BEAL Appraisal Certificate

EXPIRY DATE 1 MAY 2020

# ECOPLUS Two-way Exposed Suspended Ceiling Grid System

## Product

1.1 The ECOPLUS Two-way Exposed Suspended Ceiling Grid System is a suspended exposed (two way) grid ceiling system. It is designed to be used as a suspended ceiling system in both commercial & residential type buildings.

1.2 The system consists of cold rolled sections (main tee, cross tee, perimeters sections) manufactured from light gauge galvanized steel with a polyester paint finish on viewable faces, creating a nominal 1200 mm x 600mm grid. The grid is hung at a nominated distance from the floor or roof above by hangers and in filled with a ceiling tile (1200mm x 600mm) to form a soffit.

1.3 The connection of Cross tee tab to Main tee has been found to be stronger than typical systems available.

## Building Regulations

2.1 In the opinion of BEAL, the ECOPLUS Two-way Exposed Suspended Ceiling Grid System, when designed, installed and maintained in accordance with the statements and conditions of this Appraisal Certificate, will meet the following provisions of the NZBC.

2.2 Clause B1 STRUCTURE

Performance B1.3.1,B1.3.2 and B1.3.4. The ECOPLUS Two-way Exposed Suspended Ceiling Grid System meets the requirements for loads arising from self-weight, earthquake, wind, impact and creep [ i.e. B1.3.3 (a), (f), (h), (j) and (q)]. See paragraphs 9.1 - 9.7

2.3 Clause B2 DURABILTY

Performance B2.3.1 (b), 15 years, B2.3.1 (c), 5 years, and B2.3.2. The ECOPLUS Two-way Exposed Suspended Ceiling Grid System meets this requirement. See paragraphs 10 .1 -10.4

2.4 Clause F2 HAZARDOUS BUILDING MATERIALS

Performance F2.3.1. The ECOPLUS Two-way Exposed Suspended Ceiling Grid System meets this requirement and will not present a health hazard to people.

2.5 The ECOPLUS Two-way Exposed Suspended Ceiling Grid System has been appraised as an **Alternative Solution** in terms of New Zealand Building Code Compliance.

Applicant:

**ECOPLUS SYSTEMS Ltd**
P.O.BOX 105577
AUCKLAND
E-Mail sales@ecoplus.com
Web www.ecoplus-systems.com

Appraiser:

**BEAL**
2A Plimmerton Drive
Plimmerton, Porirua, NZ
Tel: +64 233 6661
Fax: +64 233 6662
E-Mail sales@beal.co.nz
Web www.beal.co.nz



© Building Element Assessment Laboratory Ltd. 2010 All rights reserved. Use of this document is subject to BEAL's Terms and Conditions

# Scope and Limitations

3.1 The ECOPLUS Two-way Exposed Suspended Ceiling Grid System has been appraised for use as a suspended ceiling system for internal use in both commercial and residential type buildings within the following scope

- Concrete structure/floors designed and constructed to comply with the NZBC (e.g. NZS 3101), and;
- Constructed with timber framing complying with the NZBC; and;
- Constructed with steel framing complying with the NZBC;

3.2 Shall be designed and installed in accordance with AS/NZS 2785:2000

3.3 Installation of components and accessories supplied by ECOPLUS Systems Ltd, must be carried out by competent ceiling installers experienced in the installation of suspended ceiling systems.

3.4 The ECOPLUS Two-way Exposed Suspended Ceiling Grid System is a non trafficable ceiling.

# Technical Literature

4.1 Refer to the ECOPLUS Two-way Exposed Suspended Ceiling Grid System Technical Literature Ver 1.0 dated Dec 2010. The Technical Literature must be read in conjunction with this Appraisal Certificate. All aspects of design, use, installation and maintenance contained within the Technical Literature and scope of this Appraisal certificate must be followed.

4.2 For a copy of this Technical Literature and any subsequent updates please refer to:
www.ecoplus-systems.com

# Technical Specification

5.1 System components and accessories used in the ECOPLUS Two-way Exposed Suspended Ceiling Grid System supplied or specified by ECOPLUS Systems Ltd are as follows:

## Grid Components

- ECOPLUS Main Tee - 24mm x 38mm x 3600mm double web cold rolled formed T section manufactured from hot dipped, zinc-coated galvanised steel strip AS/NZS 1397. Sections are pre-painted with a factory applied white polyester paint finish.
- ECOPLUS Cross Tee - 24mm x 28mm double web cold rolled formed T section manufactured from hot dipped, zinc-coated galvanised steel strip AS/NZS 1397. Sections are pre-painted with a factory applied white polyester paint finish. Supplied in lengths of 600mm and 1200mm.
- ECOPLUS Wall Angle - 23mm or 25mm x 19mm x 3600mm cold rolled formed L angle manufactured from hot dipped, zinc-coated galvanised steel strip AS/NZS 1397. Sections are pre-painted with a factory applied white polyester paint finish.

