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# Report



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## Condition Survey

**Airey  
BL8  
Cornish  
Dorlonco  
Reema Conclad  
Reema Hollow Panel  
Stent  
Swedish  
Unity  
Woolaway**

## **dwellings at various locations**

for

Stroud District Council  
Council Offices  
Ebley Mill  
Stroud  
GL5 4UD

By Curtins Consulting Ltd  
May 2017

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# 1.0 Introduction & Brief



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## Introduction

- 1.1 Curtins Consulting Limited were appointed by Stroud District Council (referred to in the report as SDC or the Council) to undertake a survey and prepare a report on a number of different types of non trad dwellings.
- 1.2 Airey, Cornish, Reema Hollow Panel, Stent, Unity & Woolaway are prefabricated reinforced concrete (PRC) properties, and were *Designated Defective* under the Housing Defects Act 1984.
- 1.3 Reema Conclad properties are prefabricated reinforced concrete (PRC) properties that were not *Designated Defective* under the Housing Defects Act 1984.
- 1.4 BL8 and Dorlonco properties are metal framed properties, and were not *Designated Defective* under the Housing Defects Act 1984.
- 1.5 Swedish houses are timber frame properties, and were not *Designated Defective* under the Housing Defects Act 1984.
- 1.6 The survey work was carried out in early May 2017.
- 1.7 This report has been prepared as follows:

Sections 3 to 12 detail the construction, inspections, previous reports, conclusions & recommendations for each of the property types. Section 13 provides comment on issues of mortgageability and Section 14 provides a summary of the findings, conclusions & recommendations.

In the Appendices, we have provided a full list of all the properties in the survey population (Appendix A), a list of surveyed properties (Appendix B), illustrations of typical original construction (Appendix C), photographs (Appendix D), List of Previous Reports (Appendix E).

This report is provided electronically on disk – as .pdf versions of the report text and Appendices plus Excel.xlsx versions of the tables in Appendices A, B, and full size copies of the photographs in Appendix D.

A copy of the Curtins 2003 Report is also included on the disk

- 1.8 This report has been prepared for Stroud District Council and should not be relied upon by any Third Party without express permission in writing from Curtins Consulting Ltd.

## 1.0 Introduction & Brief



### Brief

1.9 The brief was to provide a supplement to a report prepared by Curtins in 2003. The Council are considering future options for their Non Trad Stock. One option is to install and external wall insulation system (EWI), and another to carry out refurbishment works which would make the properties “mortgageable” for their tenants to buy.

The brief may be summarised as follows:

- Desk top review of Curtins 2003 Report
- Visual inspection of external walls
- Determining the configuration of the principal structural components
- Visual Inspection internally of floors, walls, ceilings where access available
- Recommendations for future action
- Provision of a Report, including an assessment of “remaining life”

### 1.10 Exclusions & Limitations

- (a) The survey will be restricted to the PRC or non trad structural elements.
- (b) For each construction type we will give an assessment of “remaining life”. This will be based upon the Curtins 2003 report, and our observations of the properties inspected. It will be assumed that unless there is evidence of deterioration then the remaining life will remain constant – 30 years in 2003 should still be 30 years in 2017. The remaining life only applies to the non-trad elements (PRC, steel frame, timber frame etc), and not to any other elements (timber roof structure, coverings, wall finishes, windows etc etc).
- (c) No trial pits will be excavated, no floorboards will be taken up. The surface waste drainage systems will not be investigated. The survey will not include investigation of non structural elements such as services (gas, electric, water supply), windows, doors, finishes (plaster, ceilings etc.), roof insulation and coverings, pollution and/or contamination, asbestos etc. Insulation, damp penetration and condensation will be examined insofar as they might adversely affect the structural components.
- (d) Property types which are *Designated Defective* under the Housing Act 1985 have a “mortgageability” problem for private owners when the existing concrete elements remain in place. Generally they become “mortgageable” when these are removed or made redundant. Stroud District Council should be aware that most “Non-Trad” property types may be problematic for private owners seeking a mortgage. Whilst this does not impact on this survey and report as SDC are not seeking to sell their stock, tenants should not be given advice based on this report that they may subsequently use to give comfort to lenders about the condition of their property.
- (e) We are unable to comment on defects which may be present but hidden from view. Further intrusive investigations may reveal additional or different defects to those observed in this survey.

## 2.0 Scale of the Investigation



- (a) A full list of the Non Traditional Stock is provided in Appendix A, divided into the various construction types. The list includes the following attributes (note: the information listed below is contained in the Excel version, it may not be included in the text version due to space constraints).

Description	Column title	Comments
Unique Property Reference Number	upnr	Numbers as per SDC lists
Property Construction	Type	The table is arranged in alphabetical order of type
Main location	Town/Village	Within each Type the location is listed alphabetically
Street	Street	Within each Town/Village the street is listed alphabetically
House Number	No	Also refers to Flat number
Post Code	Post Code	
Property Type	H/F/B	Details Houses, Flats, Bungalows. The code used is generally self-explanatory, eg SDH = Semi Detached House, F0 = Ground floor flat
Individual survey	Surveyed	Surveyed property indicated by Y
Major Works carried out (eg EWI)	Works	From data supplied by SDC
Year Works carried out	Year	From data supplied by SDC

- (b) The list of dwellings & construction types was supplied by SDC, and included properties which were of Traditional or Not Identified (“No ID”) construction. Some of these were in or near roads that contained Non-Trad construction types. In some cases we have been able to check on site and correct the record for the actual construction where there has been an error, but we have not checked every property in every road, and some errors may remain.
- (c) Not all construction types were surveyed as shown in the following table.

Construction	Surveyed	Reasons
Airey	No	External walls masonry, PRC components hidden
BL8	No	Brickwork in front of external wall metal sheeting
Cornish	No	All PRC replaced with masonry construction
Dorlonco	Yes	
Reema Conclad	Yes	
Reema Hollow Panel (without EWI)	Yes	
Reema Hollow Panel (with EWI)	No	PRC components hidden by EWI
Stent	No	PRC components hidden by EWI
Swedish (not previously surveyed)	Yes	
Swedish (previously surveyed)	No	Curtins carried out opening up surveys in 2015 & 2016
Unity	No	PRC components hidden by EWI
Woolaway	No	All to be demolished for site redevelopment

## 2.0 Scale of the Investigation



- (d) The Non Traditional stock survey population comprises 212 No properties distributed as follows. We surveyed 42 No, representing 1 in 5 properties, which was above the target of 1 in 10 properties.

Construction	Qty	Surveyed Externally	% Surveyed
Dorlonco	13	3	23.1% (1 in 4.3)
Reema Conclad	36	8	22.2% (1 in 4.5)
Reema Hollow Panel	157	25	15.9% (1 in 6.3)
Swedish	6	6	100% (1 in 1)
Total	212	42	19.8% (1 in 5.0)

- (e) All the properties surveyed were occupied, but not all tenants were at home during our survey work, and a small number of tenants declined to allow us into their homes.

Construction	Qty	Surveyed Internally	% Surveyed
Dorlonco	13	2	15.4% (1 in 6.5)
Reema Conclad	36	5	13.9% (1 in 7.2)
Reema Hollow Panel	157	20	12.7% (1 in 7.9)
Swedish	6	2	33.3% (1 in 3)
Total	212	29	13.7% (1 in 7.3)

- (f) A list of the surveyed properties is provided in Appendix B, divided into the various construction types.
- (g) The external survey was by visual inspection from ground level, focusing on the Non Trad construction components where these were exposed to view.
- (h) For Dorlonco type construction the steel frame is not exposed, but defects to the render finishes can provide some evidence of deterioration of the steelwork.
- (i) For Reema Conclad type construction the exterior face of the large panels are visible.
- (j) For Reema Hollow Panel type construction the exterior face of the large panels and the columns/beams are visible.
- (k) For Swedish timber frame properties the outer boards are visible. Apart from the site in North Nibley Curtins have carried out opening up investigations at all the sites of Swedish timber frame houses during the last two years. The survey population for this report was all the remaining dwellings to establish whether any were substantially different in external condition from those already examined.
- (l) Internally the steel frame is evident but hidden by finishes in the Dorlonco houses. In all the other construction types the Non Trad components are hidden from view, and evidence of deterioration would only be detected by disturbance to the finishes.

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## 2.0 Scale of the Investigation



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- (m) Damp penetration and condensation were examined as far as practical, generally concentrating on kitchens and bathrooms. Tenants belongs were not moved for the purposes of the survey.
  - (n) Where dwellings inspected had porches, conservatories or extensions we recorded the general arrangement, as these will have an impact on any future refurbishment works, whether EWI or other improvements. We also recorded other factors which may impact on EWI works.
  - (o) Refer to items 1.10 a) to d) in the previous sections.
  - (p) Pollution and/or contamination, asbestos etc are specifically excluded from our scope of services.
  - (q) References to left and right etc are made as if facing the elevation or internal room being described.
  - (r) Outbuildings were not inspected as part of the survey. Some property types (Cornish and Reema) have Outbuildings which are of the same construction as the Non Trad construction of the dwelling.

## 3.0 Airey

### 3.1 Construction



#### Form of Original Construction

- (a) The Airey construction was *Designated Defective* under the Housing Defects Act 1984 and the Housing Act 1985.
- (b) Details of the standard form of construction can be found in the BRE Digest "Airey Houses: Guidance to Engineers and Surveyors on Inspection of Structural Columns" published by BRE in May 1981 and "Airey Houses: Technical Information and Guidance" published by the BRE in April 1982. The form of original construction is illustrated in Appendix C1.
- (c) The external walls and party wall were formed from closely spaced storey height external wall columns, 104mm x 57mm in cross section, reinforced by a steel tube. Concrete lintels were fixed between columns at door and window positions. Concrete cladding panels were fastened to the external side of the columns with copper wire.
- (d) The inside of the columns had a timber batten cast in. To this was fixed the inner leaf plasterboard. The copper wire was fixed between plasterboard and batten, the ends extending into the cavity to hold the outer panels in position.
- (e) The internal "spine" wall was constructed of 75mm x 57mm columns. These columns are storey height, with first floor and roof joists bolted at their heads.
- (f) The party wall was constructed of two rows of columns separated by a cavity. Each row of columns is faced with plasterboard on the house side and concrete cladding panels on the cavity side.
- (g) The column bases are not usually fixed to the foundations at ground level, but some have been found to be dowelled. The columns are normally dowelled at their junction between ground and first floor.
- (h) Floor construction was ground bearing concrete to ground floor, and lattice steel joists to first floor.
- (i) The roof construction is common rafters with felt, battens and concrete tiles. All the properties being investigated had gable roofs, but the hipped version is common elsewhere in the UK.
- (j) The outbuildings were to the side or rear of the houses, and whilst they would have been built away from the house, most have been connected by a covered way. Outbuildings were built of brickwork on a raft foundation. Originally they had flat suspended concrete roofs, and over the years they may have been felted or had additional pitched timber/sheeting roofs added. The roof was constructed using expanded metal lathe (eml) as permanent shuttering. At the time of construction only mild steel eml was economically available, and corrosion and spalling of the concrete soffit is common.

## 3.0 Airey

### 3.2 Major Works Carried Out



- (a) Investigations by Mouchels (consulting engineers), probably in the mid 1980's revealed deterioration of the PRC columns at their bases.
- (b) Initially a "Leeds" scheme was adopted. This was developed by Leeds City Council, and was awarded Licence No 033 by PRC Homes Ltd, which at the time would have made houses repaired under the scheme "mortgageable" for tenants if the party & spine wall had been dealt with.
- (c) Subsequently an "External Walls" only scheme was adopted. The basis of the scheme would have been either Curtins Licence 005, or Dysons Licence 018, but as the PRC elements in the party & spine walls were not dealt with, the scheme would not have been "mortgageable" for tenants.
- (d) The external wall works had been carried out in the period 1988 to 1996, before Curtins 2003 Report, as shown in the following table

Town/Village	Road	Qty	Scheme	Year
Brownhill	Frith Wood	7	Leeds	1994
Coaley	Hamshill	6	External Walls	1995
Ebley	Orchard Road	9	Leeds	1988
Hardwicke	Elmgrove Road East	3	Leeds	1988
Hardwicke	Springfields	14	Leeds	1988
Kingswood	Chestnut Park	1	External Walls	1994
North Nibley	The Innocks	9	External Walls	1993
Slimbridge	Moorend Lane	1	External Walls	1996
Slimbridge	Tynning Crescent	1	External Walls	1996
Westrip	The Wordens	8	Leeds	1988
	<b>Total</b>	<b>59</b>		
	Summary	41	Leeds	1988
		18	External Walls	1993-1996

- (e) The Leeds scheme provides for removing the outer panels, and building specially moulded lightweight blockwork between and around the PRC posts. The blockwork is mainly U shaped, except at corners and window/door opening, where it is L shaped. The new blockwork extends over the new extended foundation. There is a cavity (uninsulated) with a new outer leaf of brickwork also built off the new extended foundation.
- (f) The External Wall scheme provides for removing the outer panels, and building dense blockwork between the PRC posts. A new outer leaf of brickwork is built on a new extended foundation, with 30mm insulation in the cavity.
- (g) The two schemes are illustrated in Appendix C2.
- (h) The PRC party wall and spine wall were not part of the works, and remain in-situ. The 2003 Report found no evidence of deterioration of the retained PRC elements.

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## **3.0 Airey**

### **3.2 Major Works Carried Out**



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- (i) The finish adopted was brick outer leaf.
  - (j) Some chimneys may have been taken down to below roof line.
  - (k) The party wall in the loft space was originally built using clinker blockwork, and unless the party wall has been replaced as part of refurbishment works it is likely that there is a gap between the top of the blocks and the underside of the roof. Such gap provides a path for smoke and flame in the event of a fire.
  - (l) First floor joists under the bathroom floor can suffer deterioration due to leakages from above.
  - (m) The 2003 Report noted that the roof coverings were at or approaching the end of their design life and there was an expectation of increasing number of repairs required over the next 30 years.
  - (n) The 2003 Report concluded that the properties had a future life in the region of 30 years.



## **3.0 Airey**

### **3.3 Conclusions & Recommendations**



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#### **Conclusions**

##### **3.3.1 External Walls**

- (a) The external walls of all the houses have been refurbished using either a Leeds or External Wall system.
- (b) There is no reason to believe that the retained (but structurally redundant) PRC columns in the external walls had deteriorated.

##### **3.3.2 Internal PRC Walls**

- (a) There was no evidence to suggest that the retained PRC columns in the party wall or spine wall had suffered deterioration.

##### **3.3.3 Loft Space – Party Wall**

- (a) There may be potential for fire and/or smoke to spread across the party wall into (or from) the neighbouring house, especially where the gaps are significant at the purlins and at the top of the blockwork wall (to the underside of the roof felt).

##### **3.3.4 Remaining Life**

- (a) No change since 2003, the retained PRC components should still have a remaining life of 30 years from now.

#### **Recommendations**

##### **3.3.5 External Walls**

- (a) No remedial works should be necessary to the external walls.

##### **3.3.6 Internal Walls**

- (a) Carry out inspections of the spine and party walls whenever a property becomes vacant due to change of tenancy.
- (b) Inspect the condition of the PRC posts by removing areas of plasterboard locally.
- (c) Check for deterioration of the first floor joists, particularly in the area under the bathroom floor.

##### **3.3.7 Loft Space – Party Wall**

- (a) The risk of fire and/or smoke to spread across the party wall should be eliminated. The risk of fire is generally quite small, but when a fire occurs the consequences can be serious. We recommend that where the risk of spread is higher, ie where large gaps around purlins and at ridge level are identified, remedial works should be undertaken immediately. Stroud District Council should adopt a policy of inspecting for this defect at all changes of tenancy, and carrying out works to seal any gaps at that time. Whenever works are undertaken to a property there should be an inspection and remedial work undertaken if necessary.

## 4.0 BL8

### 4.1 Construction



- a) The BL8 construction was not *Designated Defective* under the Housing Defects Act 1984 or the Housing Act 1985.
- b) Details of the form of construction can be found in Department of the Environment, Housing Development Directive "Temporary and Permanent Aluminium Bungalows: Corrosion" and "Prefabrication - A History of its development in Great Britain" by R.B. White published in 1965 by HMSO. The form of construction is illustrated in Appendix C3.
- c) A later version, the BL8, was a complete change from the B1 and B2 box structures. It was designed for the site assembly of flat panels for external walls and partitions, and was of greater total area (82m<sup>2</sup> for BL8, 62m<sup>2</sup> for B1 and B2). The BL8 was designed as detached, but were mainly erected as semi-detached pairs.
- d) A total of over 150,000 temporary houses were manufactured or imported during the period 1945 to 1948, of which about 55,000 were aluminium.
- e) The aluminium bungalow was the most highly prefabricated of the programme, with production concentrated in five large factories. Production of complete bungalows was in four fully finished units, transported to site on special low loaders.
- f) The houses were produced under the direction of the Ministry of Aircraft Production with preparation of sites by the Ministry of Works.
- g) The four units making up a bungalow were pushed along sets of rails to their appropriate place on the foundation slab. The jointing between units was via wooden batten placed in vertical channels in the edge of the wall panels. This batten acted like a tongue in matchboarding. The cavity was packed with insulation and closed with cover strips of aluminium. Similar strips protected the roof joints.
- h) At eaves and base of wall the units were locked by 'V' shaped interlocking connector bolts of aluminium through which a pine was driven horizontally.
- i) The foundations comprised 100mm thick concrete ground bearing slab, with 230mm brick perimeter walls.
- j) The external wall panels were 83mm thick, aluminium frame members faced with aluminium sheet and internally with plasterboard. The cavity was filled with fibre glass insulation, separated from the external sheeting by waterproof building paper.
- k) The 50mm internal partitions were built with aluminium frame panels faced on both sides with 6mm plasterboard.
- l) The concrete floor slab was covered with mastic asphalt flooring tiles.
- m) The roof comprised aluminium sheeting, lined on the underside with 19mm insulation board supported on aluminium trusses and purlins.

## 4.0 BL8

### 4.2 Major Works Carried Out



- (a) These properties were not investigated for the 2003 Report, as refurbishment works to all of them had been carried out by that time. The date of the works is not known to us.
- (b) The external walls have been refurbished by building a new brick outer leaf against the existing metal sheet external walls. The details of the works are not known to us, but we assume that the raft foundation was extended to accommodate the new brickwork, and a cavity with insulation was incorporated into the works. The refurbishment works included for a new Decra roof installed over the existing roof sheeting.
- (c) The properties in the stock are located as follows

Town/Village	Road	Qty
Cam	Fairmead	6
	Hadley Road	9
	Turner Road	10
	Tyndale Road	7
Leonard Stanley	Brimley	21
	<b>Total</b>	<b>53</b>

- (d) The 2003 Report concluded that the properties had a future life in the region of 30 years.

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## **4.0 BL8**

### **4.3 Conclusions & Recommendations**



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#### **Conclusions**

##### **4.3.1 External Walls**

- (a) The external walls of all the houses have been refurbished by a masonry wall in front of the original Non Trad walling.
- (b) There is no reason to believe that the retained (but still structural) aluminium components in the external walls have deteriorated.

##### **4.3.2 Remaining Life**

- (a) No change since 2003, the retained metal frame components should still have a remaining life of 30 years from now.

#### **Recommendations**

##### **4.3.3 External Walls**

- (a) No action is required.

## 5.0 Cornish

### 5.1 Construction



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#### Form of Original Construction

- (a) The Cornish Unit construction was *Designated Defective* under the Housing Defects Act 1984 and the Housing Act 1985
- (b) Details of the standard form of construction can be found in the BRE Digest "The Structural Condition of Cornish Unit Houses" published by the BRE in 1983. The form of construction is illustrated in Appendix C4.
- (c) The ground floor external walls comprised prefabricated reinforced concrete columns with unreinforced concrete panels slotted between them in pre-formed grooves in the column sections. Some properties have nine or eleven panels per storey height (known as Type I properties), others have four panels (Type II properties).
- (d) Type 1 properties are further split into twin column and single column construction. Twin columns properties have an inner and out leaf with a small cavity, and were initially used because it was considered that damp penetration would be a problem. Experience indicated that this was not the case and the single column system was adopted. Single column properties have columns which extend from inner finishes to exterior surface, ie without a cavity. Twin column construction is a bit of a misnomer, since the columns at windows and doors were single column. So on a typical front and rear elevation the majority of columns would be single column, even if a dwelling is listed as being twin column construction.
- (e) Single column types have a flat soffit at eaves level, and a square faced front to the plinth unit. Twin column types have a coved unit at eaves level, and a projecting curved feature front to the plinth unit.
- (f) The first floor and roof is a tile clad timber structure that can be regarded as an independent wooden structure supported by the concrete columns of the house.
- (g) The party, spine and partition ground floor walls were mainly constructed of blockwork.
- (h) The first floor party wall was blockwork. Internal first floor walls were of either block or timber stud construction. Some houses have internal PRC beams supporting first floor partition walls. Flats have either timber or concrete floor construction.
- (i) The external walls consist of one or two PRC columns separated by a cavity, except at window and door openings, where a single column is used. The columns are fixed in position at their bases by PRC plinth units, and at their tops by PRC lintels forming a ring beam at first floor level. The lintels are sometimes topped by a special cornice unit into which the wallplate is inserted, to which the first floor construction is fixed.
- (j) The overall stability of the construction is provided through the friction between the columns and panels, the continuity of the ring beam and the bracing provided by the internal blockwork walls.

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## **5.0 Cornish**

### **5.1 Construction**



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- (k) Outbuildings are sometimes the same construction as the house – PRC plinth units, columns, lintels/beams and roof panels. Some were single units, some semi-detached. With semi-detached outbuilding the adjoining part could be SDC or privately owned. The party walls were blockwork.

## 5.0 Cornish

### 5.2 Major Works Carried Out



- (a) We have no information on previous investigations. The Cornish properties were not part of Curtins 2003 Report. All the dwellings have been refurbished to a “Walls Out” scheme, see Appendix C5, but we do not know when or to which scheme. We assume that the works were completed by the time of Curtins appointment or the construction type would have been included in the survey population.
- (b) The properties in the stock are located in the following places

Town/Village	Road	Qty
Bridgend	Wharfdale Way	3
Cam	Marment Road	10
Cam	Tiltdown Close	12
Coaley	Betworthy	8
Kingswood	Chestnut Park	4
Slimbridge	Tynning Crescent	8
Wotton-Under-Edge	Fountain Crescent	7
	<b>Total</b>	<b>52</b>

- (c) Unlike some other PRC construction the party & spine walls were not of PRC construction (although some have been found in Devon & Cornwall), to no works would have been required to them. These properties have a mansard roof, and none of the first floor construction has PRC components.
- (d) Some houses have internal PRC beams which support the first floor walls (typically the partition walls between the front bedrooms and the rear bedroom/bathroom). It is possible that these were not dealt with when the external wall works were carried out, but no checks have been carried out.
- (e) These partition walls are often 100mm solid masonry, & sometimes timber stud. Where the walls are masonry the support might vary – by a PRC beam, by double timber joists, by a single timber joist, or by no support other than the floorboards. The most effective method was the PRC beam (although there was usually some minor cracking on the landing), but where there was timber (even double joists) or no support the weight of the wall causes the floor to deflect, leading to cracking on the landing. The door frames also distort, becoming out of square. The “spine” wall (with the chimney) was continuous to ground level, so the cracking and door frame movement tends to be away from this fixed point (ie the door frame to the left of the spine wall falls to the left, and the door frame to right falls to the right). The partition walls which are perpendicular to the main partition walls can also suffer cracking damage due to the movement of the main partition walls. Cracking to the Landing walls tends to occur soon after construction, due to deflection of the floor, and following this main movement subsequent movement tends to be seasonal (thermal) with little progressive movement. Cracks which are repaired tend to reopen, usually minor in nature, and not noticeable until the wallpaper is stripped for redecoration.

## 5.0 Cornish

### 5.2 Major Works Carried Out



- (f) In May 2016 we inspected a Cornish Unit house at 7 Betworthy, Coaley on behalf of yourselves (our reference 061392, report dated 31 May 2016). In this property there was only a single timber joist under each of the two partition walls, and defects to the landing walls had occurred as described above.
- (g) Outbuildings – Seventeen of the stock of 52 No dwellings have Outbuildings of PRC construction the same as the Cornish Unit construction (rather than brick, block or modern precast concrete). They were located as follows

Town/Village	Road	Qty	Other OB	PRC OB	Nos
Bridgend	Wharfdale Way	3	1	2	35 & 37
Cam	Marment Road	10	10		
Cam	Tiltdown Close	12	12		
Coaley	Betworthy	8	3	5	8, 10, 16, 22, 23
Kingswood	Chestnut Park	4	1	3	17, 20,23
Slimbridge	Tyning Crescent	8	1	7	13, 18, 20, 22, 24, 26, 27
Wotton-Under-Edge	Fountain Crescent	7	7		
	<b>Total</b>	<b>52</b>	<b>35</b>	<b>17</b>	

- (h) We have not inspected any of the PRC Outbuildings to check their present condition.



## **5.0 Cornish**

### **5.3 Conclusions & Recommendations**



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#### **Conclusions**

##### **5.3.1 External Walls**

- (a) The PRC elements in the external walls of all the properties have been removed and replaced with brick/block cavity walling. No further action is required.

##### **5.3.2 Internal Walls**

- (a) The internal walls do not contain PRC components, so no further action is required.

##### **5.3.3 First Floor construction**

- (a) Where there are masonry partition first floor walls there is a risk that they are inadequately supported from the time of construction.
- (b) The risk of partial collapse is low, except where the walls are built off the floorboards and there is not even a timber joist beneath. There would be high risk of serious damage and injury should a tenant decide to cut all the floorboards along the skirting line.

##### **5.3.4 Outbuildings**

- (a) SDC have 17 No Outbuildings of PRC Cornish Unit construction
- (b) Experience has shown that this type can suffer from deterioration of the concrete components.
- (c) Some remedial action may be required from time to time.

