

**NON-TRADITIONAL HAWKSLEY BL8 BUNGALOWS
AT LETCHWORTH**

**STRUCTURAL CONDITION SURVEY
ADDENDUM REPORT FURTHER 7 NR PROPERTIES**

Prepared for

NORTH HERTFORDSHIRE HOMES

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30 November 2007

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1 INTRODUCTION

Michael Dyson Associates Limited ("MDA") has previously undertaken a Technical Survey and Study of Hawksley BL8 Bungalows at Letchworth on behalf of North Hertfordshire Homes ("NHH").

The Bungalows situated at Campfield Way and Highover Road are of Non-Traditional type as manufactured by the Hawksley Aircraft Company and built in the late 1940s, early 1950s. The properties are constructed from prefabricated load bearing timber studding panels framed with aluminium channel section and clad with aluminium sheets. Panels were bolted together on site on pre-prepared bases.

NHH owns circa 50 Nr of these dwellings at the Letchworth site. The previous Structural Assessment initially involved the detailed examination of 2 Nr properties selected in consultation with tenants and NHH, to be representative of the semi-detached properties at the Campfield Way and Highover Road site. This was undertaken in October 2005. Following on from this, the investigation was extended in June 2006 to include a further void property which subsequently became available for inspection.

The purpose of the original Structural Assessment was to determine (by visual and invasive investigation) the existing condition of the Non-Traditional structures of the bungalows to enable forecasts to be made as to future structural performance. The survey proposed by MDA in response to the client's survey brief included for the following services:-

- Detailed inspection of the structure of the existing bungalows, including the floors, walls and roof structures and undertaking all necessary tests and investigation works.
- The provision of a detailed report highlighting the findings of the investigation, complete with photographs and other documentary information that may be helpful.
- Recommendations and repair options including estimated costing of the remedial/refurbishment works.

The report issued to NHH on 28 November 2005 following the initial investigation included a summary of the methods used to carry out the survey and the results of all intrusive tests.

The report also indicated the condition of the structures inspected, confirmed the condition of the aluminium and timber components examined and commented on the significance of deterioration noted and provided the options for repair together with budget costs as appropriate.

The purpose of the investigation of the additional void BL8 bungalow was to verify the results of the previous (limited) sample survey. A report was issued in July 2006 as an addendum to the original report and included the results of the investigation of the void property Nr 20 Highover Road.

MDA were appointed by NHH in September 2007 to undertake a further investigation of a wider sample of an additional 7 Nr BL8 bungalows, in order to enable a more accurate assessment to be

made of the overall condition of the properties. All the properties examined were tenanted at the time of the survey. This report is issued as an addendum to the previous reports and includes results of investigations of the 7 Nr properties selected for the present structural survey investigation.

In our experience of surveying and repairing this type of non-traditional property it is reasonable to assume that the results of the 10 Nr properties inspected in detail to date will be indicative of the condition of all the Hawksley BLB bungalows at the Letchworth site.

The present report assumes that the reader is familiar with the content of both the original report and the first addendum report issued by MDA.

➤ Refer to Appendix 1 for Address List of Surveyed Properties

2 SURVEY METHODOLOGY

A two-stage approach to the Structural Assessment Survey of the Hawksley BL8 Non-Traditional bungalows at Letchworth has been followed as outlined below to identify the procedure followed in relation to the total of 10 Nr properties which have now been surveyed.

2.1 Stage One

Stage One comprised a desktop review of previous published reports on the condition of the Hawksley BL8 bungalows, to identify the nature and extent of any previous repair works recommended or carried out that may have bearing on structural condition. This was then followed by an external impressionistic survey of all the properties to confirm local factors and assess the overall general condition of the bungalows.

The exercise concluded with a general overview from which particular risks were identified in order to inform and determine the extent of the invasive investigations required to assess the structural condition of the Non-traditional Hawksley BL8 bungalows.

2.2 Stage Two

A detailed visual and invasive investigation of the representative sample of the 2 Nr bungalows was carried out in October 2005, and included:-

- Detailed visual inspection of external cladding elements to confirm the extent of corrosion and structural deterioration.
- Determination of the configuration of the principal structural components.
- Detailed visual inspection of internal wall, floor, ceiling surfaces and roof voids to confirm the extent of defects, condensation, dampness and timber decay and record moisture contents where appropriate.
- Opening up of the structure of the Hawksley BL8 bungalows by careful removal of external aluminium cladding joint strips and corner cladding panels at locations around the perimeter of each property. To inspect for corrosion of structural aluminium frame components and connections.

The subsequent investigation of Nr 20 Highover Road in July 2006 followed a similar methodology. However, because the property was void at the time of the survey, areas of internal plasterboard linings were removed (by a contractor provided by NHH) to allow a detailed inspection of the perimeter aluminium channel at the base of the wall panels.

