

Appendix G
Stock Condition Survey Final Report

West Dunbartonshire Council
Stock Condition Survey – Final Report
September 2005

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**WEST DUNBARTONSHIRE COUNCIL
STOCK CONDITION SURVEY**

1.0 EXECUTIVE SUMMARY

- 1.1 In accordance with your instructions we have undertaken a stock condition survey of your housing stock with a view to assessing the current and future repairs and maintenance liability. We have surveyed a representative sample of 15% of the Council's housing stock of 12,458 units based on the different property types and locations.
- 1.2 Whilst the stock has generally been well maintained on a day to day basis it has suffered from a lack of sustained planned maintenance investment. As a result, there are a significant number of major components that have reached/are reaching the end of their useful life and will require replacement in the short term.
- 1.3 The majority of properties have pitched roofs which are covered in a mixture of concrete tiles, natural slates and clay tiles. Whilst the pitch roof coverings are generally in satisfactory condition at the present time, a significant re-roofing programme will be required during the next 20 years. The Council has had a significant programme of installing PVCu double glazed windows and virtually all properties have benefited from this work. Whilst there has been a recent programme of renewing front and back doors many are still original and, whilst serviceable, would benefit from replacement with modern secure doors. Most wall finishes are either pointed or rendered brick work and although currently in reasonable condition a significant programme of re-pointing / re-rendering will be required during the next 15 years. Environmental issues such as paths, fences and boundary walls have not been a priority and some areas are in need of attention.
- 1.4 Internally, many of the kitchens and bathrooms are original and need modernisation. Most properties have some form of central heating and whilst the Council has had a significant programme of renewing the older systems, there remain a large number that will require renewal in the next 10 years. Additionally there are a number of properties which have a partial heating systems that would benefit from been upgraded to full. Although serviceable the wiring is generally in poor condition and over a third of the stock needs re-wiring/upgrading over the next 10 years.

- 1.5 The stock includes 4,003 properties of non-traditional construction including a number of PRC (Prefabricated Reinforced Concrete) properties and 1,760 high rise properties. Curtin's Consulting, a firm of Structural Engineers, have carried out more detailed due diligence into the condition of these properties and the findings from their exercise have been incorporated into our results
- 1.6 We have made an assessment of the total repairs and maintenance costs of the stock for the next 30 years. The total cost per unit on repairs and maintenance is £47,495. These costs are based upon today's prices. They are inclusive of preliminaries but are exclusive of professional fees, VAT, management and administration costs, or any decanting costs in the event that this is necessary. In calculating our costs, we have adopted unit rates for replacement of building components which reflect those currently being experienced in West Dunbartonshire. The rates also assumes large volume procurement and the benefits that can accrue from this.
- 1.8 As part of the survey we have assessed the properties against the Scottish Executives Scottish Housing Quality Standard. The standard was issued in February 2004 with the intention that all properties in Scotland meet the Standard by 2015. The Standard sets out clear criteria that a property needs to meet in order to be classified as meeting the standard. To meet the Standard a property must:
 - Be compliant with the tolerable standard
 - Free from serious disrepair
 - Energy efficient
 - Provided with modern facilities and services
 - Healthy, safe and secure
- 1.9 In accordance with a strict interpretation of the Scottish Housing Quality Standard, approximately 92% of the stock currently fail the standard and the majority of the remainder will fail between now and 2015 without sufficient investment. The investment programme we have identified will ensure that all properties are brought up to the Standard and are maintained at the standard for the next 30 years.
- 1.10 All information recorded during the stock condition survey has been loaded onto a Microsoft Access database and this has been used as the basis for analysing the data and producing the cost reports. This database will be provided to the Council.

2.0 INTRODUCTION

- 2.1 In connection with West Dunbartonshire Council's evaluation of the investment requirements of its housing stock, we were asked to submit a proposal for a Stock Condition Survey in November 2004. Our proposal submitted in November 2004 and following a presentation was subsequently accepted.
- 2.2 We have undertaken a representative sample of 15% of the main housing stock to provide reliable information on costs and programming of works. We worked with the Council to obtain the information we required, such as address lists, location plans, details of construction types, etc.
- 2.3 The survey work was undertaken during January and February 2005 and the survey data was subsequently loaded onto our computer system. A summary of all costs is included at **Appendix 1**, and a detailed elemental cost break down at **Appendix 2**.
- 2.4 The primary purpose of the Stock Condition Survey has been to assess the cost of the work required to bring all properties up to the Scottish Housing Quality Standard within the next 10 years and then to maintain them at that standard for 20 years thereafter.

3.0 PROPERTY DATABASE

- 3.1 A database of properties was provided by the Council which was used as the basis to select the sample and to extrapolate the costs from the survey. Great reliance has therefore been placed on the contents.
- 3.2 The housing stock totals 12,458 dwellings, which we have broken into the following archetypes:

Archetype	Total Stock
Houses and bungalows pre 1944	251
Houses and bungalows 1945-64	1,771
Houses and bungalows 1965-71	494
House and bungalows post 1971	805
Flats and Maisonettes pre 1944	1,710
Flats and Maisonettes pre 1945-64	4,521
Flats and Maisonettes pre 1965-71	2,094
Flats and Maisonettes post 1971	812
Total	12,458

4.0 SAMPLING TECHNIQUE

- 4.1 The purpose of the sampling process is to present a representative financial picture of the maintenance requirements of the stock using detailed surveys of a limited number of properties. The most straightforward approach to this is a simple random sample, however where characteristics are known in advance, there is benefit in creating a "stratified" sample. Typically, maintenance requirements will correlate closely with the characteristics of the sample data, thereby increasing the reliability of the results from a limited sample.
- 4.2 The properties within the archetypes within the areas are relatively similar and, as such, the sample survey has enabled us to produce an accurate financial picture of the repairs and maintenance liability of the stock as a whole.

5.0 METHODOLOGY

5.1 The Survey Team

- 5.1.1 The Savills team specialising in planned maintenance and stock condition surveys undertook the survey. The team of surveyors, all of whom are Chartered Surveyors or staff of similar standing, have extensive experience in mass survey projects and were fully briefed on the requirements of the survey before any inspections were carried out on site. The survey team was based in Dumbarton whilst the on site inspections were carried out.

5.2 Quality Control

- 5.2.1 Prior to survey commencement, a pro-forma was devised which was used for data collection. The information was gathered using handheld computers and later transferred onto our computer database for it to be checked, collated and validated. The methodology and survey objectives were shared and tested by the Savills survey team and the Council's housing maintenance surveyors during a days pilot survey held prior to the commencement of the main survey
- 5.2.2 In addition to a comprehensive briefing of all surveyors prior to commencing the inspections, de-briefing meetings were held with all surveyors at the end of each day to enable queries to be dealt with immediately. Spot checks were also made on site of completed surveys to check compliance with the agreed methodology.

5.3 Validation of Data

- 5.3.1 Once the surveys were completed, they were loaded onto our computer database and extensive validation was undertaken electronically to check for anomalies and inconsistencies.

6.0 REPAIR CATEGORIES

6.1 Programmed Renewals

- 6.1.1 These are defined as "the provision, which should be adequate to cover the periodic overhaul / refurbishment / renewal of the building components and landlords' fixtures and fittings, to keep the property in lettable condition".
- 6.1.2 All building elements have a natural life expectancy, at the end of which they have to be replaced. The life expectancies used in generating costs were based on the following:
- Industry standards.
 - RICS and BRE publications: "Life Expectancies of Building Components".
 - The Council's experience.
 - Our experience.
- 6.1.3 Our surveyors used their professional judgement to establish when a building component requires replacement and inserted the appropriate year on the survey form. For older building components or those which we believed to have a limited remaining life, our assessment was based on the condition as found on site during our survey.
- 6.1.4 We have only recorded those items that will require renewal within the next 30 years and those items falling outside that period have not been subject to a replacement cost within our report.
- ### **6.2 Improvements**
- 6.2.1 Improvement work generally involves the installation of components that do not currently exist at a property but would enhance the property. We set out below a list of the improvements that we have assessed as part of the survey:

- Upgrade partial heating
- Install full heating
- Cavity wall insulation
- Mechanical extract fan kitchen
- Mechanical extract fan bathroom
- Wired smoke detectors
- Entryphone

6.2.2 We have profiled the improvements identified over the first 5 years following discussions with the West Dunbartonshire Council's Officers.

6.3 Contingent Major Repairs

6.3.1 Contingency major repairs are defined as repairs of a kind, which cannot be specifically foreseen and may arise from latent defects in construction. We have allowed a provision of 3% on catch-up repairs, improvements and programmed renewals over the 30-year period.

6.3.2 The allowance is specifically in respect of unforeseen work that has not been identified elsewhere in the survey but, from both our experience and that of West Dunbartonshire Council, can be predicted as likely to occur. Examples include but are not limited to, cavity wall tie failure, uninsured subsidence/settlement, general structural defects, drainage failure and latent defects in construction.

6.4 Related Assets / Other costs

6.4.1 As part of the stock condition survey we have undertaken an assessment of the Council's financial obligation to maintain the stock's related assets. These would generally include but are not limited to garages, unadopted roads and footpaths, play areas, hard standings and shops.

6.4.2 We have reviewed current Council expenditure and have allowed a provision of £622,900 per annum for the 30-year cost profile. This cost is exclusive of VAT and administration charges. We have assumed that miscellaneous works required to the various assets will be picked up as part of the day to day maintenance budget.

6.5 Asbestos Removal

- 6.5.1 We have not undertaken a detailed asbestos survey as part of this exercise. However based on recent asbestos removal cost experienced by the Council we have made a total provisional of £10,812,423 for asbestos over the next 10 years to coincide with the programmes of work that we have identified. This cost is purely for the over and above costs associated with the removal of the asbestos and does not take into account the replacement of the component removed, making good, decanting costs or the potential related management costs of any asbestos.

6.6 Response and Void Property Maintenance

- 6.6.1 Responsive and Void property maintenance is defined by the OPDM as "maintenance arising from the landlord's obligation to carry out repairs to a property, either upon a tenant's request or arising from staff inspection or in connection with the re-letting of a property".
- 6.6.2 The Council provided us with information on the levels of expenditure currently being experienced for both responsive and void property maintenance. We have analysed this information and have made an allowance of £6,266,475 per annum for the 30 year period. These costs are exclusive of VAT and administration charges.

6.7 Cyclical Maintenance

- 6.7.1 Cyclical Maintenance is defined as "maintenance and servicing, generally similar to that stated for programmed repairs". However, it is more specifically identified as various items recurring on an annual basis and the servicing of installations.
- 6.7.2 For cyclical property maintenance we have reviewed the information supplied by the Council and allowed a provision of £1,677,122 per annum for the 30 year profile. This cost is exclusive of VAT and administration charges.

6.8 Non-traditional Properties

- 6.8.1 Part of the Councils housing stock includes 4,003 properties of non-traditional construction. Curtins Consulting Engineers have assessed the work required to the structure of all of these properties to retain them for the 30 year period of the business plan.

- 6.8.2 They have undertaken a stage 1 preliminary structural risk assessment and a summary of their findings is included at **Appendix 3** and the cost of work that they have identified have been incorporated into our summary of costs at **Appendix 1**.

6.9 High Rise Structure

- 6.9.1 Curtin Consulting Engineers have also undertaken a detailed due diligence exercise to determine the extent of the structural works required to the tower blocks in order to retain them over the next 30 years.
- 6.9.2 A summary of their finding is included at **Appendix 3** and the cost of the work that they have identified has been incorporated into our summary of costs at **Appendix 1**.

6.10 Environmental Improvements

- 6.10.1 Following discussions with West Dunbartonshire Council, we have made an allowance of £12,458,000 over the first 10 years in respect of general Environmental Improvement works. This will cover work not identified in the stock survey such as additional fencing, landscaping, lighting, enhanced security measures etc. There is almost limitless work that could be undertaken in this regard but the provision we have made is to cover the areas in most need of this type of work.

7.0 SCOTTISH HOUSING QUALITY STANDARD ASSESSMENT

- 7.1 As part of our survey we have made an assessment of the level of non-compliance in the housing stock against the Scottish Housing Quality Standard. This assessment has been measured in accordance with the guidelines set out by Scottish Executive at **Appendix 4**.
- 7.2 We have identified that approximately 92% of properties fail this assessment, however, of more concern is that we predict the remainder of the stock will fail the standard by the year 2015 if the work we have identified is not undertaken.
- 7.2 The works identified in the first 10 years of our costs will bring the currently non-compliant properties up to the standard and prevent further properties becoming non decent. The works identified in the following 20 years will ensure the properties will not fall below the standard during this period.

7.3 A home that meets the standard, as described by Scottish Executive, is one must meet the following criteria:

- compliant with the tolerable standards;
- free from serious disrepair;
- energy efficient;
- provided with modern facilities and services;
- healthy, safe and secure.