#### **Recommendations**

##### **5.3.5 External Walls**

- (a) No remedial works should be required to the external walls.

##### **5.3.6 Internal Walls**

- (a) With regard to inadequately supported first floor masonry walls, we recommend that whenever a void property becomes available the handover inspection should include taking up a small number of first floor floorboards to establish whether the walls are supported by PRC beams, double or single timber joists, or just by the floorboards. If there are PRC beams their condition should be checked (by taking down the ceiling to the first joist either side of the beam) to confirm their structural adequacy. For all other methods of support you can decide whether to take action on a piecemeal basis or to deal with all the houses in that particular street at the same time under a single repair contract.
- (b) Action is essential if a wall is built directly off the floorboards without even a single timber joist underneath (due to the risk of tenants inadvertently causing failure of the wall by cutting along the skirting line).

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## **5.0 Cornish**

### **5.3 Conclusions & Recommendations**



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#### **5.3.7 PRC Outbuildings**

- (a) Whenever a property with a PRC Outbuilding becomes vacant, carry out an inspection internally & externally.
- (b) If the structure is in poor condition, take it down to floor slab level, and either leave as is or provide a timber shed for incoming tenants.
- (c) Build up a database of information concerning the size and condition of PRC Outbuildings, including whether they share a party wall with adjacent private owners (as this will require notification under the Party Wall etc Act, and additional cost to protect the retained party wall).
- (d) Provide a budget for demolition of PRC Outbuildings each year, with a view to demolishing all with 15 years (or sooner if deterioration accelerates). This is equivalent to about one per year.

## 6.0 Dorlonco

### 6.1 Construction



- (a) The Dorlonco construction was not *Designated Defective* under the Housing Defects Act 1984 or the Housing Act 1985.
- (b) Details of the form of construction are covered in the BRE Digest “Dorlonco Steel Framed Houses”. The form of construction is illustrated in Appendix C6. In essence, the dwellings are two storey houses of a steel framework made of small section channels and angle-sections. It is similar to the BISF type but has an in-situ concrete first floor supported on metal lathing, which is supported on steelwork. The external walls can either be brickwork, rendered blockwork, or render on metal lathing. The rendered blockwork type has been used in Cashes Green. The steel frame sits within the cavity of the external wall. The roofs have conventional slates on a timber sub-frame which is ultimately supported on steel trusses.
- (c) Foundation and substructure comprised on concrete strip foundation brought up to above ground level. The depth of these foundations varied but was generally about 400mm, with width depending upon the thickness of the cladding.
- (d) The frame comprised of two-storey stanchions to front and rear elevations, stanchions extending to the roof line in flank end and separating walls, a floor joist support beam, a single-storey stanchion, floor joist, first-floor level lateral ties, eaves-level lateral ties, and steel roof trusses. The stanchions were held down by angle cleats which were riveted to the internal flange of the stanchions and fixed with rag bolts into the concrete foundation.
- (e) The stanchions comprised rolled steel (RS) angles at 1.2m centres in the front and rear elevations and at about 1.5m centres in the flank end and separating walls. The stanchions in the party wall were shared with the other house forming the semi-detached pair.
- (f) At first floor level RS channel floor beams connected each of the stanchions in the front elevation to the corresponding stanchion in the rear elevation. In one half of the house these channels were supported at roughly mid-span by the loadbearing partition which separates the dining room from the kitchen. In the living room, which ran from the front to the rear elevation, the channels were connected to a RS channel spine beam which spans between the chimney breast and a single-storey stanchion located in, or abutting, the partition adjacent to the stairs.
- (g) Immediately above the floor joists, the front elevation stanchions and those of the rear elevation were tied laterally by RS angles. The flank end wall stanchions were tied at first floor level by RS angle.
- (h) The roof trusses were fabricated from angle rafters, T-section ceiling ties, vertical ties of flat strip and diagonal struts. The roof trusses spanned from front to rear from the tops of the stanchions were at 1.2m centres. All steelwork connections made on site were bolted. Two forms of roof covering have been used generally for this type of construction.
  - a. Slates or tiles nailed to timber sarking.
  - b. 50mm of breeze concrete on expanded metal lathing clad with pantiles.

A more conventional form of roof covering of slates nailed to battens has also been utilised.

## 6.0 Dorlonco

### 6.1 Construction



- 
- (i) Two forms of cladding have been commonly adopted.
- a. Brick leaf tied either to the steel frame or to the inner leaf with wall ties. The wall ties were normally galvanised vertical twist. Masonry was tied to the frame with loops of copper wire through holes in the leading edge of the stanchion and embedded in the masonry.
  - b. A sand/cement render on ribbed expanded metal lathing. Steel lathing stiffened with steel rods was tied back to the stanchions. The mesh was rendered both internally and externally, the render being carried over the stanchions. The external thickness of render was 37mm, giving a total thickness of about 50mm.

Other claddings such as rendered brick on end and Bath Stone have also been used.

The internal lining was generally of 50mm clinker blockwork plastered internally, although other material such as hollow clay pots has been used.

- (j) The party wall was of cavity construction, comprising two leaves of 50mm thick clinker blockwork separated by a 100mm cavity.
- (k) Ground floor partitions, including those at either side of the stairway, were loadbearing and were of 50mm brickwork or cast in situ concrete. The upper-storey partitions were of 50mm clinker blockwork.
- (l) The ground floor was of solid construction with coloured sand cement screed over the oversite concrete. The first floor was basically of concrete, being built up from ribbed expanded-metal lathing with 38mm of concrete, (which may have been breeze aggregate concrete) and topped with coloured cement/sand screed. The underside of the metal lath was finished with cement/sand render.

## 6.0 Dorlonco

### 6.2 Visual Inspection



- (a) Typical front, rear and side elevations are illustrated in Appendix D1, Photographs P1 to P3. It should be noted that the elevations shown are not of the same house. The houses were built in 1923, and there are 13 No properties in the stock, located as follows

Town/Village	Road	Qty	Surveyed
Cashes Green	Hyett Road	3	1
	Kingley Road	2	1
	Mosley Crescent	8	1
	<b>Total</b>	<b>13</b>	<b>3</b>

- (b) We are not aware of any previous investigations prior to Curtins investigations in 2003.
- (c) Curtins found that the steelwork had 2-3mm thick sand cement render protective coating. The steel frame was found to be in good condition with no evidence of corrosion.
- (d) It was believed at the time that some of the houses had been insulated, and cavity investigations revealed injected polystyrene beads which were found to be dry (ie no evidence of water ingress into the cavity). However, the report noted that the presence of cavity insulation introduces a risk that any moisture entering the cavity will not evaporate as it would have done when the cavity was empty. This trapped moisture could accelerate corrosion locally.
- (e) The 2003 report also noted that cavity wall ties between inner and outer leafs would not meet the current requirements at the time (& therefore not now), but those examined were in reasonable condition, with only some surface rusting.
- (f) The roof trusses in the roof were also noted to be in reasonable condition, with only minor incidences of corrosion to members.
- (g) The 2003 Report concluded that the properties had a future life in the region of 30 years.
- (h) A tenant reported that the houses were built in 1923, would appear to about the right timescale.
- (i) Three of the thirteen houses were inspected, as follows.
- (j) **14 Hyett Road** – The rendered finish was good, with no evidence of cracking, although the view of the side and rear elevations was restricted. On the rear elevation there was a single storey extension, see Photographs P4 & P5.
- (k) **14 Hyett Road** – Internally there was no evidence of cracking at wall/wall or wall/ceiling junctions. The first floor partition walls were blockwork, and it is common to find cracking at first floor wall/ceiling junctions due to deflection of the floor slab. The Kitchen floor may have been timber (rather than solid concrete), and was noted to springier than for a normal timber floor.

## 6.0 Dorlonco

### 6.2 Visual Inspection



- (l) **10 Kingsley Road** – Externally, there was evidence of previous repairs to vertical and horizontal cracking, mainly below the first floor windows to the front & rear elevations. The cracking had not re-opened.
- (m) **10 Kinsley Road** – There was no internal access.
- (n) **14 Moseley Crescent** – Externally, there were no cracking defects noted to the render. The gravel to the rear was at or close to dpc level over part of the elevation, see Photograph P6.
- (o) **14 Moseley Crescent** – Internally, there was mould in the front/gable corner of the front ground floor room which is presently being used as a bedroom, see Photograph P7.
- (p) **14 Moseley Crescent** – Internally, there was mould on the window frame and cill in the rear bedroom, see Photograph P8.
- (q) **Overhead electrics** – The houses are supplied by overhead electric cables, which cross from house to house, see Photograph P9. The fixings to the wall vary, see Photograph P10, taken at 10 Kingley Road (which differs from the ones shown in P9). At 14 Hyett Road, a fixing has come off the wall, see Photograph P11.
- (r) **Ground levels** – At 14 Hyett Road ground levels were below dpc level all the way around. At 10 Kingley Road the ground was a bit too high at the front, but otherwise acceptable. At 14 Moseley Crescent the paving was a bit too high on the front and side elevations, and the gravel at the rear was above the bellcast level (as mentioned above see Photograph P7).
- (s) **Chimneys** – At 14 Hyett Road the party wall and gable chimneys were new. At No 12 the gable chimney was new, the party wall chimney was original. At No 16 Hyett Road the gable chimney had been removed. At 10 Kingley Road both chimneys were original (No record for No 16). At Moseley Crescent all the chimneys were original.
- (t) **Gas meters & pipework** – At 10 Kingley Road the gas meter box was on the rear elevation, with pipework running on the wall. At 14 Moseley Crescent the gas meter was on the front elevation with pipework running up and across the elevation and onto the side elevation. There was no meter at No 14 Hyett Road.

## 6.0 Dorlonco

### 6.3 Conclusions & Recommendations



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#### Conclusions

##### 6.3.1 External Walls

- (a) The steel frame components appear to be performing satisfactorily, as far as can be seen from a visual inspection. The 2003 investigations found the steelwork to be in good condition and there was no reason to suspect that it has changed in the interim.
- (b) The walls have cavity insulation, which is not considered to be appropriate as it can trap any moisture against the structural steel, and ventilation will be restricted and not allow moisture to evaporate.
- (c) The houses are suitable for an external wall insulation system to be installed.

##### 6.3.2 Internal Walls

- (a) Minor mould was found in one of the two houses inspected internally. We do not consider mould to be a significant issue in these properties. Mould occurring is more likely to be associated with life-style than with the form of construction.

##### 6.3.3 Chimneys

- (a) Some chimneys have been rebuilt or removed, suggesting previous problems, perhaps with water ingress.

##### 6.3.4 Factors affecting EWI installation

- (a) Overhead Electrics – may affect EWI installation
- (b) Ground levels – where ground or paving levels are too high they may affect the EWI installation.
- (c) Gas meter boxes and pipework – whilst meter boxes can be worked around, any gas carrying pipework will need to be brought forward.

##### 6.3.5 Remaining Life

- (a) No change since 2003, the retained steel frame components should still have a remaining life of 30 years from now.

#### Recommendations

##### 6.3.6 External Walls

- (a) No remedial works are required to the external walls at the present time.
- (b) We recommend the installation of EWI. As part of the Contract the existing cavity insulation should be removed. Doing so will create an opportunity to re-inspect the steelwork within the cavity at a number of locations.
- (c) All the houses should be subjected to a detailed pre-EWI installation inspection, and any repairs to the external walls undertaken.

## **6.0 Dorlonco**

### **6.3 Conclusions & Recommendations**



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#### **Recommendations (contd)**

##### **6.3.7 Internal Walls**

- (a) No remedial works are required to the internal walls, but “whole house” ventilation systems should be installed as part of the EWI works.

##### **6.3.8 Chimneys**

- (a) Carry out inspections of the chimneys at regular intervals not exceeding two years, carry out repairs as required.
- (b) When the opportunity permits, for instance at change of tenancy, take down any gable chimneys to below roof level (& ventilate in accordance with good practice). This might not be possible where the chimney is still being used as a flue (eg boiler flue). Party wall chimneys cannot be taken down where the adjoining house is private, without the co-operation of the adjoining owners.

##### **6.3.9 Factors affecting EWI installation**

- (a) Overhead Electrics – Divert overhead electric supply cabling to below ground. This work should be initiated well in advance of the repair and EWI works. Involve private owners where there is a shared supply from existing overhead cabling.
- (b) Ground levels – reduce ground & paving levels, ideally to below 150mm below dpc. This is not always possible or practical when there is a large area of paving adjacent to the external wall, but paving and decking should be taken down locally to just below dpc level, and soil or gravel must be reduced in level to suit.
- (c) Gas pipework to be moved forward either in advance of, or as part of, the EWI Contract.



## 7.0 Reema Conclad

### 7.1 Construction



- (a) The Reema Conclad construction was not *Designated Defective* under the Housing Defects Act 1984 or the Housing Act 1985
- (b) Details of the standard form of construction can be found in the BRE Digest “Reema Large Panel System Dwelling: Construction Details” published in 1984. The form of construction is illustrated in Appendix D7.
- (c) Approximately 16,000 Reema houses had been constructed in England and 1,600 in Wales by 1965. There are three variants on the construction – Hollow Panel, Conclad and Contrad. The Hollow Panel type was *Designated Defective* under the Housing Defects Act 1984, and the Housing Act 1985, the other two versions were later designs and were not so designated. There are two types in the Stroud District Council stock, Hollow Panel and Conclad.
- (d) The Reema Conclad type was introduced in the mid 1960’s to provide improved thermal insulation as required by the 1965 Building Regulations.
- (e) The system had concrete external panels strengthened by ribs on the inner face. Steel reinforcement protrudes into the cast in-situ concrete column (a detail not present in the Hollow Panel). The external wall was dry lined with polystyrene backed plasterboard (or foil backed ordinary plasterboard), fixed to timber battens cast into the concrete.
- (f) Floors were generally of timber joists supported by joist hangers. Variations included concrete joists, or hollow precast concrete floor panels.
- (g) Roofs were generally trussed timber.
- (h) Internal partition walls were generally non load bearing timber stud with plasterboard.

## 7.0 Reema Conclad

### 7.2 Visual Inspection



- (a) Front, rear and side elevations of a typical house are illustrated in Appendix D2, Photographs Q1 to Q3, and for a typical flat in Photographs Q4 to Q6. It should be noted that the elevations shown are not of the same house (but they are of the same flat).
- (b) The flats had small ground floor extensions forming entrances to the ground and first floor flats (see Photographs Q4 & Q5).
- (c) Most of the properties had either a front entrance porch with a door (Photograph Q7) or without (Photograph Q8).
- (d) All the properties had part of the elevations tile hung, so there was a limited view of the PRC. On the flats it was above and below the main windows, and on the houses it was to the whole of the first floor of the front and rear elevations.
- (e) There are 36 No properties in the stock, located as follows

Town/Village	Road	H/B/F	Qty	Surveyed
Forest Green	Badgers Way	SDH	16	3
	Nortonwood	SDH	4	1
	Nortonwood	Flats	8	2
	Woodpecker Walk	SDH	8	2
	<b>Total</b>		<b>36</b>	<b>8</b>

- (f) No previous investigations had been carried out prior to Curtins investigations in 2003.
- (g) Curtins observed that this construction type was not known to have added chlorides during manufacture (they were designed and made after 1960 when quality control was better than it had been in the ten to fifteen years after WW2), and the main risk of corrosion of reinforcement was via carbonation of the concrete (the concrete is likely to be carbonated beyond the depth of the steel due to age and shallow concrete cover).
- (h) No incidences of spalled or cracked external elevations were found, nor any other signs of structural distress.
- (i) The 2003 report recommended that an anti-carbonation paint be applied, to reduce the rate of carbonation, and thus reduce the risk of cracking and spalling of the concrete panels. It was noted that an anti-carbonation coating would only last for about 15 years and process would need repeating every fifteen years. An alternative solution would be to overclad with an external wall insulation system (EWI), which would also offer the benefit of improved energy efficiency and aesthetics of the elevations.
- (j) The 2003 Report concluded that the properties had a future life in excess of 30 years, if an EWI system was installed.
- (k) Six of the 28 No houses and two of the 8 No flats were inspected, as follows.

## 7.0 Reema Conclad

### 7.2 Visual Inspection



- (l) **6 Badgers Way** – Externally, there was a broken piece of PRC panel close to the front door cill, see Photograph Q9. This was within the area of the front porch. The damage appeared to be longstanding (& previously repaired), and was of no structural significance. Internally, there were no defects observed which related to deterioration of the PRC.
- (m) **19 Badgers Way** – Externally, no defects noted. Internally, there were no defects observed which related to deterioration of the PRC. A little mould was noted in the front bedroom, in the area over the stairs (open cupboard). The Bathroom ceiling had mould on the ceilings over the bath/shower, and there was very minor mould in the corners of the front Lounge window cill (no photographs included in the report).
- (n) **26 Badgers Way** – Externally, no defects noted except for a minor spall of finishes at the bottom corners of two abutting panels (probably mechanical damage, rather than deterioration of the concrete). There was no access internally.
- (o) **1 & 3 Nortonwood (flats)** – Externally, there were no cracking or spalling defects to the exposed PRC panels. Internally at No 3 there was mould on the walls adjacent to the front entrance door into the porch, see Photograph Q10. It was to both side walls and the inside of the front door. The tenant advised that it is difficult to prevent mould occurring. The tenant also stated that the flat roof leaks (the entrance porches had felt roofs). There was some mould to the kitchen window upvc cill and frame (no photographs included in the report). There appeared to be some mould/damp on the wall/ceiling above the boiler in the kitchen, but it was difficult to tell as the area was not well decorated.
- (p) **19 Nortonwood** – Externally, there were no cracking or spalling defects to the exposed PRC panels, although there was restricted views of the side elevation wall. Internally there was mould to the bathroom on the wall & ceiling above the window and bath/shower, see Photograph Q11. There was mould to the left hand window reveal, see Photograph Q12. On this property the front porch had been taken down.
- (q) **7 Woodpecker Walk** – Externally, no defects noted. The joints around the panels were seen to be filled with sealant (they are usually open on this construction type). There was no access internally, as the tenant was just leaving the house when we arrived. She advised that there was some mould in one of the secondary bedrooms.
- (r) **10 Woodpecker Walk** – Externally, no defects noted. No mould was noted internally.
- (s) **Ground levels** – At the front the ground levels were below dpc level. On the side elevation they were a bit high at 1&3 Nortonwood, and 10 Woodpecker Walk. On the rear elevation there was decking which was a little too high at 6 Badgers Way and 19 Nortonwood, and ground level was a little too high at 1&3 Nortonwood.
- (t) **Porches/Downpipes** – On some properties the porch was away from the corner of the building where the downpipe is located, see Photograph Q13. On other properties the porch is very close to the corner, see Photograph Q14. Should the Council decide to overclad the buildings with EWI then the downpipe will need to be moved outwards. This will be a problem where the porch door is close to the corner as there may be insufficient room for the door to open. Some additional work may be involved.

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## 7.0 Reema Conclad

### 7.2 Visual Inspection



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- (u) **Roof verge** – For these properties the existing verge board is close to the building line, see Photograph Q15. If EWI is installed it will be necessary to extend the roof line so that the EWI so that the EWI comes up to finish under a verge soffit. The alternative would be to chamfer or slope the EWI in to fit (which does not look good).
  - (v) **Radon Pumps** – Four houses (No 27 Badgers Way, Nos 2, 7 & 8 Woodpecker Walk) have what appear to be radon pumps and ducting. Photographs Q16 & Q17 show the installation at No 7 Woodpecker Walk. If EWI is installed it will be necessary to move the pump and ductwork outwards, with a swan neck to the below ground pipework.
  - (w) **Tile Hanging** – If EWI is being considered a decision would be needed on how to deal with the existing tile hanging to first floor walls and (on flats) above and below the main windows. The usual procedure would be to remove it to fix the EWI but then to either refix it or opt for a rendered or brick slip finish. It may depend on how the local authority Planners view the matter.

## 7.0 Reema Conclad

### 7.3 Conclusions & Recommendations



#### Conclusions

##### 7.3.1 External Walls

- (a) The PRC elements in the external walls are performing satisfactorily, and apart from some minor localised repairs to panels no further remedial action is required at the present time. Of the eight properties inspected there were only two minor localised cracking/spalling defects. Pro rata across the Conclad stock we might expect about ten minor repairs.
- (b) The properties are suitable for an external wall insulation system to be installed.

##### 7.3.2 Internal Walls

- (a) Minor mould was found in about half the properties inspected internally, sometimes around windows and/or in bathrooms and kitchens (where it might be expected). Mould will be more prevalent in this property type due to cold bridging across the concrete panels. However, it was not a major problem in these properties. Mould associated with life-style may also have been a contributory factor.

##### 7.3.3 Factors affecting EWI installation

- (a) The following may affect any overcladding undertaken in the future
- (b) Ground levels, where ground, paving or decking is too high.
- (c) Porches and downpipes, where EWI may require porch doors to be re-hung or cut down and rainwater down pipes re-located (together with associated gulleys and pipework).
- (d) Roof verges, the gable ladder will need to be extended to suit the thickness of the EWI.
- (e) Radon pumps, four properties have a radon gas dispersal unit, which will need to be re-located.
- (f) Tile hangings at first floor will attract additional costs for removal and re-fixing or a suitable finish to be agreed with Planners.

##### 7.3.4 Remaining Life

- (a) No change since 2003, the retained steel frame components should still have a remaining life of 30 years from now, longer when protected by EWI.
- (b) Some remedial action may be required from time to time.

#### Recommendations

##### 7.3.5 External Walls

- (a) No remedial works are required to the external walls at the present time, any minor repairs to the PRC can be left until an EWI contract is undertaken.
- (b) We recommend the installation of EWI.
- (c) **All** properties should be subjected to a detailed pre-EWI installation inspection, and any repairs to the PRC undertaken as part of the EWI Contract.

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## **7.0 Reema Conclad**

### **7.3 Conclusions & Recommendations**



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#### **Recommendations (contd)**

##### **7.3.6 Internal Walls**

- (a) No remedial works are required to the internal walls, but “whole house” ventilation systems should be installed as part of the EWI works.

##### **7.3.7 Factors affecting EWI installation**

- (a) Ground levels – reduce ground & paving levels, ideally to below 150mm below dpc. This is not always possible or practical when there is a large area of paving adjacent to the external wall, but paving and decking should be taken down locally to just below dpc level, and soil or gravel must be reduced in level to suit.
- (b) Porches and downpipes – adjust or move to suit as part of the EWI Contract.
- (c) Roof verge – extend gable ladder as part of the EWI Contract.
- (d) Radon pumps – re-locate as part of the EWI Contract.
- (e) Tile hanging – in advance of the EWI Contract liaise with the LA Planners to establish what will and will not be acceptable, bearing in mind that private owners who are not having EWI will retain tile hanging. There may be additional Contract costs if tiles need to be taken down, stored and reinstated to suit Planners requirements.

## 8.0 Reema Hollow Panel

### 8.1 Construction



- (a) The Reema Conclad construction was *Designated Defective* under the Housing Defects Act 1984 and the Housing Act 1985.
- (b) Details of the standard form of construction can be found in the BRE Digests “The Structural Condition of Reema Hollow Panel Houses” and “Reema Large Panel System Dwelling: Construction Details” both published in 1984. The form of construction is illustrated in Appendix D8.
- (c) Approximately 16,000 Reema houses had been constructed in England and 1,600 in Wales by 1965. There are three variants on the construction – Hollow Panel, Conclad and Contrad. The Hollow Panel type was *Designated Defective* under the Housing Defects Act 1984, and the Housing Act 1985, the other two versions were later designs and were not so designated. There are two types in the Stroud District Council stock, Hollow Panel and Conclad.
- (d) The Hollow Panel type of construction comprises wide, storey height, pre-cast, lightly reinforced concrete panels, the inner & outer leafs joined by vertical ribs. Steel reinforcement protrudes into the cast in-situ concrete column at panel junctions and corners. Each panel features channel shaped rebates on upper and vertical edges. These act as permanent shuttering for the in-situ concrete columns and reinforced ring beam. At corners and party walls quoins provide the shuttering and external finish.
- (e) The in-situ concrete joining the panels together and forming the columns and beams were protected from direct exposure to weather by the permanent shuttering provided by the panels.
- (f) The first floor construction in houses comprised PRC beams with timber boarding, illustrated in Appendix D9. The PRC beams were typically cast in pairs 406mm apart, joined by cross members (“ladder beams”). These were supported by the panels and cast into the in-situ ring beam to fix them in place at 610mm centres. In flats hollow precast concrete floor panels or cast in-situ concrete floors were adopted.
- (g) Roof construction was a timber joist/rafter arrangement bearing on a timber fillet which was introduced into the in-situ eaves ring beam. To make this possible, the ring beam was cast flush.
- (h) External walls were dry lined with fibre board to provide a surface for applying finishes.
- (i) Party walls were either external panels which may have been filled with sand or plaster board faced timber stud work, if load bearing was not required.
- (h) Internal partition walls were generally either PRC panels 75mm thick or non-load bearing timber stud with plasterboard.

