Dimond Structural™

HIBOND 55
PRODUCT TECHNICAL STATEMENT

SUPPLIER

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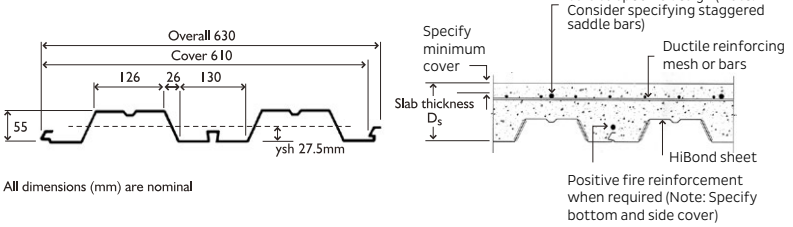

1. PRODUCT DESCRIPTION

1.1 Hibond 55 is a galvanised steel sheet that is roll-formed to a 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 is available in 0.75mm and 0.95mm base metal thickness (BMT).

2. SCOPE OF USE

2.1 Hibond 55 is intended to be designed by suitably qualified structural engineers experienced in the design of structural flooring systems, to provide PS1 certification.

2.2 Hibond 55 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.

2.3 Hibond 55 is suitable for use on spans within the limitations of the Structural Systems Manual, ideal for buildings where weight saving is preferred over the avoidance of temporary propping.

2.4 Hibond 55 can be used on extended spans within the limitations of the Structural Systems Manual with the use of structurally suitable props installed during Hibond 55 installation and kept in place for concrete placement and cure during construction.

2.5 Composite floor slabs using Hibond 55 can include additional reinforcement provided by steel mesh or bars specified by the design 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.

2.6 Hibond 55 can be installed over concrete block walls, poured concrete beams, steel beams, or timber beams, subject to the construction limitations and fixing details provided in the Structural Systems Manual.

2.7 Composite floor slabs using Hibond 55 can include the use of welded steel studs to provide connectivity to supporting steel beams sufficient to achieve composite beam action.

2.8 Use of Hibond 55 must be within the limitations on environment given in the Structural Systems Manual (Section 3.1).

3. COMPLIANCE WITH THE NEW ZEALAND BUILDING CODE

3.1 Past history of use of Dimond Structural Flooring Systems and testing and structural analysis of the Hibond 55 profile and composite floor slab indicate that provided the system design, use and maintenance is in line with the guidelines of the Structural Systems Manual and the standards referenced therein, Hibond 55 can reasonably be expected to meet the performance criteria in Clauses B1 Structure and B2 Durability of the New Zealand Building Code for a period of not less than 50 years, provided the steel components remain dry and free from contamination.

3.2 Hibond 55 can be designed using the Structural Systems Manual (Section 3.4.6) to meet the fire performance criteria in Clauses C3 and C4 of the New Zealand Building Code.

3.3 The Hibond 55 flooring system can be designed using the Structural Systems Manual (Section 3.4.7) for guidance to achieve Sound Transmission Class (STC) and Impact Insulation Class (IIC) of 55 and meet the requirements of the New Zealand Building Code Clause G6 Airborne and Impact Sound.

3.4 Where products used in The Hibond 55 flooring system are manufactured by other suppliers, compliance to the New Zealand Building Code is required to be sought from that product's manufacturer.

4. DURABILITY AND MAINTENANCE REQUIREMENTS

4.1 The use of composite concrete floor slabs based on Hibond 55 is limited to dry and non-corrosive environments unless further suitable protection of the surfaces is provided. It is the responsibility of the design engineer to assess the durability requirements and specify accordingly.

4.2 The top concrete surface may require additional crack control and/or waterproofing if it is to be exposed to moisture, and the underside surface of Hibond 55 may require additional protection from suitable protective coatings applied in-situ if exposure to moisture, marine deposits, or chemicals is expected.

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

4.4 Refer to appropriate sections of the Structural Systems Manual:

Structural Systems Manual Durability and Maintenance Criteria	Section Number
Environments and Limitations on Use	3.1.3
Concrete Surface Treatment	3.1.5
Underside Surface Treatment	3.1.5
Maintenance	3.1.6

5. DESIGN INSTRUCTIONS

5.1 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 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.