## Ceiling Tiles

ECOPLUS Ceiling Tiles allows the use of Ceiling Tiles to be installed with the ECOPLUS Two-way Exposed Suspended Grid. Ceiling Tiles shall have a mass of less than or equal to 4.8kg/m² (based on the standard 1200mm x 600mm grid layout) and shall comply with the requirements of AS/NZS2785, and give the desired finish.

ECOPLUS Systems Ltd also allows the use of Ceiling Tiles to be installed with the ECOPLUS Two-way Exposed Suspended Grid with a mass of less than or equal to 7.5kg/m2 when the ECOPLUS Cross Tees are spaced a maximum 400mm centres and shall comply with the requirements of AS/NZS2785, and give the desired finish.

## Accessories

- Suspension Tie Wire (hanger) - 2.5mm galvanised wire complying with AS 4534 (coating min. 125g/m²) supplied in standard lengths with elongation on 250mm not less than 15%.
- Fasteners for Perimeter Wall Angle - 8g x 32mm GIB® Grabber® Wafer Head Needle Tip screw or ECOPLUS approved alternative, for use with both timber and steel framing.
- 14g x 100mm hot dipped galvanised AS4680 self drilling timber screw eyes for use with timber structures.
- Ramset™ 31mm x 8mm M6 Zinc plated to AS 1791 Dynabolt™ Tie wire bolt (or ECOPLUS approved equivalent) for use with concrete structures.

## Seismic Connection Strength

5.2 The ECOPLUS Main Tee has been shown to have a load to pull-out (tension) strength in the order of 156 kg's force (1.5N);

5.3 The ECOPLUS Cross Tee has been shown to have a load to pull-out (tension) strength in the order of 143 kg's force (1.4N);

## Handling and Storage

5.4 The proper safe handling and storage of all the materials supplied by ECOPLUS Systems Ltd are the responsibility of the ceiling installer/contractor (competent and experienced in the installation of suspended ceiling systems).

5.5 Dry storage must be provided on site for all the ECOPLUS System components. All components must be stored on a flat dry surface and protected from scratches or physical damage of any kind by/to other trades.

5.6 Handling of the ECOPLUS Two-way Exposed Suspended Ceiling Grid System's Components requires care and should be handled in a manner that will prevent distortion or physical damage.

5.7 All accessories must be kept dry.

# Design Information

## General

6.1 ECOPLUS Two-way Exposed Suspended Ceiling Grid System is for use in the interior of both commercial (e.g. offices) and residential type buildings where a suspended ceiling finish (two way exposed) is required.

6.2 ECOPLUS Two-way Exposed Suspended Ceiling Grid System includes a grid system and acoustic ceiling tiles.

6.3 Ceiling layout and design should be planned prior to installation to determine grid configuration, direction, material quantities etc in accordance with AS/NZS 2785 and the Technical Literature.

© Building Element Assessment Laboratory Ltd. 2010 All rights reserved. Use of this document is subject to BEAL's Terms and Conditions 

6.4 The ECOPLUS Two-way Exposed Suspended Ceiling Grid System must be designed to comply with seismic compliance AS/NZS 1170.5.

6.5 For buildings which are permeable (i.e doors, windows) consideration should be given to wind pressures which may occur. Where this is the case the appropriate design loading must be determined by the designer in accordance with AS/NZS 2785 Clauses 3.3.5 (b) or (c). This is the responsibility of the designer and is outside the scope of the Appraisal certificate.

6.6 The deflection of the ECOPLUS Two-way Exposed Suspended Ceiling Grid System under service conditions shall be controlled by a limit for the calculated deflection of the element chosen appropriate to the structure and its intended use. The value chosen shall be not less than the table (1.0) below as per AS/NZS 2785 Clause 3.4.4.

