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ecoASA SPECIFICATION FOR RAMMED EARTH CONSTRUCTION

DRAFT

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Specification Change History

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ecoASA Specification for Rammed Earth Construction

BACKGROUND

The Public Works Green Building Policy (2018) supports the principles of sustainable development that government is bound to by the Constitution, and aims to provide leadership in the sustainable building sector through efficient energy, water and waste management, indoor environmental quality and comfort, and ensuring sustainable product and materials management.

Arising from the Public Works Green Building Policy, the National Department of Public Works and Infrastructure (NDPW&I) undertook to initiate the development of a South African eco-labelling system, whereby building materials and products related to the construction industry and the property sector would be rated in terms of their environmental impact. The objective of an eco-label is to provide accurate and honest information on environmental aspects of products in order to encourage the demand and supply of products that are less stressful on the environment (SANS 14020, 2003).

Agrément SA, a Schedule 3A entity established under the Agrément South Africa Act 11 of 2015, is mandated to assure non-standardised construction products are fit for purpose. Agrément SA is an impartial and internationally acknowledged South Africa centre for assessment and certification. Agrément SA was selected as the competent body to establish the eco-labellingsystem, which has become known as the ecoASA labelling system.

As there is no eco-label for rammed earth construction, the criteria developed in this ecoASA Specification draws extensively on:

a) The SADC Harmonized Standard for Rammed Earth Structures; Code of Practice.[1]
b) Relevant New Zealand Standards:[2]
   - NZS 4297:2020 Engineering Design of Earth Buildings;
   - NZS 4298:2020 Materials & Workmanship for Earth Buildings; and
   - NZS 4299:1999 Earth Buildings Not Requiring Specific Designs.
c) The Australian Earth Building Handbook.[3,4]
d) The Rammed Earth Design and Construction Guideline, including:[5]
   - Appendix B Specification for rammed earth works.
e) The document Rammed Earth Structures: A Code of Practice Code of Practice.[6]

The ecoASA label conforms to ISO 14020:2022 Environmental labels and declarations – General principles and to ISO 14024:1999 Environmental labels and declarations – Type I environmental labelling – Principles and procedures. ISO14024 requires environmental labelling specifications to include criteria that are objective, attainable and verifiable. It requires that interested parties have an opportunity to participate and have their comments considered. It also requires that environmental criteria be set, based on an evaluation of the environmental impacts during the actual product or service life cycle, to differentiate product and services on the basis of preferable environmental performance.

1 SADC. SADC Harmonized Standard for Rammed Earth Structures; Code of Practice, (undated). http://www.rammedearthconsulting.com/library/african-rammed-earth-harmonised-standard-en.pdf
2 EBANZ. Earth Building Standards, Earth Building Association of New Zealand. https://www.earthbuilding.org.nz/earth-building-standards/
3 Walker, et.al. Rammed Earth Design and Construction Guideline. BRE Bookstore, 20055. https://www.brebookshop.com/details.jsp?id=148940
4 The Australian Earth Building Handbook; HB 195-2002; Standards Australia.
5 Rammed Earth Consulting. UK rammed earth guidelines, standards & resources. http://rammedearthconsulting.com/rammedearth-ukstandards-guidelines.htm
6 Keable, J and Keable, R (2011) Rammed Earth Structures: A Code of Practice, Practical Action Publishing.

INTRODUCTION

(Acknowledgements: This introduction draws on, amongst others, Rammed earth: Design and construction guidelines, by Peter Walker, Rowland Keable, Joe Martin Vasilios Maniatidis (2005). Published by BRE Bookshop)

Rammed earth construction is usually regarded as esthetically pleasing, environmentally friendly. As a natural material, without or with limited processed additives, rammed earth can have significantly lower embodied carbon dioxide and energy than conventional manufactured building materials, as well as reduced toxic chemical content and fewer emissions from industrial processes. This technique can produce buildings that are strong, durable, safe and desirable.