More details of these headings is set out on the following pages.

A – It is compliant with tolerable standard

The Tolerable Standard was defined in Section 86(1) of the Housing (Scotland) Act 1987 and updated in Section 6 (102) of the Housing (Scotland) Act 2001. A dwelling meets the Standard if it:

- is structurally stable;
- is substantially free from rising or penetrating damp;
- has satisfactory provision for natural and artificial light, for ventilation and for heating;
- has an adequate piped supply of wholesome water within the property;
- has a sink provided with a satisfactory supply of both hot and cold water;
- has a fixed bath or shower and a wash-hand basin, each provided with a satisfactory supply of both hot and cold water and suitably located;
- has a water closet available for the exclusive use of the occupants of the property suitably located;
- has an effective system for the drainage and disposal of foul and surface water;
- has satisfactory facilities for cooking food;
- has satisfactory access to all external doors and outbuildings.

Failure to meet any of the standards above results in the dwelling being declared Below the Tolerable Standard (BTS). The number and location of BTS dwellings is a topic of considerable policy importance and it is therefore very important that an accurate assessment of tolerability is undertaken.

It should be remembered that a property which passes the standard is not necessarily a desirable dwelling or one in a good state of repair, but that dwellings must be lacking in basic amenities, or be in an extremely poor condition, to actually fail.

B – Is it free from serious disrepair

Dwellings which fail to meet this criterion are those where either:

- one or more of the primary building components needs replacing or major repair; or
- two or more of the secondary building components needs replacing or major repair.

C – It is energy efficient

A property which is energy efficient has:

- effective insulation;
- efficient heating;
- has additional energy efficiency measures (where technically feasible) to ensure that the property must achieve a minimum NHER rating of 5 and SAP rating of 50.

D – Provided with modern facilities and services

A property which passes this criteria would have:

- a bathroom, that would include a WC, bath or shower and wash hand basin in good and usable condition;
- a kitchen in good and usable condition;
- the kitchen must have reasonable facilities, these being;
 - adequate storage facilities where practical;
 - safe kitchen working arrangements;
 - sufficient power outlets.

E – Healthy, safe and secure

A property with is healthy, safe and secure will

- be free from lead pipework;
- have mechanical extract fan if necessary;
- adequately insulated from external noise;
- have smoke detectors;
- have safe electrical, gas and oil appliances where applicable
- common areas in a good and safe order, where applicable;
- provides adequate lighting in common internal and external areas;
- secure front and back doors;
- a front door entry system and secure rear access to enclosed common areas.

Full details of the Scottish Housing Quality Standard are included at **Appendix 4**.

8.0 LEVELS OF PRICING

- 8.1 The work recorded as part of the Stock Condition Survey has been priced using a Schedule of Rates, a copy of which is included at **Appendix 5**. The Schedule has been based on the Council's experience of letting contracts locally and our experience with other Local Authorities with similar numbers and types of property.
- 8.2 If the work is planned and procured correctly, we believe that the unit rates identified can be achieved. However, poor planning/procurement could result in large volumes of work put on the market at the same time resulting in "overheating" and cost increases as a consequence.

9.0 COST REPORTS

- 9.1.1 We have made an assessment of the total repairs and maintenance costs of the stock and a summary of all costs is included at **Appendix 1** and an elemental breakdown of costs is included at **Appendix 2**. All costs are exclusive of management and administration charges, professional fees, any decanting costs and VAT. All costs are on a day one basis and take no account of future inflation.

10.0 ENERGY ASSESSMENT

- 10.1 As part of the stock condition survey, we have undertaken an assessment of the energy performance of the properties by carrying out an NHER Enhanced Level 0 survey. The data collected has been processed by our energy consultants, Powergen Energy Solutions, and they have analysed the results and prepared a report with their findings. A copy of this report is included at **Appendix 6**.

10.0 DATABASE

- 10.1 In the first instance, we have loaded all survey data into our own specialist software to enable us to validate the survey results, undertake the necessary analysis and produce the cost reports. The completed survey database has been provided to the Council in Microsoft Access 2000.

11.0 LIMITATIONS OF SURVEY

- 11.1 The inspections and report are subject to the limitations set out at **Appendix 7**.

APPENDIX 1

SUMMARY OF ALL COSTS

West Dunbartonshire Council Stock Condition Survey

Savills

Grand Total							
Element	Years 1 to 5	Years 6 to 10	Years 11 to 15	Years 16 to 20	Years 21 to 25	Years 26 to 30	30 year total
Programmed renewals	£45,171,601	£45,171,601	£35,164,309	£41,971,606	£41,382,424	£29,075,630	£237,937,171
Improvements	£675,650	£675,650	£0	£357,850	£357,850	£0	£2,067,000
Contingent Major Repairs @ 5%	£2,292,363	£2,292,363	£1,758,215	£2,116,473	£2,087,014	£1,453,782	£12,000,209
Related Assets	£1,537,250	£1,537,250	£1,537,250	£1,537,250	£1,537,250	£1,537,250	£9,223,500
Asbestos Contingency	£4,611,750	£4,611,750	£0	£0	£0	£0	£9,223,500
Responsive/Void Maintenance	£34,507,110	£34,507,110	£34,507,110	£34,507,110	£34,507,110	£34,507,110	£207,042,660
Cyclical Maintenance	£8,301,150	£8,301,150	£8,301,150	£8,301,150	£8,301,150	£8,301,150	£49,806,900
Non traditional properties	£11,405,425	£19,804,800	£151,000	£18,000	£431,050	£420,500	£32,230,775
High Rise	£15,436,599	£1,241,539	£121,020	£642,315	£705,300	£265,080	£18,411,853
Environmental improvements	£3,074,500	£3,074,500	£0	£0	£0	£0	£6,149,000
Grand Total	£127,013,398	£121,217,713	£81,540,054	£89,451,754	£89,309,148	£75,560,502	£584,092,568
Total per annum	£25,402,680	£24,243,543	£16,308,011	£17,890,351	£17,861,830	£15,112,100	£19,469,752
Total cost per property over 30 years		£47,495					
Price Base April 2005							

All costs are exclusive of Professional Fees, VAT, management and administration costs and are based on today's prices. Costs are inclusive of preliminaries.

APPENDIX 2

DETAILED ELEMENTAL COSTS

West Dunbartonshire Council Stock Condition Survey

Savills

Total Stock

12,298

2 Jun 2005

Programmed Renewals

Description	2005-09	2010-14	2015-19	2020-24	2025-29	2030-34	Total
Kitchen	£8,708,300	£8,708,300	£3,458,400	£6,309,600	£13,096,600	£4,191,000	£44,472,200
Kitchen storage	£158,500	£158,500	£0	£0	£0	£0	£317,000
Kitchen layout	£992,750	£992,750	£0	£0	£0	£0	£1,985,500
Kitchen elec sockets (6)	£301,200	£301,200	£0	£0	£0	£0	£602,400
Sanitary ware	£5,211,595	£5,211,595	£4,106,400	£3,811,700	£2,670,200	£3,809,300	£24,820,790
Central heating boiler	£3,509,600	£3,509,600	£3,252,400	£3,518,300	£3,500,900	£3,252,400	£20,543,200
Central heating carcass	£2,059,175	£2,059,175	£2,314,800	£2,686,600	£2,895,500	£2,569,600	£14,584,850
Room heating	£559,575	£559,575	£245,300	£850,050	£257,550	£243,550	£2,715,600
Electrics CCU	£539,300	£539,300	£798,900	£979,500	£420,300	£416,100	£3,693,400
Electrics wiring01	£2,914,600	£2,914,600	£3,730,600	£4,393,100	£1,097,500	£850,400	£15,900,800
Gas/Oil systems	£288,875	£288,875	£0	£0	£0	£0	£577,750
Electrical systems	£950,125	£950,125	£0	£0	£0	£0	£1,900,250
Ext ent doors 01	£1,616,600	£1,616,600	£847,200	£876,800	£1,417,050	£2,141,900	£8,516,150
Ext ent doors 02	£432,700	£432,700	£302,300	£470,600	£564,500	£642,900	£2,845,700
Secure front door	£28,800	£28,800	£0	£0	£0	£0	£57,600
Secure rear door	£16,900	£16,900	£0	£0	£0	£0	£33,800
Entry phone	£348,500	£348,500	£258,400	£145,000	£542,200	£258,400	£1,901,000
Lighting external	£633,875	£633,875	£0	£0	£1,267,750	£0	£2,535,500
Pitched roof	£2,280,038	£2,280,038	£2,691,238	£2,000,669	£2,349,205	£2,014,610	£13,615,798
Flat roof	£608,539	£608,539	£64,629	£474,208	£605,292	£152,811	£2,514,018
Chimney	£271,422	£271,422	£239,149	£76,283	£106,651	£420,505	£1,385,431
Flashings	£289,094	£289,094	£241,456	£281,523	£352,650	£183,892	£1,637,708
Fascia/soffit/barge	£884,239	£884,239	£270,372	£279,065	£111,638	£345,146	£2,774,699
Rainwater goods	£1,256,605	£1,256,605	£397,955	£597,590	£328,756	£644,644	£4,482,154
Porch	£40,673	£40,673	£30,036	£18,031	£13,332	£12,823	£155,568
Wall structure	£26,393	£26,393	£0	£0	£0	£0	£52,785
Wall finish 1	£4,404,757	£4,404,757	£4,172,193	£1,134,118	£436,007	£812,254	£15,364,086
Wall finish 2	£508,429	£508,429	£889,225	£306,981	£77,546	£102,206	£2,392,816
Wall finish 3	£54,410	£54,410	£17,392	£4,739	£9,735	£5,145	£145,830
Wall finish 4	£2,919	£2,919	£754	£3,637	£0	£0	£10,228
Windows - Single glazed	£0	£0	£0	£17,653	£0	£3,720	£21,373
Windows - Double glazed	£574,254	£574,254	£3,832,132	£10,360,359	£5,831,348	£1,509,550	£22,681,897
Rooflights	£406,710	£406,710	£71,174	£35,579	£2,868	£39,305	£962,345
Ext com doors	£278,119	£278,119	£250,379	£328,143	£265,069	£263,371	£1,663,199
Paths	£1,357,637	£1,357,637	£1,225,354	£317,709	£361,567	£721,215	£5,341,118
Fencing	£1,224,292	£1,224,292	£873,951	£1,001,619	£881,242	£1,453,259	£6,658,655
Boundary walls	£87,507	£87,507	£99,319	£17,903	£131,758	£110,081	£534,075
Retaining walls	£246,514	£246,514	£125,315	£160,494	£1,126,834	£990,696	£2,896,366
Gates	£157,767	£157,767	£81,035	£91,557	£59,794	£117,978	£665,898
Garage doors	£37,008	£37,008	£16,349	£12,602	£6,400	£65,777	£175,144
Garage roof	£30,899	£30,899	£6,060	£19,155	£12,145	£1,560	£100,718
Garage walls	£41,133	£41,133	£37,982	£40,840	£25,208	£9,853	£196,149
Stairs finish	£7,100	£7,100	£14,981	£19,163	£17,219	£7,970	£73,532
Corridor finish	£35,220	£35,220	£61,636	£44,927	£78,970	£18,174	£274,147
Comm doors	£351,833	£351,833	£20,705	£7,123	£371,558	£331,278	£1,434,330
Communal windows	£308,374	£308,374	£76,865	£277,588	£89,582	£135,959	£1,196,742
Communal rooflights	£16,620	£16,620	£2,792	£1,098	£0	£2,034	£39,163
Lift	£112,132	£112,132	£39,181	£0	£0	£224,264	£487,709
Grand Total	£45,171,601	£45,171,601	£35,164,309	£41,971,606	£41,382,424	£29,075,630	£237,937,171
Total Per Annum	£9,034,320	£9,034,320	£7,032,862	£8,394,321	£8,276,485	£5,815,126	£7,931,239

All costs are exclusive of Professional Fees, VAT, management and administration costs and are based on today's prices. Costs are inclusive of preliminaries.

Stock Total = 1209

2 Jun 2005

Improvements

Description	2005-09	2010-14	2015-19	2020-24	2025-29	2030-34	Total
Upgrade partial heating	£215,900	£215,900	£0	£0	£0	£0	£431,800
Install full heating	£174,600	£174,600	£0	£72,700	£72,700	£0	£494,600
Wired smoke detectors	£134,850	£134,850	£0	£134,850	£134,850	£0	£539,400
Entryphone	£150,300	£150,300	£0	£150,300	£150,300	£0	£601,200
Grand Total	£675,650	£675,650	£0	£357,850	£357,850	£0	£2,067,000
Total Per Annum	£135,130	£135,130	£0	£71,570	£71,570	£0	£68,900

All costs are exclusive of Professional Fees, VAT, management and administration costs and are based on today's prices. Costs are inclusive of preliminaries.

