

Client : Brick Development Association
Title : Cost of Comparative Cladding Materials



BCIS Report to Brick Development Association
Cost of Comparative Cladding Materials

10 December 2007



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Contents

Introduction	2
Objective	2
Methodology	
Price Book Comparison.....	2
Live Project Review.....	4
Results	
Study 1: Price Book Comparison.....	5
Study 2: Live Project Review.....	6
Summary and Conclusions	7
Appendices:	
1. Bricks as a cladding material – Comparative Cost Study (attached to our email 31 January 2007).....	10
2. Alternative Specification Review issued under cover of our email dated 12 April 2007.....	11
3. Live Project Review issued under cover of our email dated 17 October 2007.....	12
4. Details of Apartment Block (4 no. drawings).....	13
5. Study 1: Price Book Comparison Spreadsheet (9 no. sheets).....	14
6. Study 2: Live Projects Review Spreadsheet (7 no. sheets).....	15

Introduction

This report has been prepared for the Brick Development Association (BDA) following the issue of BDA's email dated 12 February 2007 which confirmed the proposal detailed in the document entitled 'Bricks as cladding material – Comparative cost study', attached to our email dated 31 January 2007. Refer to Appendix 1 for a copy of this document.

The proposal was for us to compare the costs of cladding a building in brickwork with a range of commonly used alternatives using prices from major price books and data from live projects.

Objective

The proposal contained the following:-

'The Brick Development Association (BDA) believe that there is a perception that brickwork is an expensive option for external cladding to buildings'.

'The objective of this study is to collect and present cost data for brickwork and some of the common alternatives.'

It should be noted that this study was limited as far as was possible to the external skin of cladding systems.

Methodology

1. Price Specifications from Three Major Price Books.

Assuming a suitably sized project, in this case a 4 storey block of apartments with accommodation in part of the roof space, in the order of £1 million to £1.5 million. Then assuming normal cavity wall construction; inner block wall, insulated cavity and then various external façade specifications covered in the major price books. Please refer to Appendix 2 for a copy of our interim review dated 12 April 2007 and Appendix 3 for details of the apartment block we produced the measurements from.

The books we chose were those detailed in the document entitled 'Bricks as cladding material – Comparative cost study'; Laxtons, Spon's and BCIS Wessex.

We reviewed the books and noted the specifications that appeared most frequently in the books, those covered in at least two of the books, and were suitable for the type of building chosen and then averaged the rates to establish a total for comparison.

Only the external skin of each type of external envelope was measured.

Assumptions used and notes:

- Facing brick option.

Our initial report dated, 12 April 2007, was based on the most expensive facing brick detailed in Laxtons, at £350.00/1,000. Other price options in Laxtons ranged between £150.00 to £300.00 per 1,000. The rates in Spon's were based on a brick price of £300.00 per 1000 with an uplift of £10.00 per 1000. The rates in BCIS Wessex were based on a brick price of £263.20 per 1000 with an uplift of £10.00 per 1000.

Client- Brick Development Association
Title – Cost of Comparative Cladding Materials

Subsequently, we decided to review the effect that a brick costing £200.00/1,000 would have to fully reflect the range of prices of commonly used facing brick types. This is reflected in the final report contained in Appendix 5.

Within this report we looked at bricks costing £200.00/1,000, £350.00/1,000 and a brick based on an average of these prices.

- Outer skin in 100mm thick ashlar stone.

The most common external stone façade material. The rates for plain ashlar walling appear as written in the price books. Please note that the price stated by BCIS Wessex has been heavily qualified, that is, it is supplied by a specific source and delivered within a certain distance from the works.

- Outer skin in western red cedar weatherboard.

We assumed the most common form of construction for this item, i.e. the weatherboarding is fixed to timber battens which are fixed to blockwork.

The rates for the blockwork have been averaged over the three price books.

Timber weatherboarding isn't included in Spon's therefore the rates for this item of work have been averaged over the other two price books.

This item is only covered by Laxtons and BCIS Wessex. Spon's do have timber weatherboarding rates but this is for a sandwich type of construction not shiplapped boards, and therefore could not be averaged against the timber shiplapped boards priced in Laxtons and BCIS Wessex. Further, as BCIS Wessex only covers wrought softwood boarding, these rates have been uplifted by 200% in line with the details noted in Laxtons, which covers rates for both wrought softwood boarding and western red cedar boarding.

