NRG Building Systems (Aust) Pty Ltd
ABN: 13 600 327 204
Unit 2, 13-15 Octal Street Yatala QLD 4207

NRG Greenboard™ External Wall Cladding System

PERFORMANCE BASED DESIGN BRIEF (PBDB)

&

PERFORMANCE SOLUTION REPORT (PSR)

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1 Performance Based Design Brief (PBDB) & Performance Solution Report (PSR)

1.1 Performance Based Design Brief (PBDB)

This PBDB has been prepared as a project specific document.

It is only applicable to the project named below as:

Project Name:	
Project Address:	

This PBDB addresses the requirements for the *NRG Greenboard Wall Cladding System* where this is the only performance element applicable to the project.

The *NRG Greenboard External Wall Cladding System* shall demonstrate conformance with the requirements of the PBDB as a *Performance NRG Greenboard External Wall Cladding System* includes compliance with the relevant *Performance Requirements*.

This PBDB has been prepared on behalf of the project stakeholders by:

Name:	Scott Lehn
Registered Building Practitioner / Professional Engineer:	Summermore Engineering
Company:	NRG Building Systems Aust
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1.2 Performance Solution Report (PSR)

The PSR demonstrates that the *NRG Greenboard External Wall Cladding System* has been analysed & found to conform with the PBDB *agreed acceptance criteria* and complies with the relevant requirements of the NCC.

1.3 Summary of Proposal

The *NRG Greenboard External Wall Cladding System* shall satisfy external wall cladding requirements for the Project.
Project specific details applicable to the external wall cladding are as follows:

Project:	
Project Specification:	
Project Plans:	
Building Classification: *(Class 1 and 10)*	
Applicable version of BCA: *(NCC 2022, Vol.2)*	
Number of Storeys:	
Effective Height:	
Risk Score: (NCC Table H2V1a)	
External Wall Cladding Type(s):	*NRG Greenboard External Wall Cladding System*
Wind Class: (N1-N3)	
Bushfire Attack Level (BAL): *(BAL 29)*	
Required FRL:	- / - / -
External Wall Total R-value:	
AS 2047 compliant windows:	NA
AS 3959 compliant windows:	NA
AS/NZS 4200.1:2017 compliant	

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wall wrap installed to AS 4200.2:2017	Yes
DPC & Cladding Ground Clearance:	

1.4 Stakeholders

Includes people, groups and organizations who have a role in the project development and construction.

Stakeholder	Representative	Role
Building owner or owner's representative		
Builder or project manager		
Architect		
Engineers (structural, hydraulic, civil etc.)		
Design specialists (ESD, HVAC etc.)		
Building design professionals		
Trade practitioners		
Appropriate approval authority, including building surveyors		
Other relevant agencies related to – health – environment – fire safety – infrastructure (water and sewerage)		
Representatives of any other relevant party.		

1.5 Agreed Assessment Process

The *Performance Solution* for the *NRG Greenboard External Wall Cladding System* shall demonstrate compliance with all relevant *Performance Requirements* by using the following *Assessment Methods* from NCC Clause A2G2(2):

- A2G2(2)(a) Evidence of suitability in accordance with Part A5 that shows the use of a material, product, form of construction or design meets a *Performance Requirement*.
- A2G2(2)(b)(i) The Verification Methods in the NCC.
- A2G2(2)(c) Expert Judgement.

1.6 Agreed Acceptance Criteria

The agreed acceptance criteria for the *Performance Solution* of the *NRG Greenboard External Wall Cladding System* includes the relevant *Performance Requirements* from the NCC identified in the *agreed assessment process* above.

Performance	Assessment Process	Acceptance Criteria
H1P1(1), HIP1(2) (a), (b), (c), (h), (m) structure (self-weight, wind)	A2G2(2)(a), A5G3(1)(a) A current CodeMark Australia Certificate of Conformity	- Strength to resist Design ULS wind pressures
H2P2 Weatherproofing	A2G2(2)(a), A5G3(1)(a) A current CodeMark Australia Certificate of Conformity	- Performance verified at Design SLS Wind pressures. - Risk Score Max. 20
H2P3 Dampness	A2G2(2)(a), A5G3(1)(a) A current CodeMark Australia Certificate of Conformity	- DPC to AS/NZS 2908 & Ground Clearance min. 75mm
H6P1 Thermal performance	A2G2(2)(a), A5G3(1)(a) A current CodeMark Australia Certificate of Conformity	- Performance to achieve required Total R-value.
H7P5 BAL	A2G2(2)(a), A5G3(1)(a) A current CodeMark Australia Certificate of Conformity	- Performance to achieve required BAL.