APPENDIX 3

CURTIN'S STAGE ONE RISK ASSESSMENT



**STAGE ONE
PRELIMINARY STRUCTURAL RISK ASSESSMENT**

OF

**NON-TRADITIONAL AND MULTI-STOREY HOUSING STOCK
IN
WEST DUNBARTONSHIRE**

PREPARED FOR

**WEST DUNBARTONSHIRE COUNCIL
GARSHAKE ROAD
DUMBARTON**

Per

**ARNEIL JOHNSTON
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**Our Ref 22542/PPR/18675/LCC
Date: February 2005**

**Stage One Preliminary Structural Risk Assessment
of
Non-Traditional and Multi-Storey Housing Stock
in
West Dunbartonshire**

**22542/PPR/18675/LCC
February 2005**

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Date: **February 2005**

Amendment Record

Date	Description of Amendments	References

**Stage One Preliminary Structural Risk Assessment
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Non-Traditional and Multi-Storey Housing Stock
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EXECUTIVE SUMMARY

Curtins Consulting Engineers plc were commissioned on 29th September 2004 by Arneil Johnston to undertake a Stage 1 Preliminary Structural Risk Assessment of both the non-traditional and high-rise housing retained by West Dunbartonshire Council. The appraisal included consideration of the structural form, history and structural condition to enable an opinion to be offered regarding the likelihood of the stock achieving a further thirty year life.

The investigations comprised an initial appraisal based on information held by the Council, meetings with Council Housing Officers and visual inspections of selected properties. The following summarises the results of the investigations.

Non Traditional Properties

Generally the Non Traditional Housing within the ownership of West Dunbartonshire Council appears to be in an average structural condition. There are a number of structural defects observed during the investigations that are inherent to the construction types and given the extent of the stock, will attract significant financial investment.

The following table summarises our current opinion of the condition of non-traditional house types and the likelihood of achieving a further minimum thirty-year life, based upon our preliminary investigations. These recommendations are largely dependent on the quality and substance of information provided to us by the Council. Intrusive testing and investigations are required for properties classified as medium and high risk and on a smaller scale for those classified as low risk, to validate and confirm our preliminary assessment.

The properties are categorised as follows:-

- L) **Low risk:** Properties appear from information made available and visual surveys that they should, if maintained to a satisfactory level, have a minimum further life of 30 years, and are therefore considered to offer a low risk in terms of future expenditure with respect to undertaking structural remedial works.

- M) Medium risk:** Properties offering a measure of concern based on information made available and visual surveys conducted to date such that the property should have a minimum further life of 30 years with moderate expenditure. These properties are therefore considered to offer a medium risk in terms of future expenditure with respect to structural works. The level of such costs is subject to review following stage 2 investigation.
- H) High risk:** Properties offering significant concern regarding their structural stability and may only achieve a further life of 30 years with significant expenditure. These properties are therefore considered to offer a high risk in terms of future expenditure with respect to structural works. In certain cases demolition may be a more realistic option. The level of such costs is subject to review following stage 2 investigations.

Non-Traditional Construction Type	No	Risk Category		
		L	M	H
ATHOLL STEEL	275			✓
ATHOLL STEEL/ BRICK (ATSB)	12	✓		
AYRSHIRE COUNTY COUNCIL	4			✓
BELLSTONE	66	✓		
BLACKBURN BRICK	569		✓	
BLACKBURN ORLIT	2			✓
BRITISH IRON & STEEL FEDERATION	25		✓	
CANADIAN TIMBER FRAMED/BRICK	1		✓	
CONCRETE FRAME	7	✓		
CONCRETE WALL PANEL SYSTEM "REEMA"	26		✓	
CONCRETE WALLS MILLER NO FINES	1	✓		
CONCRETE WALLS WIMPY NO FINES	119	✓		
CRAIG ATHOLL	4		✓	
DUGDALE DENNIS	27		✓	
DUPLEX FOAM SLAG	407		✓	
HILCON EX	86	✓		
HILLS PRESWELD/HILCON	27			✓
KANE BRICKWOOD	21		✓	
LAWRENCE MARK 1	83		✓	
LEVENVALE TIMBER	27	✓		
NO FINES	1052		✓	
ORLIT	117			✓
ORLIT (PITCHED ROOF) (ORLT)	29			✓
ORLIT NO FRAME (SCOTCON)	129	✓		
SWEDISH TIMBER	18		✓	

Cont./

Non-Traditional Construction Type	No	Risk Category		
		L	M	H
TIMBER FRAMED WEIR MULTICOM	30	✓		
TIMBER FRAMED/BRICK WALLING	22	✓		
TIMBER KIT	217	✓		
WEIR TIMBER	55		✓	
WHITCON	1		✓	
WHITSON FAIRHURST	544			✓
TOTAL		4003		

Multi-Storey Properties

14% of the housing stock exists as high rise. All twenty six blocks exist within Dumbarton and Clydebank districts. The six 15 storey No-fines blocks in Dalmuir offer more problems than the six 12 storey variant in North Drumry. Those in Dalmuir are seen as high risk and are recommended for over-cladding in years 1-5. The type of overcladding system can only be determined following intrusive testing of the no-fines substrate. In general, insulated thin coat renders are assumed to be satisfactory for the purposes of developing the costs but the quality of the no-fines will require confirmation.

The seven blocks of Crudens Skarner, all in Dumbarton, are slightly higher at 16 storeys. The precast cladding panels indicate there are ongoing water penetration issues and a number of blocks have been provided with retrospective weep holes for drainage to the interstitial space. The properties are viewed as high risk and it is recommended that all seven will require a rainscreen system to be installed.

The three high rise blocks at Clydebank East have been overclad, although some problems have been experienced with the fixing of this system. In general it is assumed this will remain satisfactory, with routine maintenance, for the thirty year term. Re-roofing is anticipated later in the term for these blocks. The three at Clydebank East are considered medium risk whereas the three high rise towers at Mountblow are viewed as high risk albeit that they are of the same construction format. Overcladding for the three Mountblow blocks will be necessary in years 1-5.

The eight storey, cross wall property at Mountblow was not viewed and as such, a provisional sum is allocated against this to allow for over cladding and re-roofing.

High Rise Construction Type	No	Risk Category		
		L	M	H
CONCRETE FRAME WITH CONCRETE WALL PANELS (COFR)	519		✓	✓
CONCRETE FRAME WITH NO FINES WALLING (COFR)	794		✓	✓
CROSSWALL	29		✓	
CRUDENS SKARNER SYSTEM	418			✓
TOTAL	1760			

It is understood that in excess of 80% of the housing stock have received cavity wall insulation, during the last five years. It is considered that the retrospective installation of cavity wall insulation can cause degradation of the building fabric. Given the extent of post-construction cavity wall insulation across the stock, it is considered there is an increased risk of defects becoming apparent in future years. Where cavity insulation has been used on non-traditional properties this could accelerate the deterioration of the critical load-bearing members, particularly in steel and concrete framed systems. It is considered important that further intrusive investigative work be undertaken, to gain a clearer understanding of the potential structural risk associated with this installation and its long term impact on the stock.

It is recommended that intrusive surveys, as described above, be undertaken to approximately 1-2% of the non traditional housing stock, to determine the current condition of the existing wall tie, external wall construction and cavity insulation. Properties will be selected across the three management districts and the investigations will target those properties considered to be high risk based on their geographic location, altitude, exposure within the local topography and the orientation of properties and elevations subjected to the greater exposure.

Recommended Repair Costs

On the basis of the findings of the investigations budget costs have been generated to ensure a future 30-year life of the properties. The following summarises the anticipated costs for elements of structural repair recommended within this report, for both the high-rise and non-traditional housing.

The costs detailed, are in addition to those normally allocated for principal component replacement e.g. windows, doors etc, general maintenance and upkeep of non-traditional and high rise properties. Consequently, any elements of repair deemed to be covered under routine maintenance are excluded from these recommendations.

All costs exclude contractor's preliminaries, contingencies, fees, statutory costs and VAT.

Management District	Property Type	No	Estimated Cost
Alexandria	Non Traditional	1784	£14,710,200
Dumbarton	Non Traditional	685	£3,732,250
Clydebank	Non Traditional	1534	£14,820,825

Total	4003	£33,263,275
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Management District	Property Type	No	Estimated Cost
Alexandria	Multi-storey	0	£0
Dumbarton	Multi-storey	418	£6,986,415
Clydebank	Multi-storey	1342	£11,425,438

Total	1760	£18,411,853
--------------	-------------	--------------------

1.0 INTRODUCTION

Curtins Consulting Engineers plc were commissioned by Arneil Johnston to undertake a Stage One, preliminary structural risk assessment of both the non-traditional and high rise housing stock retained by West Dunbartonshire Council.

The scope of the commission included the appraisal of all information made available by the Council including interviews with critical housing staff, to allow an assessment of the structural condition of the stock, and in particular the likelihood of the stock attaining a further thirty year life.

In producing this report we have: -

- Examined earlier reports of the non-traditional stock made available by the Council
- Met and discussed particular aspects of the stock's history with officers and staff of the Council.
- Undertaken visual inspections of the high-risk properties, noting the general appearance, condition and features relevant to this study.

The purpose of this investigation is to establish an initial understanding and knowledge of the stock and its condition in order to make recommendations on any further investigations that may be necessary to fully establish the condition of the stock as part of a Stage 2 Intrusive investigation. These further recommendations include some intrusive surveys and are summarised in later sections.

The external visual inspections were carried out as discreetly as possible so as not to promote or provoke premature enquiries from residents concerning the survey.

No approach was made to the tenants at this stage and therefore access was not gained to any of the properties, to undertake internal inspections or intrusive inspections of the building fabric.

1.1 Scope of Investigations

The purpose of this investigation is to establish the structural condition of the high-rise and non-traditional properties and advise on the extent and cost of any structural repairs to ensure a minimum future life of thirty years. Where necessary, further investigation works have been recommended in order to verify and augment the assumptions made within this investigation and more accurately assess the structural condition of the properties.

This assessment has incorporated the review of archive reports where pertinent. This was supplemented by information gained from interviews and discussions with Council employees who have been responsible for managing the maintenance and refurbishment of the housing stock in recent years. A review of available technical papers and published documentation has been undertaken to obtain further guidance on the typical defects and anticipated life of components. This information was used to establish the likelihood of properties achieving a further minimum 30-year.

This report is based upon visual inspections and a desktop study, including interviews and discussions with Council employees. Clearly it is not feasible when undertaking this type or scale of survey to inspect every property. Therefore a sampling regime has been adopted that is considered to be representative of the stock as a whole.

The visual inspection of the properties has been confined to a brief overview of elevations visible from the curtilage of the property or as viewed from the public right of way. Inspection of rear elevations from within property gardens has not been carried out in the majority of instances.

The present risk assessment is confined to consideration of the principal structural elements of each of the construction types. The condition of guttering, rainwater goods, canopies, outbuildings and external fixtures and fittings, together with gas, water and electrical services, drainage, central heating, flues, bathroom and kitchen fittings and internal decorations are all excluded from consideration. The condition of windows and roof coverings has been considered where the deterioration of such elements is considered relevant to the condition of the existing structure. However, allowance has only been made within the cost analysis where specifically stated, for replacing these elements.

No internal or intrusive investigations have been undertaken as part of Stage 1. Where appropriate, it has been recommended that further investigations be undertaken to verify the findings of this investigation.

No information or details of related assets has been received during these investigations. These are excluded from these investigations.

Investigations completed in stage 1 are intended to offer an indication of the risk. It will be necessary however, to undertake further investigative work in order to quantify this aspect.

No properties have been identified for demolition or redevelopment within this report. However, it is understood that a number of the multi-storeys are the subject of further review in this regard.

Foundations and sub-soil investigations were excluded from the investigations. However, evidence of structural movement associated with foundation instability was recorded during the visual inspections, if present. Whilst many of the foundation solutions adopted at the time of construction would not comply with current standards, it is most likely that any settlement due to inadequate foundation size or depth would have already occurred. However, this does not exclude the potential risk of future movement, for example, as a result of flooding, drainage failure, frost heave or shrinkage in clay sub-soils.

A separate Environmental Risk Assessment should be commissioned to highlight any potential subterranean features likely to impact on the stock during the thirty-year period. Close liaison with the Environmental consultant is critical to understand the risks arising from issues such as landfill sites, mineral instability and flooding issues. However, any assessment of the risk associated with environmental issues is excluded from this report.

Information provided for review has not been substantiated or validated by independent research, inspection or investigation. Curtins Consulting cannot be held responsible for any errors, discrepancies or inaccuracies in the information provided by the Council or its representatives, which is provided in good faith.

