



Rammed Earth Enterprises Technical Information

Wall Thicknesses & Heights

The standard thickness of rammed earth walls is generally 300mm. In instances where niches and recesses are required for fireplaces, heater boxes etc. walls can be constructed to alternative thickness as required by the project.

The minimum structural thickness for load-bearing earth wall is 250mm. And, for a non-load bearing walls is 200mm. Below is a table detailing the minimum thickness and insulation - R ratings for rammed earth, structural and non-structural. These are minimums to achieve R ratings, the walls can be built thicker depending on wall heights and individual project specifications.

Width	Structural (Load Bearing)	Insulated	R Rating
200mm	X	X	R < 0.5
300mm	✓	X	R 0.7
400mm	✓	✓	R 2.5
450mm	✓	✓	R 3.5

Note. The above contents pertain to walls built by Rammed Earth Enterprises Pty Ltd.

During the design phase it is important to ensure that vertical wall increments are in 300mm vertical increments- for example: windowsill heights, door and window head heights and wall top heights. There are no increment limitations for raked wall tops.

Corner Chamfer Details

The standard chamfer is 45°/50mm at:

- Wall ends
- Window openings
- Door openings
- Windowsills



Electrical and Plumbing

Electrical conduits and wall boxes are rammed into the wall at locations where power-points and light switches are required.

Conduits are also placed into the wall to allow water plumbing pipes to be inserted where required. Where an area is to be tiled over or hidden by joinery, plumbing pipes and electrical conduits can be chased into the wall.

Openings

To construct rammed earth over doors or windows, we utilise engineered T-Bar lintels.

These are placed over the opening during ramming to support the earth above.

Where recesses are required in walls, formers/block-outs are placed into the formwork set up and soil is placed and compacted around them to produce the required opening or shape in the wall.

Roof Tie-Down System

In the top 600mm of the wall metal rods are inserted during compacting to provide a tie-down system for a timber top plate, this is for securing the roofing structure (see Diagrams 1 below).

Structural Steel

- T-Bar Lintels: The horizontal of the T-Bar should **not** exceed 200mm (width) in a 300mm thick wall.
- Structural Columns: Placement of structural columns should be avoided in rammed earth walls where possible. This reduces the risk of walls developing fractures where columns are embedded.

General Details

Damp-proofing and bonding of Rammed Earth to the Slab

Bondall Silasec slurry is applied to the slab where the wall is to be built, prior to the first earth compaction layer.

Concrete slabs and footings are designed for articulated full masonry as per NCC 3.2.5.

No slab rebate is required.

Standard detail of Rammed Earth to Eave Finishes (trusses, top plate, soffit, flashings etc.) detailed in the Diagram 2 below.



Fixing Details

- Skirting: Construction adhesive and 40mm fixing brads are used
- Cornice: As per standard cornice fixing methods. The cornice line should be taped prior to installation.
*Note. **Extreme care** is required from the plasterers to ensure cornice cement is not transferred to the visible wall area.*

Control/Articulation Joints

Maximum span between control/articulation joints is 4500mm. See Diagrams 3 below for information regarding control joint detail.

Permeability

Our rammed earth walls incorporate a waterproofing additive. This is combined with the raw materials during the mixing process, this ensures the walls are waterproof. However, a 75mm exposed slab edge should be maintained above finished paving/garden level to protect against moisture ingress (rising damp) into the walls.

A clear solvent based acrylic polymer sealer is applied to all walls for finishing. This seals the walls while maintaining vapour transfer in and out of the rammed earth.

Fire rating

Rammed earth walls are suitable for construction as an external wall up to BAL FZ and have a four-hour fire rating.
Refer to BAL Australian Standards (AS 3959) Construction of buildings in bushfire-prone areas.

Energy Efficiency, Thermal insulation/thermal bridging

There are two methods to ensure rammed earth walls meet the energy standards required to obtain a building permit.

1. Standard Energy Rating System

- 300mm walls uninsulated R0.7: utilised for any load-bearing internal walls, external walls of a non-habitable room or landscaping walls.
- 400mm walls insulated R2.5: utilised for any external load-bearing walls.
- 450mm walls insulated R3.5: utilised for any external load-bearing walls.



2. Performance Solution Report

- 300mm rammed earth walls (internal load bearing, internal non-load bearing, external load bearing or landscaping etc.)