Weatherboarding has also been measured around the projection in m² as required by the Standard Method of Measurement.

- Outer skin in PVC, Swish Products.

Although an unusual external cladding feature, it is covered in two price books and is used for covering domestic properties.

- Outer skin with plain tiles.

Covered by all three price books, although the specifications are slightly different we have assumed that the surface of the backing blockwall is suitable for fixing the battens straight to the surface of the wall, i.e. it does not need counter-battening. If counter-battening is required, this would be at an extra cost which could range between £1.95/m² to £4.87/m² for 38 x 19mm/ 38 x 38mm softwood counter-battening between 450mm to 600mm centres

According to the Clay Roof Tile Council there are other types of tile that are suitable for vertical coverings, such as tile and half and feature tiles, however the major price books do not cover these.

- Outer skin in rendered blockwork.

There are various types of render that are covered by the major price books on the external face of a building, described as follows:

Client- Brick Development Association
Title – Cost of Comparative Cladding Materials

1. Laxtons. Covers three main types of external render; 15mm thick render and dry dash, 15mm thick render and wet dash with a wet dash of crushed stone or shingle and 15mm thick render and Tyrolean finish plaster.

2. Spon's. Covers six types of external render type works; normal cement and sand renders, 15mm thick Sto external render only system, 20mm thick 'Cemrend' one coat render, 13mm thick Tyrolean decorative rendering, 18mm thick Drydash (pebbledash) finish of Derbyshire Spar chippings and 70mm thick insulation with decorative basecoat and topcoat render systems on top (Sto Therm Classic M-system insulation render).

3. BCIS Wessex. Covers five types of external render; 12mm and 18mm thick cement, lime and sand render, 12mm and 18mm thick Tyrolean render systems, 12mm and 18mm thick 'Cemrend' render systems, 12 and 18mm thick Roughcast external render and 18mm thick Drydash (pebbledash) finish of Derbyshire Spar chippings.

We have reviewed three types of rendering specification for the project; painted cement and sand render, Tyrolean decorative render and pebbledash as these are largely covered by all three price books in our final report

2. Collect Costs from Bills of Quantities for Live Projects

Reference is made to the attached review of at least 25 projects contained in Appendix 6 of this report with the following properties:

- i. ranging in value from £356,000 to £10.5 million,
- ii. priced between May 2006 to September 2007,
- iii. ranging in size between 134 m² to 3,936m² gross floor area, and
- iv. up to five storeys high.

We analysed the Bills of Quantities to ascertain as far as possible, the specification of the external wall construction and in particular the external skin only.

To do this, we first established the extent of any cavity wall construction and then listed all the items within the Bills of Quantities that could make up the construction of the external walls. We then balanced, as far as possible, the specific items that related to the cavity wall construction and then added on the other remaining items to establish an approximate estimate of the externally measured constructed items.

We then went through the Bills of Quantities and picked out the relevant square metre rates for those external wall construction elements/items. Where the external skin is composed of more than one element the individual items, as far as possible, have been shown. Where this is not possible or there is not enough information, this has also been noted.

We then noted rates for other elements (items) that seem to appear in the external skin of a wall or noted major external items such as solar shading and specialist linings. These are excluded from the comparison.

Results

The results have been presented in two different studies.

Study 1 is the Price Book Comparison. Please refer to that contained in Appendix 5 of this report.

Please note that this is a revised version of that issued under cover of our email dated 12 April 2007 (refer to Appendix 2 of this report), showing the comparison of the eight options described above. The previous study did not include plain painted, rendered faced block walls and included prices from Griffiths (now excluded).

Further, it includes the effects of bricks at three different levels of pricing, as described above, £200.00/1,000, at £350.00/1,000 and a brick based on the average of these prices. Therefore, based on the average of the PC Sums for the bricks commonly used (note item 3 of report contained in Appendix 5) the cost per m² of the external wall is as follows, noting the cheapest first:

1. Painted, plain rendered block faced walls, at a cost of £62/m².
2. Facing brick option, at a cost of £67/m².
3. Block with Tyrolean rendered face (no additional paint applied), at a cost of £72/m².
4. Pebbledash render on block walls option, at a cost of £74/m².
5. Timber weatherboarding and PVC cladding on block walls, both at a cost of £98/m².
6. Plain tile finish on block walls option, at a cost of £113/m².
7. Stonework (ashlar) finish option, at a cost of £768/m².