No testing for asbestos has been carried out during the preparation of this report.

Issues of mortgage ability are excluded from the present risk assessment and any costs provided are not sufficient to allow the properties to be mortgageable.

Any assessment, comment or testing for levels of toxic mould within these properties is considered beyond the scope of these investigations.

1.2 Investigation Strategy

The non-trad housing stock retained by West Dunbartonshire Council is located across 30 estates, within 3 management districts.

The following information is included for each house type:

- General condition of the properties as assessed during the visual inspections.
- An identification of the level of risk associated with each property type achieving a further life in excess of 30 years, including consideration of any previous repair and refurbishment works.
- Recommendations for Stage 2 investigations that will more accurately determine the anticipated future life of the properties.

The properties are categorised as follows:-

- L) Low risk:** Properties appear from information made available and visual surveys that they should, if maintained to a satisfactory level, have a minimum further life of 30 years, and are therefore considered to offer a low risk in terms of future expenditure with respect to undertaking structural remedial works.

- M) Medium risk:** Properties offering a measure of concern based on information made available and visual surveys conducted to date such that the property should have a minimum further life of 30 years with moderate expenditure. These properties are therefore considered to offer a medium risk in terms of future expenditure with respect to structural works. The level of such costs is subject to review following stage 2 investigation.
- H) High risk:** Properties offering significant concern regarding their structural stability and may only achieve a further life of 30 years with significant expenditure. These properties are therefore considered to offer a high risk in terms of future expenditure with respect to structural works. In certain cases demolition may be a more realistic option. The level of such costs is subject to review following stage 2 investigations.

The number of properties of a particular construction type selected for inspection and subsequent investigation varied dependant on the total number of properties of that construction type, their vulnerability and Curtins' knowledge of the defects associated with that specific non-traditional construction type.

2.0 INVESTIGATION OF THE MULTI -STOREY HOUSING STOCK

West Dunbartonshire Council currently retains 14% of their housing stock in the form of multi-storey high-rise blocks. The classification of high-rise is taken to be any building in excess of eight storeys.

26 multi-storey blocks ranging in height from 8 to 16 storeys, exist in Clydebank and Dumbarton. These are located in groups of 3 to 6 blocks and include four distinct different forms of construction-summarised below:-

- Insitu concrete frame with no-fines concrete wall panels.
- Crudens Skarner System.
- Concrete frame with precast concrete wall panels.
- Cross-wall construction.

Several blocks have been overclad however most remain as originally constructed. It is clear from old construction drawings that both piled and deep raft construction has been adopted for foundations.

Roof areas are in a variable condition and where access was obtained, roof coverings were in need of renewal in the near future.

The structural condition of the blocks is derived from feedback received from staff within the Council's Technical Services Department, site visits and review of available reports. At the time of writing further information was still awaited from the Council with regard to additional drawings and reports.

The following offers a brief overview of the multi-storey stock and its structural condition taking into account the requirement to achieve a design life in excess of thirty years.

2.1 Insitu Concrete Frame with No-Fines Concrete Walling.

These properties exist in two formats - 15 storey and 12 storey and are located at Dalmuir and North Drumry respectively. A total of 12 blocks are retained by the Council. The principal defects experienced to date include:-

- render spalling from wall panels at floor level, corners and above windows.
- concrete repairs to exposed elements of the concrete frame.
- frost attack to vulnerable panels.
- water penetration.
- condensation and poor levels of insulation.
- cold bridging at columns.

The quality of no-fines wall construction can offer structural concerns both in how it is connected to the frame but also in the quality of the no-fines construction. The render will deteriorate with time leading to more frequent water penetration leading to freeze/thaw cycle and subsequent delamination or spalling of the render and no-fines together.

Burnside Court, Crescent Court, Dalmuir Court, Dunswin Court, Ellinger Court and Overtoun Court are all no-fines construction up to 15 storeys high. Spalling of render, water penetration through roofs and parapets were all noted. Hammer tests have been conducted by others, on behalf of the Council and reports recording the extent of damage to the fabric of the building are in existence. These reports were not accessed.

Water tanks were replaced in Dalmuir Court; these are known to offer difficulties after 30-40 years. Windows/screens were replaced some ten years ago.

Existing asphalt roof coverings are generally poor and while no significant water penetration problems were highlighted it was clear that there had been historical problems as illustrated by the patch repairs undertaken.

All blocks have exhibited problems with cold bridging at the columns and condensation occurring within the flats at such locations.

High-rise blocks in Clydebank, at North Drumry, taking in Cleddans View, Duncombe View, Garscadden View, Glennfier View, Kilbowie Court and Peel View are also of a no-fines concrete construction but of 12 storeys. Unlike the blocks above, there appears to be relatively few problems with spalling roughcast. However, projecting concrete balconies were removed in 1990 as they were suffering serious corrosion and spalling.

Two roofs were recovered about 15 years ago. As noted at Dalmuir there are serious condensation issues particularly at external corners and where bedrooms adjoin the cold walls of the common circulation areas.

At ground floor level, brickwork was noted to be cracked. This was attributed to thermal movement and the absence of any joints to accommodate such movement.

Timber glazed screens at roof level on Duncombe are rotten and require replacement. It is understood this is planned to take place in the next 12 to 18 months.

There are health and safety issues with regard to achieving safe access to the upper roof level on the plant room. A secure fall-arrest system or edge protection requires to be installed here.

To prevent escalating repairs to the roughcast and more serious deterioration of the principal structural components, it is recommended that the buildings be overclad. An external insulation will be required to improve the thermal properties of the walls and roof.

Window cill details incorporate an inclined clay tile typical of many no-fines concrete construction. These will require over-cills to ensure complete protection.

On this form of construction, storey height and detail, an insulated thin coat render system can be applied. While this has greater limitations in being able to offer more varied aesthetic designs, it will address the main structural concerns and still be able to offer a thirty-year life. The preliminary costings allow for this system. Upgrading the overcladding to a rainscreen system will remove the risk associated with securing into the no-fines construction. The quality of no-fines infill can vary significantly from block to block, elevation to elevation and even from panel to panel. However, there is a significant premium with respect to the cost of the rainscreen system. In general this will be approximately 60-70% more expensive than that of the insulated render system.

2.2 Crudens - Skarner

This form of construction has been adopted at two sites in Dumbarton, namely Westbridgend and Bellsmyre accommodating three and four blocks respectively. All blocks are 16 storeys in height (not 15 as indicated in the address list) constructed using an insitu concrete frame with precast concrete cladding panels.

Condensation was noted to be an issue and problems have been reported with leaking internal drainage from baths, sinks etc. The concrete cladding panels also suffer from penetrating and interstitial dampness. Works have been undertaken to examine and attempt to address this issue. It is unclear as to how successful the retrospective installation of weeper drain points has been. When these are installed a negative pressure can be experienced that increases the risk of dampness getting behind the cladding panel.

Flexible joints between cladding panels seem to have received recent attention, presumably in an attempt to keep water out from the wall cavity.

Two blocks, thought to be Endrick House and Kinglas House, have been re-roofed. The form of construction could not be confirmed but it is believed to include Sarnafill insulation and an elastomeric waterproof covering.

High parapets are provided to the roof edge and these appear in reasonable condition. Nevertheless there are suspicions that damp or water penetration may have been a historical problem at the rear of the parapet.

The blocks at Bellsmyre clearly suffer social problems which has led to a high proportion of voids. Assuming these blocks are to be retained, we would recommend an insulated overcladding system be installed. The large panel system is better suited to a rail and rainscreen system. This enables differential movement between the panels, to be accommodated more effectively in the rainscreen system. A cheaper, insulated thin coat render system could be considered, however the existing panel joints would need to be reflected in the overcladding. This would lead to an increased risk of water penetration in the future and a requirement for increased maintenance with regards to re-sealing joints.

2.3 Concrete Frame with Precast Wall Panels

These may be similar in construction to the Cruden-Skarner system referred to above or more likely a Bison type system. They were overclad approximately 10 years ago with Resoplan R to the main elevation and an aluminium rainscreen to the gables.

Two panels became loose and were detached from the block during high winds. The defect has been the subject of a legal dispute but we understand this has been resolved. Paterson Associates prepared a report into the problems, although this has not been viewed.

The roofs were also re-covered at the same time the over-cladding was installed circa 1993.

Assuming the defect is not considered latent and that remaining panels are correctly fixed, this cladding should last for a further 20-30 years with regular maintenance. At this stage we recommend a survey be conducted twenty years hence, to examine the condition of the fixings. Re-covering of the roof is expected to be necessary in years 15-20.

The three blocks at Littleholme are similar to the above and are of 15 storeys. They have suffered persistent condensation problems which were largely addressed by upgrading the heating system. Unfortunately this is likely to have created greater problems with interstitial moisture within the wall construction, which are less obvious on the surface. Gas supplies exist in these blocks.

The roofs have been overclad with a Sarnafill-type system in the mid 1990's. For the purposes of this assessment, it is assumed all roofs to the three Littleholme blocks have been over-covered.

Park Court has suffered water accumulation behind the wall panels. This was examined in detail in the mid-1990's and remedial works instigated. Regardless this block will require opening up to establish the condition of the panel fixings, ties etc.

Windows have been replaced and these are expected to achieve a further 15 to 20 year life. It should be noted that all cost data excludes non-structural components such as windows, screens, doors etc.

While outside the remit for this commission, we were made aware that asbestos exists in these blocks. In particular, parapet walls are known to have been lined with the material. The costs contained in the tables do not include for removal of asbestos.

Our proposals include the installation of a rainscreen system to accommodate the differential movement that can occur between individual wall panels. We are unaware of guarantees for the roof work but would anticipate this needs replacing in years 15-20.

2.4 Cross-Wall Construction

Some of the first cross-wall construction properties were built in Faifley, Clydebank. These were generally 3 and 4 storeys high. The eight storey Mountblow House in Mountblow, was the first to utilise this form of construction in a high-rise format. It acted as a prototype for others in Scotland and was erected in 15 months.

The cross-wall arrangement comprises Wilson cavity blocks that are used to provide a permanent formwork to the loadbearing concrete infill. Thin precast concrete floor planks were used to achieve greater spaces and maximise steel content. Non-loadbearing external walls utilise Wilson cavity blocks.

The properties perform in a similar fashion to traditional construction. Differential movement can be experienced as the structural format relies heavily on the stairwell and external block walls for lateral stability and therefore the transfer of lateral loads to these areas can lead to a degree of structural distress throughout the building.

This block was overclad in the early 1990's and was also over-roofed. It is unclear as to what method of fixing was used for the overcladding but it is believed to be an MR insulated system. Our recommendation is that this is re-rendered in years 15-20, however, allowance should be included for removing the existing or at the very least conducting extensive investigations into the condition of the over-cladding fixings.

3.0 NON-TRADITIONAL HOUSING STOCK

West Dunbartonshire Council currently retains in the housing stock one of the most extensive and varied collections of non-traditional housing in local authority ownership. Many of these were constructed in the years immediately following the Second World War after the area was devastated by enemy bombing, with particular focus on Clydebank.

Non-traditional properties form approximately 50% of the total housing stock. In amongst the stock are construction types recognised as defective under the Housing Scotland Act 1983. The following is a summary of the types currently retained by the Council. Those listed as defective are indicated in bold italics.

Atholl Steel / Brick

Atholl Steel

BISF

Cruden

Orlit

Orlit Scotcon

Whitson Fairhurst

Ayrshire County Council

Bellstone

Blackburn Brick

Blackburn Orlit

Canadian Timber

Concrete frame

Craig Atholl

Crosswall

Dugdale Dennis

Duplex Foam Slag

Hilcon Ex

Hills Presweld / Hilcon

Kane Brickwood

Lawrence Mark 1

Concrete Wall Miller No Fines
No Fines Concrete
Swedish Timber
Weir Multicom (Timber Framed)
Weir Timber
Whitcon

It is clear that some of the more vulnerable house types have received, and continue to receive, attention and are inspected on a regular basis. For example we understand a monitoring regime is in place to conduct inspections of the Orilt house types every two years.

The following text summarises the format, condition as we believe it to be and the issues that may need to be addressed during the 30 year anticipated life for the housing stock, currently under consideration for the Business Plan. The recommendations and conclusions are developed as a result of interviews with Council staff, Curtins' extensive experience of non-traditional housing, drive-round surveys and access to data currently retained by the Council.

3.1 Atholl Steel (275 No.)

Atholl houses were constructed in two phases. The initial phase was from 1923 to 1928 with the subsequent phase 1947 to 1952.

Atholl houses were made in 3 distinct types: Atholl 1926, Atholl 1945 and Atholl 1951. All three types appear to exist within the stock. The 1945 type is clad in steel sheet covered in render and thus the joints are readily visible. These houses appear to have been decorated and it is therefore not easy by superficial visual means, to say if these steel sheets remain. The 1951 version are clad in rendered brickwork.

