



BUSHFIRE ASSESSMENT REPORT



Eco-Block Wall System

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Client:

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* For and on behalf of Exova Warringtonfire Aus Pty Ltd.

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1 SCOPE AND LIMITATIONS OF THE REVIEW

The following scope of works was undertaken on the relevant construction provisions of AS3959-2009 Construction of buildings in bushfire-prone areas, as they relate to Eco-block wall system product for BCA Class 1, 2, 3 and 10a buildings. Table 1-1 encompasses the following products and applications.

Table 1-1 – Product and applications

| Product | Profile | Details |
|---------------|---------|--|
| Eco-Block 230 | 101 mm | Expanded polystyrene form filled with reinforced concrete core wall system |
| Eco-Block 280 | 152 mm | |
| Eco-Block 330 | 203 mm | |

The scope of the review included the following aspects:

- Review of available fire related test and assessment reports relevant to the use of systems in bushfire protection applications.
- Review publically available products details, i.e. marketing information.
- Compare reviewed information with the acceptable construction practices in the following documents:
 - AS3959-2009 Construction of buildings in bushfire-prone areas (incorporating Amendment Nos. 1, 2 and 3)
- Based on comparative review, provide opinion on where the systems may be suitably used in accordance with the relevant prescribed construction practices.
- Provide recommendations of further testing or assessment of the systems that may be required in order to satisfy other prescribed provisions of AS3959-2009.

This review is an opinion to the extent that the subject system may satisfy the relevant prescribed construction practices in AS3959-2009 and is not to be construed as endorsement or certification of compliance against these provisions.

Any technical service that is with respect to the determination of compliance with AS3959-2009 is to be undertaken by an independent third party body, consistent with providing an efficient and robust fire protection product certification services for products.

2 DESCRIPTION OF SYSTEMS

2.1 PRODUCT

Product Names: Eco-Block 230, 280 and 330 series wall system.

Product Type: Polystyrene insulated filled with reinforced concrete core wall system for BCA Class 1, 2, 3 and 10a buildings.

Manufacturer: Eco Block Pty Ltd

Table 2-1 – Range of products reviewed

| Product | Profile | Details |
|---------------|---------|--|
| Eco-Block 230 | 101 mm | Expanded polystyrene form filled with reinforced concrete core wall system |
| Eco-Block 280 | 152 mm | |
| Eco-Block 330 | 203 mm | |

2.2 FIELD OF APPLICATION

The nominated systems and provided information have been compared against the prescribed requirements of AS3959-2009 in order to ascertain the extent the systems may be used with the current evidence of suitability (see BCA A2.2) and what further evidence of suitability may be generated to extend the range of prescribed uses.

2.3 REFERENCED TECHNICAL DATA

The following technical information reference sheets were provided by Eco Block Pty Ltd.

Table 2-2 – Technical information

| Document Number | Report Name | Report By | Date |
|-------------------------|---|--------------------------------------|------------|
| - | Eco-block engineers and designers manual | Eco-Block Pty Ltd | 01/2011 |
| - | Technical installation manual for Eco-Block insulated concrete walls | Eco-Block Pty Ltd | 03/2011 |
| D08100101-2 11/11008 | Eco-Block Australia, Eco-Block Wall System, CodeMark Certification Scope of BCA Compliance | Envirospec | - |
| FSR 698 | FSR 698 Fire hazard properties of Eco-Block wall systems | BRANZ Pty Ltd | 20/01/2006 |
| FAR 2251 | FAR 2251 Fire resistance of Eco-Block wall system | BRANZ Pty Ltd | 02/02/2004 |
| | Email correspondence regarding FRL of Eco-Block wall system | BRANZ Pty Ltd | 20/10/2004 |
| 16223-108915 | ASTM E119-00 Fire tests of building construction and materials, Eco-Block concrete wall | Omega Point Laboratories Inc. | 16/01/2002 |
| 16223-106668 | ASTM E119-98 Fire tests of building construction and materials, Eco-Block concrete wall | Omega Point Laboratories Inc. | 03/10/2000 |
| 15498-104229 | UBC 26-3 Room fire test standard for interior of foam plastic systems, Eco-Block 2000 | Omega Point Laboratories Inc | 22/01/1999 |
| 258389E-1 | Fire testing laboratory report, Ignition properties of Eco-Block 2000 expanded polystyrene material | Celotex Corporation Testing Services | 28/04/1998 |
| 258389H | Fire testing laboratory report, Rate of burning characteristics of Eco-Block 2000 plastic connector material | Celotex Corporation Testing Services | 03/03/1998 |
| 258389I | Fire testing laboratory report, Surface burning characteristics of Eco-Block 2000 insulated concrete form building system | Celotex Corporation Testing Services | 25/02/1998 |

The following information was not provided or made available for review:

- Any fire related test reports or assessments to Australian Standards including AS3959-2009.

