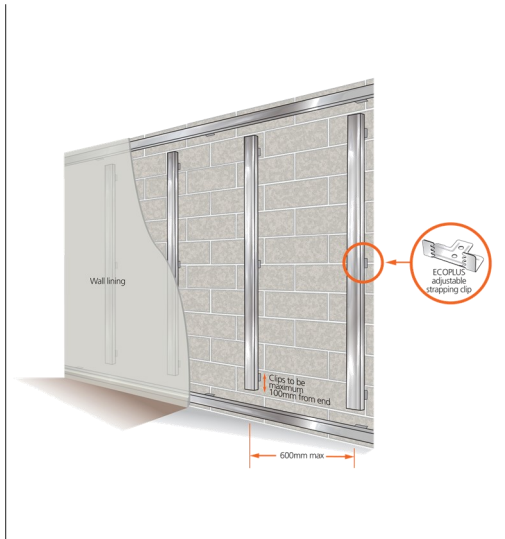
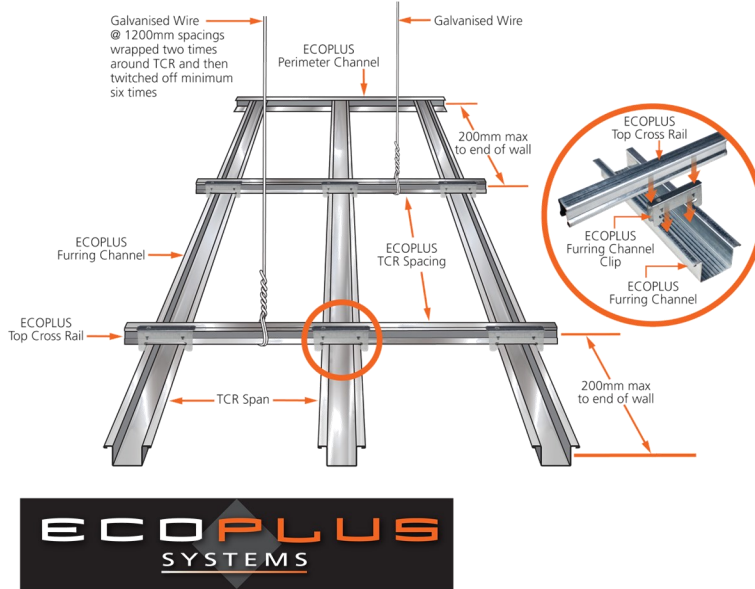




EXPIRY DATE 1 MAY 2019

BEAL Appraisal

ECOPLUS Plasterboard Grid System



Product

- 1.1 The ECOPLUS Plasterboard Grid System is a suspended flush ceiling grid system designed to be used as a suspended ceiling system for internal use in both commercial and residential type buildings.
- 1.2 The ECOPLUS Plasterboard Grid System is also a Masonry wall batten system designed to be used over masonry walls for internal use in both commercial and residential type buildings.
- 1.3 The system consists of cold rolled sections (top cross rail, furring channel, perimeter channel, furring channel clip, strapping clip) manufactured from light gauge galvanized steel. The suspended flush ceiling grid is suspended at no less than 150mm from the floor or roof above by hangers and finished with Plasterboard to form a soffit. The masonry wall batten system is used for battening out irregular walls, enabling the installation of Plasterboard.

Building Regulations

- 2.1 In the opinion of BEAL, the ECOPLUS Plasterboard Grid System, if 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 Plasterboard 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 9.1-9.9
- 2.3 Clause B2 DURABILITY
Performance B2.3.1 (b), 15 years, B2.3.1 (c), 5 years, and B2.3.2. The ECOPLUS Plasterboard Grid System meets this requirement. See paragraphs 10.1-10.4
- 2.4 Clause F2 HAZARDOUS BUILDING MATERIALS
Performance F2.3.1. The ECOPLUS Plasterboard Grid Ceiling System meets this requirement and will not present a health hazard to people.
- 2.5 The ECOPLUS Plasterboard Grid System has been appraised as an **Alternative Solution** in terms of the New



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
 New Zealand
 Tel: +64 233 6661
 Fax: +64 233 6662
 www.beal.co.nz



Zealand Building Code Compliance.