The structure is a steel frame beneath the cladding, with pitched steel trusses. The likelihood is that the frame within the wall will suffer from corrosion.

The frame needs inspecting to determine its current condition. As a pair of houses only contains 3 steel frames (1 at each gable and 1 at the party wall) it would be feasible to open up the cladding to repair / repaint the frame prior to over-cladding with insulation and render.

Abbot Crescent appears to have two different types of Atholl; the 1926 version has a hipped roof whereas the 1945 and 1951 versions have gabled ends. Both types of houses will require inspection.

There are 275 Atholl Steel properties listed on the address list and these are to be found in the Clydebank area. Whitecrook, Kilbowir, Gartocharn contain the majority.

These dwellings are two storey, 4 in a block arrangements and have not been over-clad. Four properties in Gartchocharn have received an external insulation and render system. It is understood that the properties were reviewed by a structural engineer some 15-20 years ago and the steel frame was found to be in good condition. The provision of an insulated render system will help to move the dew-point within the wall construction to a more acceptable location to safeguard the condition of the steel frame and limit the occurrence of interstitial condensation.

Those properties that have not been overclad will require intrusive survey work to check on the condition of the steel frame. Assuming this is satisfactory, or can be economically repaired, the properties will require overcladding to reduce the risk of condensation or moisture appearing in the cavity.

For the four properties in Gartocharn, as the steel frame remains these still remain a risk and the following works should be allowed.

- Inspection of steel frame in years 5-10
- Patch repair of overcladding 10-15
- Replacement of insulated render system in years 25-30
- Repair of steel frame in years 10-15

For remaining Athol Steel properties the following works will be required.

- Opening up and inspection of steel frame
- Allowance for repair of steel frame
- Overcladding of properties within years 0-5

Particular attention should be given to those constructed in the early phase of 1926 to 1928.

Atholl brick property types exist in Clydebank (12 No) and while they are termed Atholls it is believed these are a later version from Atholl Steel Houses Ltd which effectively removed all structural steel from the design. These are viewed as predominantly traditional in their performance. Future studies need to establish the following:

- Condition of wall ties between inner and outer leaves.
- Confirmation of the construction

The requirement for overcladding of this variant is less critical from a structural perspective but may be considered appropriate to meet Scottish Housing Quality Standards. Overcladding is allowed in years 6-10 subject to establishing the condition of wall ties.

3.2 BISF (25 No.)

There are approximately 25 remaining in Clydebank under the control and ownership of West Dunbartonshire Council, out of the original 100. The BISF house type is a steel framed property with render applied onto expanded metal lath below first floor and metal corrugated cladding provided to the upper storey and roof. In many cases asbestos sheeting was installed as a roof covering.

Interstitial condensation is recognised as a problem leading to corrosion of secondary steel and the lower areas of the steel columns.

Most of the stock retained by the Council in Boquhanran have been overclad and re-roofed some 10 to 11 years ago. The Council advised that in general the metal cladding to the upper level was removed and replaced with Cellufoam board. An overcladding system was subsequently installed. Similarly they have been re-roofed.

It is unclear as to the type of render systems used and to what extent the steel frame was either inspected or repaired. As these properties are prone to persistent structural problems it is recommended the following works be undertaken.

- Allow for intrusive inspection of the properties to establish construction of overcladding and condition of steelwork.
- Allow for repairs to the steel frame in years 6-10.
- Allow for patch repair of overcladding in years 6-10.
- Replace overcladding in years 21-25 – this may be reduced if not a standard system.

During our visual inspections it became clear that a number of the BISF properties, particularly those in Bellsmyre Avenue that have not been refurbished, and while these do not appear to be Council owned, there may be instances where they adjoin or are attached to a Council-owned BISF. This requires further consideration during Stage 2.

3.3 Ayrshire County Council – (4 No.) – Defective

Constructed in 1947 and also referred to as a Lindsay House Type, these were constructed using a concrete frame with a thin foam-slag concrete block outer leaf and inner leaf constructed using cold-formed steel framing. Concrete floors were generally adopted at both ground and first floor level. A lightweight steel trussed roof was employed.

The properties are recognised as defective under the Housing (Scotland) Act and the main susceptible areas are the condition of main load-carrying structural members; insitu joints between precast members; corrosion of lightweight steel framing and deflection of the roof structure where re-roofing has been carried out using an alternative, heavier tile.

It is understood these properties have not been overclad and would therefore recommend the following works be allowed.

- Intrusive investigation and sampling of concrete members including examination of the joints.
- Inspect condition of inner steel frame work.
- Allow for overcladding and strengthening of existing structural members.

3.4 Bellstone (66 No.)

All the Bellstone properties lie within Alexandria and currently West Dunbartonshire retains 66 in a variety of forms including terraced, semis and four in a block.

The format is deemed to be comparatively traditional with an outer concrete block leaf and inner lightweight concrete block. Further intrusive work is recommended to establish the condition of wall ties but this is viewed as cautionary and no costs have been allowed for any structural works to be undertaken.

A three storey block exists at Miller Road and Cook Road in Haldane, Alexandria. Some structural movement was recorded and will require more detailed examination particularly at Cook Road. A provisional sum is allowed for remedial repairs to be undertaken however it was noted that a number of these are owner-occupied.

Recommendations include:

- Investigate condition of wall ties particularly where post-construction cavity wall insulation has been installed.
- Allowance made for structural repairs at Cook Road.

3.5 Blackburn Brick (569 No.)

The Blackburn Brick, also referred to as a Blackburn Mark III or Mark IV employed a combination of traditional building techniques with prefabricated finishes.

Cavity brickwork walls are provided to the exterior and rendered to afford the property greater protection and durability.

Many of the Blackburns viewed in Third Avenue and Northfield Drive in Old Bonhill, Alexandria, have received a degree of refurbishment. However this appears to be largely superficial using a paint finish. The roofs have received attention and appear in good condition. Those properties that have not been refurbished look in very poor condition and could impact on neighbouring properties.

Nos. 40 + 42 Northfield Drive had evidence of structural movement, appearing as horizontal cracking at 1st floor level. The cause of this is unclear but allowance is included for tying external walls into the floor structure. Further checks will need to be conducted on wall ties.

Recommendations include

- Conduct intrusive survey to establish condition of wall ties and connection between wall and 1st floor.
- Allowance included for remedial works to tie first floor to external walls.

No allowance is included for over-cladding at this stage.

3.6 Blackburn-Orlit (2 No.) Defective

Only two properties remain within the stock at Overtoun Drive, Parkhall. Both are two storey properties constructed using a precast concrete frame with insitu grouted joints. The presence of chlorides in the concrete elements, high levels of carbonation, the possibility of High alumina cement within the grout used in the precast joints and in some instances, joints that have no grout, are all defects experienced in this form of property.

They are viewed as a high risk property. The recommendations include:

- Intrusive works to establish the condition of structural members and insitu joints.
- Install insulated over-cladding to both properties.
- At this stage a provisional sum is allowed for repairs but assumes the structural frame can be retained.

3.7 Swedish Timber + Canadian Timber Properties (18 + 1 No.)

The Swedish timber format was designed with a 60 year life. Erected in 1960, these properties should still have 15 years left, however it is believed that they are maybe of an earlier vintage, perhaps late 1940's.

The Swedish Timber style had the option of two forms of roof construction. One accommodates a lightweight timber shingle, while the alternative is able to accommodate a slate or tile. Where properties have been re-roofed the alignment and deflection of the roof coverings need to be examined. This will form part of a Stage two assessment.

A timber loadbearing frame exists with timber cladding boards to the external face. The wall construction is known to incorporate minimal insulating qualities. The vulnerable areas, are anywhere where dampness has the potential to accumulate or affect the timber components such as the sole plates and cladding. Clearly as a timber structure they require both good ventilation and protection against rot or timber infestation.

For the property to continue a further thirty years it is recommended that an external, insulated cladding system be installed to ensure the building remains weather-tight and critical structural components are adequately protected.

West Dunbartonshire Council has experienced deterioration and rot occurring at the base of the external cladding. This has been addressed when reported or detected. Further allowance has already been allocated within the Council's budget this year, to attend to defects of this nature.

Where overcladding the Swedish Timber house type is adopted, cognisance must be taken of the flexibility of the frame and structure. This impacts on the type of system selected which must be sufficiently flexible to prevent reflective movement appearing in the rough cast finishes.

The properties are viewed as a medium risk and the following works will be required.

- Intrusive borescope inspection to review sole plate condition
- Visual inspection to detect the presence of insect attack or timber decay
- The costs allow for overcladding but for this work to be undertaken in years 6-10

3.8 Weir Timber (55 No.)

There are 11 properties in Dumbarton and 44 in Alexandria. All properties are either two storey terraced or semi-detached. In general the Council has not experienced any significant structural problems. It is understood that cavity insulation has been installed between the load-carrying studs. Asbestos has also been removed from these properties.

The structural design is very similar to that of the Swedish timber. As in the case of Swedish Timber houses, the timber cladding can be the vulnerable element often suffering decay and rot. Patch repairs will be required throughout the duration of the thirty year term. Flashings and rain-checks over windows, doors etc often need replacing and can be incorporated in any continuing maintenance plan.

Alternatively, an insulated render can be applied that will protect the timber and enhance the U-value of the external walls. It is considered inappropriate to undertake installation of post-construction cavity insulation. This prevents timber members from "breathing" and encourages the occurrence of a dew-point at the cavity side of the external timber cladding.

The following works are proposed.

- Intrusive surveys to establish the condition of crucial timber members.
- Establish the presence or otherwise of cavity insulation.
- Conduct a visual inspection to determine the presence of any timber infestation.

Properties inspected in Cook Road had canopies that were noted to be in poor condition. An allowance is included for their replacement. Given that these are possibly cavity insulated, the properties are allocated a medium risk.

3.9 Whitson Fairhurst (544 No.) Defective

West Dunbartonshire Council retains one of the largest groupings of the Whitson Fairhurst property types in Scotland. 260 exist in Alexandria, 269 in Clydebank and 15 in Dumbarton. Constructed using a precast concrete frame, these properties are designated defective.

Principal members are often found to have significant levels of chloride, (added to the concrete to reduce setting times). Unfortunately this leads to rapid corrosion of the reinforcement particularly when allowed to become wet or damp.

Connections between precast members offer problems and while these should be grouted, it has been known for such joints to remain un-grouted and potentially unstable under wind loading.

External walls are of brick and block construction with the frame sandwiched in between. Columns often generate a cold-bridge across the cavity as a result. West Dunbartonshire has undertaken a programme of cavity wall insulation on these and this can compound the problems of dampness within the cavity. However it is believed that no testing has been conducted on the structural members to understand their current structural condition and thereby predict their expected life span. Some properties are known to have un-grouted joints.

The general view conveyed by the Council is that these properties offer no significant issues. It is a view that requires to be supported by intrusive testing and this must form an integral part of a Stage two assessment.

Whitson Fairhurst properties viewed during drive-round surveys had clearly been maintained and recently painted. No over cladding had been installed. As such, this still leaves the column vulnerable to penetrating rain in addition to interstitial moisture.

The following works are recommended:

- Conduct opening-up of the properties to locate joints. Check for the presence of grouted joints and chlorides in the concrete members. HAC should also be tested for.
- Check the location of the "dew-point" and any surface corrosion of principal concrete structural members.

The costs currently allow for overcladding of the properties to offer long term protection to the structural frame. This is proposed on the basis that the chloride levels remain at acceptable levels and all joints are intact, however a provisional sum is allowed for repairs to joints but not the removal or substitution of the concrete load-carrying elements.

3.10 Orlits (146 No.) Defective

There are 146 Orlit homes constructed across the three districts. In addition to the traditional Orlit style, there are 129 Orlit Scotcon properties.

It appears that three storey Orlit properties may exist in Cumbrae Crescent North Castlehill, Dumbarton and Shandon Brae in Haldane, Alexandria, while the remainder are generally two storey. The structure comprises a precast concrete frame of columns and beams with external walls constructed of dense concrete blocks to the outer leaf and foamed slag-concrete blocks to the inner. Galvanised metal ties were used to bind outer and inner leafs together.

Defects centre largely on the condition of the precast concrete members. High chloride levels, minimal or non-existent cover to reinforcement, poor grouting of joints all offer difficulties when it comes to assessing the life of these properties. The earlier types were provided with flat roofs, that suffered condensation to the underside, causing severe corrosion of the reinforcement.