It should be noted that when a brick costs £200.00/1,000 it would be the cheapest option of those described above at £61/m² of external wall area, and a brick costing £350.00/1,000 would be the third cheapest option, at £73.00/m².

There are other external finishes which are noted in the major price books. They have not been included in this exercise for various reasons; either they are not suitable for the type of building being reviewed or were only covered by one of the books and therefore a reasonable average could not be ascertained.

There are three main specification types that fall within this category as follows:

1. Rigid sheet cladding systems (NBS Section H20). Only covered by Spon's, noting two types of sheets 6mm thick and 7.5mm thick fixed to walls at between £87.83/m² to £81.61/m² respectively. Taking into account an average rate of £27.91/m² for 100mm thick block wall backing, (refer to details contained in Appendix 5), this system would cost between £115.74/m² to £109.52/m² respectively, without considering any linear metre items or labours, compared with the average cost of facing bricks at £67/m².
2. Fibre cement profiled sheet cladding and metal profiled/flat sheet cladding systems (NBS Section H30 and H31). Provided by all three price books noting varying specifications: Simple Marley Eternit Panels, 0.70mm thick galvanised steel sheets, 60 to 80mm thick composite panel cladding by Kingspan and specialist rates for single and double skin insulated corrugated panels and single sheet 0.55mm and 0.75mm thick galvanised sheet composite wall panels. These types of sheets are normally used to clad structures in the agricultural and industrial sectors, and smaller structures in the domestic sector (garages, sheds and small out buildings). They are normally fixed to steel structures. The rates quoted vary between £27.10/m² (simple sheet construction) to £90.98/m² (for double skin insulated sheets) depending on the type of sheet excluding any backing sheets or frame. Although some sheets are cheaper than the facing brick option, with an average cost of £67/m², this has been discounted from this exercise as it was considered not suitable for the type of building reviewed.

Client- Brick Development Association
Title – Cost of Comparative Cladding Materials

3. Natural/cast stone slab cladding systems (NBS Section H52). Laxtons provide rates for slabs 20mm to 30mm thick in English blue/grey slate facings, in various positions. BCIS Wessex provides rates for 20mm thick in 'reconstructed' stone facings. The rates quoted vary between £82.99/m² (for reconstructed stone facings) to £442.30 for blue/grey slate facings excluding any block wall backing. Taking into account an average rate of £27.91/m² for 100mm thick block wall backing (refer to details contained in Appendix 5), this system would cost between £110.90/m² to £470.21/m² respectively without considering any linear metre items or labours, compared with the average cost of facing bricks at £67/m². Not included in this exercise as there was not enough data across the major price books to produce an average figure.

Study 2 is the Live Projects Review

Please refer to that contained in Appendix 6. This has not changed from our report issued under cover of our email dated 17 October 2007 (refer to Appendix 3 for details of this).

We have simply averaged the rates noted in the Bills of Quantities as follows, noting the cheapest first:

1. Painted plain render to block walls, an average combined rate of £39.32/m² (including 100mm thick block backing), based on two Bills of Quantities items
2. Galvanised mild steel profiled sheeting to steel frame, a rate of £40.00/m² based on one Bill of Quantities item
3. Coloured cement lime mortar to block walls, a combined rate of £41.81/m² (including 100mm thick block backing), based on one Bill of Quantities item.
4. Timber rainscreen cladding fixed to timber to steel frame, a combined rate of £42.77/m² (including 19mm marine plywood backing), based on one Bill of Quantities item. Please note that where curved on plan, we found a combined rate of £49.73/m² including the backing based on one Bill of Quantities item.
5. Profiled sheeting, of various types, to steel and other backing (not known), an average rate of £48.98/m² based on four Bills of Quantities items
6. Half brick walls in facing bricks, of various types, an average rate of £53.71/m², based on 27 Bills of Quantities items. Please note that where curved on plan to various radii, we found an average rate of £69.59/m², based on four Bills of Quantities items.
7. Fibre cement sheeting fixed to block walls, a combined rate of £65.83/m² (including 100mm thick block backing), based on one Bill of Quantities item
8. Proprietary render systems (excluding Sto render – refer to item 10) to block walls, an average combined rate of £67.40/m² (including 100mm thick block backing), based on three Bills of Quantities items.
9. Painted proprietary render systems to block walls (excluding Sto render – refer to item 10), a combined rate of £68.41/m² (including 100mm thick block backing and paint), based on one Bills of Quantities item. Please note that where curved on plan, we found a combined rate of £108.38/m² including backing based on one Bills of Quantities item
10. Sto. render system to block walls, an average combined rate of £71.92/m² (including 100mm thick block backing), based on four Bills of Quantities items. Please note that where curved on plan an average combined rate of £69.54/m² including backing, based on two Bills of Quantities items. Although the average looks smaller than that noted for straight work, the answer has been affected by a one low rate, note the rates included for project fourteen, a school in Northern Ireland.
11. Timber weatherboarding fixed to block walls, an average combined rate of £74.01/m² (including 100mm thick block backing), based on two Bills of Quantities items. There are other similar Bills of Quantities items, however we could only identify the external weatherboarding rate or where weatherboarding is fixed to steel, therefore these items have been excluded from this review as we cannot complete an answer.
12. Insulated external render system to block walls, an average combined rate of £105.64/m² (including 100mm thick block backing), based on three Bills of Quantities items.
13. Plastic rainscreen cladding fixed to block walls, a combined rate of £126.98/m² (including 100mm thick block backing), based on one Bills of Quantities item.
14. Natural stone faced elevations, of various types and thickness, an average rate of £146.01/m², based on four Bills of Quantities items.

Client- Brick Development Association
Title – Cost of Comparative Cladding Materials

15. Rigid sheet cladding systems, various specifications and types, an average combined rate of £260.49/m2 (including 100mm thick block backing), based on six Bills of Quantities items.
16. Ditto to wood backing (not included), an average rate of £305.00/m2 based on two Bills of Quantities items.
17. Glass block walling systems, various specifications and types, an average rate of £391.35/m2 based on three Bills of Quantities items.
18. Curtain walling systems, various specifications and types, an average rate of £428.21/m2 based on six Bills of Quantities items.
19. Patent glazing systems, Kalwall system, an average rate of £464.55/m2 based on two Bills of Quantities items.

It should be noted that items 17 to 19 are for the complete wall system, whereas the other items only take into account the external skin.

Summary and Conclusions

Two studies were carried out to compare the cost of the external skin of brickwork with alternatives.

- Prices were taken from major published price books used in the industry.
- Prices were taken from Bills of Quantities for actual schemes.

The following tables show the relative cost of facing bricks at £200.00/1,000, £275.00/1,000 and £350.00/1,000 to other options used in the price book comparison.

Study 1 - Price Book Comparison (Cheapest First)- Bricks at £200.00/1,000	
<i>Finish Type</i>	<i>Index¹</i>
Simple single fibre cement/steel profiled sheet to steel (£27.10/m2)	44
Facing brick option (£61.00/m2)	100
Painted plain rendered block faced walls (£62.00/m2)	101
Block with Tyrolean rendered face - no additional paint applied (£72.00/m2).	118
Pebbledash render on block walls (£74.00/m2)	121
Double skin fibre cement/steel profiled sheets (£90.98/m2)	149
Timber weatherboarding on block walls (£98.00/m2)	159
PVC cladding on block walls (£98.00/m2)	160
Plain tile finish on block walls (£113.00/m2)	183
Rigid sheet cladding systems on block walls (average rate £112.63/m2)	184
Natural/cast stone cladding systems to block backing (average rate £290.46/m2)	476
Stonework (ashlar) finish option (£768.00/m2)	1249

Client- Brick Development Association
Title – Cost of Comparative Cladding Materials