The main environmental impacts of rammed earth stem from transportation of heavy materials. Using in-situ sourced materials is the ideal but is entirely dependent on the material's suitability. Rammed earth uses the subsoil layer, and it is imperative that the organic rich topsoil is recovered and reused.

Soil stabilizers, additives, dyes and coatings are often used with rammed earth construction. In general, these are not hazardous, but care must be taken to ensure that such substances are not harmful to humans and to the environment.

Rammed earth is susceptible to decay in the presence of water. This requires special consideration in design and construction and throughout its service life. New walls should be protected from inclement weather to prevent premature damage. Generally, the level of maintenance required for rammed earth construction will be higher than that of some competing materials.

Rammed earth derives much of its physical resistance from the material's relatively high density, but a consequence of this is its poor thermal resistance. However, in South African conditions a normal uninsulated 300 mm wall is normally more than adequate to meet the thermal performance levels expected of modern energy efficient buildings and to meet requirements of the National Building Regulations (NBRs).

Rammed earth is primarily built as an in-situ shuttered form of construction, which places particular demands on both design and construction. Wall design must allow shuttering to be erected and dismantled repeatedly during construction. Rammed earth works require space for storage of materials and equipment and the movement of plant. Materials should be placed at their optimum moisture content and so soil must be stored and prepared accordingly.

Rammed earth construction is not covered by the deemed-to-satisfy rules of the NBRs, and would therefore require a 'rational design' by a competent person. As highlighted in this ecoASA Specification for Rammed Earth Construction, there are several authoritative international guidelines and standards which can be used to demonstrate compliance with the functional requirements of the NBRs, for both load-bearing and non-load-bearing applications.

Notwithstanding the environmental and aesthetic advantages of earth construction, the environmental impact of rammed earth construction must be looked at over the lifecycle of the construction. Where possible to use the environmentally friendly nature of rammed earth should be used to influence environmental performance of the entire building project.

This ecoASA Specification aims to address the issues highlighted above and to produce environmental benefits by encouraging more sustainable production of raw materials, reducing the use of hazardous substances and their associated discharges and prolonging the useful life of the products and their component parts.

As information and technology change, product category requirements will be reviewed, updated and possibly amended.

APPLICATION AND EVALUATION

Manufacturers or service suppliers interested in Agrémént SA certification an ecoASA specification are encouraged to read carefully through the entire specification and to evaluate whether their products are likely to conform to the specification and to pass the assessment process.

The product (in this case the construction specification and other related requirements) will be evaluated by an independent auditing body appointed by Agrémént SA. The audit is done against the criteria specified in the ecoASA Specification. Conformance with each relevant criterion is verified by the auditing body with the aid of supporting documentation including test results where necessary. On-site verification may also be required in addition to documentation to verify conformance, and the applicant must allow the auditor access to the site for this purpose (upon arrangement).

Note that this ecoASA Specification specifies requirements that the applicant must comply with in the rammed earth construction as well as requirements that the applicant must extend to the broader construction project (using conventional materials) through a condition of contract of the applicant.

Where the product meets the requirements of the ecoASA Specification, a certificate of conformance will be issued by the auditing body that the product complies to the ecoASA Specification. Agrémént SA will then issue a licence for the use of the label, and upon receipt of the occupancy certificate, the rammed earth construction may then be called ‘ecoASA Certified’ for any rammed earth construction constructed under applicants’ specification and other related requirements.

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On-site verification may also be required in addition to documentation required in order to verify conformance, and the applicant must facilitate that the auditor gains access to the site for this purpose (upon arrangement).

OVERVIEW OF REQUIREMENTS

An overview of the requirements for conformance to this ecoASA Specification is given in Appendix A. Compliance with the ecoASA Specification and the use of the ecoASA license requires a signed declaration by the applicant, together with supporting documentation. The table in Appendix A can simply be signed by the applicant.

DEFINITIONS AND ACRONYMS

Acronyms

APEO: Alkylphenol ethoxylates (APEO) are a family of synthetic organic chemicals being used for many industries for their surfactant properties.

DoC: Demonstration of Conformance.

EMP: Environmental Management Plan.

FSC: Forest Stewardship Council.