The Council properties are believed to be the later, type II version. In general these tend to out perform earlier Orlit formats, but problems have been experienced with the grouting used in joints. The significant difference in the type II from that of the type I, is the arrangement of the joints in the beams. These are not lapped in the Type II and therefore the joint grout becomes more important in the long term performance of the frame. Where high alumina cement has been used this can degrade with time to result in the joint (an integral element of the frame) having inadequate strength to support or transfer the structural loads.

The Council undertakes bi-annual inspections of the properties. From a review of this data, the inspections appear to be only visual and involve no intrusive testing. It is important such testing is conducted within the next 12 months, to supplement the visual records.

A number of the properties have been re-roofed.

Recommendations for the Orlit properties include:

- Investigation of the condition of the joints – presence of corrosion, whether filled with grout containing HAC etc.
- Sampling and testing of the principal concrete members.
- Allowance is included for undertaken over-cladding and infilling of open joints.

3.11 Orlit Scotcon (129 No.)

The Scotcon house type was produced and erected in the early 1950's. While referred to as an Orlit Scotcon its design omitted the concrete load-bearing frame largely responsible for the Orlit being designated defective under the Housing (Scotland) Act. Instead the Scotcon used loadbearing masonry walls constructed from a 75mm precast concrete outer leaf and an inner, 100mm thick lightweight block. They exist in two and three storey formats.

The properties are viewed as performing in essentially a traditional manner. Recommendations include :

- review of the condition of wall ties but this is largely precautionary.

3.12 Lawrence Mark I (83 No.)

These exist in semi-detached, terraced or four-in-a-block formats in Faifley and Mountblow areas of Clydebank. The arrangement included the use of Wilson precast concrete cavity blocks to the outside walls with timber joists to first floor and conventional timber roof structure.

The properties perform as traditional load-bearing masonry however problems have been experienced historically with the patented tie between inner and outer elements of the external wall construction. The recommendations are for inspection of the condition of the tie arrangement to establish whether this remains in tact.

Currently, many of the properties are being re-roofed, and there is a continuing programme of this work. It was not possible to establish how many out of the 83 had been re-roofed. Allowance has been included for re-roofing in years 5 – 10.

Stage 2 works will include:

- Inspection of the wall tie arrangement and condition
- Review of roof condition relative to the new re-roofing being undertaken.

3.13 Concrete No Fines (1172 No.)

No Fines concrete construction makes-up approximately 20% of the non-traditional housing stock and is the largest single construction format.

The address list separates these into three different forms namely: No-Fines (1052), Wimpey No-Fines (119) and Miller No-Fines (1). With the possible exception of the Miller, the others are all believed to be Wimpey No-fines and the only difference being the manner in which individual districts categorised the houses.

The construction type utilises concrete mixes without fine aggregate to form a honeycombed concrete mix. The walls were cast insitu and the voids within the concrete matrix were intended to help enhance its insulating properties. Low-rise No-Fines construction did not incorporate a separate concrete frame but simply used the insitu walls as the load-bearing element.

Four storey blocks often include balconies that generate dampness issues. Otherwise the format remains in general, structurally sound. Poor insulating qualities of the concrete walls, do give rise to condensation and dampness within the flats. Overcladding with an external insulation and render system represents a good investment. Such works will also help to protect the structure and are therefore included in the cost sheets. Re-roofing has not been considered, but could be required on the flat-roofed four storey blocks. General render repairs are often necessary as part of the ongoing programme of housing repairs.

Intrusive investigations will be required to determine the quality of the dense concrete forming the door and window lintels. It is common for chlorides to be used within these elements which can cause corrosion of the embedded reinforcement and subsequent cracking and spalling. These investigations will involve obtaining a drilled sample from lintels and subsequent laboratory analysis.

Providing the chloride ion content within these concrete elements is below prescribed limits, it is anticipated that these properties will have a further life of 30 years. For the purposes of compiling budget costs, an allowance has been made for installing drilled in, sacrificial anodes to protect the reinforcement within the contaminated concrete.

An alternative to the above approach is to apply an insulated over render system to all external elevations. In addition to providing protection to the external walls and the embedded reinforcement, this system will also enhance the aesthetics and improve the energy efficiency of the properties.

The Miller No-Fines is believed to be of a similar format to that of the two-storey Wimpey No Fines. As only one property exists this is viewed as low risk. Remaining no-fines are categorised as medium risk.

No issues were specifically raised by the Council with regard to defects or long term problems experienced with this house type.

Stage 2 intrusive works will include:

- Sampling and testing of secondary structural concrete members.
- Review the condition of all No-Fines provided with flat roofs.

3.14 Reema (26 No.)

The Reemas in North Bank Place, Clydebank East, are of two and three storeys with mono-pitch, steel corrugate roofs. The roof plan arrangement generates a number of awkward details through valleys and flat roofs. It is possible that these properties were originally flat-roofed but this has not been confirmed.

Wall construction incorporates precast concrete panels. Intrusive investigation is required to fully understand the load-carrying elements and the condition of the wall panel fixings.

Some of the exposed wall panels were cracked and seemed to suggest a degree of foundation movement may have occurred. The cracks have been sealed and have not re-opened. The implication is that the movement occurred soon after completion and has now stabilised however, this is conjecture and investigation is needed to verify this assumption.

Generally the properties appear sound and with a degree of sampling and testing to confirm this, these properties could be overclad to ensure a continued life beyond 30 years. Re-roofing is considered necessary in years 11-15. Selection of a suitable overcladding system is critical as flexibility is required to enable panels to move relative to one another. A rail and panel or rainscreen-based system is considered most appropriate.

Further investigative works are required and include;

- Checking on the wall construction and the condition of any ties between inner and outer wall elements.
- Review of environmental findings in this area.
- Access to roofs in order to assess current condition of roof coverings.

3.15 Craig Atholl (4)

The properties at Drumry Road, South Drumry, were constructed as prototypes to trial a new house format. Two storey construction with pitched roofs, these properties were based around a load-bearing steel frame clad using Bellrock blocks. The frame was encased in concrete and the Bellrock blocks protected using a damp proof membrane applied to the outer face, prior to rendering.

The Council is aware of render cracking, but at this stage it was difficult to determine whether this has long term structural implications. Further intrusive investigations are required to establish:

- The condition of the steel frame.
- Location and condition of damp proof membrane. This is achieved most effectively by overcladding the property.

3.16 Dugdale Dennis (27 No.)

The Dugdale Dennis construction type dates back to 1926 with the properties in Whitecrook being constructed in 1927-29. These exist as a two-storey, four-in-a-block format.

The structural frame arrangement is believed to include a structural steel frame formed from steel columns in each elevation, with a ring beam provided at, or just below, the first floor level. The frame continues to eaves level but is not tied across the building. A clay block inner leaf with brick outer leaf was provided as cladding.

While the Council is unaware of any specific problems although there are a number of potentially vulnerable areas of the construction that need to be explored in more detail. In particular this would include the steel framework. Initial recommendations are to include for over cladding and a degree of structural repair to the steel columns.

Stage 2 investigations would include:

- Opening-up of super structure to locate and establish condition of, the steel frame work.
- Identify the presence of cavity insulation.
- Review roof structure and its arrangement.

3.17 Kane Brickwood (21 No.)

The Kane Brickwood type is an unfamiliar format and the extent of potential structural defects is unknown. A number of cracks were noted in the external walls which suggest continuing differential movement, however the precise cause of such cracking could not be established.

The Council is unaware of any significant structural issues associated with these properties. At this stage a provisional sum is included against the properties, particularly as they are nearing 80 years old.

Intrusive investigations will be required to obtain a full understanding of the design philosophy employed for this non-traditional house type.

3.18 Hills Presweld / Hilcon (27 No.)

These were semi-detached houses constructed in 1948-49 that incorporated a light steel frame at close centres (915mm). The external walls were generally of brick construction but this was substituted for the Hilcon block. The blocks are stack-bonded to suit the steel frame centres and rely heavily on the frame for stability.

First floor construction utilised Hill Lattice steel floor beams, also at 915mm centres supporting timber battens and timber flooring.

These properties offer a high risk in terms of long term stability and will require intrusive work to establish the condition of the steel frame, particularly at ground floor level. Connections or ties between frame and concrete blocks also requires examination.

Overcladding would be proposed to relocate the "dew point" beyond the cavity and thereby minimise the potentially detrimental environment that would otherwise occur. Allowance is also necessary to accommodate isolated steel repairs. A number of properties appear to have already received overcladding systems.

Stage 2 Investigations shall include:

- Identification of any corrosion to steel framed structural members.
- Condition of ties between steel frame and concrete cladding.

3.19 Hilcon Ex (86 No.)

The Hilcon Ex became the successor to the Hills Presweld / Hilcon as steel became in short supply. The design was adjusted to make the property largely traditional with a load bearing cavity wall construction. Initially the cavity wall was constructed in foam slag concrete but this was replaced using the Wilson block. Hills Presweld steel floor joists were retained from the original design.

The principal investigative works will involve:

- Examination of the ties between the inner and outer blocks forming the external wall.

Overcladding is proposed where ties are found to be satisfactory although some additional tying may prove necessary, regardless.

3.20 Timber Kit and Timber Framed Properties (270)

The address list refers to several types of timber frame construction including:

Timber framed Weir Multicom	(30)
Timber framed / brick walling	(22)
Timber kit	(217)
Canadian Timber Framed / Brick	(1)

Swedish Timber and Weir Timber are covered separately.

All the above types are primarily of more traditional construction. The timber kit properties date from the mid 1970's and therefore no investment with regard to addressing structural defects are proposed during the next 30 years. Equally the Weir Multicom also dated from the early 1970's and is expected to attract minimal investment. However, some owner-occupied properties in Faifley Road indicated both potential settlement issues and deterioration of porches and roof members. Some provisional sums will need to be allocated against these works. The 22 properties in North Drumry, referred to as timber frame with brick walling and constructed in the mid 1960's are also viewed of low risk. Visual inspections will be conducted, with investigations undertaken to examine the condition of wall ties securing the outer leaf.

Information received from the Council indicates the timber framed properties to be the focus of current up-grading work. Problems experienced in Pappert, North Bonhill include detachment of metal wire lath. These are currently forming part of an overcladding work package that is anticipated to take in most of these properties. The costs allocated, allow for this to continue with a further allowance for undertaking repairs to structural timbers. It should be noted that the unit cost is not representative of the investment required on each individual property but is taken as an average unit cost applicable to this format for the time being.

The following intrusive works are anticipated:

- Examine the condition of wall ties.
- Examination of the condition of the timber wall frame.

- Sampling of outer brick or block leaves.

3.21 Leenvale Timber (27 No.)

The specific property style is considered similar to Swedish Timber and Weir Timber. Their design appears in a single storey, two storey and 1½ storey format. All are provided with timber cladding to the exterior.

It is unknown as to whether these properties have received any cavity insulation, as this will influence the recommendations. In general, it is expected that patch repairs will be required to the external cladding and re-coating the exposed timber with preservative. Alternatively, an over-cladding system could be considered. The costs do not currently allow for this enhancement.

The properties in Landsbury Street, Leenvale appeared to be in a generally good condition.

Second stage investigations include:

- Checking for deterioration of the wall cladding and timber frame.
- Establishing the presence of cavity wall insulation.

3.22 Duplex Foamed Slab (407 No.)

The construction was predominantly of traditional load bearing, cavity walls supporting a timber joist first floor and timber pre-fabricated roof trusses. External walls were constructed using two leaves of 75mm thick foamed slag concrete blocks, 815mm long x 200mm high. These were tied with galvanised ties.

Precast concrete beams were incorporated into the ground floor construction to support both the ground floor and internal partitions.

The properties at Hood Street, South Drumry have been re-rendered. Cavity wall insulation appears to have been installed, which may create issues with regard to any corroding wall ties. Roofs are generally in need of attention.

The principal intrusive works will be to establish:

- The condition and frequency of wall ties.
- The current condition of the precast concrete (Cubitt) floor beams, where provided.
- Presence of cavity wall insulation.

3.23 Whitcon (1 No.)

Only four are believed to have been constructed. The Council currently retains one. The format is based on cavity load-bearing wall construction using hollow concrete blocks, subsequently filled with grout. Precast reinforced concrete slabs were provided to ground and first floors. Roofs were of a very shallow pitch using concrete slabs with felt.

The problems that are anticipated include condensation to underside of roof slab and subsequent corrosion, deterioration of wall ties and poor insulation. The Council reported deflecting ceilings and this may be attributable to deterioration of the floor slabs. Overcladding and re-roofing are allowed against this property.

Second stage investigations will include:

- Review of roof structure and frame.
- Presence of corrosion and deterioration of floor slabs.

4.0 THIRTY YEAR FINANCIAL PROFILES

On the basis of the findings of this review of the housing stock the following budget costs have been generated to ensure a minimum 30 year life can be achieved for the properties.