The present survey of a further 7 Nr tenanted properties at Campfield Way and Highover Road by necessity follows the methodology outlined above for the original investigation of the first 2 Nr properties.

All investigations were carried out cognisant of BRE guidance, where applicable, and MDA's extensive experience of Non-Traditional properties and Hawksley BL8 bungalows in particular.

The properties surveyed were selected by NHH as being representative of the remaining properties on the site. A total of 10 Nr properties were made available, including the previously surveyed void property, from which MDA managed to gain access to 7 Nr previously un-surveyed properties during the present survey.

Properties inspected during the present survey include:-

- Nrs 6, 8, 13, 17 and 30 Campfield Road
- Nrs 8 and 17 Highover Road.

Properties previously surveyed were;-

- Nrs 11 Campfield Way
- Nrs 20 and 25 Highover Road.

The 10 Nr properties inspected to date are considered to be typical examples of the Hawksley BL8 bungalows at Campfield Way and Highover Road and the condition of these properties will therefore be indicative of all properties on the site.

A photographic record of property elevations, survey methods, and observed defects was taken during the site investigations to illustrate the report.

- Refer to Appendix 4 for Photographic Log

2.3 Limitations of Survey

The present structural survey is restricted to consideration of the Non-Traditional structural elements of the properties. The condition of doors, windows, canopies, outbuildings and external fixtures and fittings, together with gas, water and electrical service, central heating, flues, bathroom and kitchen fittings and internal decorations are all excluded from consideration. A separate Stock Condition, HHSRS and Energy Assessment Report has been prepared by MDA as part of a wider assessment of the BL8 Bungalows at Letchworth.

Identification and testing for the possible presence of asbestos material generally and in particular within areas of the properties not accessed during the present structural survey is considered to be outside the scope of the Structural Assessment. A separate Asbestos Survey and report has been undertaken by NHH as part of the wider assessment

Testing for, or enquiring into, contamination, pollution or the possibility of the presence of Methane gas from geological or organic sources, has not been carried out as part of the structural survey; likewise, the presence of, or susceptibility to, Radon gas.

The presence of such gases in harmful amounts is not a common occurrence, however NHH may wish to carry out tests since this may well affect the future value of properties and affect planned maintenance.

No testing of electrical, mechanical, water, drainage, or other services was undertaken. Manhole covers were not lifted and below ground drainage was not tested.

No formal enquiries in respect of existing user rights, town planning and road widening, legal interests, fire certificates, effluent agreements, party wall agreement, prescriptive rights, easements, wayleaves or statutory consents were made.

This report may not be relied upon by a third party for any purpose without the written consent of Michael Dyson Associates Ltd. Furthermore, this report has been prepared and issued specifically for the benefit of NHH and no responsibility will be extended to any third party for the whole or any part of its contents.

3 SURVEY FINDINGS

The results of the present structural survey are presented in tables within the Appendices and are summarised below:

3.1 Invasive Investigations

The invasive investigation of the further 7 Nr Hawksley BL8 properties at Campfield Way and Highover Road was carried out to establish the condition of the structural frame elements and compare the results with those of the previous surveys of the bungalows carried out by MDA.

The results of the previous and present investigation of typical properties on the site will be indicative of the condition of the remaining properties in our experience.

The detailed visual inspection of external cladding sheets and drip flashings confirmed these elements are affected by various forms of deterioration.

Whilst the cladding sheets themselves are not physically damaged at any of the properties investigated, there are numerous examples of decay affecting the external walls. Corrosion of panel joint cleats and the vertical aluminium frame is evident at all properties inspected, as is corrosion of the drip angle and base channel.

Water staining and mould growth of the external aluminium cladding sheets was evident at each property. Areas of delaminating painted finishes to external cladding panels were noted at properties Nrs 8 and 17 Campfield Way and Nr 8 Highover Road. Bulging or displacement of cladding sheets was also observed at Nrs 8 and 17 Campfield Way.

Flower beds at the front and rear of a total of 6 Nr of the 7 Nr properties surveyed have areas where the garden soil level is at or above the drip mould and base channel height. Bridging of the damp proof course was not evident at Nr 17 Highover Road.

Roofs of the properties appear outwardly to be in good condition with no defects to the profiled roof covering sheets or guttering and down pipes observed. Sealant washers were noted to be present and intact at all roof fixings inspected. A previous repair to a chimney joint was observed at Nr 8 Highover Road.

Removal of vertical aluminium cladding joint strips between panel units and the aluminium corner cladding units, allowed a detailed visual inspection of the aluminium channel frame members and connecting cleats, at between 3 Nr and 5 Nr locations around the perimeter of each surveyed property.