Australian Standards

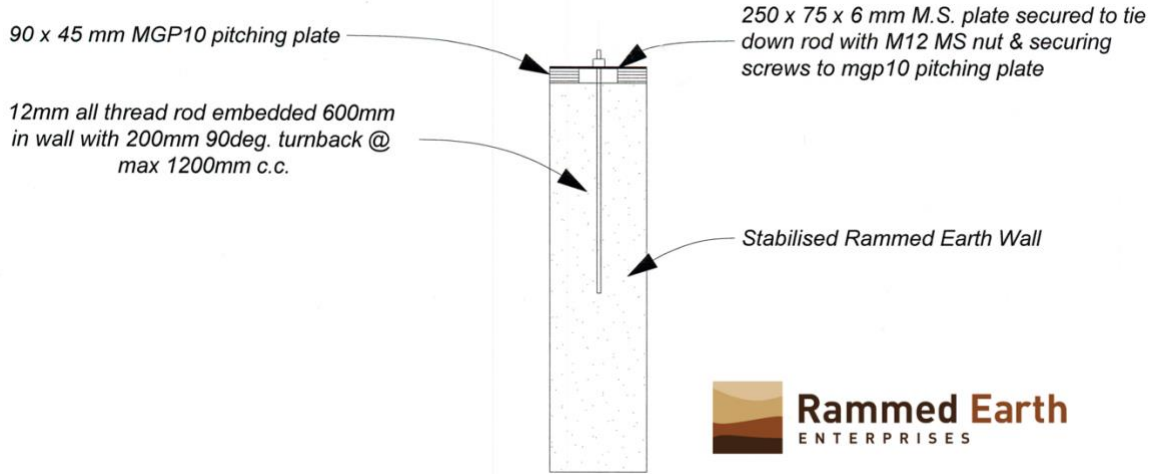
We construct our walls in accordance with all relevant Australian Standards. Our walls also comply with best practice guidelines in Standards Australia International (2001) *The Australian Earth Building Handbook HB195*.

[DIAGRAMS ON NEXT PAGE]



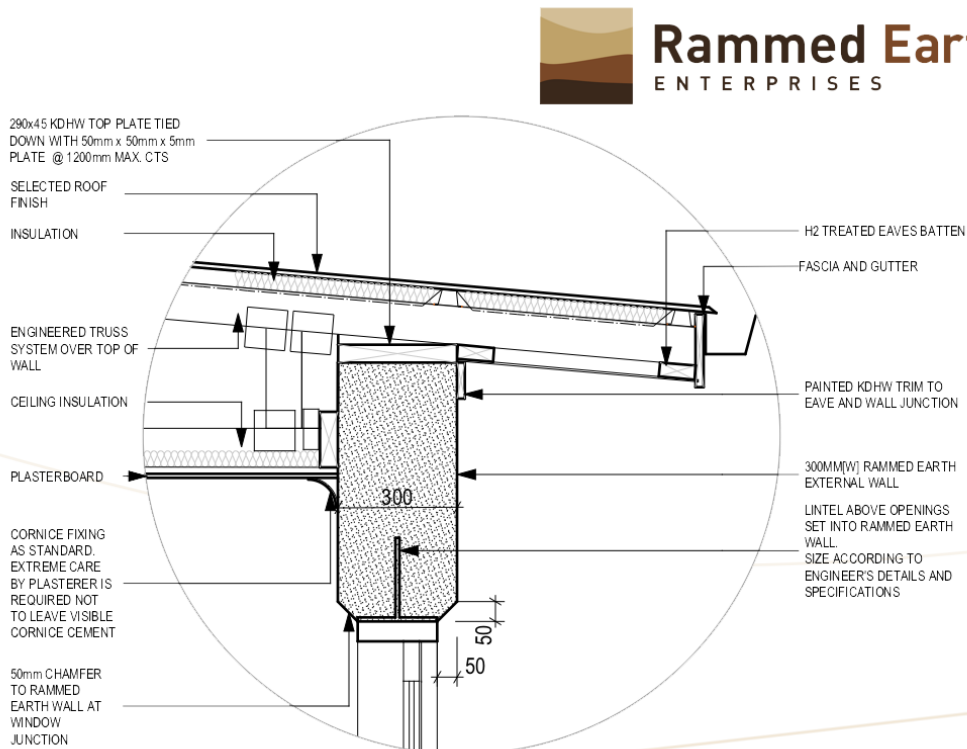
Diagrams

Diagram 1. Roof Tie-Down System



Note. The above contents pertain to walls built by Rammed Earth Enterprises Pty Ltd. These diagrams have been cropped and are not to scale.