GHS: Globally Harmonized System of Classification and Labelling of Chemicals published by the United Nations and adopted by SANS 10234.

ISO: International Standards Organisation.

NZS: New Zealand Standard.

PEFC: Programme for the Endorsement of Forest Certification.

SADC: South African Development Community.

SANS: South African National Standard, published by the South African Bureau of Standards.

VOC: Volatile Organic Compounds; any organic compound (compound which contains carbon) with a boiling point below 250°C measured at 101,3kPa.

Definitions

Applicant:	A supplier of products or services seeking Certification for its goods or services to an ecoASA Specification.
Application Fee:	Fee payable on application for Certification to an ecoASA Specification.
Auditor:	An auditor is responsible for determining conformance or alternatively, non-conformance of a product to each criterion within an ecoASA Specification. Auditors must follow the guidelines in these ecoASA Scheme Rules, and perform an audit as defined in ISO IEC 17065.
Carcinogenic:	Substances capable of causing cancer.
CAS number:	The number that uniquely identifies a chemical, given in accordance with the nomenclature systems of the International Union of Pure and Applied Chemistry or the Chemical Abstracts Service (CAS).
Chemical agent:	A GHS-aligned chemical element or compound.
Certified:	A product is considered certified after it has successfully been shown to meet the specified requirements of an ecoASA Specification, a Certificate of Conformance has been issued by a Conformity Assessment Body for the Applicant to a Specification, and Agrément South Africa has issued a License for use of the Label. The product may then be called 'ecoASA Certified'.
Certificate of Conformance:	Certification issued by Agrément South Africa that a product complies to an ecoASA Specification.
Ecotoxic:	Harmful to animals, plants, or the environment.
ecoASA label:	The Agrément South Africa ecolabel.
HAZ Code:	A unique alphanumerical code that consists of one letter and three numbers to denote a hazard statements.
Hazard category:	A division of criteria within each hazard class, for example, oral acute toxicity includes five hazard categories and flammable liquids includes four hazard categories.
Hazard class:	The nature of the physical, health or environmental hazard, for example flammable liquid, carcinogenicity or oral acute toxicity.
Hazard statement:	The statement assigned to a hazard class and category that describes the nature of the hazards of a hazardous product, including, where appropriate, the degree of hazard.
Label:	The ecoASA label.
License:	The License allows the Licence Holder to display the ecoASA Label.
License Holder:	A supplier of products or services that has successfully applied for and been awarded a Licence for the use of the ecoASA Label.
Main Contractor:	The contractor that has a legal contract with a client to deliver construction works, part of which requires rammed earth construction, which may be subject to a separate subcontract.
Product:	The term 'product' is used in an ecoASA Specification in its widest sense to include goods, services and processes.

1 PRODUCT SCOPE

Criterion 1.1: The applicant must verify that the product falls within the product scope of this specification. This Specification is applicable to rammed earth walls, rammed earth floors and rammed earth footings of buildings. This includes both loadbearing and non-loading bearing walls. The rammed earth wall and/or floor must be at least 10m^2.

An ecoASA Certificate is awarded based on the applicant by demonstrating compliance with this specification, which does not require physical evidence of an existing structure other than building plan approval upon which the ecoASA Certificate will be valid for that construction works. Notwithstanding this, an applicant can also apply for certification for an existing building, provided that all the records that are necessary to demonstrate conformance to this Specification are available.

Where the applicant's submission meets the requirements of this specification, the application will be awarded a License to construct similar rammed earth construction systems that falls within the scope of the applicant's submission and the scope of this Specification. Certification will however be conditional on building plan approval (if relevant, see Criteria 2.2).

