

ADOBE BRICK SPECIFICATION

1. GENERAL

1.1 DOCUMENTS REFERRED TO

Documents referred to in this section are:

NZS 4298 : 1998 MATERIALS & WORKMANSHIP for Earth Buildings

NZS 4299 : 1998 EARTH BUILDINGS NOT REQUIRING SPECIFIC DESIGN

Documents listed above and cited in the clauses that follow are part of this specification.

However, this specification takes precedence in the event of it being at variance with the cited document.

Copies of the above literature are available by phoning Standards NZ

1.2 QUALIFICATIONS

Carry out all adobe bricklaying work with people competent and experienced in this type of work or labourers who are working under the direct and continual supervision of such experienced people.

1.3 INSPECTION

Call for inspection of the work at critical stages defined by the project manager. These might include: Foundation Starters, Upstand DPM, First course of Horizontal reinforcement, Window Sill level, First Lintel placement, Wallplate Completed. All to good trade practice and as set out in NZS 4299.

1.4 TESTS

Carry out all required tests on bricks and mortar in accordance with NZS 4298, table 2.1 both during manufacture of bricks, before laying and during construction.

When using adobe bricks bought from a commercial supplier, bricks have to be tested in accordance with NZS 4298, table 2.1, prior to delivery. Commercial suppliers have to produce a new set of test results for both strength (modulus of rupture) and durability (spray erosion) from an independent testing laboratory every year. If the source of clay used in production changes, new tests have to be carried out. Copies of test results are to be supplied to the project manager for approval.

Prior to delivery a set of 5 drop tests has to be carried out on the yard in presence of the project manager (architect or engineer) and/or the owner. If the test is satisfactory and the bricks leave the yard, the producer takes no further responsibility, unless there is a mistake in the delivery. The owners or their project managers can confirm the produced test results by getting a set of bricks tested by an independent laboratory at their own expense.

If there is a failure in the drop tests, the producer has to check the quality of their bricks by getting them tested in the laboratory again.

1.5 QUALITY RECORDS

Keep accurate records relating to strength and quality of materials used in the construction, and make the information available to the territorial authority inspector and architect on request.

2. PRODUCTS

2.10 ADOBE (MUD) BRICKS

280x280x130 (+- 10mm) standard bricks, 430x280x130 (+- 10mm) corner/opening bricks with all to NZS 4298, made of a mix of Clay, Silt and Sand with some chopped straw, untreated sawdust (optional) and water - no cement to be used. Bricks to be tested according to table 2.1 NZS 4298, which includes Compression or Flexural tensile strength, Wet/dry appraisal, Durability and Drop test. The Erodibility index is to be 3 or better. When buying commercially produced adobe bricks, refer to section 1.5 of this document for testing programme.

2.20 VERTICAL REINFORCEMENT

Galvanised 12mm Reidbar with couplers as required

2.25 TOP OF WALL REINFORCEMENT

Reidbar Nuts on 50x50x3 galv square washers,.

2.30 DOWELCONNECTORS

R20 Steel Dowels 550 long

2.40 HORIZONTAL REINFORCEMENT

Tensile Geogrid SS40 polypropylene mesh with 6x200 HDPE bodkins or 6mm rods cut to length

2.50 MUD MORTAR

Mud Mortar made of a mix of Clay, Silt and Sand with some chopped straw (optional) or sawdust (optional) and water - no cement to be used.

Mortar to be shrinkage tested in accordance to NZS 4298 to $\leq 3\%$

2.60 DPM

Mulseal or Flintcote bituminous Emulsion.

2.70 FIRED BRICKS for UPSTAND & SILLS

Client approved fired bricks To AS/NZS 4455

2.80 MORTAR FOR UPSTAND & SILL BRICKS

Composed of Portland cement, sand and water with an admixture to the provisions of NZS 4210, clause 2.2. Obtain written approval of admixture to be used. Also obtain written approval if intending to use cement mortar as a damp proof course and where, or if intending to use hydrated lime in the mortar.

2.90 LINTELS

280 wide by 130 and 280 high, solid one piece, Heart Macrocarpa with no knots in bottom edges, any other knots to be tight with no encased bark.

3. EXECUTION

3.05 ADOBE BRICK STORAGE

Store bricks clear of the ground, under cover until laid in the wall.

3.10 STARTER POSITIONS

Before commencing laying upstand bricks, check the location of starter reinforcement by measure. Do not correct misplacement by cranking bars. Where misplacement exceeds the location tolerance of 20mm, obtain written direction before proceeding.

3.15 LAY UPSTAND

Lay Fired brick upstand in sand cement mortar, with the outside of the outer bricks on the outside face of the foundations and the inside of the upstand bricks being the width of the bricks inside the foundation wall. Fill space between fired bricks with 17.5mPa concrete with to roughened to provide key to mortar.