Connecting cleats and fixing bolts between structural panels above base level were observed to be in poor condition with corrosion observed at each surveyed property. The level of corrosion was noted to be particularly severe at the bottom cleats at 3 Nr locations (75%) at Nr 8 Campfield way, 1 Nr location (33%) at Nr 17 Campfield Way and 1 Nr location (20%) at Nr 17 Highover Road.

Drip moulds and vertical frame channel sections inspected at locations where cladding was opened up were also observed to have corroded at each surveyed property. Severe corrosion leading to perforation and disintegration of the drip mould in particular was evident at areas around the perimeter of properties Nrs 6, 8, 17 and 30 Campfield Way and Nr 8 Highover Road in particular.

Timber studding members, where exposed by the removal of the original fibreglass insulation quilting, were observed to be in good condition and free from decay at present with only minor instances of water staining evident. However, whilst no significant deterioration was observed, maximum readings of timber moisture content taken at each property were noted to be variable, ranging from a lowest reading of only 15% at 2 Nr properties to a maximum of 30% at a further 2 Nr properties, which indicates considerable levels of moisture within the timber generally. Moisture contents up to 20%-25% were recorded at the remaining properties.

The presence of levels of moisture content within timber elements above 20% is considered likely to lead to decay of the studding elements in the future.

The bitumen based building paper on the back face of the cladding panels was noted to be in generally good condition at present where this has been observed during the opening up of the external cladding panels.

Internal lining boards, where observed at the panel joint locations, were noted to be in good dry condition, indicating that panel joints at the surveyed properties have remained free from water ingress.

3.2 Internal Inspections

Internally, roof lining boards were observed to be in good condition. Timber prefabricated roof trusses were observed to be in sound condition with no splits or shakes, although an instance of fungal attack affecting timber purlins was observed at 1 Nr property. Moisture contents of the timber elements were found to be generally low, ranging from a low of 8% to a maximum of only 14%.

Our survey has revealed that additional galvanised nail plate cleats have been installed to secure the roof sheet timber purlins to the prefabricated timber trusses. Discussions with NHH confirm that the strengthening was undertaken to all properties earlier in the year following an incident where roof sheets became detached from the property Nr 8 Campfield Way during high winds last Easter.

Fire stop walls at party divides were noted to be intact and complete at the properties inspected.

Previous water leaks at chimney flashings were observed at each property, together with holes in the sheet metal roof coverings where original bolt fixings appear to have been located and previously removed.

Levels of insulation at Nrs 6 and 8 Campfield Way and Nr 17 Highover Road were found to be low at between 50mm and 100mm generally which is considered to be low by current standards. Insulation was variable up to 250mm at the other properties inspected.

Existing ventilation provision to roof voids at the soffits appears to have performed adequately in the past by preventing condensation and mould from forming on timber trusses and rafters. However, viewed externally, the vents were noted to be now blocked in most cases, which can be expected to lead to an increase in condensation within roofspaces over time. Loft insulation was noted to be pushed well into the eaves at Nr 8 Highover road in particular.

Internally, walls, floors and ceilings were noted to be free of defects, with no instances of cracking, condensation, mould or dampness evident.

➤ Refer to Appendix 3 for Results of the Survey.

3.3 Photographic Log

Photographs to illustrate the report findings, together with elevations of the Hawksley BL8 Bungalows inspected are contained within the Appendices.

Photographs were taken of the survey methodology and typical examples of the observed defects described above during the course of the invasive survey of the further 8 Nr properties.

➤ Refer to Appendix 2 for Photographic Log.

4 CONCLUSIONS

The previous investigations of properties at Campfield Way and Highover Road established that the remedial works recommended by the Government in 1965 have not been carried out and identified the onset of corrosion of the aluminium sole plate channels, connecting cleats and drip angles that had been predicted due to the impurities in the aluminium alloy used in manufacture.

The present structural survey of a further 7 Nr BL8 bungalows confirms the findings of the previous investigations. Corrosion of the aluminium base channels, connecting cleats and drip angles has now begun to occur with severity in localised areas at all the properties now inspected.

Having now investigated 10 Nr bungalows at the site in all, (some 20% of the total stock of NHH owned Hawksley BL8 bungalows) it is evident that Central Government recommendations were not implemented at any of the properties and, as such, it is likely that the anticipated deterioration and resultant corrosion of the aluminium frame components will have taken place to varying degrees at all of the remaining properties at the Letchworth site.

The observed deterioration of the sole plate channels, connecting cleats and drip angles at 100% of the surveyed properties is likely to be indicative of the typical deterioration across the remaining un-surveyed Hawksley BL8 bungalows at the site. Not only was the corrosion observed during the present survey similar in location to that observed during the previous investigations, in a number of cases, the corrosion was more advanced than that observed previously, having reached severe levels in many instances.

