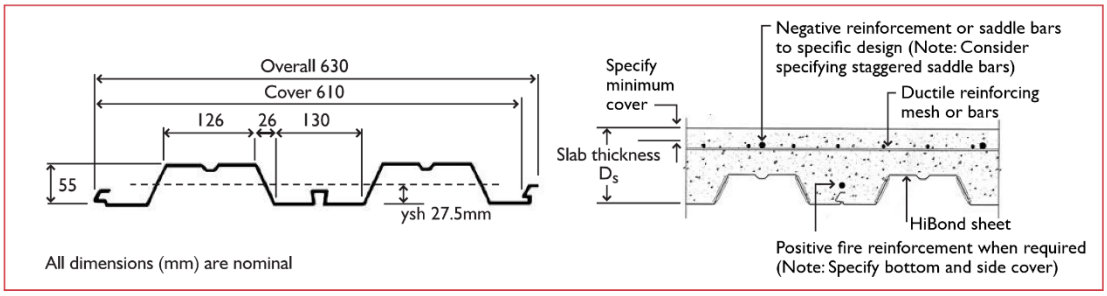
1.1 The Hibond 55 Flooring System (Hibond 55 Flooring) is a galvanised steel sheet that is roll-formed into a metal decking profile with embossments capable of combining effectively with concrete placed in-situ to form a composite, one-way reinforced concrete floor slab.

1.2 Hibond 55 Flooring is available in 0.75mm and 0.95mm base metal thickness (BMT). Hibond 55 Flooring includes components, refer Structural Systems Manual Section 3.4.11.

1.3 Hibond 55 Flooring is manufactured from Steel Grade G550 galvanised coil in Z275, i.e. 275g/m² total galvanised zinc coating weight. Components are manufactured from Steel Grade G250 (0.55mm and 1.15mm BMT), in Z275 zinc coating.

1.4 Refer to table and diagram below for section sizes and shape:

Hibond 55 Formwork Properties	0.75mm	0.95mm
Design Strength, fy (MPa)	550	520
Base Metal Thickness (mm)	0.75	0.95
Self Weight (kN/m²)	0.085	0.108
Gross Cross Sectional Area (mm²/m)	1058	1340
Neutral Axis, ysh (mm)	27.5	27.5



Scope of Use

2.1 Hibond 55 Flooring provides both permanent formwork during construction and tensile reinforcement for concrete floor slabs in-service, spanning in the direction of the Hibond 55 profile ribs.

2.2 Hibond 55 Flooring is suitable for use on unpropped spans within the limitations of the Structural Systems Manual, for buildings where weight saving is preferred over the avoidance of temporary propping. It can also be used on extended spans with the use of structurally suitable props installed during Hibond 55 Flooring installation and kept in place for concrete placement and cure during construction.

2.3 Hibond 55 Flooring is typically installed,

a. over steel beams, concrete block walls, poured concrete beams, or timber constructions, subject to the construction limitations and fixing guidelines provided in the Structural Systems Manual.

b. with additional reinforcement provided by steel mesh or bars designed and specified by the structural engineer for crack control, transverse reinforcement, negative reinforcement, or where additional reinforcement is required for point or line loads, around penetrations, or to achieve a required fire rating.

c. using welded steel studs to provide connectivity to supporting steel beams sufficient to achieve composite beam action.

2.4 Use of Hibond 55 Flooring must be within the limitations on environment and use given in the Structural Systems Manual Section 3.1.

Compliance With The New Zealand Building Code

3.1 Past history of use of Dimond Flooring systems, product testing and analysis of the Hibond 55 profile and composite floor slab, and acoustic opinions by Marshall Day Acoustics indicate that provided the system design, installation, use and maintenance is in line with the guidelines of the Structural Systems Manual and the standards referenced therein, and provided the steel components remain dry and free from contamination, Hibond 55 Flooring can reasonably be expected to meet or contribute to meeting the following performance criteria outlined in the New Zealand Building Code:

- **B1 Structure**: Performance clauses B1.3.1, B1.3.2, B1.3.3 (a) (b) (f) (h) (q), B1.3.4 (b) (d). BS 5950 Part 4:1994 and BS 5950 Part 6:1995 used as a basis for design tables in the Structural Systems Manual Sections 3.4.4 and 3.4.5, refer to Design Instructions 5.1-5.4.
- **B2 Durability**: Performance clauses B2.3.1(a). Refer to Durability & Maintenance Requirements 4.1-4.4.
- **C3 Fire Affecting Areas Beyond The Fire Source**: Performance clauses C3.4 (a), C3.6. HERA Report R4-82 used as a basis for fire design tables in the Structural Systems Manual Section 3.4.6, refer to Design Instructions 5.1-5.4.
- **G6 Airborne and Impact Sound**: Performance clause G6.3. Specific design required using guidance in the Structural Systems Manual Section 3.4.7, refer to Design Instructions 5.1-5.4.
- **F2 Hazardous Building Materials**: Performance clause F2.3.1.