3 ECO-BLOCK 230, 280 & 330 WALL SYSTEM PRODUCT REVIEW

The application of the subject system has been reviewed against the prescribed construction practices nominated in AS3959-2009. In each bushfire attack level and area of application, an opinion is provided to the use of the system. Additional details are provided as notes following and the corresponding section of AS3959-2009.

Table 3-1 – Construction for bushfire

| Application | BAL-12.5 | BAL-19 | BAL-29 | BAL-40 | BAL-FZ |
|--|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| External walls i.e. walls | ✓ [Note2&3] §3.4 & §5.4 | ✓ [Note2&3] §3.4 & §6.4 | ✓ [Note2&3] §3.4 & §7.4 | ✓ [Note2&3] §3.4 & §8.4 | ✓ [Note2&3] §3.4 & §9.4 |
| External walls i.e. joints | ✓ [Note4] §5.4.2 | ✓ [Note4] §6.4.2 | ✓ [Note4] §7.4.2 | ✓ [Note4] §8.4.2 | ✓ [Note4] §9.4.2 |
| External walls i.e. vents and weepholes | ✓ [Note5] §3.6 & §5.4.3 | ✓ [Note5] §3.6 & §6.4.3 | ✓ [Note5] §3.6 & §7.4.3 | ✓ [Note5] §3.6 & §8.4.1 | ✓ [Note5] §3.6 & §9.4.1 |

Notes:

1. This system is to have the same construction standard as that prescribed for external wall systems at the respective bushfire attack level, based on classified vegetation within 100 m of the site and heat flux exposure thresholds.
2. The testing assessment by BRANZ 'FAR 2251 Fire resistance of Eco-Block wall system' dated 02/02/2004 complies with BAL-FZ, provided the system achieves a Fire Resistance Level (FRL) of 30/30/30 or -/30/30 when tested from the outside.
3. As per section 3.4 of AS3959-2009, construction requirements specified for a particular BAL shall be acceptable for a lower level. For example, if the wall system complies with BAL-FZ, which the product indicates, then the wall system complies with other BAL levels (i.e. BAL-12.5, BAL-19, BAL-29 and BAL-40).
4. All joints in the external surface material of walls shall be covered, sealed, overlapped, backed or butt jointed to prevent gaps greater than 3mm. It is considered that this wall system do not have joints in the external surface of the walls.
5. Vents and weepholes in external walls shall be screened with a mesh having a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium, except where an aperture is less than 3 mm (refer to Section 3.6 of AS3959-2009) or are located in an external wall of a subfloor space. It is considered that these wall systems do not have vents and/or weepholes in the external surface of the walls.

4 CONCLUSION

4.1 GENERAL

Based on the review of AS3959-2009, the testing assessment by BRANZ 'FAR 2251 Fire resistance of Eco-Block wall system' dated 02/02/2004 complies with BAL-FZ, provided the system achieves a Fire Resistance Level (FRL) of 30/30/30 or -/30/30 when tested from the outside. As per section 3.4 of AS3959-2009, construction requirements specified for BAL-FAZ shall be acceptable to other BAL levels (i.e. BAL-12.5, BAL-19, BAL-29 and BAL-40).

The reviewed *Eco-Block Wall System* may be used in most circumstances with consideration and exceptions to the issues discussed in this report for each of the systems in Section 3. Compliance to relevant building regulations in the use of the product within a development is subject to acceptance by the Authorities Having Jurisdiction.

Where the use of the external wall system has not satisfied the prescribed requirements of AS3959-2009, the performance of the system may be verified, where applicable, through fire testing and/or fire assessments. In this regard, the following recommendations are provided in relation to the Eco-Block Wall System.

The testing assessment by BRANZ 'FAR 2251 Fire resistance of Eco-Block wall system' dated 02/02/2004 needs to be amended to include the following details:

1. Clarify the Fire Resistance Level (FRL) in terms of structural adequacy, integrity and insulation;
2. Provide the testing and construction details and requirements (i.e. lining the inside of the wall with plasterboard, providing fibre cement cladding on the outside, required thickness of plasterboard and fibre cement, height restrictions etc.); and
3. All limitations of the test report.

Alternate arrangements of the system in conjunction with other elements may be appropriate, subject to further investigation.

5 VALIDITY / DISCLAIMER

This report is prepared for *Eco-Block Wall System* as described in this report only and applies to the nominated materials and form of construction in review of AS3959-2009.

Any modifications, changes or amendments to the AS3959-2009 and referenced standards may invalidate the findings of this report. These items should be referred to Exova Warringtonfire Aus Pty Ltd to allow consideration to be made of the extent that these changes may have to the outcome of this review, as detailed in this report.

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