Scope and Limitations

3.1 The ECOPLUS Plasterboard 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)
- 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 The ECOPLUS Plasterboard Grid system has also been appraised for use as a masonry wall batten system for internal use in both commercial and residential type buildings within the following scope;

- Concrete masonry structures designed and constructed to comply with the NZBC (e.g. NZS 4230).

3.4 Installation of components and accessories supplied by ECOPLUS Systems Ltd and contractors, must be carried out by competent ceiling and/or wall installers experienced in the installation of suspended ceiling systems and/or wall batten systems.

3.5 The ECOPLUS Plasterboard Grid suspended ceilings system is a non-trafficable ceiling.

Technical Literature

4.1 Refer to the ECOPLUS Plasterboard Grid System current 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 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 Plasterboard Grid system supplied or specified by ECOPLUS Systems Ltd are as follows:

Grid Components

- ECOPLUS Top Cross Rail (TCR) – 21mm x 25mm (.75mm thick) cold rolled section manufactured from hot dipped, zinc coated galvanised steel AS/ NZS 1397.
- ECOPLUS Furring Channel - 38mm x 28mm (0.5mm thick) cold rolled section manufactured from hot dipped, zinc coated galvanised steel AS/ NZS 1397.
- ECOPLUS Perimeter Channel - 30mm x 28mm x 20mm cold rolled section manufactured from hot dipped, zinc coated galvanised steel AS/NZS1397.
- ECOPLUS Furring Channel Clip - Cold rolled clip manufactured from hot dipped, zinc-coated galvanised steel.

- ECOPLUS Strapping Clip - Cold rolled clip manufactured from hot dipped, zinc-coated galvanised steel AS/NZS 1397 (*Masonry wall batten system only*)

Accessories

- Suspension Tie Wire (hanger) - 2.5mm galvanised wire complying with AS4534 (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 galvanized AS 4680 self drilling timber screw eyes for use with timber structures. (*Suspended ceiling system only*)
- Ramset™ 31mm x 8mm M6 Zinc plated to AS1791 Dynabolt™ Tie wire bolt (or ECOPLUS approved equivalent) for use with concrete structures. (*suspended ceiling system only*)
- Fasteners for 9.5mm Plasterboard - #6mm x 25mm GIB® Grabber Scavenger Head needle point fine or ECOPLUS approved alternative, or coarse thread drywalls screws.
- Fasteners for 12.5mm Plasterboard - #6 x 32 GIB® Grabber Scavenger Head needle point fine or coarse thread drywall screws, or ECOPLUS approved alternative.
- Plasterboard Lining - Plasterboard is a paper bound gypsum-plaster core sheet lining material supplied in varying thicknesses and sheet sizes. Please refer to plasterboard manufacturer's Technical Literature for further details and installation.

Handling and Storage

6.1 Handling and storage of all the materials supplied by ECOPLUS Systems Ltd, both on and off site are the responsibility of the ceiling/wall installer/contractor (competent and experienced in the installation of suspended ceiling systems and /or wall batten systems).

6.2 ECOPLUS System components must be protected from scratches or physical damage of any kind by/to other trades.

6.3 Handling of the ECOPLUS Plasterboard Grid System's Components requires care and should be handled in a manner that will prevent distortion or physical damage.

6.4 All Accessories must be kept dry and protected from scratches or physical damage.

6.5 Plasterboards should be treated as a finishing material and protected from damage. Sheets must be stacked flat and kept dry at all times. Sheets must be carried on edge and not dragged. For further information please refer to the manufacturer's instructions.

