SCOPE OF USE

Dimond Structural Flooring Systems use a roll-formed profiled galvanised steel sheet as a component in reinforced concrete floor systems. The steel decking sheet provides both permanent formwork and positive tensile reinforcement in one way reinforced composite floor slab construction over concrete block walls, poured concrete beams, steel beams or timber beams, subject to the environmental limitations referenced to the appropriate grade of material selected.

It is critical to product performance that the loads applied, spans, formwork material thickness and overall composite floor slab thickness are designed within the appropriate Limit State Loads and limitations published in this manual.

Before commencing a project using a Dimond Structural Flooring System, the user must refer to the information within this manual and all sections as appropriate, ensuring relevant information is available to the end user. Failure to observe this information may result in a significant reduction in product performance. Dimond Structural accepts no liability whatsoever for products which are used otherwise than in accordance with these recommendations.

The information contained within this manual is only applicable to Dimond Structural Flooring Systems – it cannot be assumed to apply to similar products from other manufacturers.

USE OUTSIDE THE STATED GUIDELINES

If the need arises to use the Dimond Structural Flooring System outside the limitations and procedures given in this manual or if there exists any doubt on product handling or use, written approval should be obtained from Dimond Structural for the specific project, before the project is commenced.

3.1

DURABILITY

3.1.1

SCOPE

The Dimond Structural Flooring Systems described in this manual are subject to the environments in which they are used and the type of coating used as outlined in detail in this section.

3.1.2

COATING MATERIAL SPECIFICATIONS

Dimond Structural Flooring Systems are manufactured from galvanised steel coil in grade Z275 i.e. 275g/m^2 total galvanised zinc coating weight.

Other grades of zinc coating may be available. Contact Dimond Structural on 0800 Dimond (0800 346 663).

ENVIRONMENTS

3.1.3

GENERAL

3.1.3.1

The durability of galvanised zinc coated products is dependent on:

- The environment it will be installed in.
- The grade or weight of the zinc coating used.
- The degree and extent of the maintenance that will be undertaken over the life of the product.

Performance of galvanised zinc coated composite floor slabs is affected by:

- The cumulative effects of the weather to either the underside surface or moisture ingress of the top surface.
- The amount of dust (which can hold moisture) that settles on the product.
- Any other wind-blown deposits that may settle on the product, promoting corrosion.
- Proximity to the ground in subfloor areas with little or no ventilation.

Condensation or other deposits should be prevented from accumulating on the Dimond Structural Flooring System underside by providing adequate ventilation. A protective barrier must be provided if dampness is possible on the underside of the steel decking sheet. Refer Durability Statement 3.1.5.

LIMITATIONS ON USE

The use of galvanised steel decking sheet should be avoided:

- In areas where high concentrations of chemicals are combined with a high humidity, where the system remains wet for long periods of time, causing rapid consumption of the galvanised zinc coating and eventual red rusting of the base metal.
- Where the galvanised surface is being exposed to continuous moisture, without a chance for the surface to dry out for example, where the composite floor slab covers a water tank.
- In or near marine environments, where the prevailing wind carries marine salts which deposit on the steel decking, causing rapid consumption of the galvanised zinc coating and eventual red rusting of the base metal.
- In areas surrounding chemical or industrial storage buildings where any chemical attack may lessen the life of the structure or wind-driven chemical fumes may attack the galvanised coating.
- When in contact with or laid directly on ground.
- When in contact with timber and especially treated timber such as CCA (copper chrome arsenic) without the use of an isolating material such as DPC between the timber and galvanised steel decking sheet.
- When used in sub-floor areas with less than 450mm ground clearance.
- When used in sub-floor areas where ventilation does not comply with NZS 3604 Clause 6.14.

Chemical admixtures may only be used with Dimond Structural Flooring Systems if they are compatible with galvanised steel.

Refer Durability Statement 3.1.5 for guidance on methods of protection.

NZBC COMPLIANCE

Past history of use of Dimond Structural Flooring Systems indicate that provided the system design, product use and maintenance is in line with the guidelines of this manual, Dimond Structural Flooring Systems can reasonably be expected to meet the performance criteria in Clause B1 Structure and B2 Durability of the New Zealand Building Code for a period of not less than 50 years, provided they are kept free from moisture.

Dimond Structural Flooring Systems designed using the Fire Design Sections 3.3.4, 3.4.6 and 3.5.6 of this manual and will meet the performance criteria in Clauses C3 and C4 of the New Zealand Building Code (section 3.3.4 is based on testing to EN 1365-2 and sections 3.4.6 and 3.5.6 are based on HERA reports R4-82 and R4-131).

Using the Flooring Acoustic Performance sections 3.3.5, 3.4.7 and 3.5.7, Dimond Structural Flooring Systems can be designed using this manual for guidance to achieve Sound Transmission Class (STC) and Impact Insulation Class (IIC) of 55 meet the requirements of the current New Zealand Building Code Clause G6, airborne and impact sound.

Where products used in Dimond Structural Flooring Systems are manufactured by other suppliers, compliance to the New Zealand Building Code should be checked with that product's manufacturer.

DURABILITY STATEMENT

The use of Dimond Structural Flooring Systems is limited to dry and non-corrosive environments unless further protection of the surfaces is provided.

It is the responsibility of the design engineer to assess the durability requirements and specify accordingly.

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 the steel decking may require additional protection from suitable protective coatings applied in-situ if exposure to moisture, marine deposits or chemicals is expected.

Concrete surface treatment

Where the top surface of the composite floor slab is exposed to moisture, use of Dimond Structural Flooring Systems is only recommended if there is an appropriate coating system applied to the top surface of the composite floor slab and fully maintained for the design life of the structure, and/or adequate concrete crack control is achieved. Moisture seeping through cracks which are not effectively sealed can combine with oxygen to the extent that corrosion of the steel decking may occur.

As a guide and subject to designers specification and approval,

- To suppress moisture entering the concrete surface, provide the minimum necessary reinforcement in the composite floor slab and apply a suitable proprietary water proofing agent (either mixed into the concrete before pouring or sprayed onto the top surface after curing).
- To prevent moisture entering the concrete, provide the minimum necessary reinforcement in the composite floor slab, and apply a proprietary waterproof membrane to the concrete surface.

Underside surface treatment

Where the underside surface of the steel decking may be exposed to contaminants and/or moisture that will not regularly dry out, the use of Dimond Structural Flooring Systems is only recommended if suitable protection of the galvanised steel underside surface can be achieved with a proprietary coating system applied in-situ. Coating specifications and statements on suitability of use can be obtained from PPG Coatings or Akzo Nobel Coatings.

MAINTENANCE

Dimond Structural Flooring Systems require a minimum degree of maintenance to ensure expected performance is achieved.

As a guide the following should be carried out as often as is needed (this could be as often as every three months).

a) Keep surfaces clean and free from continuous contact with moisture, dust and other debris. This includes areas such as the exposed steel deck underside, e.g. decks or subfloors. Where necessary, regular maintenance should include a wash-down programme to remove all the accumulated dirt or salt buildup on all the galvanised surfaces with a soft brush and plenty of clean water or by water blasting at 15 MPa (2000 psi).

b) Ensure any concrete surface cracking exposed to possible water ingress is fully sealed. Similarly ponding of water on exposed top surfaces must be avoided to ensure durability requirements are met.

c) Periodically inspect the steel decking underside. At the first sign of any underside corrosion, the affected areas should be cleaned down, spot primed with a zinc rich primer and then repainted to an appropriate paint manufacturer's recommendations.

Any cases of severe damage or corrosion must be reported to the structural design engineer.