### Table 1.0 Deflection Limits

| | Level of finish required | | |
|---|---|---|---|
| Ceiling Type | 1 | 2 | 3 |
| Exposed Two-ways | N/A | L/250 | L/360 |

*Note:*

1. *Above table is only a partial representation of AS/NZS 2785 table 3.4.4 showing relevant information only*
2. *Level 1 applies to flush or sheeted ceilings only.*
3. *Level 2 Min. standard of finish - to be used in non critical areas such as store rooms, high ceiling areas such as warehouses and department store and the like.*
1. *Level 3 Normal standard of finish. Areas such as offices, shops and the like.*
2. *Levels 4 and 5 have not been included as they apply to flush or sheeted ceilings only.*

### Control Joints

6.7 Where control joints are required, the joints must be specifically designed in accordance with AS/NZS 2785 and maintain the integrity of the suspended ceiling system.

## Structure - Clause B1

6.8 Supporting structural framing of the building for the support of the ECOPLUS Two-way Exposed Suspended Ceiling Grid System must comprise of the following;

### Timber Structure

6.9 Timber members to which the suspended ceiling is to be attached to, shall be designed to meet the load requirements of the suspended ceiling system including the grid and panels.

6.10 Timber framing if used shall comply with NZS 3604 for both buildings or parts of buildings within the scope limitations of NZS 3604. Where buildings or parts of buildings are outside the scope of NZS3604 then they must be to specific design in accordance with NZS 3603 and AS/NZS 1170. Where specific design is required, the framing must be of at least the equivalent stiffness to the framing provisions of NZS 3604.

6.11 Timber framing must have a maximum moisture content of 16% at the time of ceiling installation.

### Concrete Structure

6.12 Concrete structure/floors designed and constructed in accordance to comply with the NZBC (NZS 3101).

### Steel Structure

6.13 Steel structures/framing shall be designed and constructed to comply with the NZBC.

### Impact Resistance

6.14 ECOPLUS Two-way Exposed Suspended Ceiling Grid System provides adequate resistance to soft body impacts, based upon experience of use in commercial applications. However all practical steps shall be taken to protect the ceiling from damage before, during and after installation.

## Durability – Clause B2

### Serviceable Life

6.15 The ECOPLUS Two-Way Exposed Suspended Ceiling Grid System when used in accordance with this Appraisal certificate and subjected to normal conditions of environment and use will meet the performance requirements of NZBC B2.3.1 (b), 15 years.

6.16 ECOPLUS Two-way Exposed Suspended Ceiling Grid System must be protected from internal and external moisture in accordance with NZBC E2 and E3.

### Maintenance

6.17 Painting - where repainting of the grid system is required consult ECOPLUS Systems Ltd and/or your nearest paint shop.

## Internal Moisture

6.18 The ECOPLUS Two-way Exposed Suspended Ceiling Grid System must be used in dry, non corrosive internal situations, and must not be used where it is likely to be exposed to water or where extended exposure above 95% RH is expected.

## Electrical (Safety)

6.21 Electrical wiring to be in accordance with the NZBC.

# Installation Information

## Installation Skill Level Requirement

7.1 Installation and finishing of the components and accessories supplied by ECOPLUS Systems Ltd must be carried out by a competent ceiling installer experienced in the installation of suspended ceilings systems.

## General

### System Information

7.2 Internal ceiling installation shall not proceed until the building is effectively weathertight and the work of wet trades has been completed and dried. Suspended ceilings shall only be installed upon the completion of construction above the ceiling.

7.3 The ceiling system shall not be suspended from, and shall be kept clear of, any building services such as ducts, unless specifically designed otherwise.

7.4 Mechanical and electrical ductwork above the suspension system shall be completed before installation of the suspended ceiling system.

7.5 Partition walls shall be fixed to the primary members of the grid and not to the tiles or infill panels. The design of this connection shall be the responsibility of the designer and is outside the scope of this Appraisal Certificate.

7.6 Minimum plenum depth
- 1200mm x 600mm Ceiling Tiles = 150mm

Where a smaller plenum depth is required this will require

© Building Element Assessment Laboratory Ltd. 2010 All rights reserved. Use of this document is subject to BEAL's Terms and Conditions 

specific design and is outside the scope of this Appraisal Certificate.