Design Information

General

Suspended Flush Ceiling Grid System

7.1 ECOPLUS Plasterboard Grid Suspended Ceiling System is for use in the interior of both commercial (e.g.

offices) and residential type buildings where a suspended ceiling finish (flush finish) is required.

7.2 ECOPLUS Plasterboard Grid Suspended Ceiling System is a suspended flush ceiling system finished with Plasterboard. The ceiling shall be suspended with a cavity no less than 150mm from the supporting structure.

7.3 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.

7.4 The ECOPLUS Plasterboard Grid Suspended Ceiling System is designed for plasterboard with a mass no greater than 25kg/m². Refer to table 2.0

7.5 For buildings that 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/NZS2785 clauses 3.3.5 (b) or (c). This is the responsibility of the designer and is outside the scope of this Appraisal certificate.

7.6 The ECOPLUS Plasterboard Grid Suspended Ceiling System must be designed to comply with seismic performance AS/NZS 1170.5.

7.7 The deflection of the Plasterboard Grid Suspended Ceiling System 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 not be less than the table (1.0) below as per AS/NZS 2785 Clause 3.4.4.

Table 1.0 Deflection Limits

Note:

1. Above table is only a partial representation of AS/NZS 2785 table 3.4.4 showing relevant information only.

Ceiling Type	Level of finish required				
	1	2	3	4	5
Flush or sheeted ceiling	L/300	L/300	L/360	L/450	L/600

these levels of finish or to the requirements of AS/NZS 2589.1

Masonry Wall Batten System

8.1 ECOPLUS Plasterboard Grid Masonry Wall Batten System is a wall batten system for use in the interior of both commercial and residential type buildings over concrete masonry walls allowing for the installation of plasterboard lining.

8.2 Plasterboard lining shall be finished in accordance with AS/NZS 2589.1

Structure - Clause B1

9.1 Supporting structure of the building for the support of the ECOPLUS Plasterboard Grid System must comprise of the following:

Timber Framing

9.2 Timber framing shall be treated as required by NZS 3602.

9.3 Timber framing must 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.

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

Steel Framing

9.5 Steel framing must be to a specific design meeting the requirements of the NZBC.

Concrete Structure

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

9.7 Concrete masonry structures shall be designed and constructed in accordance with NZBC (NZS 4230).

Impact Resistance:

9.8 The ECOPLUS Plasterboard Grid System finished with Plasterboard provides adequate resistance to soft body impact, based upon experience of use in domestic and commercial applications.

Control Joints

9.9 Where control joints are required, the joints must be specifically designed to maintain the integrity of the desired finish. Refer to plasterboard manufacturer's Technical Literature for further information.

Durability- Clause B2

10.1 The ECOPLUS Plasterboard 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), with a serviceable life of at least 15years.

10.2 This is dependent on the system remaining dry in service, and being maintained in accordance with this Appraisal Certificate.

Maintenance

10.3 Lining systems must be protected from internal and external moisture in accordance with NZBC E2 and E3. Regular maintenance is essential to ensure the performance requirements of the NZBC are met and to ensure the maximum serviceability of the ECOPLUS Plasterboard Grid System.

10.4 Refer to the plasterboard manufacturer's Technical Literature for any maintenance requirements.

Spread of Fire - Clause C3

11.1 The ECOPLUS Plasterboard Grid System is a non-fire rated system.

11.2 Separation or protection must be provided to the ECOPLUS Plasterboard Grid System from heats sources such as stoves, heaters, flues and chimneys.

11.3 NZBC Acceptable Solution C/AS1, Part 9 and Verification Method C/MM1 provide methods for separation and protection of combustible materials from heat sources.

11.4 Plasterboards are to comply with C3.3.1 when used within the limits of the Spread of Flame Index (SFI) and Smoke Developed Index (SDI) and for locations as defined in table 6.2 of Acceptable Solution C/AS1. Refer to the plasterboard manufacturer's Technical Literature for the AS 1530:3 surface finish properties.