5.2 The information within the Structural Systems Manual is based on comprehensive system performance testing and is only applicable to Hibond 55. It cannot be assumed to apply to similar products from other manufacturers.

5.3 Refer to appropriate sections of the Structural Systems Manual:

Structural Systems Manual Design Criteria	Section Number
General Design Considerations	3.2.1 - 2
Design Basis	3.4.1
Formwork	3.4.2.1
Composite Floor Slab	3.4.2.2
Section Properties	3.4.3
Load Span Tables Formwork Span Capability Composite Slab Span and Load Capability Fire Rating	 3.4.4 3.4.5 3.4.6
Acoustic Performance	3.4.7

6. INSTALLATION AND CONSTRUCTION INSTRUCTIONS

6.1 Before commencing a project using Hibond 55, 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).

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 Installation and Construction Instructions	Section Number
Installation	3.6
Components	3.4.11
Construction Details	3.4.12

7. QUALITY ASSURANCE

7.1 Hibond 55 is manufactured to tolerances given in the Structural Systems Manual section 3.4.9.

7.2 Hibond 55 is manufactured from galvanised steel that complies with the tolerances in AS/NZS 1365.

7.3 Load Span capacities have been established based on physical testing and design to BS 5950 (Part 4:1994 and Part 6:1995).

8. PRODUCT SUPPORT

8.1 Support is available from Dimond for design considerations, construction details, installation requirements, and maintenance advice.

8.2 Dimond can provide reference to preferred installers of Hibond 55 who are familiar with installation methods and construction details required for the system.

9. MATERIALS SPECIFICATION

Materials used in the construction of composite floor systems based on the use of Hibond 55 are to comply with the following specifications:

9.1 Galvanised Steel

To comply with AS/NZS 1365 and AS 1397

Hibond 55 Steel Decking

- Zinc Weight, Z275 (275g/m^2 zinc coating weight)
- Zinc Weight, Z450 may be available subject to quantity and lead time
- 0.75mm BMT Design Yield Strength 550MPa
- 0.95mm BMT Design Yield Strength 520MPa

Edge Form (1.15mm BMT) and End Caps/Rake Cut Edge Flashings (0.55mm BMT) Grade G250, Z275.

9.2 Stitching Screws

10g x 16mm Tek Screws Class 3 to AS 3566.2

Sheet fastening: Fix leading edge of pan at all sheet ends into permanent supports and at maximum 1m centres along sheets into permanent side supports. Consider additional fixings to avoid wind uplift issues.

Side lap fastening at maximum 600mm spacing

Edge Form fastening: every second rib at sheet ends and maximum 750mm when fastened along sheets.

9.3 Concrete

To comply with NZS 3104
Minimum 28-day Compressive Strength 25MPa for high grade concrete
Appropriate additives may be specified, but they must be compatible with galvanised steel
Maximum aggregate size to comply with AS/NZS 2327 and be no greater than a nominal size of 20mm.

9.4 Additional Reinforcement

Ductile steel reinforcement mesh or bars to comply with AS/NZS 4671
Distance between bars to comply with the limitations in AS/NZS 2327.

9.5 Welded Shear Studs

Headed studs to comply with AS 1554.2
Minimum Tensile 410MPa, minimum yield 345MPa
Diameter 19mm and length to suit slab depth in compliance with AS/NZS 2327.

10. USE OUTSIDE THE STATED GUIDELINES

If the need arises to use Hibond 55 outside the limitations and procedures referred to in this statement, or if there exists any doubt on product handling or use, written approval must be obtained from Dimond for the specific project, before the project is commenced.

11. DISCLAIMER

As part of Dimond Structural's policy of continuing product and system development the company reserves the right at any time and without notice, to discontinue or change the products, materials, design advice, features or specifications represented in the Structural Systems Manual without incurring any liability. The information in the Structural Systems Manual is issued for general application in New Zealand, and should not be treated as a substitute for detailed technical advice in relation to requirements for individual projects in New Zealand or overseas. To the extent permitted by law, Dimond Structural disclaim any liability for loss or damage incurred by the use of the information in the Structural Systems Manual and this Product Technical Statement unless it is covered by a specific warranty agreement. Dimond, a division of Fletcher Steel Ltd. February 2022.