## 8.0 Reema Hollow Panel

### 8.2 Visual Inspection



#### 8.2.1 General

- (a) Front, rear and side elevations of typical houses are illustrated in Appendix D3, Photographs S1 to S6, for a typical bungalow in Photographs S7 to S9, and for a typical flat in Photographs S10 to S12. There were many different house, flat and bungalow layouts within the stock, and we have not attempted to log them all. Photographs S1 to S12 are representative of the stock. On the accompanying disk there is a folder with photographs showing different elevations in each of the seven town/village sites.
- (b) Just from the properties we visited there were about four different layouts of semi-detached houses, two different layouts of terraces, three different layouts of bungalow, and two different layouts of flats. There was also a detached bungalow.
- (c) Photographs S13 & S14 show two variations of adjacent blocks in Forest Green, S13 has ground and first floor flats, S14 has a flat at first floor and a shop at ground floor. It is not known whether SDC also owns the shop.
- (d) There are 257 No properties in the stock, 65 No with existing EWI, but the majority (192 No) were as original, located as follows

Town/Village	Road	Qty with EWI	Qty without EWI	Surveyed External	Surveyed Internal
Cashes Green	Moorhall Place	14			
Cashes Green	Mosley Road	6			
Cashes Green	Queens Drive	5			
Cashes Green	Stanton Road	22			
Forest Green	Lawnside		65	8	6
Leonard Stanley	Mankley Road		31	4	3
Minchinhampton	Glebe Road		19	2	2
Nailsworth	Ringfield Close		27		
Nailsworth	Tanners Piece		8		
Nailsworth	Upper Park Road		6	5	3
Stonehouse	Midland Road		5	1	1
Stonehouse	Willow Road		12	2	2
Stroud	Gibson Close	18			
Whiteshill	Victory Road		18	2	2
Woodchester	Blacklow Close		1	1	1
	<b>Total</b>	<b>65</b>	<b>192</b>	<b>25</b>	<b>20</b>

- (e) The 35 No properties at Ringfield Close & Tanners Piece in Nailsworth are scheduled for demolition and were not surveyed.
- (f) Those properties with existing EWI were not surveyed for this Report.



## 8.0 Reema Hollow Panel

### 8.2 Visual Inspection



#### 8.2.1 General (contd)

- (g) Two Reema houses were listed for Wharfedale Way, Bridgend, but inspection showed that the houses had been demolished, see Photograph S15.
- (h) Three Reema houses were listed for Brimley, Leonard Stanley, but inspection at showed that the houses examined were not of Reema construction (or any Non-Trad type), see Photograph S16.
- (i) During inspections we photographed issues such as structural defects, mould and items which might affect any EWI works in the future. Some of these photographs are referred to in the text and included in Appendix D3, but there were too many to include them all. On the accompanying disk we have included photographs which illustrate our observations, but they are not specifically cross referenced or referred to in the body text of this report.

#### 8.2.2 Site Inspections at Lawnside, Forest Green

- (a) 12A Lawnside – Mid-Terrace House with alleyway. Externally, a previous repair to the rear lintel over the alleyway had cracked along the joint with the existing finishes, but otherwise was performing satisfactorily. Internally, there were two small areas of mould low down on the external front & alleyway walls, see Photograph S17, which were roughly square with a clear centre. In the Bedrooms there was mould around the window reveals, together with other instances of square mould shapes with clear middle parts, see Photograph S18 to S22.
- (b) 18 Lawnside – Semi-detached Bungalow. Externally, a short length of cracked/spalled concrete just above eaves level on the gable wall, see Photograph S23. Internally, the tenant mentioned damp in the Bedroom on the wall below the bed. We were unable to view this because of bed/furniture.
- (c) 21 Lawnside – Semi-detached House. No external or internal defects observed.
- (d) 24 Lawnside – Mid-Terrace House with alleyway. No external defects observed. Internally, small area of mould/damp in the corner of one of the rooms.
- (e) 25 Lawnside – Mid-Terrace House with alleyway. No external defects observed, there was no internal access.
- (f) 37 Lawnside – End Terrace House. No external defects observed. Internally, some mould on the window reveals and heads in the kitchen & bathroom.
- (g) 45 Lawnside – Semi-detached Bungalow. No external defects observed. Internally, some on the window reveals and head in the kitchen, and two areas of square stains (similar in shape and size to the mould seen in No 12A Lawnside), see Photographs S24 & S25. In the gable/rear wall corner there was a vertical crack 100mm each side of the corner, and what appeared to be mould staining, see Photograph S26. There were also two very faint square stains (similar to S25) either side of the cracking.

## 8.0 Reema Hollow Panel

### 8.2 Visual Inspection



#### 8.2.2 Site Inspections at Lawnside, Forest Green (contd)

- (h) 56 Lawnside – Mid-Terrace House with alleyway. Externally, on the front, low down by the front door, see Photograph S27, there was a very small area of spalled concrete, and a very short length of exposed, corroded steel. There was a short crack extending up and across to the door frame/reveal. Internally there was no access to inspect.
- (i) Ground levels – Ground and paving levels were generally below the bottom of the PRC panels (although not necessarily 150mm below), except at Nos 45 & 56 Lawnside, on the front. At 18 Lawnside, front paving to the left of the front door was above the bottom of the panels, see Photograph S28.
- (j) Porches, Conservatories & Covered Ways – Some properties have additions to take into account in undertaking any EWI installations. Nos 18, 21, 24, 25, 37 and 45 all had these structures. Photographs are included for future reference on the accompanying disk in *S Series Folder, sub-folder D-EWI issues/Forest Green*.

#### 8.2.3 Site Inspections at Mankley Road, Leonard Stanley

- (a) 26 Mankley Road – Semi-detached Bungalow. No external defects observed. Internally, small areas of mould in the bathroom & bedroom.
- (b) 39 Mankley Road – Semi-detached House. No external defects observed. Internally, there was significant mould in almost every room, mainly around the windows (on the frames, the cills, the head, the reveals), but also at ceiling level, and some on the walls. Photographs S29 and S30 show a typical reveal. The mould in this property was the most extensive in area and density of all the properties we inspected (and elsewhere). Photographs are included for future reference on the accompanying disk in *S Series Folder, sub-folder C-Defects/Leonard Stanley*.
- (c) 51 & 52 Mankley Road – Semi-detached ground & first floor flats. Externally, there was a crack on the front door step to No 52, see Photograph S31, which extends up onto the reveal. The step & reveal are part of the large PRC panel which forms the external wall. Internally there was no access to No 51. At No 52, there was some mould to the wall just inside the Hall (at the bottom of the stairs, an unheated and unventilated area), see Photograph S32. There was light mould is isolated patches on or around the bathroom and kitchen windows.
- (d) Ground levels – Ground and paving levels were generally below the bottom of the PRC panels (although not necessarily 150mm below).
- (e) Porches, Conservatories & Covered Ways – No 39 has a dilapidated conservatory which will need to be taken into account in undertaking any EWI installations, see Photograph S33.
- (f) Gas meters & pipework – No 39 has a gas meter, see Photograph S34, and this house and Nos 51 & 52 has gas pipework running along the external elevations, see Photograph S35. Meters & pipework will need to be taken into account in undertaking any EWI installations.

## 8.0 Reema Hollow Panel

### 8.2 Visual Inspection



#### 8.2.4 Site Inspections at Glebe Road, Minchinhampton

- (a) 38 Glebe Road – Semi-detached Bungalow. No external defects observed. The panels had been drilled at regular intervals; we suspect that insulation has been injected into the cavity. Internally, small isolated areas of mould on/around the bedroom windows.
- (b) 89 Glebe Road – Semi-detached House. No external defects observed. Internally, small isolated patches of mould on/around the bedroom windows.
- (c) Ground levels – Ground and paving levels were generally below the bottom of the PRC panels (although not necessarily 150mm below). At the rear party wall At No 89 the gravel level was locally higher than the bottom of the PRC panel over a short length, but it could be easily reduced. It was also too high at the front due to a kerb height planter.
- (d) Porches, Conservatories & Covered Ways – No 38 has joined the bungalow to the Outbuilding (which is assembled using Reema panels), see Photograph S36, which will need to be taken into account in undertaking any EWI installations.
- (e) Overhead electric cables – No 89 was served by overhead electric cables to the gable wall, see Photograph S37. From the fixing point the cables run down the gable to enter building at first floor level. There appears to be another cable running horizontally at first floor level to the rear eaves (maybe serving the adjoining house).
- (f) Gas meters & pipework – No 89 has a gas meter and pipework running along the front external wall. Meters & pipework will need to be taken into account in undertaking any EWI installation.

#### 8.2.5 Site Inspections at Upper Park Road, Nailsworth

- (a) 1 & 2 Upper Park Road – Semi-detached ground & first floor flats. Externally no defects observed. Internally no defects observed in Flat No 1, the first floor flat. There was no access to the ground floor flat.
- (b) 3 & 4 Upper Park Road – Semi-detached ground & first floor flats. Externally no defects observed. Internally no defects observed in Flat No 4, the first floor flat. There was no access to the ground floor flat.
- (c) 6 Upper Park Road – Semi-detached House - External. There were no defects observed to the PRC panels. The house has a single storey side extension which also forms a porch over the “front” door, see Photographs S38 & S39. On the rear there was a crack at the junction of the extension and main house, see Photograph S40. The crack was from ridge to dpc, wider at the top and becoming thinner lower down. There was a similar crack on the front side, within the porch. At dpc level on the rear, to the left of the door there was a horizontal crack becoming vertical, see Photograph S41. There was a more evident crack above the door rising up to the roof verge, see Photograph S42. On the side elevation there was a crack along the dpc level, see Photographs S43 & S44.

## 8.0 Reema Hollow Panel

### 8.2 Visual Inspection



#### 8.2.5 Site Inspections at Upper Park Road, Nailsworth (contd)

- (d) 6 Upper Park Road – On the rear of the main house there was cast in-situ concrete between the underside of the panels and the foundation blockwork, see Photograph S45. The exposed footings are usually painted black, and the blockwork looks modern. We suspect that this corner of the house has been underpinned. The pattern of cracking to the side extension suggests some settlement has occurred.
- (e) 6 Upper Park Road – Semi-detached House - Internal. There was mould on and around the windows in the bedrooms (no photographs available)
- (f) Internal Investigations in Nos 3 & 6. In March 2017 we carried out some opening up of the floors, and have reported those findings to you at the time. For completeness we report on that investigation and also on the construction within the loft space.
- (g) First floors – In the flats, Nos 1 & 3, the first floor was cast in-situ concrete, see Photographs S46 & S47. Below the floorboards and battens there was building paper, which we ripped back to reveal a cast in-situ reinforced concrete floor slab. In house No 6, below the floorboards, see Photograph S48, was a PRC “ladder” beam (basically two long beams joined via cross beams at the ends and at regular intervals along its length). Photograph S49 shows a typical view of the floor with the ground floor ceiling taken down. Sets of “ladder” beams cover the whole of the floor. We often find that beams have been damaged during the installation of central heating pipe work and electric cables, but they can suffer from defects due to their construction. Photograph S50 shows a section of missing concrete due to poor construction, leaving the reinforcement exposed. More commonly there can be spalled or cracked concrete with exposed corroded reinforcement. It should be noted that Photographs S49 & S50 were not taken in houses in the Stroud District Council stock.
- (h) Loft space - In the flats, see Photograph S51, we could see that the party wall was of PRC panel construction, the same as the external walls. The chimney was rendered, but we suspect it was also of PRC construction. The roof purlins are supported onto the wall, see Photograph S52, and there was a large gap around the timber, leaving a hole in the party wall which would allow the spread of flames and smoke in the event of a fire. In the loft space of No 6, see Photographs S53 & S54, we could see that the party wall was of PRC panel construction, the same as the external walls. There were two chimneys (both shared with the adjoining property), and these were of PRC construction.
- (i) Ground levels – Ground and paving levels were generally below the bottom of the PRC panels (although not necessarily 150mm below). At the rear of both blocks the ground level was significantly below dpc level.
- (j) Extensions – It was noted that the extension to No 5 (adjoining No 6) had a flat roof extension (see Photograph S55) rather than a lean-to roof (compare S55 with S39).
- (k) Overhead electric cables & Gas meters/pipework – All the properties were served by overhead electric cables, see Photographs S56 & S57, and had gas meters and pipework on the external walls (see Photograph S45 for No 6).

## 8.0 Reema Hollow Panel

### 8.2 Visual Inspection



#### 8.2.6 Site Inspection at Midland Road, Stonehouse

- (a) 155 Midland Road – Semi-detached House. Externally, there were no defects to the PRC panels observed except for a very small area of spalled concrete on the rear elevation. Internally, small isolated patches of mould on/around the bedroom windows. The tenants advised that they used a condensate trap in the small bedroom, where there was a damp stain on the ceiling due to a past gutter problem. There was some minor (normal) mould in the bathroom.
- (b) Ground levels – Ground and paving levels were generally below the bottom of the PRC panels (although not necessarily 150mm below).
- (c) Porches, Conservatories & Covered Ways – No 155 did not have a porch, but No 147 and some others in the road did have them.
- (d) Overhead electric cables – There were no overhead electric cables.
- (e) Gas meters & pipework – Generally properties in the road had external gas meter boxes and pipework running on the external walls.
- (f) Chimneys – Nos 149 and 151 have had chimneys taken down to below roof level.

#### 8.2.7 Site Inspections at Willow Road, Stonehouse

- (a) 22 Willow Road – Semi-detached Bungalow. Externally, there were no defects to the PRC panels observed except for a small length of the render below the panels had detached from the footing blockwork on the front elevation to the right of the door. Internally, there were no areas of concern.
- (b) 26 Willow Road – Mid-Terrace House with alleyway. Externally, there were no defects were observed to the PRC panels. At the rear a boiler overflow was constantly running, causing staining to the PRC wall panel below. Internally there was a small area of mould in the bathroom above the bath, and damp staining on the ceiling in a bedroom from a past ingress problem.
- (c) Ground levels – Ground and paving levels were generally below the bottom of the PRC panels (although not necessarily 150mm below).
- (d) Porches, Conservatories & Covered Ways – Both had joined the Outbuilding to the house, see Photographs S58 & S59. The Outbuilding to No 22 was of Reema panel construction, and No 26 was blockwork.
- (e) Overhead electric cables – There were no overhead electric cables.
- (f) Gas meters & pipework – No 22 had a gas meter box and vertical pipework on the gable wall. There wasn't an external meter at No 26.

## 8.0 Reema Hollow Panel

### 8.2 Visual Inspection



#### 8.2.8 Site Inspections at Victory Road, Whiteshill

- (a) 26 Victory Road – End Terrace House. Externally, there were no defects were observed to the PRC panels. Internally there were no mould or damp problems.
- (b) 31 Victory Road – Semi-detached House. Externally, there were no defects were observed to the PRC panels. This property was the same style as No 6 Upper Park Road, Nailsworth, and also had a single storey side extension (with a flat concrete roof, not a timber lean-to roof, and no porch over the front door), see Photographs S60 & S61. On the side there was a crack above the window, see Photographs S62 & S63. Internally, there was cracking in a similar location to the outside cracking, see Photographs S64 & S65. Internally a general view of the ceiling is shown in Photograph S66. The ceiling was generally in poor condition, with spalling concrete and peeling finishes, see Photographs S67 & S68. In the front corner there was evidence of past (perhaps ongoing) damp ingress, see Photograph S69. Internally in the main house we observed mould in the rear bedroom. The tenant advised that he had dry lined the wall but the mould keeps reappearing. In the front bedroom, also now dry lined, there were no further mould issues.
- (c) Ground levels – Ground and paving levels were generally below the bottom of the PRC panels (although not necessarily 150mm below).
- (d) Porches, Conservatories & Covered Ways – None to either house.
- (e) Overhead electric cables – Both properties are served by overhead electric cables. At No 26 the power lines are relatively close to the building, and the tenants advised that a recent project to provide new guttering and roofing was not carried out to their home (& another) due to the risk of arcing.
- (f) Gas meters & pipework – No 26 had a gas meter box on the front elevation by the party wall, and vertical & horizontal pipework on the front and gable walls. There wasn't an external meter at No 31.

#### 8.2.9 Site Inspection at Blacklow Close, Woodchester

- (a) Highfield, Blacklow Close – Detached Bungalow. A general view of the bungalow is shown in Photograph S71. The original bungalow had a detached garage to the side, and this has been joined to the original building, to create a kitchen and other rooms. There was one defect noted to the external PRC panels, a crack below and to the right of the front window, see Photograph S72. The view was restricted in some areas due to excessive vegetation. Internally, there was no mould or other issues.
- (b) Ground levels – Ground and paving levels were generally below the bottom of the PRC panels (although not necessarily 150mm below).
- (c) Porches, Conservatories & Covered Ways – None, but if EWI is being considered then a decision will be required as to whether it will include the extended parts to the right side of the original building.



## 8.0 Reema Hollow Panel

### 8.2 Visual Inspection



#### 8.2.9 Site Inspection at Blacklow Close, Woodchester (contd)

- (d) Overhead electric cables – The building is served by an overhead electric cable, which enter at the rear. The cable pole is directly behind the extended part (& may interfere locally with EWI if installed). The pole appears to feed a number of properties.
- (e) Gas meters & pipework – There was a gas meter box on the side elevation by the door into the extended part. There was no gas pipework evident.

#### 8.2.10 Factors affecting EWI

- (a) Gable & Hipped Roofs – Where there is a gable wall the gable roof ladder may need to be extended to accommodate the additional width of the overcladding. Where there is a hipped roof the width of the soffit should be able to accommodate the EWI. Those with hipped roofs are shown in the following table

Town/Village	Road	Hipped	Gable	Comments
Forest Green	Lawnside		All in road	Verge on some may be wide enough
Leonard Stanley	Mankley Road	26, 39, 51/52		All in road hipped
Minchinhampton	Glebe Road		All in road	Verge on some may be wide enough
Nailsworth	Upper Park Road	1-4, 5&6		5&6 have gable with soffit
Stonehouse	Midland Road		All in road	Verge on some may be wide enough
Stonehouse	Willow Road		All in road	Verge on some may be wide enough
Whiteshill	Victory Road	26 & 31		31 has gable with soffit
Woodchester	Blacklow Close	High Field		

- (b) Ground levels – Ground and paving levels were generally below the bottom of the PRC panels (although not necessarily 150mm below). You will need to decide whether to risk later problems (cold bridging, mould) by leaving the path/paving levels high and raising the bottom track of the EWI.
- (c) Porches, Conservatories & Covered Ways – You will need to decide whether to overclad or leave. Some structures may need removal anyway, where dilapidated.
- (d) Overhead electric cables – Action will be required to divert, or box out the cabling.
- (e) Gas meters & pipework – Action will be required to extend pipework outwards prior to works commencing.

## 8.0 Reema Hollow Panel

### 8.3 Conclusions & Recommendations



#### Conclusions

##### 8.3.1 General

- (a) Nos 8 & 10 Wharfdale Way, Bridgend, have been demolished, there were no Reema houses on the site.
- (b) Nos 53, 54 & 55 Brimley, Leonard Stanley, were not of Reema Hollow Panel construction, nor of any other Non-Trad type.
- (c) 19 No properties were not identified as Reema Hollow Panel were on the database of information supplied to us. Most of these were as original, but two were already overclad.
- (d) These conclusions and recommendations apply only to the Reema properties which have not been already overclad.

##### 8.3.2 External PRC Walls

- (a) The PRC elements in the external walls are performing satisfactorily, and apart from some minor localised repairs to panels no further remedial action is required at the present time. Of the 25 No properties inspected there were only four minor localised cracking/spalling defects. Pro rata across the Hollow Panel stock we might expect about thirty to fifty minor repairs.
- (b) The properties are suitable for an external wall insulation system to be installed.

##### 8.3.3 Internal

- (a) Minor mould was found in about three quarters of the properties inspected internally, sometimes around windows and/or in bathrooms and kitchens (where it might be expected). The mould varied from very minor to very significant, the worst being at No 39 Lawnside, Forest Green. There were two houses where there was peculiar patterns of mould (12A and 45 Lawnside), which we cannot explain without opening up. We suspect that there was something in the cavity causing localised cold bridging. Mould will be more prevalent in this property type due to cold bridging across the concrete panels. For most properties mould was not a major problem, and in some the level was such that it could almost be called "normal". No 39 Lawnside was particularly bad, and in this and a few others life-style may also have been a contributory factor.
- (b) The first floor construction of PRC "ladder" beams, was found by opening up at a property in Nailsworth. It is likely that they will be found in all other houses in the stock. Their condition may be good, but past experience has shown that they are often damaged during services installations such as central heating pipework and cabling.
- (c) In flats the first floor construction is likely to be cast in-situ concrete, also found by opening up in Nailsworth.
- (d) The party walls are likely to be PRC panels throughout the stock (again, as found in Nailsworth).
- (e) There may be potential for fire and/or smoke to spread across the party wall into (or from) the neighbouring house, especially where the gaps are significant around purlins and at the top of the PRC units (to the underside of the roof felt).
- (f) Chimneys may be of PRC or traditional construction.



## 8.0 Reema Hollow Panel

### 8.3 Conclusions & Recommendations



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#### Conclusions (contd)

##### 8.3.4 Extensions

- (a) Some houses have single storey side extensions, and both of the ones we inspected had defects. Some remedial works are required, and these could wait until an EWI contract is undertaken. However, some internal repairs are required to the extension at 31 Victory Road, Whitehill on a more urgent basis.

##### 8.3.5 Factors affecting EWI installation

- (a) The following may affect any overcladding undertaken in the future
- (b) **Ground levels**, where ground, paving or decking is too high.
- (c) **Porches, conservatories and covered ways** may need to be taken down and rebuilt or disposed of. It may be possible to work around them, but installing EWI to the external walls within may not leave enough width for access. Each case will need to be determined on its merits.
- (d) **Roof verges** - the gable ladder may need to be extended to suit the thickness of the EWI on some properties, but generally there will be a wide enough verge soffit to avoid the need to extend the roof line.
- (e) **Overhead electric cables** - If the properties are overclad in the future any overhead electric cables will need to be dealt with. It was common practice for the incoming mains to be via overhead cable to one house of the pair, or the terrace, with cables routed along the eaves to the other property. If overcladding is carried out the cables should be routed underground, but this takes time to organise and should be carried out well in advance of EWI works. If the adjoining property is privately owned there may be a problem if the supply is interrupted to facilitate the diversion works.
- (f) **Gas meter boxes and pipework** - Many properties have external meters, and associated pipework. If EWI is installed the meters can be worked around, but the pipework will need to be brought forward outside of the cladding.

##### 8.3.6 Remaining Life

- (a) The PRC wall panels should have a remaining life of 30 years from now, probably longer when protected by EWI.
- (b) Some remedial action may be required from time to time on the first floor "ladder" beams, and these will need to be inspected when practical to do so (eg at changes of tenancy).

## 8.0 Reema Hollow Panel

### 8.3 Conclusions & Recommendations



#### Recommendations

##### 8.3.7 General

- (a) Amend your Masterlist/Database to record that Nos 8 & 10 Wharfdale, Bridgend have been demolished, and Nos 53, 54, & 55 Brimley, Leonard Stanley, are traditionally built, not Reema Hollow Panel.
- (b) Amend your Masterlist/Database to record the properties previously listed as trad or "no id" as Reema HP (see Appendix A6 for details).
- (c) You should confirm the ownership of the shop unit in Lawnside. It was not listed in the database provided, but that may have been because it was not residential. If it does belong to SDC you may wish to consider overcladding options.

##### 8.3.8 External Walls

- (a) No remedial works are required to the external walls at the present time, any minor repairs to the PRC can be left until an EWI contract is undertaken.
- (b) We recommend the installation of EWI.
- (c) **All** properties should be subjected to a detailed pre-EWI installation inspection, and any repairs to the PRC undertaken as part of the EWI Contract.

##### 8.3.9 Internal

- (a) No remedial works are required, but "whole house" ventilation systems should be installed as part of the EWI works. This should assist with mould issues in the majority of cases, but more extensive works may be required at 39 Lawnside, Forest Green.
- (b) No works are required to the PRC panels in the party wall
- (c) The risk of fire and/or smoke to spread across the party wall should be eliminated. The risk of fire is generally quite small, but when a fire occurs the consequences can be serious. We recommend that where the risk of spread is higher, ie where large gaps around purlins etc are identified, remedial works should be undertaken immediately. Stroud District Council should adopt a policy of inspecting for this defect at all changes of tenancy, and carrying out works to seal any gaps at that time. Whenever works are undertaken to a property there should be an inspection and remedial work undertaken if necessary. (Note: this applies to those already EWI'd too)
- (d) The first floor "ladder" beams should also be inspected at all changes of tenancy, and remedial works to any cracks and spalls carried out. If central heating and/or cabling works are proposed contractors should be warned in advance of their presence and instructed not to damage them in any way during their installation work. Pre and post M&E works inspections should be carried out. Failure of a "ladder" beam may well have serious consequences for occupants in the rooms below. (Note: this applies to those already EWI'd too)

##### 8.3.10 Extensions

- (a) Carry out remedial works internally to No 31 Victory Road, Whiteshill in the short term, to make the room habitable again. External repairs can await an EWI contract.

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## 8.0 Reema Hollow Panel

### 8.3 Conclusions & Recommendations



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#### Recommendations (contd)

##### 8.3.11 Factors affecting EWI installation

- (a) **Ground levels** - reduce ground & paving levels, ideally to below 150mm below dpc. This is not always possible or practical when there is a large area of paving adjacent to the external wall, but paving and decking should be taken down locally to just below dpc level, and soil or gravel must be reduced in level to suit where ground, paving or decking is too high.
- (b) **Porches, conservatories and covered ways** – carry out a survey of requirements in advance of any EWI contract. Each case will need to be determined on its merits.
- (c) **Roof verges** – extend the gable ladder where required as part of the EWI contract.
- (d) **Overhead electric cables** - Divert overhead electric supply cabling to below ground. This work should be initiated well in advance of the repair and EWI works. Involve private owners where there is a shared supply from existing overhead cabling.
- (e) **Gas meter boxes and pipework** - Gas pipework to be moved forward either in advance of, or as part of, the EWI Contract.