Internal Moisture - Clause E3

12.1 The ECOPLUS Plasterboard 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 90% RH is expected.

Electrical (safety) - Clause G9

13.1 Electrical wiring to be in accordance with the NZBC.

Installation Information

Installation Skill Level Requirement

14.1 Installation and finishing of the components and accessories supplied by ECOPLUS Systems Ltd shall be carried out by competent ceiling and/or wall installers experienced in the installation of suspended ceiling systems and/or wall batten systems.

General

System Installation

15.1 Internal ceiling installation/batten system 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.

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

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

15.4 Partitions shall be fixed to the primary members of the suspended ceiling grid. The design of the connection shall be the responsibility of the designer and is outside the scope of this Appraisal certificate.

15.5 The ECOPLUS Plasterboard Grid suspended ceiling system must be suspended with a cavity no less than 150mm from the supporting structure.

15.6 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 specifications
- Manufacturer's installation specification
- AS/NZS 2785

Grid System: Suspended Ceiling

16.1 All components must be designed and installed in accordance with the ECOPLUS Plasterboard Grid Technical Literature.

16.2 The ECOPLUS Perimeter Channel is fixed at 600mm centres max. using 8g x 32mm GIB® Grabber wafer head needle tip screws, or ECOPLUS approved alternative, to framing. Perimeter Channels are butt-jointed at connections.

16.3 ECOPLUS Top Cross Rails (TCR) are to be positioned within 200mm of abutting wall. TCR are then centered according to weight as per Table 2.0. Top Cross Rails are connected to one another by placing a 400mm off cut of TCR on top of the butt-joint (200mm each side)

and fixed in place using 'self tapping wafer button screws' approx 100mm either side of the butt- joint.

Table 2.0 ECOPLUS TCR SPACING

16.4 The ECOPLUS Furring Channel is secured to the ECOPLUS TCR at maximum 600mm apart, via the ECOPLUS Furring Channel Clip. A "click-clack" sound ensures a positive connection. Lengths of ECOPLUS Furring Channels are joined with one another by expanding one end of a channel and sliding the other joining length into the expanded channel, ensuring an overlap of at least 200mm.

16.5 2.5mm diameter straightened galvanized suspension tie wire (hanger) is used to support ECOPLUS Top Cross Rail (TCR) at a maximum of

Plasterboard weight	ECOPLUS TCR Spacing
≤ 13kg/m ²	1200mm max.
≤ 25kg/m ²	900mm max.

16.6 If the wire is altered due to load requirements this shall be the responsibility of the designer and is outside the scope of the Appraisal certificate.

Masonry Wall Batten System

17.1 ECOPLUS Strapping Clips fixed at maximum 1200mm spacings and fixed in accordance with the Technical Literature. Clips must be fixed at no more than 100mm away from the end of Furring Channel lengths.

17.2 ECOPLUS Furring Channels are securely fitted into the ECOPLUS Strapping Clips using a side to side rolling action. ECOPLUS Furring Channels are spaced at 600mm centres max. Furring Channels must be cut to ensure a 25mm gap is achieved at both the top and bottom of each length.

Lining

18.1 Plasterboard sheets shall be fixed across the ECOPLUS Furring Channel in accordance with the ECOPLUS Plasterboard Grid System Technical Literature and plasterboard manufacturer's Technical Literature.

18.2 Sheets are fixed at 200mm centres across the ECOPLUS Furring Channel commencing from the centre of the sheet. Sheet fixings must be no closer than 12mm to sheet edges.

18.3 Where sheet end butt-joints are made on the ECOPLUS Furring Channels, the ends shall be fixed at 200mm centres. End joints must be staggered - i.e. occur on different Furring Channels.

18.4 The lining shall be finished to either Table 1.0 or AS/NZS 2589.1&2.

Fasteners

19.1 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 design ultimate strength the greater of 50kg (0.5kN) minimum, or load requirements of AS/NZS 2785 Clause 3.2.2 (c).