The following section outlines the anticipated costs for repair of each of the property types contained within this report. The costs are in addition to those normally included for the general maintenance and upkeep of non-traditional properties. Consequently, any elements of general repair deemed to be covered by routine maintenance, or any replacement of principal, non-structural components such as doors, windows, screens etc, are excluded in all recommendations.

The assessments of defects and repairs are based upon the visual inspections undertaken during the stage 1 investigations and are subject to verification following the stage 2 investigations.

The cost estimates provided in this report are based upon information received from recent tenders, budget costs supplied by experienced contractors and professional cost indices used by the construction industry. They strictly cover structural remedial works and do not include allowances for maintenance of elements of the building fabric such as guttering, windows, periodic decoration, doors, finishes etc.

All costs are based on rates and prices current as at January 2005, and exclude contractor's preliminaries, management charges, decant / disruption compensation costs, professional and statutory fees and VAT. The costs assume the local construction industry can accommodate the increased demands for skilled labour without a significant adjustment to labour rates. It also assumes the subsequent works will be procured in a manner to take advantage of the potential economies arising from being able to award a large contract.

It should be noted that the cost analysis is based on the current condition of the properties and the estimated rate of deterioration of the building fabric. The rate of deterioration and associated costs cannot be effectively estimated beyond year 10. Therefore, it will be necessary to undertake a further cost analysis at year 5 to 10 in order to assess the accuracy of the costs for the remainder of the building life.

Costs are presented as total expenditure required over the next 30 years. In order to present the costs in different year bands, the rate of deterioration of structural elements will need to be predicted. The stage 2 investigations will identify the current condition of the principal structural elements and establish their anticipated rate of deterioration. In the absence of such information it is recommended that all costs be considered as expenditure required during years 1-10.

No allowance has been made to undertake repairs associated with foundation movement during the thirty years.

Post Construction, Cavity Wall Insulation

The following section relates to Council properties, which have received cavity wall insulation since construction. This has taken place largely during the last 5 years, and it is understood that in excess of 80% of the housing stock has received cavity wall insulation. This has been applied to both traditional and non-traditional properties.

Potential Defects

It is considered that the retrospective installation of cavity wall insulation can cause degradation of the building fabric if incorrectly installed or if an inappropriate property is insulated. Given that the majority of the Council housing stock has received this treatment relatively recently, it is unlikely that any defects that might be associated with such installations, will be visible at this time. Given the extent of the cavity wall insulation across the stock, it is considered that an increasing number of defects will become apparent in future years.

It is considered that the presence of cavity insulation could lead to the prolonged high moisture content of the outer leaf, arising from penetrating rain; the relocation of the dew-point within the outer leaf, as a consequence of the cavity insulation and the lack of a ventilated cavity due to the presence of full cavity insulation, will lead to an increased risk of freeze/thaw action. This could potentially accelerate wall tie corrosion. It is further considered that, as certain types of cavity wall insulation become increasingly wet, they will become less effective and cause dampness to cross the cavity, that may in turn appear internally.

While not all these issues are of a structural nature and may be the result of other factors or a combination of factors apart from cavity insulation, there is considered sufficient evidence for further investigative work to be undertaken, to determine the vulnerability from such circumstances.

Recommended Investigations

On the basis of the above it is recommended that a series of intrusive surveys are undertaken to appraise the presence of increased levels of moisture within wall cavities filled with insulation. These investigations would aim to retrieve samples of existing masonry for subsequent laboratory analysis, to determine levels of water absorption of masonry, moisture content of masonry, mortar and internal wall surfaces, material identification and the mortar mix design properties. Samples of existing wall ties should also be retrieved for laboratory analysis to determine the thickness of galvanising remaining on wall ties.

Visual inspections should also be undertaken to determine the type, condition and frequency of wall ties. Recommendations are included in BRE 401: Replacing Wall Ties, on the most appropriate sampling methods.

It is recommended that intrusive surveys, as described above, are undertaken to approximately 1-2% of the non-traditional housing stock, to determine the current condition of the existing wall ties and external wall construction. Properties will be selected across the three management districts and the investigations will target those properties considered to be high risk based on their geographic location, altitude, exposure within the local topography and the orientation of properties and elevations subjected to greater exposure.

Recommended Repair Costs

With the present level of information it is not possible to predict the rate of deterioration or the extent of the problem, but there is a high risk that major works in the form of external wall repairs or tie replacement may be required sometime during the next 30 years. However, given that much of the cavity filling has been undertaken recently, it is considered that these repair works will be required towards the end of the 30 year period.

These remedial works are likely to include the installation of an external insulation render system. Depending on the nature of the cavity fill insulation used, it could be an option to remove it from the cavity. This would not apply to foam-based products. It is understood that polystyrene, blown-fibre and paper-based cavity insulants have been used by West Dunbartonshire Council. It may also be necessary to install remedial wall ties, depending on the condition of the existing ties at the time of installing the new render system.

The following tables contained in Appendix A, summarise the non-traditional and multi-storey costs associated with the currently anticipated structural repairs required during the thirty-year term.

APPENDIX A : COST TABLES

West Dunbartonshire Council
Summary of Multi-storey
Structural Costs



consulting

District	Settlement	Block	Construction Type	No of storeys	Number of units	Demolition	Time Increment of Expenditure						Total Per Block
							Years 1-5	Years 6-10	Years 11-15	Years 16-20	Years 21-25	Years 26-30	
Clydebank	Dalmuir	Burnside Court	Concrete Frame with No lines Walling (COFR)	15 storeys	88		£629,034	£0	£20,170	£0	£19,800	£669,004	
	Dalmuir	Crescent Court	Concrete Frame with No lines Walling (COFR)	15 storeys	87		£629,034	£0	£20,170	£0	£19,800	£669,004	
	Dalmuir	Dalmuir Court	Concrete Frame with No lines Walling (COFR)	15 storeys	88		£629,034	£0	£20,170	£0	£19,800	£669,004	
	Dalmuir	Dunsavin Court	Concrete Frame with No lines Walling (COFR)	15 storeys	87		£629,034	£0	£20,170	£0	£19,800	£669,004	
	Dalmuir	Ellinger Court	Concrete Frame with No lines Walling (COFR)	15 storeys	84		£629,034	£0	£20,170	£0	£19,800	£669,004	
	Dalmuir	Overtoun Court	Concrete Frame with No lines Walling (COFR)	15 storeys	87		£629,034	£0	£20,170	£0	£19,800	£669,004	
Clydebank	North Drumry	Cleddans View	Concrete Frame with No lines Walling (COFR)	12 Storeys	46		£1,000	£494,000	£0	£0	£0	£495,000	
	North Drumry	Duncombe View	Concrete Frame with No lines Walling (COFR)	12 Storeys	45		£1,000	£494,000	£0	£0	£0	£495,000	
	North Drumry	Garscadden View	Concrete Frame with No lines Walling (COFR)	12 Storeys	46		£494,000	£0	£0	£18,300	£0	£522,140	
	North Drumry	Glennifer View	Concrete Frame with No lines Walling (COFR)	12 Storeys	46		£494,000	£0	£0	£18,300	£0	£531,800	
	North Drumry	Kilbowie Court	Concrete Frame with No lines Walling (COFR)	12 Storeys	46		£494,000	£0	£0	£18,300	£0	£531,800	
	North Drumry	Peel View	Concrete Frame with No lines Walling (COFR)	12 Storeys	44		£494,000	£0	£0	£18,300	£0	£531,800	
Dumbarton	Bellsmyre	Douglas House	Crudens Skarner System	16 storeys	62		£1,001,955	£0	£0	£0	£42,480	£1,044,435	
	Bellsmyre	Endrick House	Crudens Skarner System	16 storeys	62		£1,001,955	£0	£0	£0	£42,480	£1,044,435	
	Bellsmyre	Fruin House	Crudens Skarner System	16 storeys	61		£1,001,955	£0	£0	£0	£42,480	£1,044,435	
	Bellsmyre	Kinglas House	Crudens Skarner System	16 storeys	62		£1,001,955	£0	£0	£0	£42,480	£1,044,435	
Clydebank	Clydebank East	Edmonstone Court	Concrete Frame with Concrete wall Panels (COFR)	16 storeys	90		£2,250	£84,513	£0	£0	£128,060	£214,823	
	Clydebank East	Howeclags Court	Concrete Frame with Concrete wall Panels (COFR)	16 storeys	90		£2,250	£84,513	£0	£0	£128,060	£214,823	
	Clydebank East	Newshot Court	Concrete Frame with Concrete wall Panels (COFR)	16 storeys	91		£2,250	£84,513	£0	£0	£128,060	£214,823	
Clydebank	Littleholm	Clyde Court	Concrete Frame with Concrete wall Panels (COFR)	15 storeys	85		£962,250	£0	£0	£39,705	£25,200	£1,027,155	
	Littleholm	Park Court	Concrete Frame with Concrete wall Panels (COFR)	15 storeys	82		£962,250	£0	£0	£39,705	£25,200	£1,027,155	
	Littleholm	West Court	Concrete Frame with Concrete wall Panels (COFR)	15 storeys	81		£962,250	£0	£0	£39,705	£25,200	£1,027,155	
Dumbarton	Westbridgend	Clyde Court	Crudens Skarner System	16 storeys	59		£911,025	£0	£0	£25,200	£0	£936,225	
	Westbridgend	Leven Court	Crudens Skarner System	16 storeys	57		£911,025	£0	£0	£25,200	£0	£936,225	
	Westbridgend	Lomond Court	Crudens Skarner System	16 storeys	55		£911,025	£0	£0	£25,200	£0	£936,225	
Clydebank	Mountblow	Mountblow House	Crosswall (Cros)	8 storeys	29		£50,000	£0	£0	£450,000	£0	£500,000	
							£15,436,599	£1,241,539	£121,020	£842,315	£705,300	£18,411,853	
							1760						

Provisional sum allowed for overcladding and repair to Crosswall Properties

1 All costs exclude contractor's preliminaries, site overheads, security etc. They also exclude consultant's fees, statutory charges, VAT.

2 Year 1 is assumed to be 2005-2006

3 The costs are specifically for works to safeguard the structural integrity of the buildings and assume there is a maintenance programme of expenditure that runs in parallel throughout the thirty year term

4 Costs exclude any allowance for replacement or upgrade of mechanical and electrical installations

5 Costs exclude the testing and removal of any asbestos

West Dunbartonshire Council Non Trad Costs Final.xls
30 Year Non Trad Costs



CCE Ref	Construction Type	District	No	Time Increment of Expenditure					Total Per Property	Total Expenditure
				Years 1-5	Years 6-10	Years 11-15	Years 16-20	Years 21-25		
	BLACKBURN BRICK	Alexandria	182	£1,000	£4,500		£4,500		£1,000	£192,000
	ATHOLL STEEL	Alexandria	4	£16,400					£9,000	£36,000
	BELLSTONE	Alexandria	61	£0					£16,400	£16,400
	LAWRENCE MARK 1	Alexandria	5	£4,000					£0	£0
	LEVENVALE TIMBER	Alexandria	3		£12,000				£4,000	£20,000
	NO FINES	Alexandria	27		£2,100				£12,000	£36,000
	ORLIT	Alexandria	762		£7,000			£1,150	£3,250	£87,750
	ORLIT NO FRAME (SCOTCON)	Alexandria	79		£19,950				£7,000	£5,334,000
	TIMBER KIT	Alexandria	128		£6,500				£19,950	£1,576,050
	TIMBER KIT	Alexandria	182		£10,900				£6,500	£838,500
	WEIR TIMBER	Alexandria	35						£10,900	£1,983,800
	WHITSON FAIRHURST	Alexandria	44		£13,900			£0	£12,000	£420,000
		Alexandria	280	£13,685	£0				£13,900	£811,600
									£13,685	£3,556,100
	BISF									
	BLACKBURN BRICK	Clydebank	25	£0	£2,000	£0	£0	£16,000	£0	£18,000
	BLACKBURN ORLIT	Clydebank	71	£1,000					£1,000	£71,000
	ATHOLL STEEL	Clydebank	2	£16,000	£0	£0	£0		£16,000	£32,000
	ATHOLL STEEL/BRICK (ATSB)	Clydebank	270	£16,400	£16,400				£16,400	£4,428,000
	AYRSHIRE COUNTY COUNCIL	Clydebank	12	£0					£16,400	£196,800
	CANADIAN TIMBER FRAMED/BRICK	Clydebank	4	£17,500					£17,500	£70,000
	CONCRETE WALL PANEL SYSTEM "REEMA"	Clydebank	1			£500			£500	£1,000
	CONCRETE WALLS MILLER NO FINES	Clydebank	26	£7,000		£3,250			£10,250	£266,500
	CONCRETE WALLS WIMPLY NO FINES	Clydebank	1		£7,130				£7,130	£7,130
	CRAIG ATHOLL	Clydebank	119		£7,130				£7,130	£848,470
	DUGDALE DENNIS	Clydebank	4	£15,500					£15,500	£62,000
	DUPLEX FOAM SLAG	Clydebank	27		£14,000				£14,000	£378,000
	HILCON EX	Clydebank	407	£5,250	£14,225				£5,250	£2,138,750
	HILLS PRESWELDHILCON	Clydebank	86						£5,250	£1,223,350
	KANE BRICKWOOD	Clydebank	27	£17,225					£17,225	£465,075
	LAWRENCE MARK 1	Clydebank	21	£0	£2,500	£2,500			£5,000	£105,000
	ORLIT (PITCHED ROOF) (ORLIT)	Clydebank	80	£0	£12,000				£12,000	£960,000
	TIMBER FRAMED WEIR MULTICOM	Clydebank	28		£19,950				£19,950	£578,550
	TIMBER FRAMED/BRICK WALLING	Clydebank	30		£5,000				£5,000	£150,000
	WHITCON	Clydebank	22						£0	£0
	WHITSON FAIRHURST	Clydebank	1	£24,000	£4,400				£24,000	£24,000
		Clydebank	269	£4,400	£4,400				£8,800	£2,367,200
	BLACKBURN BRICK	Dumbarton	306						£1,000	£306,000
	CONCRETE FRAME	Dumbarton	7	£1,000					£7,350	£51,450
	NO FINES	Dumbarton	290	£7,350	£7,130				£7,130	£2,067,700
	ORLIT	Dumbarton	38	£20,100					£20,100	£763,800
	SWEDISH TIMBER	Dumbarton	18		£14,050				£14,050	£252,900
	WEIR TIMBER	Dumbarton	11		£14,400				£14,400	£158,400
	WHITSON FAIRHURST	Dumbarton	15		£4,400	£4,400			£8,800	£132,000