The following are excluded from this specification:

a) Adobe construction; an air-dried brick made from a puddled earth mix cast in a mould and which contains a mixture of clay, sand and silt.
b) Cinva and pressed bricks; an earth brick that is made in a mechanical press, either machine operated or hand operated.
c) Electrical and other services; although provision is made for such services to be incorporated into the rammed earth construction.
d) Structural and non-structural fittings and securing these to the rammed earth construction, such as wall plates, concrete lintels, window and door frames.
e) Insulated rammed earth: a sandwich construction of rammed earth with a layer of insulation between two skins of the earth wall.
f) Rammed earth walls containing reinforcing bars other than reinforced earth lintels.
g) The addition of lightweight materials such as vermiculite, pumice, natural fibres, polystyrene waste and cork to the soil.
h) The use of crushed recycled bricks or building rubble mixed with soil.

Demonstration of Conformance

DoC 1.1: A description of the scope of certification that the applicant is applying for, together with supporting documentation, such as:

a) rammed earth walls (loadbearing and non-loading bearing);
b) rammed earth floors; and
c) rammed earth footings.

2. FITNESS FOR PURPOSE: BUILDING PLAN AND REGULATORY REQUIREMENTS

To be certified, the rammed earth construction must be fit to perform its intended purpose or application. A minimum level of quality and durability is implicit before the ecoASA ecolabel can be displayed on the product. The applicant must ensure that the finished rammed earth construction product is fit for its intended purpose.

Criterion 2.1: Unless excluded elsewhere in this specification, the specification for the construction of the rammed earth works including, materials specifications and work processes, must be prepared in accordance with a recognised standard or guideline, including but not limited to:

a) The SADC Harmonized Standard for Rammed Earth Structures; Code of Practice.
b) Relevant New Zealand Standards:
- NZS 4297:2020 Engineering Design of Earth Buildings;
- NZS 4298:2020 Materials & Workmanship for Earth Buildings; and
- NZS 4299:1999 Earth Buildings Not Requiring Specific Designs.

c) The Australian Earth Building Handbook.
d) The Rammed Earth Design and Construction Guideline, including:
- Appendix B Specification for rammed earth works.

e) The document Rammed Earth Structures: A Code of Practice Code of Practice

The materials specification must clearly detail the commercial products to be used as a stabiliser, binder, pigment, surface coating, waterproofing agent, preparatory agents, cleaning agent and degreaser.

Demonstration of Conformance

DoC 2.1: A signed declaration by the applicant that the design and specification for the rammed earth construction has been prepared in accordance with a recognised standard or guideline, together with a copy of the specification for the rammed earth construction.

Criterion 2.2: Where the rammed earth construction forms part of a building within the scope of the National Building Regulations and Standards Act, building plan approval must be issued before the product can claim to be ecoASA Certified for that particular construction works.

Demonstration of Conformance

DoC 2.2: Upon receipt, a copy of the building plan approval issued by the local authority for the relevant building.

3. HAZARDOUS AND PROHIBITED SUBSTANCES

The criteria in this section are intended to address the main hazardous substances used during construction (including transport and storage). The intention is to reduce the use of hazardous materials and to prevent pollutants entering the environment.

Rammed earth construction is normally a component of a building or construction project. To enhance the positive impact of rammed earth construction in encouraging less stressful on the environment, the criteria below apply to the main contractor and the whole construction process and not only to the rammed earth construction component.

Criterion 3.1: The specification for the whole construction project must require that where construction workers can come into contact with substances which are classifiable as toxic or hazardous in the table below, work instructions must be issued for workers for safe work conditions and to wear protective equipment to avoid eye and hand irritation or other health hazards.

