Guide to the Housing Corporation's Life Cycle Cost Measure for Social Housing

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A New Life Cycle Cost Measure for the Housing Corporation

Context

The Housing Corporation, in order to promote life cycle costing as part of its value for money agenda, introduced a life cycle cost measure in its funding arrangements for 2006-2008.

The measure was based on a research report '*Whole Life Cost of Social Housing'* produced by BCIS in 2003

The life cycle cost measure was a target percentage of the Net Present Value (NPV) of Housing Association maintenance costs over 100 years, to capital costs of 85%

Following feedback from Housing Associations and Comments from the National Audit Office the Housing Corporation have:

- Revised the target to reflect the Housing Associations maintenance costs over 60 years
- Produced this report offering guidance on the assumptions made in calculating the target to assist associations in making a meaningful comparison with their own life cycle cost calculations.

It should be stressed that the purpose of the target is to promote the use of Life Cycle Costing as a means of producing better housing.

Where associations produce life cycle cost plans for their schemes and/or consider life cycle costs in developing their standard designs, then reporting the results should not be a burden. If they do not, it may be.

Good practice is not a burden, playing lip service to it is.

The new Life Cycle Cost Measure

The revised measure which will apply to the next funding round is a NPV target maintenance costs as a percentage of capital costs of 80%.

$$\frac{\textit{NPV* of Housing Associations Maintenance costs}}{\textit{Capital cost}} \times 100 = 80\%$$

NPV* = Net Present Value over 60 years at 3.5% discount rate

Making Comparisons with the new Life Cycle Cost Measure

Inevitably there will be differences between the Life Cycle Cost calculations carried out by individual Housing Associations and those carried out by BCIS. These will result from three main factors:

- *The Scope*, i.e. variations in what has been included.
- *The Period*, i.e. calculations over periods other than 60 years
- *The Discount rate* used

The following sections describe the BCIS assumptions and gives some indication of the impact of using different assumptions.

The Scope

The maintenance costs are intended to reflect only those areas of work that are the responsibility of the Housing Association. The scope will differ from Housing Association to Housing Association.

The BCIS calculations include:

- Maintenance, refurbishment, replacement and external redecoration of the fabric of the dwellings
- Internal redecoration on change of tenancy, tenants changing on an average 6-year cycle
- Maintenance gas central heating and security and alarm systems
- Refurbishment including replacing fittings on change of tenancy on a 12-year cycle
- Refurbishment including replacing heating installation on change of tenancy on a 24-year cycle
- Refurbishment including the change of electrical installations on change of tenancy on a 30 year cycle
- Maintenance, refurbishment, replacement and external and internal redecoration of common parts
- Cleaning common parts
- Cleaning to fabric when associated with maintenance e.g. washing window frames, cleaning out gutters etc. (Note: It has been assume that

window glass is cleaned externally when frames are cleaned but not otherwise.)
- Maintenance of external works

BCIS calculations exclude
- Tax
- Energy costs
- Residual value
- Defects, vandalism or accidental damage
- Tenants domestic cleaning
- Internal redecoration of the private parts of dwellings, except at change of tenant
- Maintenance costs associated with roads and mains sewers (as these will be adopted and no future cost will accrue to the RSL)
- Repair and redecoration to voids between the 6-year cycles
- The cost of final demolition. Including demolition at 60 years increases the NPV of the maintenance costs to capital cost percentage by less than 1%

The Period
The BCIS calculations are based on a 60-year life at a discount rate of 3.5%.

The following table indicates the impact of changing the life of the building on the cost of maintenance as a percentage of capital costs, based on 3 bed, 5 person semi-detached house.
Table 1: Impact of changing period of calculation

Building life	Percentage
40 years	65%
60 years	80%
100 years	85%

The Discount Rate
The BCIS calculations are based on the Treasury's test discount rate of 3.5% over 60 years.