3.17 APPLY DPM

Paint on bituminous emulsion on top of brushed down upstand, avoiding drips down face of bricks, starting with a primer coat, then two top coats painted thickly in opposite directions all to manufacturers instructions. Do not attempt to apply DPM in frosty weather or use any DPM that has been frosted.

3.20 SETOUT

Setout bricks to minimise cutting and part width bricks

3.22 PROFILES

Set up profiles to run string lines at each course 5mm clear of face of bricks. Profiles to be braced to stay within 5mm of plumb for every 2.4 of height of the wall.

3.25 WINDOW & DOOR BUCKS

Place anchor and stay timber window and door bucks to lay bricks up to at openings. Bucks to have sufficient strength to stay with 3mm of straight when under sideways pressure from bricks laid up to them.

3.30 LAY ADOBE BRICKS

In 20mm mud mortar bed to NZS 4299 to string lines to within 5mm of plumb every 2.4 of height and each course within 10mm of horizontal. Wet down bricks in the course below before spreading mortar, dunk each brick for 10-30 sec both to avoid sucking moisture out of mortar and spoiling bond. Keep vertical mortar joints aligned on alternate courses. Mortar joints need to be completely filled without gaps.

3.32 BOND

Lay bricks in stretcher bond, single width unless detailed or stated otherwise.

3.33 FRESH MORTAR

Use mortar that has been mixed within the last week, discarding old mortar. (Old mixed mud can promote growth of brown mould-like material).

Mortar to be neither too wet or too dry. Too wet and it will shrink too much a squish out too much, too dry and it won't bond properly to the course below and you can't settle bricks down into position properly.

3.35 PROTECT WALLS

Protect tops of walls from any significant rain with 250 micron polythene, extending 100mm out from each side of the walls, weighted down with planks which themselves are weighted down with reject bricks etc. On sites with significant driving rain, protect the walls totally by running plastic down each side of each wall, weighted down at the bottom.

Once full width top plate is on, protect walls from excessive moisture until the roof is going up. Do not permanently cover walls in plastic as to ensure the walls to dry out and settle. Keep covers well ventilated.

3.37 CLEAN DOWN AS YOU GO

Scrape surplus mortar off bricks as they are laid, smoothing joints flush to bricks or rebating them as desired.. While mortar is still damp, fill gaps in mortar and clean off bricks so minimal finishing work is required later.

3.40 PLACE REINFORCEMENT

Extend vertical reinforcing up using Reidbar Couplers. Use Reidbar Nuts on square washers to tie vertical reinforcing to top plate.

Lay Horizontal reinforcement mesh every third course or more often if asked for on the drawings. Lap corners and joins and tension with bodkins or 6mm rods to NZS 4299, fig 5.5 (pg 59)

3.42 GRINGO BLOCKS

Place any gringo blocks or other anchors asked for on the drawings for attachment of window & door frames, joinery units etc. as the work proceeds

3.45 SILLS

Leave out 1/4 brick either side at the outside bottom of window sills as a recess for fired brick sill to be laid in later. Protect sills with plastic as below.

3.50 LAY LINTELS

Lay lintels level both ways in 20mm mud mortar with 280mm bearing either side both full width of lintel. For openings greater than 2m 450mm bearing is required.

3.55 LAY WALLPLATES

Lay full width top plates on a 20mm bed of mortar and level both ways. When mortar is dry, nailplate top plates together to NZS 4299, fig 7.1 & 7.2 (pg 76).

3.57 INSTALL DOWEL CONNECTORS

Drive R20 dowels into 19mm hole in top plate and 500 into earth walls. Dowels to be spaced 200 - 300 of every rod and otherwise @ 900 crs to NZS 4299, fig 5.4 (pg 57)

3.60 PROTECT FINISHED WALLS

Once full width top plate is on, protect walls from excessive moisture until the roof is going up. Do not permanently cover walls in plastic as to ensure the walls to dry out and settle.

3.75 FIX FRAMING to WALLPLATES

Fix floor joists, ceiling joists and roof framing as detailed - note the requirements for this are much greater than for NZS3604 light timber framing.

3.80 FIT WINDOWS & DOORS

Once roof is on fit windows and doors as detailed taking care to allow the lintel to sink down over top of window & door heads

3.85 LAY FIRED BRICK SILLS

Lay fired brick sills in sand-cement mortar on wetted down earth walls and keyed with 100mm galv flathead nails at 200 crs. driven 80mm into earth.

3.90 FINISH WALLS

For a quality finished job refer to Appendix L of NZS 4298 or consult a professional for options and recipes.