Classification of Hazardous Agents (Regulation for Hazardous Cheminal Agents; OH&S Act)		
Warning	**HAZ**	**Pictogarm**
Danger: Fatal if swallowed	H300	
Danger: Toxic if swallowed	H301	
Danger: Fatal in contact with skin	H310	
Danger: Toxic in contact with skin	H311	
Danger: Fatal if inhaled	H330	
Danger: Toxic if inhaled	H331	
Danger: Causes severe skin burns and eye damage	H314	
Danger: Causes serious eye damage	H318	
Danger: May cause allergy or asthma symptoms or breathing difficulties if inhaled	H334	
Danger: May cause genetic defects	H340	
Warning: Suspected of causing genetic defects	H341	
Danger: May cause cancer	H350	
Warning: Suspected of causing cancer	H351	
Danger: May damage fertility or the unborn child	H360	
Warning: Suspected of damaging fertility or unborn child	H361	
Danger: Causes damages to organs	H370	
Warning: May cause damage to organs	H371	
Danger: Causes damages to organs through prolonged or repeated exposure	H372	
Warning: May cause damage to organs through prolonged or repeated exposure	H373	
Danger: May be fatal if swallowed and enters airways	H304	
Warning: May be harmful if swallowed and enters airways	H305	
Warning: Harmful if swallowed	H302	
Warning: Harmful in contact with skin	H312	
Warning: Harmful if inhaled	H332	
Warning: Causes skin irritation	H315	
Warning: May cause an allergic skin reaction	H317	
Warning: Causes serious eye irritation	H319	
Warning: May cause respiratory irritation	H335	
Warning: May cause drowsiness or dizziness	H336	
Warning: Harms public health and the environment by destroying ozone in the upper atmosphere	H420	
Warning: Very Toxic to aquatic life	H400	
Warning: Very Toxic to aquatic life with long lasting effects	H410	
Toxic to aquatic life with long lasting effects	H411	
May cause harm to breast-fed children	H362	na

Demonstration of Conformance

DoC 3.1: A signed declaration from the applicant stating that the specification for the construction works and for the rammed earth construction requires that where workers can come into contact with substances which are classifiable as toxic or hazardous in the table below, work instructions must be issued for workers for safe work conditions and to wear protective equipment to avoid eye and hand irritation or other health hazards, together with supporting with the documentation.

Criterion 3.2: The specification for the rammed earth construction must require that flashing material at the base of a rammed earth wall must not consist of lead sheeting or zinc-coated steel, and that the specification for the construction works must require that lead sheeting or zinc-coated steel must not be used on the construction project.

** Agrément SA has issued a Certificate for a bitumen coating that can be used for this.*

Demonstration of Conformance

DoC 3.2: A signed declaration from the applicant stating that the specification for the rammed earth construction requires that flashing material at the base of a rammed earth wall must not consist of lead sheeting or zinc-coated steel, and that the specification for the construction works requires that lead sheeting or zinc-coated steel must not be used, together with supporting with the documentation.

Criterion 3.3: The specification for the construction works and for the rammed earth construction must require that pigments and additives based on lead, tin, cadmium, chromium VI and mercury and their compounds must not be used at any stage on the construction project.

Demonstration of Conformance

DoC 3.3: A signed declaration from the applicant stating that the specification for the construction works and for the rammed earth construction requires that pigments and additives based on lead, tin, cadmium, chromium VI and mercury and their compounds must not be used at any stage, together with supporting with the documentation.

Criterion 3.4: The specification for the construction works and for the rammed earth construction must require that:

a) paint must be lead free or contain more not than 90 parts per million of lead;
b) paint used on internal surfaces are marketed and/or labelled as APEO free;
c) paint used on internal surfaces are marketed and/or labelled as low VOC.

Demonstration of Conformance

DoC 3.2: A signed declaration from the applicant stating that the specification for the construction works, including for the rammed earth construction, requires compliance with the criteria here for no or low lead, APEO free and low VOC paint to be used at any stage on the construction project, together with supporting with the documentation.

4. RESPONSIBLE PRODUCTION

Responsible production (or construction) encourages the use of sustainable materials, the use and reuse of materials, minimising the impacts of the construction on the environment.

4.1 Sustainable Timber

Criterion 4.1: The specification for the construction works and for the rammed earth construction must require that wood that is not certified under a recognised certification scheme (e.g. FSC or PEFC) as being sustainably managed must not originate from the following controversial sources:

- Illegal harvesting: Illegally harvested wood are those that are harvested, traded or transported in a way that is in breach with applicable national regulations; or
- uncertified high conservation value communities: Wood that is harvested from forest and plantation environments that are protected for biological and/or social reasons.