## 9.0 Stent

### 9.1 Construction



- (a) The Stent construction was *Designated Defective* under the Housing Defects Act 1984 and the Housing Act 1985.
- (b) Details of the standard form of construction can be found in the BRE Digest "The Structural Condition of Stent houses" published by BRE in 1984. The form of original construction is illustrated in Appendix C10.
- (c) The substructure was concrete strip footings, onto which sat a PRC plinth units of vertical channel section. The ground floor was concrete ground bearing slab, with the inner face of the channel section providing a permanent shutter to the concrete.
- (d) The external walls were formed from storey height 300mm wide by 300mm deep by 100mm thick T or L sections prefabricated reinforced concrete panels. The top of the T-section had double V-section vertical joints so that when the panels are butted together there is a vertical feature exterior face (although sometimes the exterior was rendered finish, hiding the vertical joints).
- (e) The panels were clamped at their bases onto the top of the channel section, with holding down bolts and mild steel plates.
- (f) The inner leaf was 50mm or 75mm clinker concrete blocks which abut the bottom of the T-section, the block being tied to the panels with steel ties. The cavity had glass fibre insulation.
- (g) At first floor level there was a PRC ring beam, with a splayed outer face (providing another feature to the exterior face). The channel of the ring beam had two reinforcing bars placed which was then filled with in-situ concrete.
- (h) The first floor panels were then fixed to the ring beam as for the ground floor panels. At eaves level was another PRC ring beam, this time with a horizontal projection forming the soffit. This too had two reinforcing bars before being filled with in-situ concrete.
- (i) The party wall was constructed of clinker concrete blockwork.
- (j) Partition walls which were load bearing were constructed with 100mm clinker concrete blocks and non-load bearing walls of 50mm clinker concrete blocks.
- (k) First floor construction was either timber joists or rolled steel joists, with timber floorboards.
- (l) The roof construction was supported off the eaves ring beam, comprising either rolled steel or timber rafters with felt, battens and concrete tiles. A variation to construction was to provide a flat roof with cover of bituminous felt.
- (m) Overall stability of the structure was provided by the combined stiffness of the panels/blockwork forming the external walls with additional bracing by the internal blockwork partitions.

## 9.0 Stent

### 9.2 Major Works Carried Out



- (a) Investigations by Mouchels (consulting engineers), in 1987 incorporated a large number of concrete tests to determine the chloride ion content level. In all tests the content was less than 0.6% of the cement content, indicating that chlorides were not added to the concrete during manufacture of the PRC components. Mouchels also found a number of areas of internal cracking.
- (b) Curtins further investigated the buildings in 1996, but found no evidence of the internal cracking reported by Mouchels in 1987.
- (c) Curtins recommended that the houses be overclad with an external wall insulation system (EWI), to protect the concrete frame. This work was undertaken by the Council in 1998.
- (d) We have no details of the overcladding system adopted.
- (e) The houses are located as follows

Town/Village	Road	Qty
Kingsway	Dursley	26
St Georges Road	Dursley	29
	<b>Total</b>	<b>55</b>

- (f) It is now nineteen years since the overcladding works were carried out, and Curtins noted in the 2003 Report that an overcladding system can have an anticipated life of 20-30 years. It was suggested that patch repairs or re-painting of the EWI would be required from year 20 onwards.
- (g) The 2003 Report concluded that the properties had a future life of 30 years, subject to routine maintenance of the EWI to continue providing protection of the PRC.

## 9.0 Stent

### 9.3 Conclusions & Recommendations



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#### Conclusions

##### 9.3.1 External PRC Walls

- (a) Since 1998 the PRC external walls of the houses have been protected by EWI.
- (b) There is no reason to believe that the retained PRC has deteriorated, and the 30 year life expectancy estimated in 2003 may still hold true.

##### 9.3.2 Internal Walls

- (a) Some internal cracking was reported in 1987, but was not found in 1996. It is likely to have been repaired during that period.
- (b) However, the internal walls, and the inner leaf of the external walls are clinker blockwork, so it is unlikely that any defects noted would be associated with deterioration of the outer PRC components.

#### Recommendations

##### 9.3.3 External PRC Walls

- (a) No remedial works should be necessary to the PRC components to the external walls.
- (b) Carry out an inspection and assessment of the EWI in 2018, and again in 2023. Carry out any repairs to the finishes necessary to continue protection of the PRC.
- (c) The Council may wish to consider removing the existing and installing new EWI from about 2023 onwards, depending on the condition of the existing and energy efficiency targets in the 2020's. EWI installed in 1998 is unlikely to meet current standards, so certainly will not meet them in the next decade.
- (d) Whilst it may be possible to overclad the existing EWI, removing the overcladding would provide an opportunity to re-examine in detail the condition of the PRC. Although this is a much more expensive option for the Council, we would recommend removal and renewal in order to properly reassess the structural condition of the houses.

##### 9.3.4 Internal Walls

- (a) Carry out inspections as follows whenever a property becomes vacant due to change of tenancy.
- (b) The PRC components are hidden from view externally by the EWI and internally by the clinker block inner leaf. Inspection internally may reveal cracking of the blockwork along the line of the T-section ribs in the external wall construction, providing some degree of early warning that deterioration is occurring.
- (c) If a property is likely to be vacant for a short period between tenancies (perhaps due to say new kitchen/bath/central heating being installed) the opportunity should be taken to carry out some localised opening up at random to view holding down bolts/straps at ground floor level, and the precast beams to first floor and eaves level.
- (d) The first floor and roof construction materials (timber or steel) should be recorded for future reference.
- (e) If steel first floor joists have been used, check their condition in locations vulnerable to corrosion, such as below the bath and WC.

## 10.0 Swedish

### 10.1 Construction



- (a) Swedish construction was not *Designated Defective* under the Housing Defects Act 1984 or the Housing Act 1985.
- (b) The Swedish Timber Framed Dwelling was one of a number of prefabricated house systems, utilised to meet the general demand for additional housing which developed after the end of the Second World War. Consequently, the vast number of these dwellings were built for Local Authorities and similar organisations to enhance their housing stocks. Between 1945 and 1951 about 4500 dwellings were built.
- (c) Details of the standard form can be found in the BRE Report “Timber Frame Housing System Built in the UK 1920 to 1965” published in 1995. The standard form of the main structure is described below and the various stages of construction are illustrated in Appendix D11.
- (d) Dwellings comprise semi-detached chalet bungalows and two storey houses. The external walls are clad in vertical timber boarding throughout, and the dwellings have steep pitch gable roofs covered with concrete tiles, slates or timber shingles. The chalet bungalows and some houses have single-storey gable roof extensions.
- (e) The external walls comprise storey height timber frame panels which were nailed together. The panels had 50mm x 125mm or 50mm x 75mm timber studs (the 50mm dimension was normal to the plane of the wall), spaced at centres of up to 1450mm, with horizontal timber noggings and, in some panels, timber diagonal braces. The panels are sheathed internally with 75mm x 20mm in tongued and grooved (T&G) vertical timber boarding, backed with building paper. The panels were lined with 3mm hardboard to provide a surface for decorating. Crude insulation was provided by 15mm thick ‘Tentex’ fibreboard which was located inside the cavity.
- (f) Externally the panels were directly clad with nail-fixed, half-checked and channeled 75mm x 20mm vertical timber boarding over a bituminous building paper breather membrane. The bottom rails of the panels were fixed to a separate timber sole plate (called a Keel plate), which also supported the pre-formed frame panels above.
- (g) The partition walls comprise 50mm x 75mm or 50mm x 50mm timber stud framing, which was faced on both sides with 22mm T&G vertical boards & 3mm hardboard, which was treated with a fire retardant paint on vertical inner surfaces to provide a suitable base for decoration.
- (e) The party wall was constructed of 225mm (9 inch, one brick thick) brickwork, plastered internally. This wall extended up into the loft space.
- (f) The substructure comprised concrete strip footings which support a 225mm brick perimeter wall and 225mm & 112mm brick honeycomb internal support walls. The underfloor depth varied, oversite cover was concrete. The underfloor space was ventilated by up to eight airbricks. A bituminous felt or asphalt dpc was laid along the perimeter and internal support walls.



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## 10.0 Swedish

### 10.1 Construction



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- (g) The suspended ground floor was of 22mm T&G boards, supported on 125mm x 50mm timber joists at 450mm centres, spanning between front and rear. Intermediate support was provided by the brick internal support walls. The joists were notched at one end to bear directly on both the dpc and the timber sole plate. The single storey extension generally had a concrete floor.
  - (i) The first floor was 22mm T&G boards, supported on 200mm x 50mm timber joists at 450mm centres, spanning between front and rear. Intermediate support was provided by a ground floor spine wall to which the joists are notched and nailed. The joists form part of the roof structure in the chalet bungalow, which encloses two bedrooms and has two dormer windows on the rear elevation
  - (h) The gabled roof was of about 45° pitch, covered with slates, tiles or timber shingles on timber battens on bituminous felt over 20mm T&G timber sarking boards. The roof was of framed timber construction, with 150mm x 50mm timber rafters, spaced at either 450mm or 915mm centres depending on the weight of roof cover. In the chalet bungalows the spacing was 450mm, except at dormer and porch positions, at each of which one rafter was omitted. At approximately the centre of each rafter, each rafter pair had a collar of two 100mm x 20mm timber members; one member was nailed to each side of the rafter pair. Ceiling ties, which form the first floor joists in the chalet bungalows, were connected to corresponding rafters by 22mm thick timber gussets, nailed to both faces of the members.



## 10.0 Swedish

### 10.2 Visual Inspection



- (a) Front, rear and side elevations of a typical Dormer Bungalow are illustrated in Appendix D4, Photographs T1 to T3, and for a typical house in Photographs T4 to T6. It should be noted that the elevations shown are not of the same property in each case.
- (b) We are not aware of any investigations prior to Curtins investigations in 2003.
- (c) In 2003 Curtins noted that an extensive refurbishment programme had been undertaken during the preceding twelve months to repair any defective timber, to install insulation internally (Internal Wall Insulation – IWI), and to carry out any roof repairs required.
- (d) In 2003 Curtins carried out investigations to determine the condition of the sole plate & dpc, and found in every case that the frames were in good condition with little or no evidence of degradation. In 2003 it was concluded that the properties were in good condition and subject to regular maintenance will perform satisfactorily for the next thirty years.
- (e) In 2015 and 2016 Curtins carried out a number of intrusive investigations to the stock, and for this report the remaining properties were inspected without further opening up.
- (f) The location and recent surveys of the properties are listed in the following table

Town/Village	Road	Qty	Surveyed 2015/2016	Inspected 2017
North Nibley	Barrs Lane	1	-	1
Painswick	Parkfield Cottages	6	6	-
Stancombe	Swedale	2	2	-
Stinchcombe	The Avenue	3	3	-
The Camp	Bushy Beeches	2	1	1
Uley	The Knoll	3	1	2
Wotton-Under-Edge	Mount Pleasant	3	1	2
	<b>Total</b>	<b>20</b>	<b>14</b>	<b>6</b>

- (g) At Parkfield Cottages, Painswick, Curtins opened up Nos 1, 3 & 5, and inspected Nos 2, 4, and 6. Curtins report was referenced BR1500C, dated December 2015. Nos 1 to 4 were chalet bungalows, Nos 5 & 6 were houses.
- (h) At Swedale, Stancombe, Curtins opened up both houses (Nos 1 & 2). Curtins report was referenced BR1500, dated October 2015. Subsequent to our Report, the houses were subject to extensive repair to the timber frame, followed by the installation of EWI overcladding.
- (i) At The Avenue, Stinchcombe, Curtins opened up all three chalet bungalows (Nos 1, 2 & 3). Curtins report was referenced BR1500E, dated August 2016).
- (j) At Bushey Beeches, The Camp, Curtins opened up chalet bungalow No 2. Curtins report was referenced BR1500D, dated December 2015.

## 10.0 Swedish

### 10.2 Visual Inspection



- (k) At The Knoll, Uley, Curtins opened up house No 5. Curtins report was referenced BR1500A, dated December 2015.
- (l) At Mount Pleasant, Wotton-Under-Edge, Curtins opened up No 1. Curtins report was referenced BR1500B, dated December 2015.
- (m) Copies of the reports on the surveys of 2015 and 2016 are included on the accompanying disk, and we will not repeat the findings in this report, other than to say that some of the repairs carried out to the properties in 2002 (and possibly since) had failed, and that in places the condition of the timber to the keel plate, and bottom sections of timber frame was very poor in many places, as was some of the outer timber boarding.
- (n) Viewing the outer boards alone will not give full picture of the condition of the property, particularly not the structural condition of the hidden frame timbers and inner boards. However, viewing the outer boards and comparing them with adjacent properties which have been opened up will allow some extrapolation to be made and a judgement made of the likely condition of the properties of the remaining dwellings.
- (o) The addresses of the properties inspected for this report were as follows

Town/Village	Road	Qty	Inspected 2017	Type
North Nibley	Barrs Lane	1	No 32	Chalet Bungalow
Painswick	Parkfield Cottages			-
Stancombe	Swedale			-
Stinchcombe	The Avenue			-
The Camp	Bushy Beeches	1	No 3	House
Uley	The Knoll	2	Nos 5 & 8	Houses
Wotton-Under-Edge	Mount Pleasant	2	Nos 3 & 7	Chalet Bungalows
	<b>Total</b>	<b>6</b>		

- (p) The results of the inspections were as follows
- (q) **32 Barrs Lane, North Nibley** – This property was the only one in the village, so no comparison with an opened up property could be made. Mixture of original and replacement outer boards, and generally in reasonable condition. At the front the gutter was disconnected at the downpipe, see Photograph T7. On the side elevation there was extensive ivy growth, see Photograph T8. On the side elevation of the Outbuilding the ground level was too high at the corner, see Photograph T9, and also on this elevation the bottoms of some of the outer boards had rotted away, see Photograph T10. The incoming mains electricity supply cable was to the side elevation of the main house, see Photograph T11. On the rear, one of the dormer window timber side panels was in poor condition, see Photograph T12, and the party wall chimney capping was spalled/broken away, see Photograph T13. There was no internal access for inspection.

## 10.0 Swedish

### 10.2 Visual Inspection



- (r) **3 Bushey Beeches, The Camp** – On the front roof there was some distortion of the roof tiles below the gable chimney, see Photograph T14. On the front wall an architrave to a first floor window was rotted, see Photograph T15, with similar a defect to the patio door architrave (but not as advanced). Also on the front elevation a short length of first floor window cill was rotten, see Photograph T16, and one or two of the outer boards had “sprung” at the bottom of the first floor, see Photograph T17. Generally the outer boards appeared to be original and in reasonable condition. It was difficult to detect whether some boards were replacement, due to the thick coating of finishes applied. It is likely there were some replacements. On the side elevation there was some algae discolouration on the boards, see Photograph T18. The flashing at the junction of the Outbuilding and main roof appears to have been covered with “flashband” or similar, and was deteriorating, see Photograph T19. The incoming mains electricity supply cable was to the side elevation of the main house, see Photograph T20. Internally, there was minor mould on the frame of one of the bedroom windows, but otherwise no defects were noted.
- (s) **6 The Knoll, Uley** – This house is attached to No 5 which was opened up in 2015. The replacement canopy over the front door has left a small area of exposed untreated timber (as it was at No 5), see Photograph T21. On the Outbuilding front roof some of the tiles had slipped, see Photograph T22. On the front corner of the Outbuilding there was a poor repair to rotten fascia board, see Photograph T23. On the side elevation there was some rot and woodworm to the outer panels, see Photograph T24, and rotten timber at the corner of the bay window, see Photograph T25. Also at the rear at least one of the air vents to the subfloor appears to have been blocked, see Photograph T26. The outer boards were a mixture of original and replacements, some were rotted, se Photographs T27 (above the patio doors) and T28 (near the party wall). Internally there were no defects noted.
- (t) **8 The Knoll, Uley** – On the Outbuilding front roof some of the tiles had slipped, see Photograph T29. On the rear there was some rot to the lintel architrave to the patio doors, see Photograph T30. The outer boards were a mixture of original and replacements, all of which appeared to be in reasonable condition. There was no internal access for inspection.
- (u) **3 Mount Pleasant, Wotton-Under-Edge** – This house is attached to No 1 which was opened up in 2015. There was extensive ivy growth to the front elevation (as there was at No 1), see Photograph T31. On the front corner there was rot to the outer boards, see Photograph T32. On the side elevation there was rot to the small window architrave, see Photograph T33. The incoming mains electricity supply cable was to the side elevation of the main house, see Photograph T34. From here a second cable runs along the fascia to supply No 1. The rear gable chimney has been taken down, see Photograph T35. There was some rot to the dormer window architraves, see Photograph T36 for an example. There was no internal access for inspection.

## 10.0 Swedish

### 10.2 Visual Inspection



- (v) **7 Mount Pleasant, Wotton-Under-Edge** – The verge to the front left side of the porch was cracked and there had been some movement of the tiling above, see Photograph T37. On the rear at the junction of the main house and Outbuilding a slipped tile had become lodged in the gutter, see Photograph T38. There is a gap between the gutter end and the adjacent roof overhang, so rainwater falling on the roof can run off onto the timber wall below. On the rear there was rot to the outer boards, see Photograph T39. On the rear, one of the dormer window timber side panels was in poor condition, see Photograph T40, and there was vegetation in the gutter and dead/dormant vegetation below, see Photograph T41. There was no internal access for inspection.
- (w) **Ground levels** – apart from the side elevation of the Outbuilding at 32 Barrs Lane North Nibley (Photograph T9), ground levels were generally sufficiently below the underside of the outer boards.
- (x) **Overhead Electric Cables** – if the properties are overclad in the future any overhead electric cables will need to be dealt with. Apart from Uley the other sites all have overhead cabling to the side elevation, see Photographs T11 (North Nibley), T20 (The Camp), T34 (No 3 at Wotton). At No 7 Wotton the incoming mains appears to be routed via private house No 5. It was common practice for the incoming mains to be via overhead cable to one house of the pair, with cables routed along the eaves to the other property. If overcladding is carried out the cables should be routed underground, but this takes time to organise and should be carried out well in advance of EWI works. If the adjoining property is privately owned there may be a problem if the supply is interrupted to facilitate the diversion works.
- (y) **Gas meters and pipework** – Some properties have external meters (North Nibley and Wotton), and associated pipework. If EWI is installed the meters can be worked around, but the pipework will need to be brought forward outside of the cladding.
- (z) **Chimneys** – Properties have two chimneys as standard, to the party wall and the gable. In all six properties inspected both chimneys remain except for the gable chimney at No 3 at Wotton (Photograph T35).

## 10.0 Swedish

### 10.3 Conclusions & Recommendations



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#### Conclusions

##### 10.3.1 External

- (a) The general appearance of the elevations was good, but there was a mixture of original and replacement timber, and there were some areas of rotten timber at ground level. The general appearance matched that found when we carried out the opening up investigations at the same sites in 2015 and 2016.
- (b) We suspect that opening up will reveal similar defects to those identified by opening up, and similar remedial works would be required prior to overcladding.
- (c) There are maintenance works that could be carried out to reduce the risk of water ingress into the structure – cleaning gutters, removing ivy growth, reducing ground level, replacing slipped or missing tiles etc.
- (d) The conclusions reached in the individual site reports will apply to the properties not opened up.

##### 10.3.2 Internal

- (a) Internal access was restricted as tenants were not at home during our visits, but for those inspected there was no evidence of significant structural defects to the internal walls.
- (b) There was no evidence of significant mould problems.

##### 10.3.3 Remaining Life

- (a) The two houses at Stancombe have been repaired and EWI installed, and the timber frame should have 30 years life remaining.
- (b) For the remaining properties the remaining life is considered to be very limited unless extensive repairs are carried out in the short term.

#### Recommendations

##### 10.3.4 External

- (a) Carry out repairs to the structures and install EWI, as recommended in the individual site reports (the site at Stancombe has already been completed).
- (b) There is no need to carry out further opening up works to investigate the structures, but extensive removal of outer boards will be required in order to carry out repairs in any event.
- (c) This work should be carried out within the next three years.

##### 10.3.5 Internal

- (a) No remedial works are required to the internal walls, but “whole house” ventilation systems should be installed as part of the EWI works.

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## **10.0 Swedish**

### **10.3 Conclusions & Recommendations**

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#### **Recommendations (contd)**

##### **10.3.6 Maintenance Works**

- (a) Carry out the following in the current financial year
- (b) Ensure gutters and downpipes are cleaned and operating adequately.
- (c) Remove all ivy (& similar) growth on the elevations.
- (d) Carry out repairs and improvements to dormer windows, sides and surrounds.
- (e) Carry out repairs to chimneys
- (f) Replace missing and slipped roof tiles
- (g) Ensure that Outbuilding to main house flashing details are performing adequately, repair and replace as necessary.
- (h) Reduce ground level to minimum of 100mm below the underside of the outer boards.
- (i) Ensure underfloor vents are operating, not blocked off.

##### **10.3.7 EWI Enabling Works**

- (a) Divert overhead electric supply cabling to below ground. This work should be initiated well in advance of the repair and EWI works. Involve private owners where there is a shared supply from existing overhead cabling.
- (a) Gas pipework to be moved forward either in advance of, or as part of, the EWI Contract.

## 11.0 Unity

### 11.1 Construction



- (a) Unity construction was *Designated Defective* under the Housing Defects Act 1984 and the Housing Act 1985
- (b) Details of the standard form of construction can be found in the BRE Digest "The Structural Condition of Unity Houses" published by the BRE in 1983. The form of construction is illustrated in Appendix C12.
- (c) The PRC columns are sandwiched between an inner leaf of blockwork and an outer leaf proprietary blockwork panel.
- (d) Reinforced concrete lintels are fixed to the columns and partially support blockwork in both leaves above. The window columns are exposed in the form of mullions in the larger openings.
- (e) There are two basic types of Unity dwelling. The earlier version (Mark I) has outer cladding and inner block skin not fixed to the columns but tied across the cavity with copper ties. The later version (Mark II) has outer cladding fixed directly to the columns using copper straps. The columns are slightly different cross section; the Mark I columns have a slight recess in the side, the Mark II columns are of plain rectangular section.
- (f) The party wall was cavity blockwork, 65mm thick with similar sized cavity.
- (g) The partition walls were mainly constructed of blockwork, but could also be storey height reinforced plaster units.
- (h) The substructure was concrete strip footings, on which sat the PRC columns. The ground floor slab was then cast over the top, often with a infill gap between the underside of the slab and the top of the foundation. Sometimes this was filled with brickwork, sometimes just rubble. The floor was finished with vinyl tiles or mastic asphalt.
- (i) The first floor was tonged & grooved boards onto either timber joists, steel I-beams or steel lattice beams. The joists were fixed to the PRC columns via steel endplates.
- (j) The roof comprised timber rafters connected to column heads with steel plates, overlain by felt, battens and tiles.
- (k) Some properties have attached outbuildings as described in the BRE Digest.



## 11.0 Unity

### 11.2 Major Works Carried Out



- (a) We have no information on previous investigations.
- (b) Refurbishment works were undertaken in 2001 to provide an external wall insulation (EWI) system.
- (c) The properties in the stock are located as follows

Town/Village	Road	Qty	Mk I or II
Cashes Green	Hillcrest Road	30	I
Ebley	Devereaux Crescent	12	I
Hardwicke	Springfields	17	II
	<b>Total</b>	<b>59</b>	

- (d) We have no information whether the dwellings are houses, bungalows or flats.
- (e) Unlike some other PRC construction, the party, spine and partition walls were not of PRC construction.
- (f) In 2003 Curtins cut through the EWI (& outer leaf concrete panels) to access the PRC columns.
- (g) The columns were found to be visually in good condition, with no cracking or spalling. The copper ties (which hold the columns and panels together) were also found to be in good condition. Samples of concrete were taken from all the properties surveyed and laboratory analysis showed that no chlorides had been added to the concrete mix during manufacture. The risk of corrosion of the concrete was considered to be low.
- (h) It is now sixteen years since the overcladding works were carried out, and Curtins noted in the 2003 Report that patch repairs or re-painting of the EWI would be required from time to time.
- (i) The 2003 Report concluded that the properties had a future life of 30 years, subject to routine maintenance of the EWI to continue providing protection of the PRC.
- (j) Curtins also looked at the roof structures, and found timber trusses in reasonable condition. It was noted that due to the age of the properties some repairs to the roofs would be required after 16 to 20 years (ie 2019 to 2023), and beyond that some properties will require a complete re-roof.



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## **11.0 Unity**

### **11.3 Conclusions & Recommendations**



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#### **Conclusions**

##### **11.3.1 External Walls**

- (a) The PRC elements in the external walls were in good condition with a low risk of corrosion to the steel reinforcement, and of all the properties have been protected by the installation of EWI. No further action is required.

##### **11.3.2 Internal Walls**

- (a) The internal walls do not contain PRC components, so no further action is required.

##### **11.3.3 Remaining Life**

- (a) No change since 2003, the retained PRC components should still have a remaining life of 30 years from now, subject to routine maintenance of the EWI.

#### **Recommendations**

##### **11.3.4 External Walls**

- (a) No remedial works should be required to the PRC components in the external walls.
- (b) Carry out repairs and repainting of the EWI from time to time as required.

##### **11.3.5 Internal Walls**

- (a) No further action required.

## 12.0 Woolaway

### 12.1 Construction



- (a) Woolaway construction was *Designated Defective* under the Housing Defects Act 1984 and the Housing Act 1985
- (b) Details of the standard form of construction can be found in the BRE Digest “The Structural Condition of Woolaway Houses” published in 1983. The form of original construction is illustrated in Appendix C13.
- (c) The Woolaway house comprises storey height pre-cast columns, infilled with half storey height panels to form a discontinuous cavity, secured to columns with six bolts per panel.
- (d) At ground, first floor, and roof levels, pre-cast ring beam components are placed on the tops of the columns and panels, located via nibs on the tops and/or bottom as appropriate to hold the elements in position.
- (e) The first floor is supported by mild steel joist hangers fixed to the first floor ring beam, but does not offer significant lateral restraint to the external walls at first floor level.
- (f) A conventional pitched roof structure oversails the ring beam at roof level and is fixed to a wall plate which restrains the front and rear walls of the house.
- (g) The sub-structure consists of unreinforced concrete slab thickened for form footings under the walls, and with the pre-cast plinth unit set on top to receive the walls. A bitumastic asphalt covers the oversite concrete to form a damp proof course.
- (h) Window and door jambs are formed by the structural posts, & the cills are of pre-cast concrete.
- (i) Non loadbearing partitions are formed from timber studwork. Windows, doors, stairs, cupboards etc are of normal timber construction. Ceilings are of plasterboard. Internal walls are plastercoated, or dry lined onto woodwool slabs fixed to the walls.
- (j) The party wall was PRC construction, either with one row of posts with panels on each side, or two rows of posts separated by a small cavity with panels on the room side of each row of posts. In the loft space brickwork was built on top of the PRC wall to divide off adjacent properties.
- (k) The spine wall at ground floor level could be of PRC or blockwork construction. All first floor walls were of timber stud construction.
- (l) The external structure of the building was finished with machine applied roughcast render.
- (j) The overall stability of the structure is dependent mainly on the integrity of the external walls.