19.2 ECOPLUS Strapping Clips are fixed to masonry using appropriate fixings. E.g. 'knock-in anchor' or plug and screw (for a masonry wall) by an appropriately

qualified contractor experienced in wall installations.

Fittings

20.1 Where luminaries are installed into the ceiling they shall comply with AS 2946. The design and installation of luminaries or similar fittings are the responsibility of the designer and is outside the scope of this Appraisal Certificate.

20.2 Ancillary services such as electrical cables and air conditioning ducts shall not be suspended from the ceiling hangers unless specifically designed for that purpose. Other services such as fire sprinklers and the like shall be independently supported from the ECOPLUS Plasterboard Grid System.

Cutting

21.1 ECOPLUS grid components are cut using tin snips.

Health and Safety

22.1 When cutting or drilling the ECOPLUS Plasterboard Grid System grid components appropriate personal safety equipment shall be used e.g. gloves and eye protection.

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

22.3 Refer to the Technical Literature from the relevant manufacturer for the safe use and handling of the accessories that make up the ECOPLUS Plasterboard Grid System.

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

23.1 The following testing of the ECOPLUS Plasterboard 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 and elongation of Top Cross Rail, Furring channel and Strapping Clip.
 - Tensile strength of the 2.5mm galvanised wire

Other Investigations

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

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

24.3 Wind loadings, self weight, seismic loadings, shear force, fastener pull through testing and calculations for the ECOPLUS Plasterboard 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.

24.4 Ease of application has been assessed

24.5 The Technical Literature for the ECOPLUS Plasterboard Grid System has been examined by BEAL

and found to be satisfactory.

Quality

25.1 The manufacture of the ECOPLUS Plasterboard Grid System components has been assessed by BEAL and found to be satisfactory.

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

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

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

25.5 Designers are responsible for the building design and building contractors are responsible for the quality of installation of the perimeter channel, grid system components and plasterboard in accordance with the instructions of ECOPLUS Plasterboard Grid System Technical Literature Ver 1.0 dated Dec 2010 and this Appraisal Certificate.

25.6 For a copy of this Technical Literature and any subsequent updates please refer to:

www.ecoplus-systems.com

25.7 Building owners are responsible for the maintenance of the ECOPLUS Plasterboard Grid System in accordance with the instructions of ECOPLUS Systems Ltd and this Appraisal Certificate.

Sources of Information

- AS1791:1986 Chromate conversion coatings
- AS2946:1991 Suspended Ceilings, recessed luminaries and air diffusers—Interface requirements for physical compatibility
- AS 4600:1996 Cold form steel structure code
- AS 468-: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 dip zinc coated or aluminum/zinc— coated
- AS/NZS 1530.3:1999 Simultaneous determination of ignitability, flame propagation, heat release and smoke release
- AS/NZS 2589.1&2:1997 Gypsum linings— Application and finishing
- AS/NZS 2785:2000 Suspended Ceilings
- 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
- New Zealand Building Code Handbook and Approved Documents, Building industry Authority, 1992.
- The Building Regulations 1992, up to, and including October 2004 Amendment.

2. The Appraisal Certificate holder continues to meet the quality requirements of the ECOPLUS Plasterboard Grid System Building Product Quality Plan and has the plan revalidated by BEAL on an annual basis.
3. ECOPLUS Systems Ltd, shall notify BEAL and obtain approval of any changes to 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 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 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—Director
[Images updated AUG 2011]

Concluding Statement

26.1 In the opinion of BEAL, the ECOPLUS Plasterboard Grid System is fit for purpose and will comply with the NZBC to the extent specified provided that it is used, designed, installed and maintained as set out in this Appraisal Certificate.

The Appraisal Certificate is issued only to ECOPLUS Systems Ltd, and is valid until further notification, subject to the conditions of this Appraisal.

Conditions of Appraisal

1. This Appraisal Certificate :
 - A) Relates only to the ECOPLUS Plasterboard 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 of BEAL