7.7 ECOPLUS Systems Ltd and the ceiling installer/ contractor (competent and experienced in the installation of suspended ceiling systems) shall ensure the installation of the completed ceiling/s comply with the following;

- The contract specification
- Manufacturer's installation specification
- AS/NZS 2785

### Grid System

7.8 For standard installation, ECOPLUS Main Tees are spaced at 1200mm centres using the ECOPLUS self locking system.

7.9 The ECOPLUS Cross Tee shall be fixed in place at 600mm centres. The ECOPLUS Cross Tee interlocks through the ECOPLUS Main Tee pre punched web slots.

7.10 The ECOPLUS Wall Angle Trim is fixed at 600mm centres using 8g x 32mm GIB® Grabber® Wafer Head Needle Tip screws or ECOPLUS approved alternative, into plasterboard wall.

7.11 2.5mm diameter straightened galvanised Suspension Tie Wire to support ECOPLUS Main Tee at maximum 1200mm centres. Wire is installed through pre-punched holes and secured with three tight 360° turns.

7.12 Where the position of the Suspension Tie Wire is altered due to load requirements this shall be the responsibility of the designer and is outside the scope of the Appraisal Certificate.

### Ceiling Tiles

7.13 Must be installed in accordance with the Technical Literature by competent ceiling installers experienced in installation of suspended ceiling systems.

7.14 Ceiling Tiles should fit neatly into the grid system and cut panels at the perimeter trimmed to the full space between the last grid member and the perimeter trim to prevent lateral movement.

### Fasteners

7.15 Fixing of the Suspension Tie Wire to the structure above with proprietary fasteners shall be installed in accordance with the manufacturers recommendations and be suitable for the structure material. Such fasteners shall have a ultimate design strength the greater of 50kg (0.5kN) minimum, or load requirements of AS/NZS 2785 Clause 3.2.2 (c).

### Luminaries

7.16 Down-lights or other services shall not rely on the ceiling panel for support. They shall be installed in rigid infill, (e.g. MDF board, supported on the ceiling grid) or the load shall be transferred back to the ceiling structural components, subject to specific design (NZS 4219).

7.17 Where luminaries are installed into the ceiling they shall comply with AS 2946 and are supported by the installation of supporting cross T sections subject to specific design (NZS 4219). The design and installation of luminaries and the like is the responsibility of the designer and is outside scope of this Appraisal Certificate.

### Services

7.18 Ancillary services such as electrical cables and air conditioning ducts shall not be suspended from the ceiling hangers unless specifically designed for that purpose.

7.19 Other services such as fire sprinklers and the like shall be independently supported from the ECOPLUS Two-way Exposed Suspended Ceiling Grid System.

### Cutting

7.20 ECOPLUS grid components are cut using tin snips.

7.21 ECOPLUS Ceiling Tiles can be cut using a sharp, short-bladed trimming knife from either side on a flat clean surface. Where holes for lights etc are required this shall be undertaken by an appropriately qualified tradesman using appropriate cutting equipment.

### Health and Safety

7.22 When cutting or drilling the ECOPLUS Two-way Exposed Suspended Ceiling System grid or perimeter channels appropriate personal safety equipment shall be used e.g. gloves and eye protection.

7.23 All aspects of cutting and drilling must comply with the latest regulations of the occupational safety and health division of the labour department.

## Basis of Appraisal

BEAL use the compliance verification procedure to demonstrate compliance with the relevant clauses of the NZBC based on a risk analysis procedure. The following is a summary of the technical investigations carried out

### Tests

8.1 The following testing of the ECOPLUS Two-way Exposed Suspended Ceiling Grid System and its respective components has been undertaken by BEAL unless otherwise noted:

- Testing conducted by SGS laboratories included
  - Thickness measurements of grid components
  - Tensile strength of the Main Tee
  - Tensile strength of the 2.5mm galvanised wire

### Other Investigations

8.2 BEAL opinion on NZBC Clause B1 code compliance was based on testing of components and in service history.

8.3 BEAL opinion on NZBC Clause B2 code compliance was based on testing of the components and in-service history.

8.4 Wind loadings, self weight, seismic loadings, shear force, fastener pull through testing and calculations for the ECOPLUS Two-way Exposed Suspended Ceiling Grid System were determined by an independent Chartered Engineer in respect to the requirements of compliance document B1 Structure. Structural and durability opinions were provided.

8.5 Ease of application has been assessed

8.6 The Technical Literature for the ECOPLUS Two-way Exposed Suspended Ceiling Grid System has been examined by BEAL and found to be satisfactory.