## 12.0 Woolaway

### 12.2 Major Works Carried Out



- (a) Previous investigations were undertaken by Mouchels in 1986, which showed concrete frames in poor condition. Further investigations in 1986 revealed similar defects on another site. Concrete testing in both investigations showed high levels of chloride ion content, and therefore a high risk of corrosion of the steel.
- (b) Further investigation at two other sites in 1992 confirmed the earlier findings, of poor condition and high risk of corrosion.
- (c) Mouchels recommended removal of the PRC components, but it was recognised that this would involve significant costs. Overcladding was undertaken in 1988, 1994 and 1996 on the basis that this would slow the rate of deterioration but not eliminate it completely, and a periodic inspection regime would be needed to monitor their condition (which is difficult when the PRC components are hidden from view externally by the EWI, and internally by wall boarding).
- (d) Curtins carried out investigations in 2003, including Linear Polarisation Rate Measurement (LPRM) to determine whether the rate was declining or not. Curtins found that the concrete was dry, and the rate of corrosion had appeared to have reduced. They recommended carrying out further testing in 5-10 years (ie 2008-2013), which was not achieved. They also noted that breaches of the EWI (damage, leakage, overflowing gutters) might affect the rate of corrosion, and *“have a significant effect on the structural integrity”*.
- (e) It was noted that corrosion had caused a total loss of reinforcement in a section of a property in Mankley Road, Leonard Stanley). In a further four houses (two of which were in Mankley Road) the rate of corrosion was found to be sufficiently high to suggest that *“structural damage could occur within the next five years”*.
- (f) Additionally, it was noted that voids existing within some of the columns and some had *“severe cracking”*.
- (g) Curtins concluded that despite the overcladding offering protection to the PRC external walls there was still cause for concern. The overcladding may have provided a short term solution but it will not provide for a further 30 years life.
- (h) Curtins recommended that removal of the PRC components and replacement with masonry cavity walling (a “walls out” solution) would be the most appropriate remedial solution, and this work should be undertaken within the next five years (ie by 2008).
- (i) No mention was made of the PRC components in the party wall and spine wall, but there would be options to have tested and retained them if found to be in acceptable condition.
- (j) If the Council wished to make them generally “mortgageable” for tenants to buy it would have been necessary to removal and replace these walls with masonry as well. This would have made the overall costs significantly higher (and disruption to tenants significantly greater).
- (k) The alternative strategy of redevelopment of the sites was not discussed in the 2003 report.

## 12.0 Woolaway

### 12.2 Major Works Carried Out



- (l) The Council have now decided to undertake redevelopment of the all the Woolaway sites, and most properties have already been demolished, and the sites redeveloped.
- (m) The properties in the stock are located as follows

			Demolished		Retained
Town/Village	Road	Qty 2015	Qty	Years	Qty 2017
Leonard Stanley	Mankley Road	19	19	2013/4 & 16	
Minchinhampton	Old Common	18	18	2013	
Minchinhampton	The Tynings	17	17	2013	
Stroud	Bisley Old Road	6	6	2016	
Stroud	Daniels Road	5	3	2016	2
Stroud	Mason Road	17	14	2013 & 2016	3
Stroud	Target Close	12	12	2014 & 2015	
<b>Total</b>		<b>94</b>	<b>89</b>		<b>5</b>

- (n) Only five properties remain, in two locations, as follows

Town/Village	Street	No	Post Code	Type	Works
Stroud	Daniels Road	13	GL5 1HX	ETH	EWI
Stroud	Daniels Road	15	GL5 1HX	MTH	EWI
Stroud	Mason Road	35	GL5 1HU	SDH	EWI
Stroud	Mason Road	37	GL5 1HU	SDH	Refurbish
Stroud	Mason Road	43	GL5 1HU	SDH	EWI

- (o) Nos 13 & 15 Daniels Road are left hand houses in a terrace of four, the other two houses (17 & 19) are privately owned.
- (p) Nos 35 & 43 Mason Road are semi-detached houses where the adjoining property is privately owned.
- (q) No 37 Mason Road is a semi-detached house which has been refurbished. We do not know the extent of the works, but it would appear that the PRC components in the external walls have been taken down and replaced with traditional brick/block cavity walling. We do not know whether the PRC components in the party wall and the ground floor spine wall have been dealt with.

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## 12.0 Woolaway

### 12.3 Conclusions & Recommendations



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#### Conclusions

- (a) The problem has been resolved, apart from four of the five remaining.
- (b) These four are attached to privately owned properties, and we understand that SDC Development team will “deal” with them, either by sale or refurbishment.
- (c) One of the five has been refurbished, but we do not know whether the works included the party and spine walls.
- (d) The previous Reports indicate that the Council was right to decide to deal with this construction type by redevelopment of the sites.

#### Recommendations

- (a) We assume that demolition of the remaining houses will not be practical due to adjoining privately owned houses.
- (b) We recommend a “walls out” replacement of the external walls with traditional brick/block cavity walls.
- (c) If general “mortgageability” is required for tenants to buy their homes then it will be necessary to also deal with the PRC components in the party & spine walls. (Note: See comments on this in Section 14).

## 13.0 Notes on Mortgageability



### 13.1 General

- (a) The first and most important thing to note is that Curtins are not the arbiters of what is and is not “mortgageable”. We can give an opinion on what may be acceptable for lending, but it is only the lenders themselves that can make the decision lend or not. And it should be recognised that even amongst the lenders there are different attitudes to non-traditional housing.
- (b) If you are considering attempting to make your homes “mortgageable” for your tenants you should engage with a number of lenders and obtain from them a written commitment that if properties are presented having had works carried out they will be accepted. In our experience a single lender would not commit to making mortgages available to every house in a street, they will want to limit their exposure to a small percentage of the stock. You may need to find a number of lenders who will commit to each road or estate, and the more houses available the more lenders will be required.
- (c) The second aspect is that there are two types of borrower. The tenant, and the social landlord. For the tenant the “mortgageability” must be general – the homeowner will want to easily sell their home when the time comes. For the social landlord the lenders usually require a 30 year rental stream, and the non-traditional properties in your stock should achieve this longevity.
- (d) The third aspect concerns the construction type. The “mortgageability” problem arose in the early 1980’s, and the Housing Defects Act of 1984 and Housing Act of 1985 confirmed some construction types as being “*Designated Defective*”. This only applied to property which was of PRC (prefabricated reinforced concrete) construction, and these types of property became instantly unmortgageable from about 1982 onwards.
- (e) In theory, but not necessarily in practice, any construction type which was not “*Designated Defective*” should be mortgageable. However, the lenders, in protecting their own interests, have tended to put any Non-Trad type into the unmortgageable category.
- (f) Over the years the lenders have moved the goal posts to suit themselves, and in the years before the “prime and secondary” mortgages which lead to the credit crunch in 2008, the lenders were less fussy about what was acceptable and very fussy after 2008.
- (g) Curtins cannot therefore second guess the lenders, and the comments about each of the construction types that follow should be for general guidance only – to reiterate, it is only the individual lenders who can tell you what they will and will not accept.
- (h) Finally, for the “*Designated Defective*” construction types in the mid 1980’s the Government of the day passed legislation to enable homeowners at the time to be able to sell their homes on the open market as & when they wished. This involved having works carried out to remove or make structurally redundant all PRC components in the property. To achieve this provision was made for designers to submit schemes and receive Licences for the work to be carried out. Upon completion a “PRC Certificate” would be issued (this was actually a 10 year warranty similar to the NHBC warranty on a new property). There are no Licence schemes for construction types which are not “*Designated Defective*”.

## 13.0 Notes on Mortgageability



### 13.2 Airey

- (a) *Designated Defective*, a PRC type.
- (b) Works carried out to date – either External Walls only or the Leeds Scheme. The former did not reach Licence requirements. The Leeds scheme did have a Licence, No 033.
- (c) Retained PRC – the party wall and spine wall.
- (d) Works required to achieve mortgageability –
  - External Walls scheme 18 No houses – replace the existing party wall with traditional masonry or structural timber stud in accordance with a Licence. Make spine wall redundant using timber stud.
  - Leeds scheme 41 No houses – No works required, in theory already mortgageable, the problem may be having the documentation to prove it
- (e) Effect of works on tenants – very disruptive, would need to be temporarily decanted for several weeks.

### 13.3 BL8

- (a) Not *Designated Defective*, a steel frame construction type.
- (b) Works carried out to date – brick overcladding to external walls.
- (c) Works required to achieve mortgageability – No works required, in theory already mortgageable.

### 13.4 Cornish

- (a) *Designated Defective*, a PRC type.
- (b) Works carried out to date – replacement of PRC external walls with traditional masonry construction. Some houses may have internal PRC beams (see Section 5.2(e)), and if these were not dealt with (by removing or making redundant) then the Licence requirements would not have been met. Whilst the external walls were dealt with by a “walls out” scheme, the Council would need to prove it was to a PRC Homes Ltd Licence scheme.
- (c) Works required to achieve mortgageability – Check which of the stock has internal PRC beams, and any that do will need additional works to remove them or make them redundant. This would mean taking down ceilings to carry out the works required.
- (d) Effect of works on tenants – No effect if no PRC beams. Otherwise disruptive, may need to be temporarily decanted (for a few days). Less effect for the lounge beam(s) but kitchen would be unusable for most of the works.
- (e) First actions – proof of Licence and check PRC beams situation (it wont be every house).

## 13.0 Notes on Mortgageability



### 13.5 Dorlonco

- (a) Not *Designated Defective*, a steel frame construction type.
- (b) Works carried out to date – None.
- (c) Works required to achieve mortgageability – No works required, in theory already mortgageable.

### 13.6 Reema Conclad

- (a) Not *Designated Defective*, a PRC type.
- (b) Works carried out to date – None, but EWI recommended in this report.
- (c) Works required to achieve mortgageability – No works required, in theory already mortgageable.

### 13.7 Reema Hollow Panel

- (a) *Designated Defective*, a PRC type.
- (b) Works carried out to date – EWI to 65 No, 35 No to be demolished and no works to remaining 157 No, but EWI recommended in this report.
- (c) Works required to achieve mortgageability – removal of the PRC external walls and party walls (which will have added difficulty where adjoining house is private), and replacing them with traditional masonry construction. If the chimney is PRC that has to be dealt with as well to comply with Licence requirements. For houses removal of the first floor ladder beams and replacing them with timber joists. Extend foundations to carry increase width of wall. All that would remain of the original would be the ground floor slab, the internal stud/masonry partition walls and the roof. For the 65 No with EWI additional cost of removal.
- (d) Effect of works on tenants – very disruptive, would need to be temporarily decanted, probably for twenty weeks (depending on amount of improvements incorporated into the works – eg new central heating, rewiring, kitchens, bathrooms etc).
- (e) Flats – some lenders do not like to lend against flats, particularly where there is deck access. SDC do not have deck access flats, but nevertheless you should proceed with caution. Check and confirm that lenders will lend before spending significant sums to bring them up to mortgageable standard.
- (f) This is the largest of the Non-Trad stocks, and the cost for all would be somewhere in the order of £15m to £25m excluding decanting costs and loss of rental income during the works.
- (g) If SDC were to have a single contract for the works and started a new one every week (without any breaks), the Contract period would be about 5 years.



## 13.0 Notes on Mortgageability



### 13.8 Stent

- (a) *Designated Defective*, a PRC type.
- (b) Works carried out to date – EWI.
- (c) Works required to achieve mortgageability – removal of the PRC external walls, and replacing them with traditional masonry construction. Extend foundations to carry increase width of wall. Additional cost of removal of EWI.
- (d) Effect of works on tenants – very disruptive, would need to be temporarily decanted, probably for fourteen to eighteen weeks (depending on amount of improvements incorporated into the works – eg new central heating, rewiring, kitchens, bathrooms etc).
- (e) Additional costs for decanting and loss of rental income.

### 13.9 Swedish

- (a) Not *Designated Defective*, a timber frame construction type.
- (b) Works carried out to date – EWI to 2 No, remainder to have structural repairs and EWI recommended in this report.
- (c) Works required to achieve mortgageability – No works required, in theory already mortgageable.

### 13.10 Unity

- (a) *Designated Defective*, a PRC type.
- (b) Works carried out to date – EWI.
- (c) Works required to achieve mortgageability – removal or making structurally redundant the PRC external walls, and replacing them with traditional masonry construction. Extend foundations to carry increase width of wall. Additional cost of removal of EWI.
- (d) Effect of works on tenants – very disruptive, would need to be temporarily decanted, probably for twelve to sixteen weeks (depending on amount of improvements incorporated into the works – eg new central heating, rewiring, kitchens, bathrooms etc). There is less impact on the internal features as the inner leaf blockwork is retained, so probably less scope and need to undertake improvements than in other PRC types.
- (e) Additional costs for decanting and loss of rental income.
- (f) SDC have 42 No Mk I's and 17 No Mk II's. The Mk II's are the easier to do as the inner leaf is more stable than with the Mk I's. The Unity is probably the easier of the PRC types to deal with, compared to the Reema HP etc.

## 13.0 Notes on Mortgageability



### 13.11 Woolaway

- (a) *Designated Defective*, a PRC type.
- (b) Works carried out to date – EWI to four, external walls replaced with traditional masonry on one and the remainder have been demolished.
- (c) Works required to achieve mortgageability – removal of the PRC external walls, spine walls at ground floor level (if PRC) and party walls (which will have added difficulty where adjoining house is private), and replacing them with traditional masonry construction. Extend foundations to carry increase width of wall. All that would remain of the original would be the ground floor slab, the internal stud/masonry partition walls and the roof. For the 4 No with EWI additional cost of removal.
- (d) We do not know whether the one house which SDC have replaced the external walls the party wall and spine wall have also been dealt with. This house is adjoining a private house, and the procedure with the party wall would be to build a new party wall alongside the existing (ie the house become slightly smaller). We do not know if the house was done to a Licence or to a bespoke scheme designed by the Council. If the latter it may not be acceptable to lenders for mortgage purposes.
- (e) We would recommend that if you wish to sell the refurbished properties on the private market (rather than re-letting to your tenants) you should obtain documentation confirming the works were carried out to a Licence (which means approaching the Licence holders).

### 13.12 Other considerations

- (a) In addition to decanting and loss of rental income during the works, there will also be significant SDC management time to consider, both technical and housing management staff.
- (b) No Licences have been updated for twenty years, and any works “to the Licence” will also need to comply with current Building Regulations at the time of the works. For example the U-value to be achieved is far more onerous today than when the Licences were first written in the mid 1980’s, so for example wall thicknesses are greater to accommodate more insulation.
- (c) Proving that works to Airey & Cornish so many years ago were to a Licence may not be easy if the paperwork at the time has been lost.
- (d) Curtins have Licence schemes for all the different PRC types in your stock.

## 14.0 Summary



### All

Type	Construction	Designated Defective	Major Works	Qty	Mortgageable?*
Airey	PRC	Yes	External Walls	59	No, internal PRC
BL8	Steel frame	No	Overcladding - Brick	53	Yes
Cornish	PRC	Yes	Walls Out	52	Yes, PRC removed
Dorlonco	Steel frame	No	As original	13	Yes
Reema HP	PRC	Yes	EWI & As Original	256	No, all PRC remain
Reema CC	PRC	No	As original	36	Yes
Stent	PRC	Yes	EWI	55	No, all PRC remain
Swedish	Timber Frame	No	EWI & As Original	20	Yes
Unity	PRC	Yes	EWI	59	No, all PRC remain
Woolaway	PRC	Yes	EWI & Demolished	5	No, all PRC remain
				608	*Note: in theory only

### Airey

Town/Village	Road	Qty	Scheme	Year
Brownhill	Frith Wood	7	Leeds	1994
Coaley	Hamshill	6	External Walls	1995
Ebley	Orchard Road	9	Leeds	1988
Hardwicke	Elmgrove Road East	3	Leeds	1988
Hardwicke	Springfields	14	Leeds	1988
Kingswood	Chestnut Park	1	External Walls	1994
North Nibley	The Innocks	9	External Walls	1993
Slimbridge	Moorend Lane	1	External Walls	1996
Slimbridge	Tynning Crescent	1	External Walls	1996
Westrip	The Wordens	8	Leeds	1988
	<b>Total</b>	<b>59</b>		
	Summary	41	Leeds	1988
		18	External Walls	1993-1996

### **Retained PRC Remaining Life – 30 years**

**Recommendations** – Internal inspections of retained PRC in the party & spine walls whenever property vacant. Check risk of fire spread across party wall, seal where required.

## 14.0 Summary



### BL8

Town/Village	Road	Qty
Cam	Fairmead	6
	Hadley Road	9
	Turner Road	10
	Tyndale Road	7
Leonard Stanley	Brimley	21
	<b>Total</b>	<b>53</b>

**Retained metal frame Remaining Life** – 30 years

**Recommendations** – No further action required

### Cornish

Town/Village	Road	Qty
Bridgend	Wharfdale Way	3
Cam	Marment Road	10
Cam	Tilsdown Close	12
Coaley	Betworthy	8
Kingswood	Chestnut Park	4
Slimbridge	Tyning Crescent	8
Wotton-Under-Edge	Fountain Crescent	7
	<b>Total</b>	<b>52</b>

**Retained PRC Remaining Life** – Not applicable, all PRC in external walls removed and replaced with traditional brick/block cavity walling

**Recommendations** – Internal inspections of support to first floor walls whenever property vacant, and action to improve support where required. Inspections of PRC constructed Outbuildings to build up database of structural condition, aim to remove all PRC Outbuildings within 20 years or less.

## 14.0 Summary



### Dorlonco

Town/Village	Road	Qty
Cashes Green	Hyett Road	3
	Kingley Road	2
	Mosley Crescent	8
	<b>Total</b>	<b>13</b>

**Retained Steel Frame Remaining Life – 30 years**

### **Recommendations –**

- Install EWI, but also remove existing cavity fill & use the opportunity of opening up to inspect the steelwork within the cavity.
- Install “whole house” ventilation system in conjunction with EWI.
- Inspect chimneys during voids, and take down to below roof where deteriorated or not needed.
- Enabling works for EWI include dealing with overhead electric cables, reducing ground levels where too high, and moving gas pipework away from the building.

### Reema Conclad

Town/Village	Road	H/B/F	Qty
Forest Green	Badgers Way	SDH	16
	Nortonwood	SDH	4
	Nortonwood	Flats	8
	Woodpecker Walk	SDH	8
	<b>Total</b>		<b>36</b>

**PRC Remaining Life – 30 years, more if EWI installed**

### **Recommendations –**

- Install EWI, inspect **all** properties and carry out repairs to the PRC in advance.
- Install “whole house” ventilation system in conjunction with EWI.
- Enabling works for EWI include dealing with reducing ground levels where too high, dealing with porches and rainwater down pipes, extending the roof gable ladder, re-locating radon gas pumps & ducts away from the buildings, and liaising with LA Planners regarding the existing tile hangings to the first floor.

## 14.0 Summary



### Reema Hollow Panel

Town/Village	Road	Qty with EWI	Qty without EWI	Surveyed
Cashes Green	Moorhall Place	14		No
Cashes Green	Mosley Road	6		No
Cashes Green	Queens Drive	5		No
Cashes Green	Stanton Road	22		No
Forest Green	Lawnside		65	Yes
Leonard Stanley	Mankley Road		31	Yes
Minchinhampton	Glebe Road		19	Yes
Nailsworth	Ringfield Close		27	No
Nailsworth	Tanners Piece		8	No
Nailsworth	Upper Park Road		6	Yes
Stonehouse	Midland Road		5	Yes
Stonehouse	Willow Road		12	Yes
Stroud	Gibson Close	18		No
Whiteshill	Victory Road		18	Yes
Woodchester	Blacklow Close		1	Yes
	<b>Total</b>	<b>65</b>	<b>192</b>	

**Scheduled for Demolition** – Ringfield Close & Tanner Place, Nailsworth (35 No)

**PRC Remaining Life** – 30 years, possibly more if EWI installed. May need to repair first floor PRC “ladder” beams from time to time.

### **Recommendations** –

- Amend database to correct additions and deletions found during the survey
- Install EWI, inspect **all** properties and carry out repairs to the PRC in advance.
- Install “whole house” ventilation system in conjunction with EWI.
- Check for and seal gaps across the party walls where there is a risk of fire spread.
- Check “ladder” FF beams at all changes of tenancy.
- Repairs to single storey extension at 31 Victory Road, Whiteshill
- Enabling works for EWI include dealing with reducing ground levels where too high, dealing with overhead cabling, gas pipework, porches, conservatories, roof verges

## 14.0 Summary



### Stent

Town/Village	Road	Qty
Kingsway	Dursley	26
St Georges Road	Dursley	29
	<b>Total</b>	<b>55</b>

**PRC Remaining Life** – 30 years, subject to routine maintenance of the EWI (which is now 19 years old).

### **Recommendations –**

- Assessment of the EWI in 2018, and 2023. Carry out any repairs to the finishes necessary to continue protection of the PRC.
- Consider new EWI from 2023.
- If new EWI, then remove existing to enable a full assessment of the condition of the PRC prior to installing new.
- Carry out internal inspections at changes of tenancy, including random opening up to view the PRC wall condition. Log the floor construction materials (steel or timber), check condition, and repair/replace as necessary.

### Swedish Timber Frame

Town/Village	Road	Qty	Type
North Nibley	Barrs Lane	1	Chalet Bungalow
Painswick	Parkfield Cottages	6	Chalet Bungalows & Houses
Stancombe	Swedale	2	Houses
Stinchcombe	The Avenue	3	Chalet Bungalows
The Camp	Bushy Beeches	2	House
Uley	The Knoll	3	Houses
Wotton-Under-Edge	Mount Pleasant	3	Chalet Bungalows
	<b>Total</b>	<b>20</b>	

### **Timber Frame Remaining Life –**

Stancombe - 30 years

Other sites – Limited without extensive repairs to the timber frame in the short term

### **Recommendations –**

- Repairs & EWI to be installed within three years.
- Install “whole house” ventilation system in conjunction with EWI.
- Carry out maintenance works this year – gutters, ivy, dormer windows, chimneys, roof tiles, flashing, ground levels, underfloor vents all need attention to varying degrees.
- EWI enabling works prior to Repair & EWI Contract – overhead cables & gas pipework.

## 14.0 Summary



### Unity

Town/Village	Road	Qty
Cashes Green	Hillcrest Road	30
Ebley	Devereaux Crescent	12
Hardwicke	Springfields	17
	<b>Total</b>	<b>59</b>

**PRC Remaining Life** – 30 years, subject to routine maintenance of the EWI (which is now 16 years old).

**Recommendations** – Repairs to the EWI to continue protection of the PRC.

### Woolaway

Town/Village	Road	Qty 2015	Demolished		Qty 2017
			Qty	Years	
Leonard Stanley	Mankley Road	19	19	2013/4 & 16	0
Minchinhampton	Old Common	18	18	2013	0
Minchinhampton	The Tynings	17	17		0
Stroud	Bisley Old Road	6	6	2016	0
Stroud	Daniels Road	5	3	2016	2
Stroud	Mason Road	17	14	2013 & 2016	3
Stroud	Target Close	12	12	2014 & 2015	0
	<b>Total</b>	<b>94</b>	<b>89</b>		<b>5</b>

**PRC Remaining Life** – Limited

**Recommendations** – Demolition of the remaining houses, site redevelopment. If not, “walls out” replacement of external walls with traditional masonry construction (& if mortgageability required, the party & spine walls too).