3.2 Relevant Standards:

AS/NZS 1170	Structural Design Actions
AS/NZS 1365	Tolerances for Flat-rolled Steel Products
AS/NZS 2327	Composite Structures - Composite Steel-Concrete Construction in Buildings
AS 1397	Continuous Hot-dip Metallic Coated Steel Sheet and Strip - Coatings of Zinc and Zinc Alloyed with Aluminium and Magnesium
BS 5950 Part 4:1994	Structural Use of Steelwork in Building, Part 4. Code of Practice for Design of Composite Slabs with Profiled Steel Sheeting
BS 5950 Part 6:1995	Structural Use of Steelwork in Building, Part 6. Code of Practice for Design of Light Gauge Profiled Steel Sheeting
SNZ TS 3404:2018	Durability Requirements for Steel Structures and Components

3.3 Where products used with Hibond 55 Flooring is manufactured by other suppliers, compliance to the New Zealand Building Code is required to be sought from that product's manufacturer.

Durability & Maintenance Requirements

4.1 The use of Hibond 55 Flooring is limited to dry and non-corrosive environments, unless further suitable protection of the surfaces is provided. It is the responsibility of the structural engineer to assess the durability requirements and specify accordingly.

4.2 Hibond 55 Flooring may require additional protection from suitable protective coatings applied in-situ if exposure to moisture, marine deposits or chemicals is expected,

a. the top concrete surface may require additional crack control and/or waterproofing

b. the underside metal surface may require additional protection from suitable protective coatings applied in-situ.

4.3 Hibond 55 Flooring requires maintenance to ensure the surfaces remain in sound condition and moisture ingress and contamination is prevented. This requires surfaces to be kept clean and free from defects and contaminants that could give rise to material degradation over time.

4.4 Refer to appropriate sections of the Structural Systems Manual:

Structural Systems Manual	Section Number
Environments and Limitations on Use	3.1.3
Durability (Surface & Underside Treatment)	3.1.5
Maintenance	3.1.6

Design Instructions

5.1 Hibond 55 Flooring is intended to be designed by suitably qualified structural engineers and acoustics practitioners experienced in the design of structural building systems, to provide PS1 certification.

5.2 It is critical to product performance that the materials selected, the loads applied, spans, additional reinforcement, and overall slab thickness are designed within the appropriate Limit State Loads in AS/NZS 1170, formwork and composite slab load-span performance in AS/NZS 2327 and limitations published in the Structural Systems Manual and the following standards referenced therein.

5.3 The information within the Structural Systems Manual is only applicable to Dimond Hibond 55 Flooring. It cannot be assumed to apply to similar products from other manufacturers.

5.4 Refer to appropriate sections of the Structural Systems Manual:

Structural Systems Manual	Section Number
General Design Considerations	3.2.1 - 2
Design Basis	3.4.1
Design Considerations	3.4.2
Section Properties	3.4.3
Load Span Tables	3.4.4 - 5
Fire Design Tables	3.4.6
Acoustic Performance	3.4.7

Installation and Construction Instructions

6.1 Before commencing a project using Hibond 55 Flooring, the installer and builder must refer to the appropriate sections of the Structural Systems Manual, ensuring relevant information (e.g. any limitations on use) is available to the end user. Failure to observe this information may result in a significant reduction in product performance. Dimond accepts no liability whatsoever for products that are used otherwise than in accordance with these recommendations.

6.2 The construction sequence and delivery, installation and placement of Hibond 55 sheets, reinforcement and concrete components should comply with AS/NZS 2327 (Clause 1.3 and Appendix A). Installation is also to be carried out in accordance with the Structural Systems Manual Section 3.6.

6.3 Consideration of the expected loads and propping requirements during construction that are relevant to the specific design project must be given at the design stage to ensure construction can proceed in a safe manner, and contractors are aware of any constraints. Further information on construction practice is documented in Steel Construction Institute publication P300.

6.4 Refer to the appropriate sections of the Structural Systems Manual:

Structural Systems Manual	Section Number
Installation	3.6
Components	3.4.11
General Construction Details	3.4.12

Warnings & Bans

Not subject to a warning or ban under section 26 of the Building Act 2004.

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