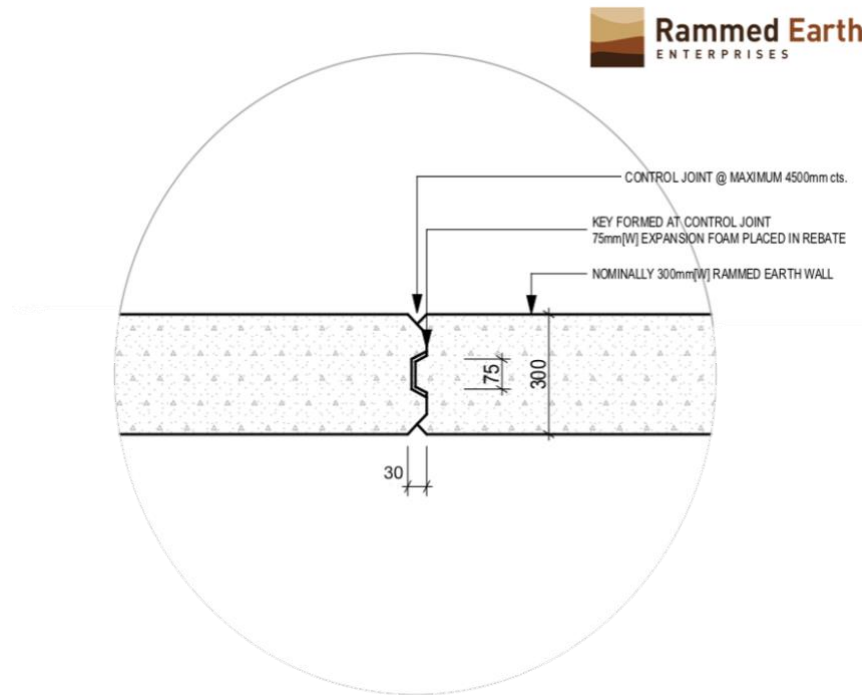
Diagram 2. Nominal Eave Detail



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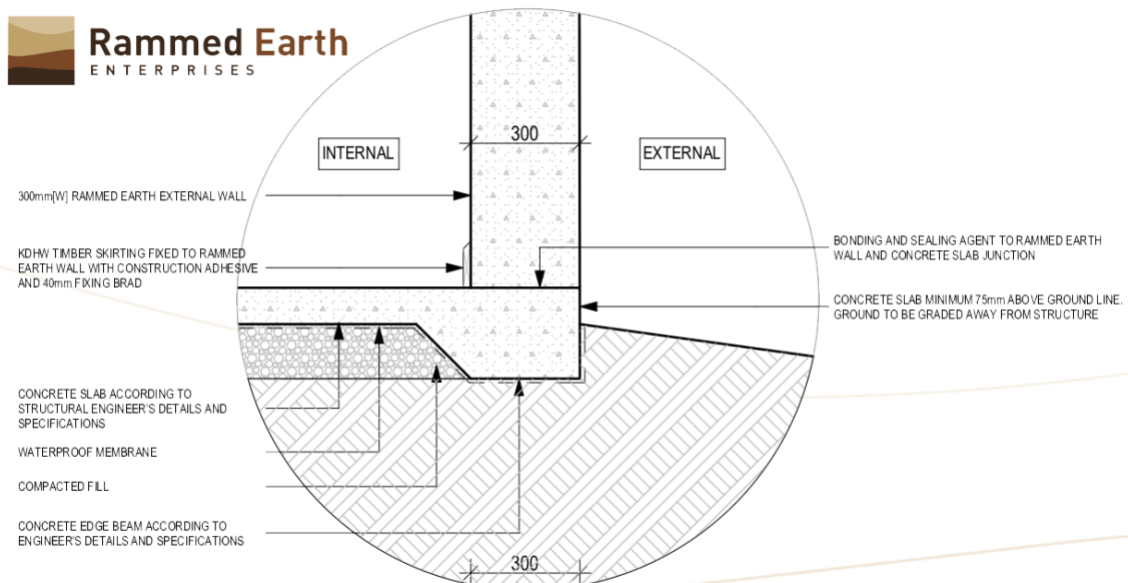


Diagram 3. Articulation/Control Joint Plan Detail



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Diagram 4. Nominal Concrete Footing Detail



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