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# Appendix A



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## List of Addresses

No	Construction
A1	Airey
A2	BL8
A3	Cornish
A4	Dorlonco
A5	Reema Conclad
A6	Reema Hollow Panel
A7	Stent
A8	Swedish
A9	Unity
10	Woolaway

# Appendix A1

## List of Airey Addresses



UPNR	Town/Village	Street	No	Post Code	H/F/B	Scheme	Year
72090020	Brownhill	Frith Wood	2	GL6 8AE	SDH	Leeds	1994
72090030	Brownhill	Frith Wood	3	GL6 8AE	SDH	Leeds	1994
72090040	Brownhill	Frith Wood	4	GL6 8AE	SDH	Leeds	1994
72090050	Brownhill	Frith Wood	5	GL6 8AE	SDH	Leeds	1994
72090060	Brownhill	Frith Wood	6	GL6 8AE	SDH	Leeds	1994
72090090	Brownhill	Frith Wood	9	GL6 8AE	SDH	Leeds	1994
72090100	Brownhill	Frith Wood	10	GL6 8AE	SDH	Leeds	1994
15030030	Coaley	Hamshill	3	GL11 5EJ	SDH	External walls	1995
15030040	Coaley	Hamshill	4	GL11 5EJ	SDH	External walls	1995
15030050	Coaley	Hamshill	5	GL11 5EJ	SDH	External walls	1995
15030060	Coaley	Hamshill	6	GL11 5EJ	SDH	External walls	1995
15030070	Coaley	Hamshill	7	GL11 5EJ	SDH	External walls	1995
15030080	Coaley	Hamshill	8	GL11 5EJ	SDH	External walls	1995
45090690	Ebley	Orchard Road	69	GL5 4TZ	SDH	Leeds	1988
45090710	Ebley	Orchard Road	71	GL5 4TZ	SDH	Leeds	1988
45091000	Ebley	Orchard Road	100	GL5 4UA	SDH	Leeds	1988
45091040	Ebley	Orchard Road	104	GL5 4UA	SDH	Leeds	1988
45091060	Ebley	Orchard Road	106	GL5 4UA	SDH	Leeds	1988
45091080	Ebley	Orchard Road	108	GL5 4UA	SDH	Leeds	1988
45091160	Ebley	Orchard Road	116	GL5 4UA	SDH	Leeds	1988
45091220	Ebley	Orchard Road	122	GL5 4UA	SDH	Leeds	1988
45091240	Ebley	Orchard Road	124	GL5 4UA	SDH	Leeds	1988
50010400	Hardwicke	Elmgrove Road East	40	GL2 4PY	SDH	Leeds	1988
50010440	Hardwicke	Elmgrove Road East	44	GL2 4PY	SDH	Leeds	1988
50010460	Hardwicke	Elmgrove Road East	46	GL2 4PY	SDH	Leeds	1988
50070030	Hardwicke	Springfield	3	GL2 4PX	SDH	Leeds	1988
50070040	Hardwicke	Springfield	4	GL2 4PX	SDH	Leeds	1988
50070050	Hardwicke	Springfield	5	GL2 4PX	SDH	Leeds	1988
50070070	Hardwicke	Springfield	7	GL2 4PX	SDH	Leeds	1988
50070080	Hardwicke	Springfield	8	GL2 4PX	SDH	Leeds	1988
50070090	Hardwicke	Springfield	9	GL2 4PX	SDH	Leeds	1988
50070100	Hardwicke	Springfield	10	GL2 4PX	SDH	Leeds	1988
50070110	Hardwicke	Springfield	11	GL2 4PX	SDH	Leeds	1988
50070150	Hardwicke	Springfield	15	GL2 4PX	SDH	Leeds	1988
50070180	Hardwicke	Springfield	18	GL2 4PX	SDH	Leeds	1988
50070200	Hardwicke	Springfield	20	GL2 4PX	SDH	Leeds	1988
50070220	Hardwicke	Springfield	22	GL2 4PX	SDH	Leeds	1988
50070240	Hardwicke	Springfield	24	GL2 4PX	SDH	Leeds	1988

# Appendix A1

## List of Airey Addresses



UPNR	Town/Village	Street	No	Post Code	H/F/B	Scheme	Year
50070360	Hardwicke	Springfield	36	GL2 4PX	SDH	Leeds	1988
20010070	Kingswood	Chestnut Park	7	GL12 8RJ	SDH	External walls	1994
21050010	North Nibley	The Innocks	1	GL11 6DP	SDH	External walls	1993
21050020	North Nibley	The Innocks	2	GL11 6DP	SDH	External walls	1993
21050030	North Nibley	The Innocks	3	GL11 6DP	SDH	External walls	1993
21050040	North Nibley	The Innocks	4	GL11 6DP	SDH	External walls	1993
21050070	North Nibley	The Innocks	7	GL11 6DP	SDH	External walls	1993
21050080	North Nibley	The Innocks	8	GL11 6DP	SDH	External walls	1993
21050100	North Nibley	The Innocks	10	GL11 6DP	SDH	External walls	1993
21050110	North Nibley	The Innocks	11	GL11 6DP	SDH	External walls	1993
21050120	North Nibley	The Innocks	12	GL11 6DP	SDH	External walls	1993
23030170	Slimbridge	Moorend Lane	17	GL2 7DG	SDH	External walls	1996
23070080	Slimbridge	Tynning Crescent	8	GL2 7DE	SDH	External walls	1996
58070030	Westrip	The Wordens	3	GL5 4RX	SDH	Leeds	1988
58070040	Westrip	The Wordens	4	GL5 4RX	SDH	Leeds	1988
58070110	Westrip	The Wordens	11	GL5 4RX	SDH	Leeds	1988
58070120	Westrip	The Wordens	12	GL5 4RX	SDH	Leeds	1988
58070160	Westrip	The Wordens	16	GL5 4RX	SDH	Leeds	1988
58070190	Westrip	The Wordens	19	GL5 4RX	SDH	Leeds	1988
58070220	Westrip	The Wordens	22	GL5 4RX	SDH	Leeds	1988
58070290	Westrip	The Wordens	29	GL5 4RX	SDH	Leeds	1988

Summary:

Town/Village	Road	Qty	Scheme	Year
Brownshill	Frith Wood	7	Leeds	1994
Coaley	Hamshill	6	External Walls	1995
Ebley	Orchard Road	9	Leeds	1988
Hardwicke	Elmgrove Road East	3	Leeds	1988
Hardwicke	Springfields	14	Leeds	1988
Kingswood	Chestnut Park	1	External Walls	1994
North Nibley	The Innocks	9	External Walls	1993
Slimbridge	Moorend Lane	1	External Walls	1996
Slimbridge	Tynning Crescent	1	External Walls	1996
Westrip	The Wordens	8	Leeds	1988
	<b>Total</b>	<b>59</b>		
	Summary	41	Leeds	1988
		18	External Walls	1993-1996

## Appendix A2

### List of BL8 Addresses



UPNR	Town/Village	Street	No	Post Code
14170690	Cam	Fairmead	69	GL11 5JT
14170710	Cam	Fairmead	71	GL11 5JT
14170750	Cam	Fairmead	75	GL11 5JT
14170770	Cam	Fairmead	77	GL11 5JT
14170810	Cam	Fairmead	81	GL11 5JU
14170850	Cam	Fairmead	85	GL11 5JU
14370070	Cam	Hadley Road	7	GL11 6LU
14370090	Cam	Hadley Road	9	GL11 6LU
14370110	Cam	Hadley Road	11	GL11 6LU
14370150	Cam	Hadley Road	15	GL11 6LU
14370160	Cam	Hadley Road	16	GL11 6LU
14370220	Cam	Hadley Road	22	GL11 6LU
14370260	Cam	Hadley Road	26	GL11 6LU
14370280	Cam	Hadley Road	28	GL11 6LU
14370300	Cam	Hadley Road	30	GL11 6LU
14470010	Cam	Turner Road	1	GL11 6LT
14470020	Cam	Turner Road	2	GL11 6LS
14470030	Cam	Turner Road	3	GL11 6LT
14470040	Cam	Turner Road	4	GL11 6LS
14470050	Cam	Turner Road	5	GL11 6LT
14470110	Cam	Turner Road	11	GL11 6LT
14470120	Cam	Turner Road	12	GL11 6LS
14470130	Cam	Turner Road	13	GL11 6LT
14470150	Cam	Turner Road	15	GL11 6LT
14470180	Cam	Turner Road	18	GL11 6LS
14490070	Cam	Tyndale Road	7	GL11 6LH
14490090	Cam	Tyndale Road	9	GL11 6LH
14490100	Cam	Tyndale Road	10	GL11 6LH
14490140	Cam	Tyndale Road	14	GL11 6LH
14490200	Cam	Tyndale Road	20	GL11 6LH
14490210	Cam	Tyndale Road	21	GL11 6LH
14490220	Cam	Tyndale Road	22	GL11 6LH
54010070	Leonard Stanley	Brimley	7	GL10 3LZ
54010090	Leonard Stanley	Brimley	9	GL10 3LZ
54010130	Leonard Stanley	Brimley	13	GL10 3LZ
54010150	Leonard Stanley	Brimley	15	GL10 3LZ
54010190	Leonard Stanley	Brimley	19	GL10 3LZ
54010200	Leonard Stanley	Brimley	20	GL10 3LZ

## Appendix A2

### List of BL8 Addresses



UPNR	Town/Village	Street	No	Post Code
54010220	Leonard Stanley	Brimley	22	GL10 3LZ
54010260	Leonard Stanley	Brimley	26	GL10 3LZ
54010270	Leonard Stanley	Brimley	27	GL10 3LZ
54010300	Leonard Stanley	Brimley	30	GL10 3LZ
54010330	Leonard Stanley	Brimley	33	GL10 3NA
54010340	Leonard Stanley	Brimley	34	GL10 3NA
54010360	Leonard Stanley	Brimley	36	GL10 3NA
54010380	Leonard Stanley	Brimley	38	GL10 3NA
54010390	Leonard Stanley	Brimley	39	GL10 3NA
54010410	Leonard Stanley	Brimley	41	GL10 3NA
54010420	Leonard Stanley	Brimley	42	GL10 3NA
54010430	Leonard Stanley	Brimley	43	GL10 3NA
54010440	Leonard Stanley	Brimley	44	GL10 3NA
54010450	Leonard Stanley	Brimley	45	GL10 3NA
54010480	Leonard Stanley	Brimley	48	GL10 3NA

Notes:

All properties are semi-detached bungalows. All have had a brick overcladding.

## Appendix A3 List of Cornish Addresses



UPNR	Town/Village	Street	No	Post Code	H/F/B	PRC OB
60040330	Bridgend	Wharfdale Way	33	GL10 2AJ	SDH	No
60040350	Bridgend	Wharfdale Way	35	GL10 2AJ	SDH	Yes
60040370	Bridgend	Wharfdale Way	37	GL10 2AJ	SDH	Yes
14410070	Cam	Marment Road	7	GL11 6LA	n/r	No
14410080	Cam	Marment Road	8	GL11 6LA	n/r	No
14410090	Cam	Marment Road	9	GL11 6LA	n/r	No
14410100	Cam	Marment Road	10	GL11 6LA	n/r	No
14410110	Cam	Marment Road	11	GL11 6LA	n/r	No
14410160	Cam	Marment Road	16	GL11 6LA	n/r	No
14410170	Cam	Marment Road	17	GL11 6LA	n/r	No
14410180	Cam	Marment Road	18	GL11 6LA	n/r	No
14410190	Cam	Marment Road	19	GL11 6LA	n/r	No
14410200	Cam	Marment Road	20	GL11 6LA	n/r	No
14290060	Cam	Tilsdown Close	6	GL11 6HG	SDH	No
14290070	Cam	Tilsdown Close	7	GL11 6HG	SDH	No
14290090	Cam	Tilsdown Close	9	GL11 6HG	SDH	No
14290110	Cam	Tilsdown Close	11	GL11 6HG	SDH	No
14290130	Cam	Tilsdown Close	13	GL11 6HG	SDH	No
14290150	Cam	Tilsdown Close	15	GL11 6HG	SDH	No
14290160	Cam	Tilsdown Close	16	GL11 6HG	SDH	No
14290180	Cam	Tilsdown Close	18	GL11 6HG	SDH	No
14290250	Cam	Tilsdown Close	25	GL11 6HG	SDH	No
14290320	Cam	Tilsdown Close	32	GL11 6HG	SDH	No
14290340	Cam	Tilsdown Close	34	GL11 6HG	SDH	No
14290360	Cam	Tilsdown Close	36	GL11 6HG	SDH	No
15010070	Coaley	Betworthy	7	GL11 5EF	SDH	No
15010080	Coaley	Betworthy	8	GL11 5EF	SDH	Yes
15010090	Coaley	Betworthy	9	GL11 5EF	SDH	No
15010100	Coaley	Betworthy	10	GL11 5EF	SDH	Yes
15010130	Coaley	Betworthy	13	GL11 5EF	SDH	No
15010160	Coaley	Betworthy	16	GL11 5EF	SDH	Yes
15010220	Coaley	Betworthy	22	GL11 5EF	SDH	Yes
15010230	Coaley	Betworthy	23	GL11 5EF	SDH	Yes
20010140	Kingswood	Chestnut Park	14	GL12 8RJ	SDH	No
20010170	Kingswood	Chestnut Park	17	GL12 8RJ	SDH	Yes
20010200	Kingswood	Chestnut Park	20	GL12 8RJ	SDH	Yes
20010230	Kingswood	Chestnut Park	23	GL12 8RJ	SDH	Yes

## Appendix A3 List of Cornish Addresses



UPNR	Town/Village	Street	No	Post Code	H/F/B	PRC OB
23070110	Slimbridge	Tyning Crescent	11	GL2 7DE	SDH	No
23070130	Slimbridge	Tyning Crescent	13	GL2 7DE	SDH	Yes
23070180	Slimbridge	Tyning Crescent	18	GL2 7DE	SDH	Yes
23070200	Slimbridge	Tyning Crescent	20	GL2 7DE	SDH	Yes
23070220	Slimbridge	Tyning Crescent	22	GL2 7DE	SDH	Yes
23070240	Slimbridge	Tyning Crescent	24	GL2 7DE	SDH	Yes
23070260	Slimbridge	Tyning Crescent	26	GL2 7DE	SDH	Yes
23070270	Slimbridge	Tyning Crescent	27	GL2 7DE	SDH	Yes
26130150	Wotton-Under-Edge	Fountain Crescent	15	GL12 7LD	SDH	No
26130190	Wotton-Under-Edge	Fountain Crescent	19	GL12 7LD	SDH	No
26130210	Wotton-Under-Edge	Fountain Crescent	21	GL12 7LD	SDH	No
26130230	Wotton-Under-Edge	Fountain Crescent	23	GL12 7LD	SDH	No
26130270	Wotton-Under-Edge	Fountain Crescent	27	GL12 7LD	SDH	No
26130380	Wotton-Under-Edge	Fountain Crescent	38	GL12 7LD	SDH	No
26130400	Wotton-Under-Edge	Fountain Crescent	40	GL12 7LD	SDH	No

Town/Village	Road	Qty
Bridgend	Wharfdale Way	3
Cam	Marment Road	10
Cam	Tilsdown Close	12
Coaley	Betworthy	8
Kingswood	Chestnut Park	4
Slimbridge	Tyning Crescent	8
Wotton-Under-Edge	Fountain Crescent	7
	<b>Total</b>	<b>52</b>

Type codes:

- SDH = Semi-detached house
- ETH = End Terraced house
- MTH = Mid Terraced house
- MTHa = Mid Terraced house with alleyway
- F0 = Ground floor flat
- F1 = First floor flat

Notes: Marment Road, Cam – n/r = no record of type, but were SDH, ETH & MTHa

## Appendix A4 List of Dorlonco Addresses



UPNR	Town/Village	Street	No	Post Code	Surveyed 2017 (External/Internal)
14030720	Cashes Green	Hyett Road	12	GL5 4LW	
14030740	Cashes Green	Hyett Road	14	GL5 4LW	Y/Y
14030760	Cashes Green	Hyett Road	16	GL5 4LW	
14290400	Cashes Green	Kingley Road	10	GL5 4LW	Y/N
14490020	Cashes Green	Kingley Road	16	GL5 4LS	
1411104B	Cashes Green	Mosley Crescent	11	GL5 4LT	
1411098A	Cashes Green	Mosley Crescent	12	GL5 4LT	
43010350	Cashes Green	Mosley Crescent	13	GL5 4LT	
43010370	Cashes Green	Mosley Crescent	14	GL5 4LT	Y/Y
43010390	Cashes Green	Mosley Crescent	15	GL5 4LT	
43010410	Cashes Green	Mosley Crescent	16	GL5 4LT	
43010430	Cashes Green	Mosley Crescent	17	GL5 4LT	
43030020	Cashes Green	Mosley Crescent	18	GL5 4LT	

Note:

All properties are semi-detached houses.



## Appendix A5 List of Reema Conclad Addresses



UPNR	Town/Village	Street	No	Post Code	H/F	Surveyed 2017 (External/Internal)
77290060	Forest Green	Badgers Way	1	GL6 0HE	SDH	
77310010	Forest Green	Badgers Way	2	GL6 0HE	SDH	
77310030	Forest Green	Badgers Way	3	GL6 0HE	SDH	
77310050	Forest Green	Badgers Way	5	GL6 0HE	SDH	
77310060	Forest Green	Badgers Way	6	GL6 0HE	SDH	Y/Y
77310070	Forest Green	Badgers Way	8	GL6 0HE	SDH	
77310090	Forest Green	Badgers Way	9	GL6 0HE	SDH	
77310100	Forest Green	Badgers Way	10	GL6 0HE	SDH	
77310110	Forest Green	Badgers Way	15	GL6 0HE	SDH	
77310120	Forest Green	Badgers Way	17	GL6 0HE	SDH	Y/Y
77310140	Forest Green	Badgers Way	19	GL6 0HE	SDH	
77310160	Forest Green	Badgers Way	20	GL6 0HE	SDH	
77310180	Forest Green	Badgers Way	22	GL6 0HE	SDH	
77310200	Forest Green	Badgers Way	26	GL6 0HE	SDH	Y/N
77310220	Forest Green	Badgers Way	27	GL6 0HE	SDH	
77330060	Forest Green	Badgers Way	29	GL6 0HE	SDH	
50090130	Forest Green	Nortonwood	1	GL6 0HD	F1	Y/N
50090140	Forest Green	Nortonwood	3	GL6 0HD	F0	Y/Y
50090150	Forest Green	Nortonwood	5	GL6 0HD	F1	
50090160	Forest Green	Nortonwood	7	GL6 0HD	F0	
50090170	Forest Green	Nortonwood	19	GL6 0HD	SDH	Y/Y
50090180	Forest Green	Nortonwood	29	GL6 0HD	SDH	
50090190	Forest Green	Nortonwood	31	GL6 0HD	F1	
50090200	Forest Green	Nortonwood	33	GL6 0HD	F0	
50090210	Forest Green	Nortonwood	35	GL6 0HD	F1	
50090220	Forest Green	Nortonwood	37	GL6 0HD	F0	
50090230	Forest Green	Nortonwood	41	GL6 0HD	SDH	
50090240	Forest Green	Nortonwood	43	GL6 0HD	SDH	
74030180	Forest Green	Woodpecker Walk	2	GL6 0HQ	SDH	
74030190	Forest Green	Woodpecker Walk	5	GL6 0HQ	SDH	
53010010	Forest Green	Woodpecker Walk	7	GL6 0HQ	SDH	Y/N
53010040	Forest Green	Woodpecker Walk	8	GL6 0HQ	SDH	
53010050	Forest Green	Woodpecker Walk	10	GL6 0HQ	SDH	Y/Y
53010060	Forest Green	Woodpecker Walk	15	GL6 0HQ	SDH	
53010070	Forest Green	Woodpecker Walk	19	GL6 0HQ	SDH	
53010080	Forest Green	Woodpecker Walk	25	GL6 0HQ	SDH	

Note: SDH = Semi-detached, F0 = Ground floor flat, F1 = First floor flat

# Appendix A6

## List of Reema Hollow Panel Addresses



UPNR	Town/Village	Street	No	Post Code	H/F	EWI	EWI Year	Survey 2017 (Ext/Int)	Sch for Dem
43170010	Cashes Green	Moorhall Place	1	GL5 4LY		Y	1998		
43170020	Cashes Green	Moorhall Place	2	GL5 4LY		Y	1998		
43170030	Cashes Green	Moorhall Place	3	GL5 4LY		Y	1998		
43170040	Cashes Green	Moorhall Place	4	GL5 4LY		Y	1998		
43170060	Cashes Green	Moorhall Place	6	GL5 4LY		Y	1998		
43170080	Cashes Green	Moorhall Place	8	GL5 4LY		Y	1998		
43170090	Cashes Green	Moorhall Place	9	GL5 4LY		Y	1998		
43170100	Cashes Green	Moorhall Place	10	GL5 4LY		Y	1998		
43170110	Cashes Green	Moorhall Place	11	GL5 4LY		Y	1998		
43170120	Cashes Green	Moorhall Place	12	GL5 4LY		Y	1998		
43170130	Cashes Green	Moorhall Place	13	GL5 4LY		Y	1998		
43170140	Cashes Green	Moorhall Place	14	GL5 4LY		Y	1998		
43170150	Cashes Green	Moorhall Place	15	GL5 4LY		Y	1998		
43170160	Cashes Green	Moorhall Place	16	GL5 4LY		Y	1998		
43210680	Cashes Green	Mosley Road	68	GL5 4LU		Y	1998		
43210700	Cashes Green	Mosley Road	70	GL5 4LU		Y	1998		
43210720	Cashes Green	Mosley Road	72	GL5 4LU		Y	1998		
43210760	Cashes Green	Mosley Road	76	GL5 4LU		Y	1998		
43210780	Cashes Green	Mosley Road	78	GL5 4LU		Y	1998		
43210800	Cashes Green	Mosley Road	80	GL5 4LU		Y	1998		
43250150	Cashes Green	Queens Drive	15	GL5 4NB		Y	1998		
43250170	Cashes Green	Queens Drive	17	GL5 4NB		Y	1998		
43250190	Cashes Green	Queens Drive	19	GL5 4NB		Y	1998		
43250210	Cashes Green	Queens Drive	21	GL5 4NB		Y	1998		
43250230	Cashes Green	Queens Drive	23	GL5 4NB		Y	1998		
43270020	Cashes Green	Stanton Road	2	GL5 4LX	SDH	Y	1998		
43270040	Cashes Green	Stanton Road	4	GL5 4LX	SDH	Y	1998		
43270060	Cashes Green	Stanton Road	6	GL5 4LX	SDH	Y	1998		
43270080	Cashes Green	Stanton Road	8	GL5 4LX	SDH	Y	1998		
43270100	Cashes Green	Stanton Road	10	GL5 4LX	SDH	Y	1998		
43270120	Cashes Green	Stanton Road	12	GL5 4LX	SDH	Y	1998		
43270140	Cashes Green	Stanton Road	14	GL5 4LX	SDH	Y	1998		
43270160	Cashes Green	Stanton Road	16	GL5 4LX	SDH	Y	1998		
43270170	Cashes Green	Stanton Road	17	GL5 4LX	SDH	Y	1998		
43270180	Cashes Green	Stanton Road	18	GL5 4LX	SDH	Y	1998		
43270190	Cashes Green	Stanton Road	19	GL5 4LX	SDH	Y	1998		
43270200	Cashes Green	Stanton Road	20	GL5 4LX	SDH	Y	1998		
43270210	Cashes Green	Stanton Road	21	GL5 4LX	SDH	Y	1998		
43270230	Cashes Green	Stanton Road	23	GL5 4LX	SDH	Y	1998		
43270250	Cashes Green	Stanton Road	25	GL5 4LX	SDH	Y	1998		
43270270	Cashes Green	Stanton Road	27	GL5 4LX	SDH	Y	1998		
43270290	Cashes Green	Stanton Road	29	GL5 4LX	SDH	Y	1998		
43270310	Cashes Green	Stanton Road	31	GL5 4LX	SDH	Y	1998		
43270330	Cashes Green	Stanton Road	33	GL5 4LX	SDH	Y	1998		
43270350	Cashes Green	Stanton Road	35	GL5 4LX	SDH	Y	1998		
43270370	Cashes Green	Stanton Road	37	GL5 4LX	SDH	Y	1998		
43270390	Cashes Green	Stanton Road	39	GL5 4LX	SDH	Y	1998		

# Appendix A6

## List of Reema Hollow Panel Addresses



UPNR	Town/Village	Street	No	Post Code	H/F	EWI	EWI Year	Survey 2017 (Ext/Int)	Sch for Dem
77170010	Forest Green	Lawnside	1	GL6 0ER	ETH	N			
77170020	Forest Green	Lawnside	2	GL6 0ER	MTHa	N			
77170030	Forest Green	Lawnside	3	GL6 0ER	MTHa	N			
77170040	Forest Green	Lawnside	4	GL6 0ER	ETH	N			
7717005A	Forest Green	Lawnside	5A	GL6 0ER	F1	N			
77170060	Forest Green	Lawnside	6	GL6 0ER	F1	N			
7717006A	Forest Green	Lawnside	6A	GL6 0ER	F1	N			
77170070	Forest Green	Lawnside	7	GL6 0ER	ETH	N			
77170080	Forest Green	Lawnside	8	GL6 0ER	MTHa	N			
77170090	Forest Green	Lawnside	9	GL6 0ER	MTHa	N			
77170100	Forest Green	Lawnside	10	GL6 0ER	ETH	N			
77170110	Forest Green	Lawnside	11	GL6 0ER	ETH	N			
77170120	Forest Green	Lawnside	12	GL6 0ER	MTHa	N			
7717012A	Forest Green	Lawnside	12A	GL6 0ER	MTHa	N		Y/Y	
77170140	Forest Green	Lawnside	14	GL6 0ER	ETH	N			
77170150	Forest Green	Lawnside	15	GL6 0ER	SDB	N			
77170160	Forest Green	Lawnside	16	GL6 0ER	SDB	N			
77170170	Forest Green	Lawnside	17	GL6 0ER	SDB	N			
77170180	Forest Green	Lawnside	18	GL6 0ER	SDB	N		Y/Y	
77170190	Forest Green	Lawnside	19	GL6 0ER	SDB	N			
77170200	Forest Green	Lawnside	20	GL6 0ER	SDB	N			
77170210	Forest Green	Lawnside	21	GL6 0ER	SDH	N		Y/Y	
77170220	Forest Green	Lawnside	22	GL6 0ER	SDH	N			
77170230	Forest Green	Lawnside	23	GL6 0ER	ETH	N			
77170240	Forest Green	Lawnside	24	GL6 0ER	MTHa	N		Y/Y	
77170250	Forest Green	Lawnside	25	GL6 0ER	MTHa	N		Y/N	
77170260	Forest Green	Lawnside	26	GL6 0ER	ETH	N			
77170270	Forest Green	Lawnside	27	GL6 0ER	ETH	N			
77170280	Forest Green	Lawnside	28	GL6 0ER	MTHa	N			
77170290	Forest Green	Lawnside	29	GL6 0ER	MTHa	N			
77170300	Forest Green	Lawnside	30	GL6 0ER	ETH	N			
77170310	Forest Green	Lawnside	31	GL6 0ER	SDH	N			
77170320	Forest Green	Lawnside	32	GL6 0ER	SDH	N			
77170330	Forest Green	Lawnside	33	GL6 0ER	SDH	N			
77170340	Forest Green	Lawnside	34	GL6 0ER	SDH	N			
77170350	Forest Green	Lawnside	35	GL6 0ER	SDH	N			
77170360	Forest Green	Lawnside	36	GL6 0ER	SDH	N			
77170370	Forest Green	Lawnside	37	GL6 0ER	ETH	N		Y/Y	
77170380	Forest Green	Lawnside	38	GL6 0ER	MTHa	N			
77170390	Forest Green	Lawnside	39	GL6 0ER	MTHa	N			
77170400	Forest Green	Lawnside	40	GL6 0ER	ETH	N			
77170410	Forest Green	Lawnside	41	GL6 0ER	ETH	N			
77170420	Forest Green	Lawnside	42	GL6 0ER	MTHa	N			
77170430	Forest Green	Lawnside	43	GL6 0ER	MTHa	N			
77170440	Forest Green	Lawnside	44	GL6 0ER	ETH	N		Y/N	
77170450	Forest Green	Lawnside	45	GL6 0ER	SDB	N			
77170460	Forest Green	Lawnside	46	GL6 0ER	SDB	N			