### Quality Requirements

9.1 The manufacture of the ECOPLUS Two-way Exposed Suspended Ceiling Grid System components has been assessed by BEAL and found to be

© Building Element Assessment Laboratory Ltd. 2010 All rights reserved. Use of this document is subject to BEAL's Terms and Conditions 

satisfactory.

9.2 The quality of materials, components and accessories supplied by ECOPLUS Systems Ltd. is managed through the use of a Building Product Quality Plan.

9.3 The ECOPLUS Building Product Quality Plan ensures continuous conformance with the quality requirements from purchase to supply of components.

9.4 ECOPLUS Building Product Quality Plan is reviewed at least annually by BEAL.

9.5 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of the perimeter channel, grid system and panels in accordance with the instructions of ECOPLUS Two-way Exposed Suspended Ceiling Grid System Technical Literature Ver 1.0 dated Dec 2010 and this Appraisal Certificate.

9.6 For a copy of this Technical Literature and any subsequent updates please refer to:
www.ecoplus-systems.com

9.7 Building owners are responsible for the maintenance of the ECOPLUS Two-way Exposed Suspended Ceiling System in accordance with instructions of ECOPLUS Systems Ltd. and this Appraisal Certificate.

## Sources of Information

- AS 1791:1986 Chromate conversion coatings
- AS 2946:1991 Suspended Ceilings, recessed luminaries and air diffusers - Interface requirements for physical compatibility
- AS 4600:1996 Cold form steel structure code
- AS 4680:2006 Hot-dipped galvanised (zinc) coatings on fabricated ferrous materials.
- AS/NZS 1170:2002 Structural design actions
- AS/NZS 1397:2001 Steel sheet and strip -Hot dipped zinc coated or aluminum /zinc coated.
- AS/NZS 2785:2000 Suspended Ceilings - Design and Installation.
- AS/NZS 3101:2006 Concrete Structures Standard
- AS/NZS 4534:2006 Zinc and zinc/aluminum alloy coatings in steel wire
- NZS 3602:2003 Timber and wood-based products for use in building.
- NZS 3603:1993 Timber structures standard
- NZS 3604:1999 Timber framed Buildings
- NZS 4219:1983 Specification of Seismic Resistance of Engineering Systems in Buildings.
- New Zealand Building Code Handbook and Approved Documents, Building Industry Authority,
- The Building Regulations 1992, up to, and including October 2004 Amendment.

## Concluding Statement

20.1 In the opinion of BEAL, the ECOPLUS Two-way Exposed Suspended Ceiling Grid System is fit for purpose and will comply with the NZBC provided that it is designed, installed and maintained as per this Appraisal Certificate and Technical Literature.
The Appraisal Certificate is issued only to ECOPLUS Systems Ltd, and will be reviewed within 3 years from the date of issuance unless audits require otherwise, subject to conditions of Appraisal.

# Conditions of Appraisal

1. This Appraisal Certificate :
   A) Relates to the ECOPLUS Two-way Exposed Suspended Ceiling Grid System as described herein;
   B) Must be read, considered and used in full together with the Technical Literature
   C) Does not address any legislation, regulations, codes or standards, not specifically named herein;
   D) Is copyright to BEAL

2. The Appraisal Certificate holder continues to meet the quality requirements of the ECOPLUS Two-way Exposed Suspended Ceiling Grid System Building Product Quality Plan and has the certificate revalidated by BEAL on an annual basis.

3. ECOPLUS Systems Ltd, shall notify BEAL and obtain approval of any changes in product specification or quality assurance prior to product being marketed including any trade literature, web site info or the like.

4. BEAL makes no representation as to:
   A) The nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
   B) The presence or absence of any patent or similar rights subsisting in the product or any other product;
   C) Any guarantee or warranty offered by the Appraisal Certificate holder.

5. BEAL's verification of the building product or system complying with one or more of the above-mentioned criteria is given on the basis that the criteria used were those that were appropriate to demonstrate compliance with the NZBC at the date of issuance of this Appraisal Certificate. In the event that the criteria is withdrawn or amended at a later date, this Appraisal may no longer remain valid.

6. Any reference in this Appraisal Certificate to any other publication shall be read as a reference to the version of publication specified in this Appraisal Certificate.

Authorised signatory

C R Prouse Principal Building Scientist
[MAY 2011]

© Building Element Assessment Laboratory Ltd. 2010 All rights reserved. Use of this document is subject to BEAL's Terms and Conditions 