As noted in the original report on these properties, factors of safety regarding structural stability and in particular, the ability to resist uplift and overturning will be compromised as a consequence of corrosion of the aluminium cleats, base channel and frame channels. Whilst structural collapse of individual properties is unlikely to occur, localised structural damage is a distinct possibility if the bungalows remain un-repaired or when corrosion becomes more widely manifest.

The reported incident of roof panels becoming detached in high winds at Nr 8 Campfield Way serves to emphasise in a dramatic way the inherent weaknesses in the original structural design. Whilst the additional nail plate fixing of the purlins will help to strengthening the roof, the timber trusses will not be adequately fastened to the walls and the walls to the base unless the previous recommended repairs of the 1960s are fully implemented as a minimum requirement.

The results of the present survey indicate that localised corrosion of the components inspected is common among the BL8 bungalows at Campfield Way and Highover Road, and it would appear to be progressing.

The results of the present survey therefore support the findings and the recommendations for repairs as detailed in the previous report issued to NHH by MDA.

5 REPAIR OPTIONS

5.1 Summary or Repair Options

The investigation of the present condition of the Non-Traditional Hawksley BL8 bungalows has confirmed the requirement that structural repairs be implemented to overcome the inherent weaknesses in the original designs. In addition expenditure on improvements and lifecycle renewals and repairs will undoubtedly be required to maintain the properties over the next 30 years, notwithstanding the requirements to achieve Decent Homes Standards.

It has been demonstrated that implementing the previously recommended repairs to cill sections, panel joints and roof truss connections, in conjunction with improvements to external wall and roof structures will provide adequate structural stability to the Hawksley BL8 bungalows.

A number of options for the repair and improvement of the bungalows should be considered within the above context:

5.2 Option 1 – Do Nothing

In view of the defects in structure presently identified and the potential for structural instability of the properties, this option is not considered viable in anything but the short-term.

5.3 Option 2 – Minimal Repairs to Existing Structure

In theory, the minimal structural repairs recommended to protect and strengthen the existing structures could be implemented. In practice this option does nothing to improve the structure in terms of meeting present day Building Regulations structural requirements or improving thermal performance, CO₂ emissions and achieving Decent Homes standards.

This option should therefore be considered as a stop gap measure only.

Existing roof structures and coverings could be retained with repairs implemented only on a responsive basis.

Budget Costings

The cost of such minimal repairs is estimated at £3400 per bungalow (plus VAT).

5.4 Option 3 – Full Structural repairs and improvements to Existing Structure

The external walls and roof structures should be strengthened and improved, in addition to the above minimum structural works and generally in compliance with the “1965 repair”.

External finishes could be in profiled sheeting to maintained existing appearance or in render over insulation or brick slips over insulation, both constructed on the existing foundations.

Where walls are to be replaced with masonry, new foundations will need to be designed to extend beyond the existing foundations, to accommodate a wider external wall of either brick cladding or block and brick cavity wall construction.

Budget Costings

The cost of this option, repairing the 50 Nr Hawksley BL8 bungalows to a 30 year assured life standard is estimated to be in the order of £26,000 to £37,000 per bungalow (excluding VAT) for lightweight overcladding and masonry schemes respectively.

5.5 Option 4 – Rebuilding on Existing Foundations

The extent of the reinstatement works described above to provide new roof coverings and masonry external walls (necessitating new doors and windows) in conjunction with any proposed improvements to achieve Decent Homes Standards where these are deemed necessary, (kitchens, bathrooms, central heating and other works) is not too removed in practice from the demolition and rebuilding of the bungalows on the existing foundations. Both options would require decanting of tenants and would aim to provide a 'new' structure designed to a 60 year standard. A degree of remodelling of internal layouts could be considered as part of this option, whilst retaining the original footprint and services/drainage etc of the original dwellings.

Budget Costings

The cost of this option, rebuilding the 50 Nr Hawksley BL8 bungalows to a 60 year standard on the existing foundations (assuming they were adequate) is estimated to be in the order of £60,000 per bungalow, but is dependent on level of specification and the degree of re-modelling.

5.6 Option 5 – Redevelopment of Site

The extent of works, to maintain structural integrity, and improve the bungalows to achieve present and foreseeable standards, is arguably not cost effective. Redevelopment of the site would be an option available to NHH to better meet the needs of tenants and provide a sustainable community for the foreseeable future. Consultations with tenants and the results of Housing Demand Surveys (outside the scope of the present survey) might demonstrate a need for a different mix of properties on the site.

APPENDICES