# Appendix A6

## List of Reema Hollow Panel Addresses



UPNR	Town/Village	Street	No	Post Code	H/F	EWI	EWI Year	Survey 2017 (Ext/Int)	Sch for Dem
77170470	Forest Green	Lawnside	47	GL6 0ER	SDB	N			
77170480	Forest Green	Lawnside	48	GL6 0ER	SDB	N			
77170490	Forest Green	Lawnside	49	GL6 0ER	SDB	N			
77170500	Forest Green	Lawnside	50	GL6 0ER	SDB	N			
77170510	Forest Green	Lawnside	51	GL6 0ER	SDB	N			
77170520	Forest Green	Lawnside	52	GL6 0ER	SDB	N			
77170530	Forest Green	Lawnside	53	GL6 0ER	SDB	N			
77170540	Forest Green	Lawnside	54	GL6 0ER	SDB	N			
77170550	Forest Green	Lawnside	55	GL6 0ER	ETH	N			
77170560	Forest Green	Lawnside	56	GL6 0ER	MTHa	N		Y/Y	
77170570	Forest Green	Lawnside	57	GL6 0ER	MTHa	N			
77170580	Forest Green	Lawnside	58	GL6 0ER	ETH	N			
77170590	Forest Green	Lawnside	59	GL6 0ER	ETH	N			
77170600	Forest Green	Lawnside	60	GL6 0ER	MTHa	N			
77170610	Forest Green	Lawnside	61	GL6 0ER	MTHa	N			
77170620	Forest Green	Lawnside	62	GL6 0ER	ETH	N			
77170630	Forest Green	Lawnside	63	GL6 0ER	SDH	N			
77170640	Forest Green	Lawnside	64	GL6 0ER	SDH	N			
54030230	Leonard Stanley	Mankley Road	23	GL10 3LX	SDB	N			
54030240	Leonard Stanley	Mankley Road	24	GL10 3LX	SDB	N			
54030250	Leonard Stanley	Mankley Road	25	GL10 3LX	SDB	N			
54030260	Leonard Stanley	Mankley Road	26	GL10 3LX	SDB	N		Y/Y	
54030270	Leonard Stanley	Mankley Road	27	GL10 3LX	F0	N			
54030280	Leonard Stanley	Mankley Road	28	GL10 3LX	F1	N			
54030290	Leonard Stanley	Mankley Road	29	GL10 3LX	F1	N			
54030300	Leonard Stanley	Mankley Road	30	GL10 3LX	F0	N			
54030310	Leonard Stanley	Mankley Road	31	GL10 3LX	F0	N			
54030320	Leonard Stanley	Mankley Road	32	GL10 3LX	F1	N			
54030330	Leonard Stanley	Mankley Road	33	GL10 3LX	F0	N			
54030340	Leonard Stanley	Mankley Road	34	GL10 3LX	F1	N			
54030350	Leonard Stanley	Mankley Road	35	GL10 3LX	F0	N			
54030360	Leonard Stanley	Mankley Road	36	GL10 3LX	SDB	N			
54030370	Leonard Stanley	Mankley Road	37	GL10 3LX	SDH	N			
54030380	Leonard Stanley	Mankley Road	38	GL10 3LX	SDH	N			
54030390	Leonard Stanley	Mankley Road	39	GL10 3LX	SDH	N		Y/Y	
54030410	Leonard Stanley	Mankley Road	41	GL10 3LX	SDH	N			
54030430	Leonard Stanley	Mankley Road	43	GL10 3LX	SDH	N			
54030440	Leonard Stanley	Mankley Road	44	GL10 3LX	SDH	N			
54030460	Leonard Stanley	Mankley Road	46	GL10 3LX	MTH	N			
54030470	Leonard Stanley	Mankley Road	47	GL10 3LX	MTH	N			
54030480	Leonard Stanley	Mankley Road	48	GL10 3LX	ETH	N			
54030490	Leonard Stanley	Mankley Road	49	GL10 3LX	SDH	N			
54030500	Leonard Stanley	Mankley Road	50	GL10 3LX	SDB	N			
54030510	Leonard Stanley	Mankley Road	51	GL10 3LX	F0	N		Y/N	
54030520	Leonard Stanley	Mankley Road	52	GL10 3LX	F1	N		Y/Y	
54030530	Leonard Stanley	Mankley Road	53	GL10 3LX	F1	N			
54030540	Leonard Stanley	Mankley Road	54	GL10 3LX	F0	N			

# Appendix A6

## List of Reema Hollow Panel Addresses



UPNR	Town/Village	Street	No	Post Code	H/F	EWI	EWI Year	Survey 2017 (Ext/Int)	Sch for Dem
54030550	Leonard Stanley	Mankley Road	55	GL10 3LX	SDB	N			
54030560	Leonard Stanley	Mankley Road	56	GL10 3LX	SDB	N			
75190340	Minchinhampton	Glebe Road	34	GL6 9JZ	SDB	N			
75190360	Minchinhampton	Glebe Road	36	GL6 9JZ	SDB	N			
75190380	Minchinhampton	Glebe Road	38	GL6 9JZ	SDB	N		Y/Y	
75190400	Minchinhampton	Glebe Road	40	GL6 9JZ	SDB	N			
75190420	Minchinhampton	Glebe Road	42	GL6 9JZ	SDB	N			
75190440	Minchinhampton	Glebe Road	44	GL6 9JZ	SDB	N			
75190460	Minchinhampton	Glebe Road	46	GL6 9JZ	SDB	N			
75190480	Minchinhampton	Glebe Road	48	GL6 9JZ	SDB	N			
75190870	Minchinhampton	Glebe Road	87	GL6 9JY	SDH	N			
75190890	Minchinhampton	Glebe Road	89	GL6 9JY	SDH	N		Y/Y	
75190910	Minchinhampton	Glebe Road	91	GL6 9JY	SDH	N			
75190930	Minchinhampton	Glebe Road	93	GL6 9JY	SDH	N			
75190950	Minchinhampton	Glebe Road	95	GL6 9JY	SDH	N			
75190970	Minchinhampton	Glebe Road	97	GL6 9JY	SDH	N			
75191010	Minchinhampton	Glebe Road	101	GL6 9JY	SDH	N			
75191030	Minchinhampton	Glebe Road	103	GL6 9JY	SDH	N			
75191050	Minchinhampton	Glebe Road	105	GL6 9JY	SDH	N			
75191070	Minchinhampton	Glebe Road	107	GL6 9JY	SDH	N			
75191090	Minchinhampton	Glebe Road	109	GL6 9JY	SDH	N			
77490010	Nailsworth	Ringfield Close	1	GL6 0HY		N			Y
77490020	Nailsworth	Ringfield Close	2	GL6 0HY		N			Y
77490030	Nailsworth	Ringfield Close	3	GL6 0HY		N			Y
77490040	Nailsworth	Ringfield Close	4	GL6 0HY		N			Y
77490050	Nailsworth	Ringfield Close	5	GL6 0HY		N			Y
77490060	Nailsworth	Ringfield Close	6	GL6 0HY		N			Y
77490070	Nailsworth	Ringfield Close	7	GL6 0HY		N			Y
77490080	Nailsworth	Ringfield Close	8	GL6 0HY		N			Y
77490090	Nailsworth	Ringfield Close	9	GL6 0HY		N			Y
77490100	Nailsworth	Ringfield Close	10	GL6 0HY		N			Y
77490110	Nailsworth	Ringfield Close	11	GL6 0HY		N			Y
77490120	Nailsworth	Ringfield Close	12	GL6 0HY		N			Y
7749012A	Nailsworth	Ringfield Close	12A	GL6 0HY		N			Y
77490140	Nailsworth	Ringfield Close	14	GL6 0HY		N			Y
77490150	Nailsworth	Ringfield Close	15	GL6 0HY		N			Y
77490160	Nailsworth	Ringfield Close	16	GL6 0HY		N			Y
77490170	Nailsworth	Ringfield Close	17	GL6 0HY		N			Y
77490180	Nailsworth	Ringfield Close	18	GL6 0HY		N			Y
77490190	Nailsworth	Ringfield Close	19	GL6 0HY		N			Y
77490200	Nailsworth	Ringfield Close	20	GL6 0HY		N			Y
77490210	Nailsworth	Ringfield Close	21	GL6 0HY		N			Y
77490220	Nailsworth	Ringfield Close	22	GL6 0HY		N			Y
77490230	Nailsworth	Ringfield Close	23	GL6 0HY		N			Y
77490240	Nailsworth	Ringfield Close	24	GL6 0HY		N			Y
77490250	Nailsworth	Ringfield Close	25	GL6 0HY		N			Y
77490260	Nailsworth	Ringfield Close	26	GL6 0HY		N			Y
77490280	Nailsworth	Ringfield Close	28	GL6 0HY		N			Y



# Appendix A6

## List of Reema Hollow Panel Addresses



UPNR	Town/Village	Street	No	Post Code	H/F	EWI	EWI Year	Survey 2017 (Ext/Int)	Sch for Dem
77510010	Nailsworth	Tanners Piece	1	GL6 0LN		N			Y
77510020	Nailsworth	Tanners Piece	2	GL6 0LN		N			Y
77510030	Nailsworth	Tanners Piece	3	GL6 0LN		N			Y
77510040	Nailsworth	Tanners Piece	4	GL6 0LN		N			Y
77510050	Nailsworth	Tanners Piece	5	GL6 0LN		N			Y
77510060	Nailsworth	Tanners Piece	6	GL6 0HS		N			Y
77510070	Nailsworth	Tanners Piece	7	GL6 0LN		N			Y
77510080	Nailsworth	Tanners Piece	8	GL6 0LN		N			Y
77530010	Nailsworth	Upper Park Road	1	GL6 0HU	F0	N		Y/Y	
77530020	Nailsworth	Upper Park Road	2	GL6 0HU	F1	N		Y/N	
77530030	Nailsworth	Upper Park Road	3	GL6 0HU	F1	N		Y/Y	
77530040	Nailsworth	Upper Park Road	4	GL6 0HU	F0	N		Y/N	
77530050	Nailsworth	Upper Park Road	5	GL6 0HU	SDH	N			
77530060	Nailsworth	Upper Park Road	6	GL6 0HU	SDH	N		Y/Y	
60251470	Stonehouse	Midland Road	147	GL10 2DT	SDH	N			
60251490	Stonehouse	Midland Road	149	GL10 2DT	SDH	N			
60251510	Stonehouse	Midland Road	151	GL10 2DT	SDH	N			
60251530	Stonehouse	Midland Road	153	GL10 2DT	SDH	N			
60251550	Stonehouse	Midland Road	155	GL10 2DT	SDH	N		Y/Y	
60350040	Stonehouse	Willow Road	4	GL10 2DS	ETH	N			
60350060	Stonehouse	Willow Road	6	GL10 2DS	MTHa	N			
60350080	Stonehouse	Willow Road	8	GL10 2DS	MTHa	N			
60350120	Stonehouse	Willow Road	12	GL10 2DS	SDB	N			
60350140	Stonehouse	Willow Road	14	GL10 2DS	SDB	N			
60350160	Stonehouse	Willow Road	16	GL10 2DS	SDH	N			
60350180	Stonehouse	Willow Road	18	GL10 2DS	SDH	N			
60350200	Stonehouse	Willow Road	20	GL10 2DS	SDB	N			
60350220	Stonehouse	Willow Road	22	GL10 2DS	SDB	N		Y/Y	
60350240	Stonehouse	Willow Road	24	GL10 2DS	ETH	N			
60350260	Stonehouse	Willow Road	26	GL10 2DS	MTHa	N		Y/Y	
60350280	Stonehouse	Willow Road	28	GL10 2DS	MTHa	N			
83150010	Stroud	Gibson Close	1	GL5 1HZ		Y	1998		
83150030	Stroud	Gibson Close	3	GL5 1HZ		Y	1998		
83150050	Stroud	Gibson Close	5	GL5 1HZ		Y	1998		
83150060	Stroud	Gibson Close	6	GL5 1HZ		Y	1998		
83150070	Stroud	Gibson Close	7	GL5 1HZ		Y	1998		
83150080	Stroud	Gibson Close	8	GL5 1HZ		Y	1998		
83150090	Stroud	Gibson Close	9	GL5 1HZ		Y	1998		
83150100	Stroud	Gibson Close	10	GL5 1HZ		Y	1998		
83150120	Stroud	Gibson Close	12	GL5 1HZ		Y	1998		
83150130	Stroud	Gibson Close	13	GL5 1HZ		Y	1998		
83150140	Stroud	Gibson Close	14	GL5 1HZ		Y	1998		
83150150	Stroud	Gibson Close	15	GL5 1HZ		Y	1998		
83150160	Stroud	Gibson Close	16	GL5 1HZ		Y	1998		
83150170	Stroud	Gibson Close	17	GL5 1HZ		Y	1998		
83150180	Stroud	Gibson Close	18	GL5 1HZ		Y	1998		
83150190	Stroud	Gibson Close	19	GL5 1HZ		Y	1998		

# Appendix A6

## List of Reema Hollow Panel Addresses



UPNR	Town/Village	Street	No	Post Code	H/F	EWI	EWI Year	Survey 2017 (Ext/Int)	Sch for Dem
83150200	Stroud	Gibson Close	20	GL5 1HZ		Y	1998		
83150220	Stroud	Gibson Close	22	GL5 1HZ		Y	1998		
86050130	Whiteshill	Victory Road	13	GL6 6BD	SDH	N			
86050140	Whiteshill	Victory Road	14	GL6 6BD	SDH	N			
86050150	Whiteshill	Victory Road	15	GL6 6BD	SDH	N			
86050190	Whiteshill	Victory Road	19	GL6 6BD	SDH	N			
86050200	Whiteshill	Victory Road	20	GL6 6BD	SDH	N			
86050230	Whiteshill	Victory Road	23	GL6 6BD	ETH	N			
86050240	Whiteshill	Victory Road	24	GL6 6BD	MTH	N			
86050250	Whiteshill	Victory Road	25	GL6 6BS	MTH	N			
86050260	Whiteshill	Victory Road	26	GL6 6BD	ETH	N		Y/Y	
86050270	Whiteshill	Victory Road	27	GL6 6BD	SDH	N			
86050280	Whiteshill	Victory Road	28	GL6 6BD	SDH	N			
86050290	Whiteshill	Victory Road	29	GL6 6BD	SDH	N			
86050300	Whiteshill	Victory Road	30	GL6 6BD	SDH	N			
86050310	Whiteshill	Victory Road	31	GL6 6BD	SDH	N		Y/Y	
86050320	Whiteshill	Victory Road	32	GL6 6BD	SDH	N			
86050420	Whiteshill	Victory Road	42	GL6 6BD	SDB	N			
86050430	Whiteshill	Victory Road	43	GL6 6BD	SDB	N			
86050450	Whiteshill	Victory Road	45	GL6 6BD	SDH	N			
87219970	Woodchester	Blacklow Close	High Field	GL5 5PT	DB	N		Y/Y	

Notes:

Properties which were not listed as Reema Hollow Panel by SDC

UPNR	Town/Village	Street	No	Post Code	H/F	EWI	EWI Year	Survey 2017 (Ext/Int)	Sch for Dem
43270190	Cashes Green	Stanton Road	19	GL5 4LX	SDH	Y	1998		
43270210	Cashes Green	Stanton Road	21	GL5 4LX	SDH	Y	1998		
7717012A	Forest Green	Lawnside	12A	GL6 0ER	MTHa	N		Y/Y	
77170550	Forest Green	Lawnside	55	GL6 0ER	ETH	N			
77170560	Forest Green	Lawnside	56	GL6 0ER	MTHa	N		Y/Y	
77170570	Forest Green	Lawnside	57	GL6 0ER	MTHa	N			
77170580	Forest Green	Lawnside	58	GL6 0ER	ETH	N			
77170590	Forest Green	Lawnside	59	GL6 0ER	ETH	N			
77170600	Forest Green	Lawnside	60	GL6 0ER	MTHa	N			
77170610	Forest Green	Lawnside	61	GL6 0ER	MTHa	N			
77170620	Forest Green	Lawnside	62	GL6 0ER	ETH	N			
77170630	Forest Green	Lawnside	63	GL6 0ER	SDH	N			
77170640	Forest Green	Lawnside	64	GL6 0ER	SDH	N			
54030270	Leonard Stanley	Mankley Road	27	GL10 3LX	F0	N			
54030280	Leonard Stanley	Mankley Road	28	GL10 3LX	F1	N			
54030290	Leonard Stanley	Mankley Road	29	GL10 3LX	F1	N			
54030300	Leonard Stanley	Mankley Road	30	GL10 3LX	F0	N			
54030550	Leonard Stanley	Mankley Road	55	GL10 3LX	SDB	N			
54030560	Leonard Stanley	Mankley Road	56	GL10 3LX	SDB	N			

## Appendix A6 List of Reema Hollow Panel Addresses



Nos 53, 54 & 55 Brimley, Leonard Stanley were listed by SDC as Reema Hollow Panel but are traditional construction.

Properties which were listed as Reema Hollow Panel by SDC but have been demolished

UPNR	Town/Village	Street	No	Post Code
60040080	Bridgend	Wharfdale Way	8	GL10 2AQ
60040100	Bridgend	Wharfdale Way	10	GL10 2AQ

Properties scheduled for demolition by SDC, so not included in the survey population

UPNR	Town/Village	Street	No	Post Code
77490010	Nailsworth	Ringfield Close	1	GL6 0HY
77490020	Nailsworth	Ringfield Close	2	GL6 0HY
77490030	Nailsworth	Ringfield Close	3	GL6 0HY
77490040	Nailsworth	Ringfield Close	4	GL6 0HY
77490050	Nailsworth	Ringfield Close	5	GL6 0HY
77490060	Nailsworth	Ringfield Close	6	GL6 0HY
77490070	Nailsworth	Ringfield Close	7	GL6 0HY
77490080	Nailsworth	Ringfield Close	8	GL6 0HY
77490090	Nailsworth	Ringfield Close	9	GL6 0HY
77490100	Nailsworth	Ringfield Close	10	GL6 0HY
77490110	Nailsworth	Ringfield Close	11	GL6 0HY
77490120	Nailsworth	Ringfield Close	12	GL6 0HY
7749012A	Nailsworth	Ringfield Close	12A	GL6 0HY
77490140	Nailsworth	Ringfield Close	14	GL6 0HY
77490150	Nailsworth	Ringfield Close	15	GL6 0HY
77490160	Nailsworth	Ringfield Close	16	GL6 0HY
77490170	Nailsworth	Ringfield Close	17	GL6 0HY
77490180	Nailsworth	Ringfield Close	18	GL6 0HY
77490190	Nailsworth	Ringfield Close	19	GL6 0HY
77490200	Nailsworth	Ringfield Close	20	GL6 0HY
77490210	Nailsworth	Ringfield Close	21	GL6 0HY
77490220	Nailsworth	Ringfield Close	22	GL6 0HY
77490230	Nailsworth	Ringfield Close	23	GL6 0HY
77490240	Nailsworth	Ringfield Close	24	GL6 0HY
77490250	Nailsworth	Ringfield Close	25	GL6 0HY
77490260	Nailsworth	Ringfield Close	26	GL6 0HY
77490280	Nailsworth	Ringfield Close	28	GL6 0HY
77510010	Nailsworth	Tanners Piece	1	GL6 0LN
77510020	Nailsworth	Tanners Piece	2	GL6 0LN
77510030	Nailsworth	Tanners Piece	3	GL6 0LN
77510040	Nailsworth	Tanners Piece	4	GL6 0LN
77510050	Nailsworth	Tanners Piece	5	GL6 0LN
77510060	Nailsworth	Tanners Piece	6	GL6 0HS
77510070	Nailsworth	Tanners Piece	7	GL6 0LN
77510080	Nailsworth	Tanners Piece	8	GL6 0LN



## Appendix A7 List of Stent Addresses



UPNR	Town/Village	Street	No	Post Code
16290010	Dursley	Kingsway	1	GL11 4DJ
16290020	Dursley	Kingsway	2	GL11 4DL
16290030	Dursley	Kingsway	3	GL11 4DJ
16290040	Dursley	Kingsway	4	GL11 4DL
16290060	Dursley	Kingsway	6	GL11 4DL
16290080	Dursley	Kingsway	8	GL11 4DL
16290090	Dursley	Kingsway	9	GL11 4DJ
16290100	Dursley	Kingsway	10	GL11 4DL
16290110	Dursley	Kingsway	11	GL11 4DJ
16290130	Dursley	Kingsway	13	GL11 4DJ
16290140	Dursley	Kingsway	14	GL11 4DL
16290150	Dursley	Kingsway	15	GL11 4DJ
16290160	Dursley	Kingsway	16	GL11 4DL
16290200	Dursley	Kingsway	20	GL11 4DL
16290220	Dursley	Kingsway	22	GL11 4DL
16290230	Dursley	Kingsway	23	GL11 4DJ
16290240	Dursley	Kingsway	24	GL11 4DL
16290260	Dursley	Kingsway	26	GL11 4DL
16290270	Dursley	Kingsway	27	GL11 4DJ
16290280	Dursley	Kingsway	28	GL11 4DL
16290300	Dursley	Kingsway	30	GL11 4DL
16290320	Dursley	Kingsway	32	GL11 4DL
16290330	Dursley	Kingsway	33	GL11 4DJ
16290350	Dursley	Kingsway	35	GL11 4DJ
16290360	Dursley	Kingsway	36	GL11 4DL
16290380	Dursley	Kingsway	38	GL11 4DL
16370020	Dursley	St Georges Road	2	GL11 4DW
16370030	Dursley	St Georges Road	3	GL11 4DN
16370040	Dursley	St Georges Road	4	GL11 4DW
16370070	Dursley	St Georges Road	7	GL11 4DN
16370080	Dursley	St Georges Road	8	GL11 4DW
16370110	Dursley	St Georges Road	11	GL11 4DN
16370120	Dursley	St Georges Road	12	GL11 4DW
16370130	Dursley	St Georges Road	13	GL11 4DN
16370140	Dursley	St Georges Road	14	GL11 4DW
16370150	Dursley	St Georges Road	15	GL11 4DN
16370160	Dursley	St Georges Road	16	GL11 4DW
16370180	Dursley	St Georges Road	18	GL11 4DW

## Appendix A7 List of Stent Addresses



UPNR	Town/Village	Street	No	Post Code
16370200	Dursley	St Georges Road	20	GL11 4DW
16370220	Dursley	St Georges Road	22	GL11 4DW
16370230	Dursley	St Georges Road	23	GL11 4DN
16370240	Dursley	St Georges Road	24	GL11 4DW
16370250	Dursley	St Georges Road	25	GL11 4DN
16370260	Dursley	St Georges Road	26	GL11 4DW
16370270	Dursley	St Georges Road	27	GL11 4DN
16370280	Dursley	St Georges Road	28	GL11 4DW
16370290	Dursley	St Georges Road	29	GL11 4DN
16370300	Dursley	St Georges Road	30	GL11 4DW
16370310	Dursley	St Georges Road	31	GL11 4DN
16370320	Dursley	St Georges Road	32	GL11 4DW
16370330	Dursley	St Georges Road	33	GL11 4DN
16370340	Dursley	St Georges Road	34	GL11 4DW
16370350	Dursley	St Georges Road	35	GL11 4DN
16370370	Dursley	St Georges Road	37	GL11 4DN
16370380	Dursley	St Georges Road	38	GL11 4DW

Notes:

All properties have had an External Wall Insulation (EWI) system installed in 1998.

# Appendix A8

## List of Swedish Timber Frame Addresses



UPNR	Town/Village	Street	No	Post Code	H/B/F	Survey 2017 (External/Internal)	Survey Year
21010320	North Nibley	Barrs Lane	32	GL11 6DT	SDcB	Y/N	
81130010	Painswick	Parkfield Cottages	1	GL6 6SW	SDcB		2015
81130020	Painswick	Parkfield Cottages	2	GL6 6SW	SDcB		2015
81130030	Painswick	Parkfield Cottages	3	GL6 6SW	SDcB		2015
81130040	Painswick	Parkfield Cottages	4	GL6 6SW	SDcB		2015
81130050	Painswick	Parkfield Cottages	5	GL6 6SW	SDH		2015
81130060	Painswick	Parkfield Cottages	6	GL6 6SW	SDH		2015
71050010	Stacombe	Swedale	1	GL6 7NF	SDH		2015
71050020	Stacombe	Swedale	2	GL6 7NF	SDH		2015
24010010	Stinchcombe	The Avenue	1	GL11 6AJ	SDcB		2016
24010020	Stinchcombe	The Avenue	2	GL11 6AJ	SDcB		2016
24010030	Stinchcombe	The Avenue	3	GL11 6AJ	SDcB		2016
76010020	The Camp	Bushy Beeches, Honeycombe Lane	2	GL6 7HN	SDcB		2015
76010030	The Camp	Bushy Beeches, Honeycombe Lane	3	GL6 7HN	SDH	Y/Y	
25010050	Uley	The Knoll	5	GL11 5SR	SDH		2015
25010060	Uley	The Knoll	6	GL11 5SR	SDH	Y/Y	
25010080	Uley	The Knoll	8	GL11 5SR	SDH	Y/N	
26230010	Wotton-Under-Edge	Mount Pleasant	1	GL12 7JS	SDcB		2015
26230030	Wotton-Under-Edge	Mount Pleasant	3	GL12 7JS	SDcB	Y/N	
26230070	Wotton-Under-Edge	Mount Pleasant	7	GL12 7JS	SDcB	Y/N	

Summary:

Town/Village	Road	Qty	2015/16 Report Reference
North Nibley	Barrs Lane	1	
Painswick	Parkfield Cottages	6	BR1500C December 2015
Stacombe	Swedale	2	BR1500 October 2015
Stinchcombe	The Avenue	3	BR1500E August 2016
The Camp	Bushy Beeches	2	BR1500D December 2015
Uley	The Knoll	3	BR1500A December 2015
Wotton-Under-Edge	Mount Pleasant	3	BR1500B December 2015
	<b>Total</b>	<b>20</b>	

Type codes: SDH = Semi-detached house  
SDcB = Semi-detached Chalet Bungalow

Houses at Swedale, Stancob,e have had EWI installed in 2016.