4003	£11,405,425	£19,804,800	£151,000	£18,000	£431,050	£420,500	£33,263,275
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Notes

- 1 All costs exclude contractor's preliminaries, site overheads, security etc. They also exclude consultant's fees, statutory charges, VAT.
- 2 Year 1 is assumed to be 2005-2006
- 3 The costs are specifically for works to safeguard the structural integrity of the buildings and assume there is a maintenance programme of expenditure that runs in parallel throughout the thirty year term
- 4 Costs exclude any allowance for replacement or upgrade of mechanical and electrical installations
- 5 The costs are taken as the average applied to the particular non-rad format. Costs for individual units will be dependent on the nature/layout of that specific unit.
- 6 Costs exclude the testing and removal of asbestos

APPENDIX 4

SCOTTISH HOUSING QUALITY STANDARD



SCOTTISH EXECUTIVE

Development Department

Chief Executives – Local Authorities
Directors of Housing/
Chief Housing Officers – Local Authorities
Directors of RSLs in Scotland

Copies to: Chief Executive, COSLA
Director, SFHA
Chief Executive, CIH
Scottish Director, CML
Director, Shelter
Other Consultees

Mike Neilson

Head of Housing and Area Regeneration Group
Victoria Quay
Edinburgh EH6 6QQ

Telephone: 0131-244 0768

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mike.neilson@scotland.gsi.gov.uk

<http://www.scotland.gov.uk>

Your ref:

Our ref:

4 February 2004

Dear Colleague

SCOTTISH HOUSING QUALITY STANDARD (SHQS)

The Minister for Communities has made an announcement today about the Scottish Housing Quality Standard in a statement to the Scottish Parliament. This gives details of the content of the Standard and sets a target date for bringing houses in the social rented sector up to this Standard.

The Scottish Executive's consultation paper "Modernising Scotland's Social Housing", issued in March 2003, set out proposals for a national standard based on a minimum set of quality measures for all houses in the social rented sector (at the time this was referred to as the Scottish Social Housing Standard). In the meantime, Scottish Ministers announced that, following recommendations of the Housing Improvement Task Force, they would bring in a cross-tenure Scottish Housing Quality Standard in line with the Partnership Agreement to introduce a decent homes standard. Decisions on the final version of the Standard have taken account of the responses to the consultation and a summary of the responses is available from the Executive and on the Executive's website – www.scotland.gov.uk/consultations/housing/mssh04-00.asp. Account has also been taken of the results of the Scottish House Condition Survey which was published in November 2003.

The intention has been to define a standard which is relevant to the 21st Century and is consistent with views on what constitutes acceptable, good quality housing. It differs from the statutory Tolerable Standard (a very basic standard of acceptability) and the Building Standards as they apply to new housing.

As initially proposed in "Modernising Scotland's Social Housing" the Standard is based on a number of broad quality criteria. To meet the Standard the house must be:

- compliant with the tolerable standard;
- free from serious disrepair;
- energy efficient
- provided with modern facilities and services;
- healthy, safe and secure.



The precise way in which these broad criteria are to be defined is set out in the attached note which sets out a detailed specification of the Standard. A number of changes have been made to the detailed specification in the light of the responses to the consultation and you may wish to note, in particular:

- there is now an explicit requirement for the required full central heating system to be energy efficient;
- the standard for loft insulation is 100mm;
- although there is not a standard requirement for double glazing, this may be necessary in certain houses if there are problems with external noise or to ensure that the house meets the thermal efficiency standard;
- there is a requirement for adequate noise insulation where there are problems with external noise (the possibility of having a noise insulation standard for noise generated within the building was considered but rejected on grounds of practicality);
- mechanical ventilation should be provided in either the kitchen or bathroom, or both, if there are persistent problems of condensation dampness;
- the suggested requirement for a second WC in houses with 3 or more bedrooms has been dropped because of the practical difficulties of adapting existing houses to add an additional WC;
- there is a requirement to ensure that common areas and facilities linked to the house but external to the dwelling are in good and safe order with adequate lighting.

Careful consideration was given to whether the Standard should include accessibility requirements. There is an existing 'visitability' standard for new build properties that aims to make it much easier for disabled persons to visit the house in question. A higher standard is promoted by Communities Scotland for new build social housing in accordance with the 'Housing for Varying Needs' design guidance based on the 'barrier free' concept. As well as containing many similar features to the 'visitability' standard, it provides for additional specifications to help disabled occupants.

Many respondents commented that these standards could not be realistically applied to all existing properties. There were concerns that it could give rise to significant rebuilding at disproportionate cost. It was also recognised that different occupants have different needs and that many houses which could never be adapted to provide suitable housing for persons with disabilities, nevertheless provide quite satisfactory housing for most households. Whilst the Executive has, therefore, decided not to include any accessibility requirements in the Standard itself, it fully recognises the need to ensure that there is suitable housing for persons with disabilities. The Executive expects each local authority, through the process of preparing Local Housing Strategies, to identify, over time, the scale and nature of these needs and to draw up proposals for meeting any shortfall.

The intention is that the Scottish Housing Quality Standard is relevant to the housing stock as a whole. Its application will, however, vary according to tenure.

In the social rented sector, the Minister has made it clear that she expects local authorities and registered social landlords to ensure that their stock meets the standard by 2015. However they will be able to set their own milestones for progressing towards the 2015 target date, taking account of their local circumstances. They will also be expected to prepare Standard Delivery Plans for submission to Scottish Ministers by April 2005 at the latest; these will be assessed by Communities



Scotland on behalf of Scottish Ministers. In the case of local authorities, these will take the form of an update to, or revision of, the Local Housing Strategy. Further guidance on the content of Delivery Plans and the criteria for assessing them will be issued in due course.

Social landlords may, following consultation with their tenants, wish to augment the Standard with additional local specifications. The Executive has no difficulty with this providing there are clear plans for achieving the national Standard and the additional resources are available.

In the private sector, aside from instances where owners may be required to, for example, bring properties up to the Tolerable Standard or rectify serious disrepair that has been subject of a statutory notice, it is ultimately a matter for individual owners to decide whether to make improvements if their properties do not meet the Standard. However, local authorities will wish to take account of the Standard in monitoring the condition of the private sector housing stock in their areas; they will need to consider what measures might be adopted to encourage private owners to undertake relevant works and to report on this in future Local Housing Strategies.

If you have any queries on the Standard, please contact Mary MacDonald (tel: 0131 244 5569) (e-mail mary.macdonald@scotland.gsi.gov.uk) or Helen Jones (tel: 0131 244 5570) (e-mail helen.e.jones@scotland.gsi.gov.uk) in the first instance.

Yours sincerely



MIKE NEILSON



SCOTTISH HOUSING QUALITY STANDARD

Housing Quality Criteria	Criteria definition	Criteria elements	Failure assessed by:
COMPLIANT WITH THE TOLERABLE STANDARD	The Tolerable Standard	Below Tolerable Standard	Single Primary Failure
FREE FROM SERIOUS DISREPAIR	Primary Building Elements	Wall structures Internal floor structures Foundations Roof structure	Single Primary Element Failure. An element fails where it requires repair or replacement of more than 20%
	Secondary Building Elements	Roof covering Chimney stacks Flashings Rainwater goods External wall finishes Access decks/ balustrades Common access stairs / landings, pathways within the curtilage of the dwelling Individual dwelling balconies / verandas Individual dwelling, attached garages, internal stairs Damp Proof Course Windows/ doors Common windows/ roof lights Underground drainage	Failure by <u>two</u> or more elements. An element fails where it requires repair or replacement of more than 20%.
ENERGY EFFICIENT	Effective Insulation	Cavity insulation where technically feasible and appropriate ¹ 100mm loft insulation where appropriate ² Insulation of hot water tanks and pipes (and cold water tanks as an ancillary measure)	Single Element Failure

¹ In some types of housing, it is not possible to install cavity wall insulation; in other cases installation may be prohibited by building regulations because cavity wall insulation would lead to other problems such as water penetration and dampness.

² 100mm is the minimum existing insulation which will meet the standard, but where insulation is being installed it must meet the standard required by the building regulations.



	Efficient Heating	A full house central heating system that has an acceptable efficiency rating ³ , or similarly efficient heating system that is developed in the future	Single Element Failure
	Additional energy efficiency measures	Additional energy efficiency measures, where technically feasible ⁴ , necessary to achieving a minimum NHER rating of 5 or SAP rating of 50	Single Element Failure where a necessary, practical measure has not been implemented
MODERN FACILITIES AND SERVICES	Bathroom Condition	Bathroom amenities should include a WC, bath or shower and wash hand basin in good and usable condition	Single Element Failure An element fails where it requires repair or replacement of more than 25%
	Kitchen Condition	Kitchen fittings in good and usable condition	Single Element Failure An item fails where it requires repair or replacement of more than 25%
	Kitchen Facilities	Adequate kitchen storage to current building standards where practical (1m ³ within or adjacent to the kitchen; space for a cooker and related activity space in front of it to allow safe use) Safe kitchen working arrangements, including worktop space on at least one side of, and at least the same width as, the cooker Sufficient power outlets (6 or more sockets)	Single Element Failure

³ An inefficient central heating system is defined here as being:

- a solid fuel boiler with an annual seasonal efficiency of 55% or less
- a natural gas boiler with an annual seasonal efficiency of 55% or less
- an oil-fired boiler with an annual seasonal efficiency of 65% or less
- a gravity or semi-gravity heating system more than 20 years old.

An inefficient electric storage heating system is defined here as being:

- free-standing large volume storage heaters more than 20 years old
- free standing compact storage heaters more than 20 years old
- electric fan-assisted storage warm air heating more than 20 years old
- electric wired underfloor heating, set in solid floors, more than 20 years old
- electric ceiling heating more than 20 years old.

⁴ Such measures might include coated double or even triple glazing. It is recognised that it will not always be technically feasible, without disproportionate cost, to bring certain houses up to the minimum thermal efficiency standard. Building Standards may be relaxed if it is not reasonably practical to meet the minimum standards.



HEALTHY, SAFE AND SECURE	Healthy	Internal pipe work lead-free Mechanical ventilation in the kitchen and bathroom where this is required to tackle persistent problems of condensation dampness and mould growth Adequate noise insulation ⁵ where there are problems with external noise from e.g. traffic or factories	Single Element Failure Persistent problem categorised by condensation or mould on more than 5% of the wall and ceiling area of bathroom or kitchen
	Safe	A smoke detector present in the home ⁶ Safe electrical systems Safe gas and oil systems and appliances Common stairwells, lifts, lobbies, courts, laundry and drying areas, refuse chutes and bin stores, where provided, in good and safe order Adequate lighting in common internal and external areas within the curtilage of the house	Single Element Failure
	Secure	Secure front and rear access doors Front door entry systems and secure rear access to enclosed common areas	Single Element Failure

⁵ In most cases, the insulation will be provided through double or triple glazing.

⁶ Existing smoke detectors may be hard wired or battery powered; new installations must be hard wired.