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1.7 Required Supporting Evidence and Documentation

As identified in the Agreed Acceptance Criteria, acceptable evidence of suitability to support the *performance solution* in accordance with Clause A2G2(2) shall be comprised of:

- A current CodeMark Australia Certificate or CodeMark *Certificate of Conformity*, that refers to:
  - Complying test report(s) issued by an *Accredited Testing Laboratory.*
  - Complying certificate(s) or report(s) from a *professional engineer*.
- Complying other form(s) of documentary evidence, including Installation and Construction Details for the *NRG Greenboard External Wall Cladding System*.

Performance	Evidence / Documentation	Prepared By:
H1P1(1), HIP1(2) (a), (b), (c), (h), (m) structure (self-weight, wind)	CodeMark Australia Certificate	CodeMark *Certification body*
H2P2 Weatherproofing	CodeMark Australia Certificate	CodeMark *Certification body*
H2P3Dampness	CodeMark Australia Certificate	CodeMark *Certification body*
H6P1 Thermal performance	CodeMark Australia Certificate	CodeMark *Certification body*
H7P5 BAL	CodeMark Australia Certificate	CodeMark *Certification body*
All the above	CodeMark endorsed *NRG Greenboard External Wall Cladding System, Specification and Installation Manual, Edition 10 May 2017*	*NRG Building Systems Australia*

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1.8 Format and content of the Performance Solution Report (PSR)

The format of the PSR to be presented to the Stakeholders shall specifically address how each of the following PBDB requirements have been achieved:

- Agreed Assessment Process
- Agreed Acceptance Criteria
- Required Supporting Evidence

The body of the PSR will include reference to all *required supporting evidence and documentation* as listed in the PBDB.
Complete copies of all *required supporting evidence and documentation* will be appended to the PSR.

1.9 Acknowledgement of Participants

This PBDB has been prepared for the purpose of supporting the approval of a Building Permit for the project. It has been produced with the participation of:

Stakeholder	Name	Signature/Date
Building owner or owner's representative		
Builder or project manager		
Architect		
Engineers (structural, hydraulic, civil etc.)		
Design specialists (ESD, HVAC etc.)		
Building design professionals		
Trade practitioners		
Appropriate approval authority, including building surveyors		
Other relevant agencies related to – health – environment – fire safety		
– infrastructure (water and sewerage)		
Representatives of any other relevant party.		

1.10 Owners Consent

If the owner is not the applicant for the Building Permit, the owner's consent is attached. Where applicable, the owner's consent is provided in writing and includes a statement that they agree with the Performance Solution method and understand this is the method of compliance being proposed in the PBDB.

2 Carry out the Analysis

The *NRG Greenboard External Wall Cladding System* performance has been evaluated against the relevant *Performance Requirements* identified in accordance with the *Agreed Assessment Process* and listed in conjunction with the *Agreed Acceptance Criteria*. The analysis has included a comparison of the *Required Supporting Evidence and Documentation,* and project specific information included in the *Summary of Proposal* to verify the proposed *Performance Solution* meets the relevant NCC requirements and is "fit for purpose".

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3 Collate and Evaluate Results

Results of the analysis of the performance of the *NRG Greenboard External Wall Cladding System*

compared to the *Agreed Acceptance Criteria* are included below.