Demonstration of Conformance
DoC 4.1: A signed declaration from the applicant stating that a condition of contract for the rammed earth construction and the specification for rammed earth requires that that any wood used on the construction project must not originate from illegal harvesting or uncertified high conservation value communities, together with supporting with the documentation.

4.2 Soil

Criteria 4.2: If the volume of suitable soil required for the rammed earth construction is not available on site, the specification for the rammed earth construction must require that the soil:

a) is quarried from legal sources;
b) within a distance of not more that 200 km from the site; and
c) the topsoil is stockpiled for reuse or disposed of as per the owner of the soil quarry.

Demonstration of Conformance
DoC 4.2: A signed declaration from the applicant stating that the specification for rammed earth meets the requirements of this criterion for sourcing of the soil, together with supporting with the documentation.

Criterion 4.3: The specification for the rammed earth construction must require that any soil transported to the site and any stockpiles of soil on the site must be covered to prevent soil and dust pollution.

Demonstration of Conformance
DoC 4.3: A signed declaration from the applicant stating that the specification for rammed earth requires that any soil transported to the site and any stockpiles of soil on the site must be covered to prevent soil and dust pollution, together with supporting with the documentation.

Criterion 4.4: The specification for the rammed earth construction must require that mixing of soil and stabilizers and admixtures must be done on a plastic sheet.

Demonstration of Conformance
DoC 4.4: A signed declaration from the applicant stating that the specification for rammed earth requires that mixing of soil and stabilizers and admixtures must be done on a plastic sheet, together with supporting with the documentation.

4.3 Formwork

Criterion 4.5: The specification for the construction works must require that the formwork for the rammed earth wall must be reusable on site for more than five pours.

Demonstration of Conformance
DoC 4.5: A signed declaration from the applicant stating that the specification for rammed earth requires that the formwork for the rammed earth must be reusable on site for more than five pours.

4.4 Air, Water and Waste Management

Criterion 4.6: The specification for the construction works must require that the main contractor must develop a site-specific Environmental Management Plan (EMP) for air, water and waste management, covering as a minimum:

a) air pollution from petrol and diesel equipment;
b) dust pollution;
c) treatment and/or disposal of polluted water;
d) separating recyclable and reusable material from waste, by grade and type of recyclable material;
e) transport of recyclable material to recycling plants and/lor sites that are capable of handling the type of recyclable material; and
f) disposal of non-recyclable waste to registered sites.

The environmental management plan must specify how the effectiveness of environmental management measures will be monitored, and it should also include trigger values or conditions under which corrective actions are to be taken.

Demonstration of Conformance
DoC 4.6: A signed declaration from the applicant stating that a condition of contract for the rammed earth construction requires that the main contractor must develop a site-specific Environmental Management Plan (EMP), together with supporting documentation.

5. MAINTENANCE AND REPAIR

Enhancing the life of a product is key to enhancing sustainability.

Criterion 5.1: The applicant must compile a maintenance and repair manual for the rammed earth construction, which must be made available to the client or end user.

Demonstration of Conformance

DoC 5.1: A signed declaration from the applicant stating that a maintenance and repair manual for the rammed earth construction has been prepared and will be made available to the client or end user on completion of the rammed earth construction, together with supporting documentation.

6. LEGAL COMPLIANCE

Criterion 6.1: As a minimum, the applicant is responsible that the contractor for the rammed earth construction must comply with all relevant environmental legislation at the local authority, provincial and national levels. This may include, but is not limited to:

a) Environment Conservation Act No. 73, 1989.
b) Hazardous Substances Act No. 15 of 1989.
c) Mineral and Petroleum Resources Development Act No. 28 of 2002 (MPRDA).
d) National Environmental Management Act No. 107 of 1998 (NEMA).
e) National Environmental Management: Air Quality Act No. 39 of 2004 (NEM:AQA).
f) National Environmental Management: Biodiversity Act No. 10 of 2004 (NEM:BA).
g) National Environmental Management: Protected Areas Act No. 57 of 2003 (NEM:PAA).
h) National Environmental Management: Waste Act No. 59 of 2008 (NEM:WA).
i) National Water Act No. 36 of 1998 (NWA).
j) Wastewater and Industrial Effluent By-laws.