Study 1 - Price Book Comparison (Cheapest First)- Bricks at £350.00/1,000	
<i>Finish Type</i>	<i>Index¹</i>
Simple single fibre cement/steel profiled sheet to steel (£27.10/m2)	37
Painted plain rendered block faced walls (£62.00/m2)	85
Block with Tyrolean rendered face - no additional paint applied (£72.00/m2).	99
Facing brick option (£73.00/m2)	100
Pebbledash render on block walls (£74.00/m2)	102
Double skin fibre cement/steel profiled sheets (£90.98/m2)	125
Timber weatherboarding on block walls (£98.00/m2)	134
PVC cladding on block walls (£98.00/m2)	134
Plain tile finish on block walls (£113.00/m2)	154
Rigid sheet cladding systems on block walls (average rate £112.63/m2)	154
Natural/cast stone cladding systems to block backing (average rate £290.46/m2)	397
Stonework (ashlar) finish option (£768.00/m2)	1048

Study 1 - Price Book Comparison (Cheapest First)- Bricks at £275.00/1,000	
<i>Finish Type</i>	<i>Index¹</i>
Simple single fibre cement/steel profiled sheet to steel (£27.10/m2)	40
Painted plain rendered block faced walls (£62.00/m2)	92
Facing brick option (67.00/m2)	100
Block with Tyrolean rendered face - no additional paint applied (£72.00/m2).	107
Pebbledash render on block walls (£74.00/m2)	110
Double skin fibre cement/steel profiled sheets (£90.98/m2)	135
Timber weatherboarding on block walls (£98.00/m2)	146
PVC cladding on block walls (£98.00/m2)	146
Plain tile finish on block walls (£113.00/m2)	167
Rigid sheet cladding systems on block walls (average rate £112.63/m2)	168
Natural/cast stone cladding systems to block backing (average rate £290.46/m2)	435
Stonework (ashlar) finish option (£768.00/m2)	1140

Notes:

1. Total cost expressed as an index of brick outer skin option = 100.
2. The comparison figures come from the details contained in Appendix 5 of this report, refer to details against item 3 (average figures). Where this is not the case, the figure used to establish the ratio has been noted.
3. Includes the effects of the other finishes that have not been included in the measured exercise contained in Appendix 5 of this report, refer items 1 to 3 of the narrative related to study no. 1, price book comparison. Please note the contents of pages 5 and 6 above for details of this.

Client- Brick Development Association
Title – Cost of Comparative Cladding Materials

The following table illustrates the results of the live project review.

Study 2 – Live Project Review (Cheapest First as per details noted above)	
<i>Finish Type</i>	<i>Index¹</i>
Painted plain render to block walls.	73
Galvanised mild steel profiled sheet to steel.	74
Coloured cement mortar to block walls.	77
Timber rainscreen cladding fixed to steel.	80
Profiled sheeting of various descriptions fixed to steel and other backing	91
Half brick walls in facing bricks.	100
Fibre cement sheeting fixed to block walls.	123
Proprietary render systems.	125
Painted proprietary render systems.	127
Sto. render systems to block walls.	134
Timber weatherboarding fixed to block walls.	138
Insulated external render systems to block walls.	197
Plastic rainscreen cladding systems fixed to block walls.	236
Natural stone faced elevations	272
Rigid sheet cladding systems (average of items 15 and 16).	526
Glass block walling systems	729
Curtain walling systems	797
Patent glazing systems	865

Notes:

1. Total cost expressed as an index of brick outer skin option = 100.
2. Refer to details related to study no. 2, live projects review. Please note the contents of pages 6 and 7 above.

In conclusion:

- Brick is a competitive option for the external skin.
- Most of the options that are less expensive in the study, fall within the range of available facing bricks.
- The external skin cost based on a brick cost of £200/1,000 is similar to the cost of a painted, plain rendered faced block wall.
- The less expensive sheeting options are likely to have a lower life expectancy than facing brick.
- The painted/rendered finish option/s is likely to have higher life cycle costs.

Appendix 1

Bricks as a Cladding Material – Comparative Cost Study

Appendix 2

Alternative Specification Review issued under cover of our email dated 12 April 2007

Appendix 3

Live Project Review issued under cover of our email dated 17 October 2007

Appendix 4

Details of Apartment Block (4 no. drawings)

Appendix 5

Study 1 – Price Book Comparison Spreadsheets (9 no. sheets)

Appendix 6

Study 2 – Live Projects Review Spreadsheet (7 no. sheets)