<table>
<tr><th>Acceptance Criteria</th><th>Project Requirements (see Summary of Proposal)</th><th>System Performance
(see Required Supporting Evidence and Documentation)</th></tr>
<tr><td>Strength to resist Design ULS wind pressures</td><td>Wind Class (N1 to N3)</td><td>Wind Class N1, N2, N3</td></tr>
<tr><td>Weatherproofing performance verified at Design SLS Wind pressures
Risk Score Max. 20</td><td>Wind Class (N1 to N3)

Risk Score =</td><td>Wind Class N1, N2, N3

Risk Score 20 or less</td></tr>
<tr><td>Ground Clearance min. 75mm</td><td>Ground Clearance =</td><td>Ground Clearance min. 75mm</td></tr>
<tr><td>Performance to achieve required BAL.</td><td>BAL =</td><td>BAL max. 29</td></tr>
<tr><td>Performance to achieve required Total R-value.</td><td>R_T (m^2K/W) =</td><td>
<table>
<tr><th colspan="2" rowspan="2">StateWall® Exterior Wall Cladding System</th><th colspan="2">Total R-value (m^2.K/W)</th></tr>
<tr><th>Winter
(Heat flow outwards)</th><th>Summer
(Heat flowinwards)</th></tr>
<tr><td rowspan="2">75 mm</td><td>Cavity-Fix</td><td>3.3</td><td>3.0</td></tr>
<tr><td>Direct Fix</td><td>3.1</td><td>2.8</td></tr>
<tr><td rowspan="2">100 mm</td><td>Cavity-Fix</td><td>3.9</td><td>3.7</td></tr>
<tr><td>Direct Fix</td><td>3.7</td><td>3.5</td></tr>
<tr><td rowspan="2">150 mm</td><td>Cavity-Fix</td><td>5.3</td><td>4.9</td></tr>
<tr><td>Direct Fix</td><td>5.1</td><td>4.8</td></tr>
</table>
</td></tr>
</table>

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4 PERFORMANCE SOLUTION REPORT

This PSR demonstrates that the *agreed acceptance criteria* and compliance with all relevant *Performance Requirements* agreed in the PBDB are achieved by the *NRG Greenboard External Wall Cladding System*.

The PERFORMANCE SOLUTION REPORT includes:

4.1 Overview of the PBDB

4.1.1 Scope of the Project

See section *Summary of Proposal* above

4.1.2 Relevant Stakeholders

See section *Stakeholders* above

4.1.3 Approaches and methods of analysis

See section *Agreed Assessment Process* above.

4.1.4 Applicable NCC Performance Requirements

See section *Agreed Acceptance Criteria* above.

4.1.5 Any assumptions that were made

As required.

4.1.6 Acceptance criteria and safety factors agreed to by stakeholders

See section *Agreed Acceptance Criteria* above.
Factors of Safety include those prescribed by the relevant Australian Standards including AS/NZS 1170 series for structural elements, and others as defined by the stakeholders in determining the project specific information contained in section *Summary of Proposal* above.

4.2 Overview and outline of the analysis, modelling and/or testing carried out

4.2.1 Method of analysis used

See section *Carry out the Analysis* above.

4.3 Evaluation of results including:

4.3.1 Comparison of results with acceptance criteria

See section *Collate and Evaluate Results* above.

4.4 Conclusion

4.4.1 Specifications of the final design that are deemed to be acceptable

See *Summary of Proposal*, *Agreed Acceptance Criteria,* and comparison with supporting *Evidence /Documentation*.

4.4.2 The NCC Performance Requirements that were met

See section *Agreed Acceptance Criteria* which lists relevant *Performance Requirements* & *Deemed-to-Satisfy provisions* from the NCC identified in the agreed assessment process.

4.4.3 All limitations to the design and any conditions of use

For the purposes of this PSR, the specific limitations of use applying to the *NRG Greenboard External Wall Cladding System* include.

1. Those Limitations and Conditions included in the CodeMark Certificate.
2. This PSR does not deal with materials safety, site safety, or safe work practices in any form and should be considered in conjunction with a suitable Safety Data Sheets.
3. This PSR does not deal with the quality assurance aspects of the manufacturing and construction process and should be considered in conjunction with the necessary safety analyses.
4. This PSR is based on the test reports and other documentation as referenced. Whilst the responsibility for the accuracy and applicability of these documents remains with their authors, I believe such documentation has been prepared on a sound basis.
5. This report covers only those matters and products listed and should not be interpreted as covering any other matter or product.

I certify that the performance solution referred to above complies with the performance requirements listed.

I believe that I hold the required skills, experience, and knowledge to issue this certificate and can demonstrate this if requested to do so.

Signature:

Date of issue:

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