The following table indicates the impact of changing the discount rate on the cost of maintenance as a percentage of capital costs, based on 3 bed, 5 person semi-detached house.
Table 2: Impact of changing discount rate

Discount rate	Percentage
2.5%	105%
3.5%	80%
4.5%	65%

The calculations

The life cycle costs models used in calculating the target
To assist the Housing Corporation in setting the life cycle costs target, BCIS modelled the life cycle costs associated with 6 dwelling types. The models created expanded on models originally commissioned by the DTI for use in calculating the Tender Price Index of Social Housing (TPISH). From these TPISH models, BCIS produced detailed quantity models in the form of spreadsheets that include allowances for substructure and external works elements conforming to the Housing Corporation's standard Works Cost component allowances – substructure at 16.27% of Superstructure costs, External Works at 43.73%. Essentially, the cost models were expanded into elemental Bills of Quantities.

Table 1 below shows the 6 dwelling types for which BCIS created life cycle cost models .

Table 3: Dwelling types modelled

Dwelling type	***Size and built form***
3 Bedroom / 5 Person Terrace House	85m², 2 storey
3 Bedroom / 5 Person Semi detached House	85m², 2 storey
4 Bedroom / 7 Person Terrace House	110m², 2 storey
1Bedroom / 2 Person Flats	50m², in 2 storey block of 4 flats
2 Bedroom / 3 Person Flats	62.2m², in 2 storey block of 8 flats
2 Bedroom / 4 Person Flats	65.6m², in 3 storey block of 6 flats including lift

The results

Dwelling Types

The calculations were based on 4th Quarter 2006 costs.

Maintenance costs as a percentage of capital cost for six dwelling types are given in Table 4.

Table 5: Capital and maintenance costs by type of dwelling

Dwelling type	***Capital Cost***	***Maintenance NPV****	***Maintenance as % of Capital***
3B/5P Terrace	£73,153	£61,596	84%
3B/5P Semi	£78,564	£62,357	79%
4B/7P Terrace	£86,542	£69,786	81%
1B/2P Flat	£51,694	£40759	79%
2B/3P Flat	£56,879	£43,949	77%
2B/4P Flat	£77,007	£57,093	74%

** NPV over 60 years at 3.5% discount rate.*

Elements

The elements with the highest maintenance to capital cost ratios are generally those that are included in major refurbishments, mainly the services elements and the fittings. Conversely external works also has a high ratio because of the constant repletion of fairly small items of work, particularly grass and planted areas, which need constant maintenance at some times of the year.

Table 5 shows the elements where maintenance costs as a percentage of capital costs are highest, based on 3 bed, 5 person semi-detached house.

Table 5 Elements with the highest maintenance to capital ratio

Element	***Maintenance* as % of Capital***
Fittings	210%
External Works	148%
Heating	133%
Electrical Installation	118%
Wall finishes	92%

** NPV over 60 years at 3.5% discount rate.*

Table 6 shows the maintenance to capital ratios elements by element for the 3 bed, 5 person semi-detached house.

Table 5: Capital and maintenance costs by type of dwelling

Element	***Capital Cost***	***Maintenance NPV****	***Maintenance as % of Capital***
Foundations	£7,990	0	0%
Upper Floor	£1,629	£77	5%
Roof	£5,701	£1,210	21%
Stairs	£881	£421	48%
Ext. Walls	£7,460	0	0%
Chimney	0	0	-
Windows	£2,675	£1,799	67%
Ext. Doors	£1,901	£1,333	70%
Int. Walls	£4,531	£856	19%
Int. Doors	£3,572	£2,272	64%
Wall Finish	£2,701	£2495	92%
Floor Finish	£1,520	£621	41%
Ceiling Finish	£1,516	£651	43%
Fittings	£2,523	£5,309	210%
Sanitary	£2,152	£1230	57%
Hot & Cold water	£2,128	£2,100	99%
Heating	£4,624	£6,144	133%
Electrical and lift	£3,459	£4,083	118%
Gas	£128	0	0%
Site works	£12,347	£23,121	187%
Drainage	£5,206	£3,790	73%
Ext. Services	£3,919	£4,846	124%
Total	£78,564	£62,357	79%
Demolition		0	

** NPV over 60 years at 3.5% discount rate.*