Demonstration of Conformance

DoC 6.1: If the applicant or sub-contractor used for the rammed earth construction (if different) is guilty of a breach of an environmental law within the preceding two years, the responsible party must provide evidence of corrective action, together with supporting documentation.

APPENDIX A. DEMONSTRATION OF CONFORMANCE

Product description including model name/number:				
Section	**Criterion**	**Demonstration of Conformance**	**Supporting information**	**Signature of Declarant**
1. Product Scope				
1. Product Scope	1.1	Description of the scope of certification that the applicant is applying for, together with supporting documentation	Attached: Y / N	
2. Fitness for Purpose				
	2.1	Declaration that the design and specification for the rammed earth construction has been prepared in accordance with a recognised standard or guideline, together with a copy of the specification for the rammed earth construction and relevant documentation.	Attached: Y / N	
	2.2	Upon receipt, a copy of the building plan approval issued by the local authority for the relevant building	Attached: Y / N	
3. Hazardous and Prohibited Substances				
	3.1	Declaration that the specification and a condition of contract for the rammed earth construction requires that where workers can come into contact with substances which are classifiable as toxic or hazardous in the table below, work instructions must be issued for workers for safe work conditions and to wear protective equipment to avoid eye and hand irritation or other health hazards, together with supporting with the documentation	Attached: Y / N	
	3.2	Declaration that the specification for the rammed earth construction requires that flashing material at the base of a rammed earth wall must not consist of lead sheeting or zinc-coated steel, and that a condition of contract requires that lead sheeting or zinc-coated steel must not be used at any stage, together with supporting with the documentation	Attached: Y / N	
	3.3	Declaration that the specification and a condition of contract for the rammed earth construction requires that pigments and additives based on lead, tin, cadmium, chromium VI and mercury and their compounds must not be used at any stage, together with supporting with the documentation	Attached: Y / N	
	3.4	Declaration from the applicant stating that the specification and a condition of contract for the rammed earth construction requires compliance with the criteria here for no or low lead, APEO free and low VOC paint to be used at any stage on the construction project, together with supporting with the documentation	Attached: Y / N	
4. Responsible Production				
4.1 Sustainable Timber	4.1	Declaration that the specification and a condition of contract for the rammed earth construction requires that that any wood used on the construction project must not originate from illegal harvesting or uncertified high conservation value communities, together with supporting with the documentation	Attached: Y / N	

Product description including model name/number:				
Section	**Criterion**	**Demonstration of Conformance**	**Supporting information**	**Signature of Declarant**
4.2 Soil	4.2	Declaration that the specification for rammed earth meets the requirements of this criterion for sourcing of the soil, together with supporting with the documentation	Attached: Y / N	
	4.3	Declaration that the specification for rammed earth requires that any soil transported to the site and any stockpiles of soil on the site must be covered to prevent soil and dust pollution, together with supporting with the documentation	Attached: Y / N	
	4.4	Declaration that the specification for rammed earth requires that mixing of soil and stabilizers and admixtures must be done on a plastic sheet, together with supporting with the documentation	Attached: Y / N	
4.3 Formwork	4.5	Declaration stating that the specification for rammed earth requires that the formwork for the rammed earth must be reusable on site for more than five pours	Attached: Y / N	
4.4 Air, Water and Waste Management	4.6	Declaration stating that a condition of contract for the rammed earth construction requires that the main contractor must develop a site-specific Environmental Management Plan (EMP), together with supporting documentation.	Attached: Y / N	
5. Maintenance and Repair				
	5.1	Declaration that a maintenance and repair manual for the rammed earth construction has been prepared and will be made available to the client or end user on completion of the rammed earth construction, together with supporting documentation	Attached: Y / N	
6. Legal Compliance				
	6.1	If the applicant or sub-contractor used for the rammed earth construction (if different) is guilty of a breach of an environmental law within the preceding two years, the responsible party must provide evidence of corrective action, together with supporting documentation	Attached: Y / N	