# Appendix A9

## List of Unity Addresses



UPRN	Town/Village	Street	No	Post Code	Mark I or II	EWI Year
43090010	Cashes Green	Hillcrest Road	1	GL5 4NL	I	1998
43090030	Cashes Green	Hillcrest Road	3	GL5 4NL	I	1998
43090070	Cashes Green	Hillcrest Road	7	GL5 4NL	I	1998
43090090	Cashes Green	Hillcrest Road	9	GL5 4NL	I	1998
43090200	Cashes Green	Hillcrest Road	20	GL5 4NN	I	1998
43090210	Cashes Green	Hillcrest Road	21	GL5 4NN	I	1998
43090250	Cashes Green	Hillcrest Road	25	GL5 4NN	I	1998
43090270	Cashes Green	Hillcrest Road	27	GL5 4NN	I	1998
43090280	Cashes Green	Hillcrest Road	28	GL5 4NN	I	1998
43090290	Cashes Green	Hillcrest Road	29	GL5 4NN	I	1998
43090300	Cashes Green	Hillcrest Road	30	GL5 4NN	I	1998
43090310	Cashes Green	Hillcrest Road	31	GL5 4NN	I	1998
43090330	Cashes Green	Hillcrest Road	33	GL5 4NW	I	1998
43090350	Cashes Green	Hillcrest Road	35	GL5 4NW	I	1998
43090360	Cashes Green	Hillcrest Road	36	GL5 4NW	I	1998
43090370	Cashes Green	Hillcrest Road	37	GL5 4NW	I	1998
43090380	Cashes Green	Hillcrest Road	38	GL5 4NW	I	1998
43090390	Cashes Green	Hillcrest Road	39	GL5 4NW	I	1998
43090410	Cashes Green	Hillcrest Road	41	GL5 4NW	I	1998
43090430	Cashes Green	Hillcrest Road	43	GL5 4NW	I	1998
43090450	Cashes Green	Hillcrest Road	45	GL5 4NW	I	1998
43090470	Cashes Green	Hillcrest Road	47	GL5 4NW	I	1998
43090490	Cashes Green	Hillcrest Road	49	GL5 4NE	I	1998
43090510	Cashes Green	Hillcrest Road	51	GL5 4NE	I	1998
43090530	Cashes Green	Hillcrest Road	53	GL5 4NE	I	1998
43090550	Cashes Green	Hillcrest Road	55	GL5 4NE	I	1998
43090570	Cashes Green	Hillcrest Road	57	GL5 4NE	I	1998
43090590	Cashes Green	Hillcrest Road	59	GL5 4NE	I	1998
43090610	Cashes Green	Hillcrest Road	61	GL5 4NE	I	1998
43090630	Cashes Green	Hillcrest Road	63	GL5 4NE	I	1998
45030300	Ebley	Devereaux Crescent	30	GL5 4PY	I	1998
45030320	Ebley	Devereaux Crescent	32	GL5 4PY	I	1998
45030340	Ebley	Devereaux Crescent	34	GL5 4PY	I	1998
45030360	Ebley	Devereaux Crescent	36	GL5 4PY	I	1998
45030370	Ebley	Devereaux Crescent	37	GL5 4PX	I	1998
45030410	Ebley	Devereaux Crescent	41	GL5 4PX	I	1998
45030470	Ebley	Devereaux Crescent	47	GL5 4PX	I	1998
45030490	Ebley	Devereaux Crescent	49	GL5 4PX	I	1998

# Appendix A9

## List of Unity Addresses



UPRN	Town/Village	Street	No	Post Code	Mark I or II	EWI Year
45030530	Ebley	Devereaux Crescent	53	GL5 4PX	I	1998
45030550	Ebley	Devereaux Crescent	55	GL5 4PX	I	1998
45030590	Ebley	Devereaux Crescent	59	GL5 4PX	I	1998
45030610	Ebley	Devereaux Crescent	61	GL5 4PX	I	1998
50070190	Hardwicke	Springfield	19	GL2 4PX	II	1999
50070210	Hardwicke	Springfield	21	GL2 4PX	II	1999
50070230	Hardwicke	Springfield	23	GL2 4PX	II	1999
50070250	Hardwicke	Springfield	25	GL2 4PX	II	1999
50070270	Hardwicke	Springfield	27	GL2 4PX	II	1999
50070290	Hardwicke	Springfield	29	GL2 4PX	II	1999
50070310	Hardwicke	Springfield	31	GL2 4PX	II	1999
50070390	Hardwicke	Springfield	39	GL2 4PX	II	1999
50070420	Hardwicke	Springfield	42	GL2 4PX	II	1999
50070440	Hardwicke	Springfield	44	GL2 4PX	II	1999
50070460	Hardwicke	Springfield	46	GL2 4PX	II	1999
50070480	Hardwicke	Springfield	48	GL2 4PX	II	1999
50070520	Hardwicke	Springfield	52	GL2 4PX	II	1999
50070540	Hardwicke	Springfield	54	GL2 4PX	II	1999
50070600	Hardwicke	Springfield	60	GL2 4PX	II	1999
50070620	Hardwicke	Springfield	62	GL2 4PX	II	1999
50070660	Hardwicke	Springfield	66	GL2 4PX	II	1999

### Summary

Town/Village	Road	Qty	Mk I or II
Cashes Green	Hillcrest Road	30	I
Ebley	Devereaux Crescent	12	I
Hardwicke	Springfields	17	II
	<b>Total</b>	<b>59</b>	

# Appendix A10

## List of Woolaway Addresses



UPNR	Town/Village	Street	No	Post Code	Type	Year Demolish	Works	Works Year
54030150	Leonard Stanley	Mankley Road	15	GL10 3LX		2013	Redevelop	2016
54030160	Leonard Stanley	Mankley Road	16	GL10 3LX		2013	Redevelop	2016
54030170	Leonard Stanley	Mankley Road	17	GL10 3LX		2013	Redevelop	2016
54030180	Leonard Stanley	Mankley Road	18	GL10 3LX		2013	Redevelop	2016
54030190	Leonard Stanley	Mankley Road	19	GL10 3LX		2013	Redevelop	2016
54030200	Leonard Stanley	Mankley Road	20	GL10 3LX		2013	Redevelop	2016
54030210	Leonard Stanley	Mankley Road	21	GL10 3LX		2016	Redevelop	2016
54030600	Leonard Stanley	Mankley Road	60	GL10 3LY		2014	Redevelop	2016
54030610	Leonard Stanley	Mankley Road	61	GL10 3LY		2014	Redevelop	2016
54030640	Leonard Stanley	Mankley Road	64	GL10 3LY		2014	Redevelop	2016
54030650	Leonard Stanley	Mankley Road	65	GL10 3LY		2014	Redevelop	2016
54030660	Leonard Stanley	Mankley Road	66	GL10 3LY		2014	Redevelop	2016
54030670	Leonard Stanley	Mankley Road	67	GL10 3LY		2014	Redevelop	2016
54030680	Leonard Stanley	Mankley Road	68	GL10 3LY		2014	Redevelop	2016
54030690	Leonard Stanley	Mankley Road	69	GL10 3LY		2014	Redevelop	2016
54030700	Leonard Stanley	Mankley Road	70	GL10 3LY		2014	Redevelop	2016
54030710	Leonard Stanley	Mankley Road	71	GL10 3LY		2014	Redevelop	2016
54030720	Leonard Stanley	Mankley Road	72	GL10 3LY		2014	Redevelop	2016
54030730	Leonard Stanley	Mankley Road	73	GL10 3LY		2014	Redevelop	2016
75290010	Minchinhampton	Old Common	1	GL6 9EH		2013	Redevelop	
75290020	Minchinhampton	Old Common	2	GL6 9EH		2013	Redevelop	
75290030	Minchinhampton	Old Common	3	GL6 9EH		2013	Redevelop	
75290040	Minchinhampton	Old Common	4	GL6 9EH		2013	Redevelop	
75290050	Minchinhampton	Old Common	5	GL6 9EH		2013	Redevelop	
75290060	Minchinhampton	Old Common	6	GL6 9EH		2013	Redevelop	
75290070	Minchinhampton	Old Common	7	GL6 9EH		2013	Redevelop	
75290080	Minchinhampton	Old Common	8	GL6 9EH		2013	Redevelop	
75290090	Minchinhampton	Old Common	9	GL6 9EH		2013	Redevelop	
75290100	Minchinhampton	Old Common	10	GL6 9EH		2013	Redevelop	
75290110	Minchinhampton	Old Common	11	GL6 9EH		2013	Redevelop	
75290120	Minchinhampton	Old Common	12	GL6 9EH		2013	Redevelop	
75290130	Minchinhampton	Old Common	13	GL6 9EH		2013	Redevelop	
75290160	Minchinhampton	Old Common	16	GL6 9EH		2013	Redevelop	
75290170	Minchinhampton	Old Common	17	GL6 9EH		2013	Redevelop	
75290180	Minchinhampton	Old Common	18	GL6 9EH		2013	Redevelop	
75290190	Minchinhampton	Old Common	19	GL6 9EH		2013	Redevelop	
75290200	Minchinhampton	Old Common	20	GL6 9EH		2013	Redevelop	



# Appendix A10

## List of Woolaway Addresses



UPNR	Town/Village	Street	No	Post Code	Type	Year Demolish	Works	Works Year
75350010	Minchinhampton	The Tynings	1	GL6 9EJ		2013	Redevelop	
75350020	Minchinhampton	The Tynings	2	GL6 9EJ		2013	Redevelop	
75350030	Minchinhampton	The Tynings	3	GL6 9EJ		2013	Redevelop	
75350040	Minchinhampton	The Tynings	4	GL6 9EJ		2013	Redevelop	
75350050	Minchinhampton	The Tynings	5	GL6 9EJ		2013	Redevelop	
75350070	Minchinhampton	The Tynings	7	GL6 9EJ		2013	Redevelop	
75350080	Minchinhampton	The Tynings	8	GL6 9EJ		2013	Redevelop	
75350090	Minchinhampton	The Tynings	9	GL6 9EJ		2013	Redevelop	
75350100	Minchinhampton	The Tynings	10	GL6 9EJ		2013	Redevelop	
75350110	Minchinhampton	The Tynings	11	GL6 9EJ		2013	Redevelop	
75350120	Minchinhampton	The Tynings	12	GL6 9EJ		2013	Redevelop	
75350130	Minchinhampton	The Tynings	13	GL6 9EJ		2013	Redevelop	
75350140	Minchinhampton	The Tynings	14	GL6 9EJ		2013	Redevelop	
75350370	Minchinhampton	The Tynings	37	GL6 9EW		2013	Redevelop	
75350390	Minchinhampton	The Tynings	39	GL6 9EW		2013	Redevelop	
75350400	Minchinhampton	The Tynings	40	GL6 9EW		2013	Redevelop	
75350410	Minchinhampton	The Tynings	41	GL6 9EW		2013	Redevelop	
83031760	Stroud	Bisley Old Road	176	GL5 1NN		2016	Redevelop	
83031780	Stroud	Bisley Old Road	178	GL5 1NN		2016	Redevelop	
83031800	Stroud	Bisley Old Road	180	GL5 1NN		2016	Redevelop	
83031820	Stroud	Bisley Old Road	182	GL5 1NN		2016	Redevelop	
83031840	Stroud	Bisley Old Road	184	GL5 1NN		2016	Redevelop	
83031860	Stroud	Bisley Old Road	186	GL5 1NN		2016	Redevelop	
83110130	Stroud	Daniels Road	13	GL5 1HX	ETH		EWI	
83110150	Stroud	Daniels Road	15	GL5 1HX	MTH		EWI	
83110310	Stroud	Daniels Road	31	GL5 1HX		2016	Redevelop	2017
83110330	Stroud	Daniels Road	33	GL5 1HX		2016	Redevelop	2017
83110350	Stroud	Daniels Road	35	GL5 1HX		2016	Redevelop	2017
83190130	Stroud	Mason Road	13	GL5 1HU		2016	Redevelop	2016
83190150	Stroud	Mason Road	15	GL5 1HU		2016	Redevelop	2016
83190170	Stroud	Mason Road	17	GL5 1HU		2016	Redevelop	2016
83190190	Stroud	Mason Road	19	GL5 1HU		2016	Redevelop	2016
83190210	Stroud	Mason Road	21	GL5 1HU		2016	Redevelop	2016
83190220	Stroud	Mason Road	22	GL5 1HU		2013	Redevelop	2016
83190230	Stroud	Mason Road	23	GL5 1HU		2016	Redevelop	2016
83190240	Stroud	Mason Road	24	GL5 1HU		2013	Redevelop	2016
83190250	Stroud	Mason Road	25	GL5 1HU		2016	Redevelop	2016
83190260	Stroud	Mason Road	26	GL5 1HU		2013	Redevelop	2016

# Appendix A10

## List of Woolaway Addresses



UPNR	Town/Village	Street	No	Post Code	Type	Year Demolish	Works	Works Year
83190270	Stroud	Mason Road	27	GL5 1HU		2016	Redevelop	2016
83190280	Stroud	Mason Road	28	GL5 1HU		2013	Redevelop	2016
83190290	Stroud	Mason Road	29	GL5 1HU		2016	Redevelop	2016
83190310	Stroud	Mason Road	31	GL5 1HU		2016	Redevelop	2016
83190350	Stroud	Mason Road	35	GL5 1HU	SDH		EWI	
83190370	Stroud	Mason Road	37	GL5 1HU	SDH		Refurbish	2017
83190430	Stroud	Mason Road	43	GL5 1HU	SDH		EWI	
83310010	Stroud	Target Close	1	GL5 1JA		2014	Redevelop	
83310020	Stroud	Target Close	2	GL5 1JA		2014	Redevelop	
83310030	Stroud	Target Close	3	GL5 1JA		2014	Redevelop	
83310040	Stroud	Target Close	4	GL5 1JA		2014	Redevelop	
83310050	Stroud	Target Close	5	GL5 1JA		2014	Redevelop	
83310070	Stroud	Target Close	7	GL5 1JA		2014	Redevelop	
83310090	Stroud	Target Close	9	GL5 1JA		2014	Redevelop	
83310110	Stroud	Target Close	11	GL5 1JA		2014	Redevelop	
83310130	Stroud	Target Close	13	GL5 1JA		2014	Redevelop	
83310150	Stroud	Target Close	15	GL5 1JA		2014	Redevelop	
83310190	Stroud	Target Close	19	GL5 1JA		2014	Redevelop	
83310200	Stroud	Target Close	20	GL5 1JA		2014	Redevelop	

### Summary of Remaining Stock

UPNR	Town/Village	Street	No	Post Code	Type	Year Demolish	Works	Works Year
83110130	Stroud	Daniels Road	13	GL5 1HX	ETH		EWI	
83110150	Stroud	Daniels Road	15	GL5 1HX	MTH	-	EWI	
83190350	Stroud	Mason Road	35	GL5 1HU	SDH	-	EWI	
83190370	Stroud	Mason Road	37	GL5 1HU	SDH	-	Refurbish	2017
83190430	Stroud	Mason Road	43	GL5 1HU	SDH	-	EWI	

Type codes:

SDH = Semi-detached house  
ETH = End Terraced house  
MTH = Mid Terraced house



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## Appendix B



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### List of Survey Addresses

No	Construction
1	Dorlonco
2	Reema Conclad
3	Reema Hollow Panel
5	Swedish Timber Frame

# Appendix B

## List of Survey Addresses



UPRN	Construction	Town/Village	Street	No	Post Code	H/B/F	Surveyed 2017 (Ext/Int)
14030740	Dorlonco	Cashes Green	Hyett Road	14	GL5 4LW	SDH	Y/Y
14290400	Dorlonco	Cashes Green	Kingley Road	10	GL5 4LW	SDH	Y/N
43010370	Dorlonco	Cashes Green	Mosley Crescent	14	GL5 4LT	SDH	Y/Y
77310060	Reema CC	Forest Green	Badgers Way	6	GL6 0HE	SDH	Y/Y
77310120	Reema CC	Forest Green	Badgers Way	17	GL6 0HE	SDH	Y/Y
77310200	Reema CC	Forest Green	Badgers Way	26	GL6 0HE	SDH	Y/N
50090130	Reema CC	Forest Green	Nortonwood	1	GL6 0HD	F1	Y/N
50090140	Reema CC	Forest Green	Nortonwood	3	GL6 0HD	F0	Y/Y
50090170	Reema CC	Forest Green	Nortonwood	19	GL6 0HD	SDH	Y/Y
53010010	Reema CC	Forest Green	Woodpecker Walk	7	GL6 0HQ	SDH	Y/N
53010050	Reema CC	Forest Green	Woodpecker Walk	10	GL6 0HQ	SDH	Y/Y
7717012A	Reema HP	Forest Green	Lawnside	12A	GL6 0ER	MTHa	Y/Y
77170180	Reema HP	Forest Green	Lawnside	18	GL6 0ER	SDB	Y/Y
77170210	Reema HP	Forest Green	Lawnside	21	GL6 0ER	SDH	Y/Y
77170240	Reema HP	Forest Green	Lawnside	24	GL6 0ER	MTHa	Y/Y
77170250	Reema HP	Forest Green	Lawnside	25	GL6 0ER	MTHa	Y/N
77170370	Reema HP	Forest Green	Lawnside	37	GL6 0ER	ETH	Y/Y
77170440	Reema HP	Forest Green	Lawnside	44	GL6 0ER	ETH	Y/N
77170560	Reema HP	Forest Green	Lawnside	56	GL6 0ER	MTHa	Y/Y
54030260	Reema HP	Leonard Stanley	Mankley Road	26	GL10 3LX	SDB	Y/Y
54030390	Reema HP	Leonard Stanley	Mankley Road	39	GL10 3LX	SDH	Y/Y
54030510	Reema HP	Leonard Stanley	Mankley Road	51	GL10 3LX	F0	Y/N
54030520	Reema HP	Leonard Stanley	Mankley Road	52	GL10 3LX	F1	Y/Y
75190380	Reema HP	Minchinhampton	Glebe Road	38	GL6 9JZ	SDB	Y/Y
75190890	Reema HP	Minchinhampton	Glebe Road	89	GL6 9JY	SDH	Y/Y
77530010	Reema HP	Nailsworth	Upper Park Road	1	GL6 0HU	F0	Y/Y
77530020	Reema HP	Nailsworth	Upper Park Road	2	GL6 0HU	F1	Y/N
77530030	Reema HP	Nailsworth	Upper Park Road	3	GL6 0HU	F1	Y/Y
77530040	Reema HP	Nailsworth	Upper Park Road	4	GL6 0HU	F0	Y/N
77530060	Reema HP	Nailsworth	Upper Park Road	6	GL6 0HU	SDH	Y/Y
60251550	Reema HP	Stonehouse	Midland Road	155	GL10 2DT	SDH	Y/Y
60350220	Reema HP	Stonehouse	Willow Road	22	GL10 2DS	SDB	Y/Y
60350260	Reema HP	Stonehouse	Willow Road	26	GL10 2DS	MTHa	Y/Y
86050260	Reema HP	Whiteshill	Victory Road	26	GL6 6BD	ETH	Y/Y
86050310	Reema HP	Whiteshill	Victory Road	31	GL6 6BD	SDH	Y/Y
87219970	Reema HP	Woodchester	Blacklow Close	High Field	GL5 5PT	DB	Y/Y

## Appendix B

### List of Survey Addresses



UPRN	Construction	Town/Village	Street	No	Post Code	H/B/F	Surveyed 2017 (Ext/Int)
21010320	Swedish	North Nibley	Barrs Lane	32	GL11 6DT	SDcB	Y/N
76010030	Swedish	The Camp	Bushy Beeches, Honeycombe Lane	3	GL6 7HN	SDH	Y/Y
25010060	Swedish	Uley	The Knoll	6	GL11 5SR	SDH	Y/Y
25010080	Swedish	Uley	The Knoll	8	GL11 5SR	SDH	Y/N
26230030	Swedish	Wotton-Under-Edge	Mount Pleasant	3	GL12 7JS	SDcB	Y/N
26230070	Swedish	Wotton-Under-Edge	Mount Pleasant	7	GL12 7JS	SDcB	Y/N

## Appendix C

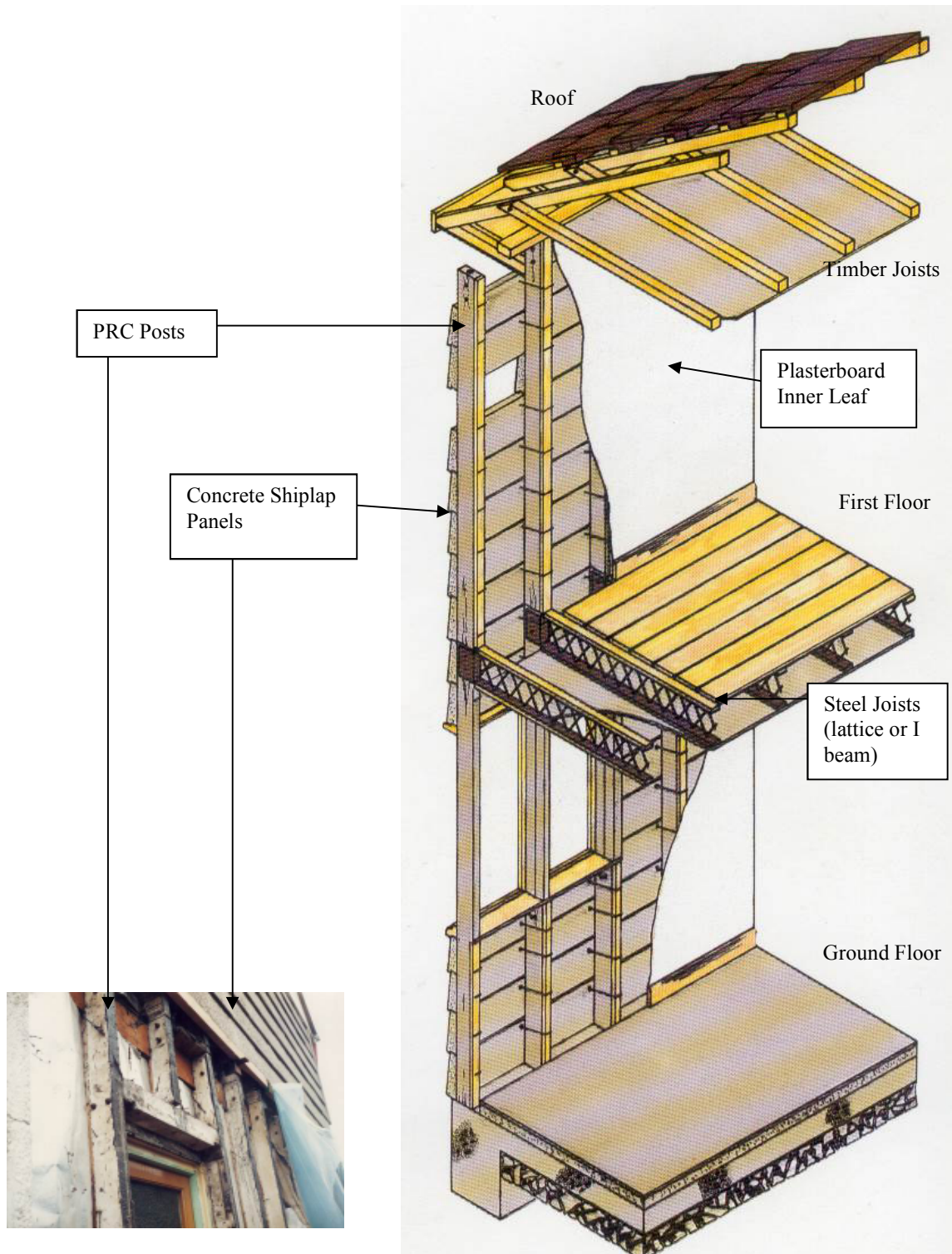


### Forms of Construction

No	Construction
C1	Airey – Original Construction
C2	Airey – Existing Construction
C3	BL8
C4	Cornish – Original Construction
C5	Cornish – Existing Construction
C6	Dorlonco
C7	Reema Conclad
C8	Reema Hollow Panel - Walls
C9	Reema Hollow Panel – Floor Beams
C10	Stent
C11	Swedish
C12	Unity
C13	Woolaway

# AIREY

## FORM OF ORIGINAL CONSTRUCTION



TYPICAL ELEVATION  
Panels removed showing columns

TYPICAL ISOMETRIC VIEW OF AIREY CONSTRUCTION



# AIREY

## EXTERNAL WALL REPAIR SCHEME

Works carried out by Stroud District Council in 1990's:

1. External walls - brick, insulated cavity, block.
2. PRC party wall retained.
3. PRC spine wall retained

PRC Posts retained, except at windows, doors and corners.

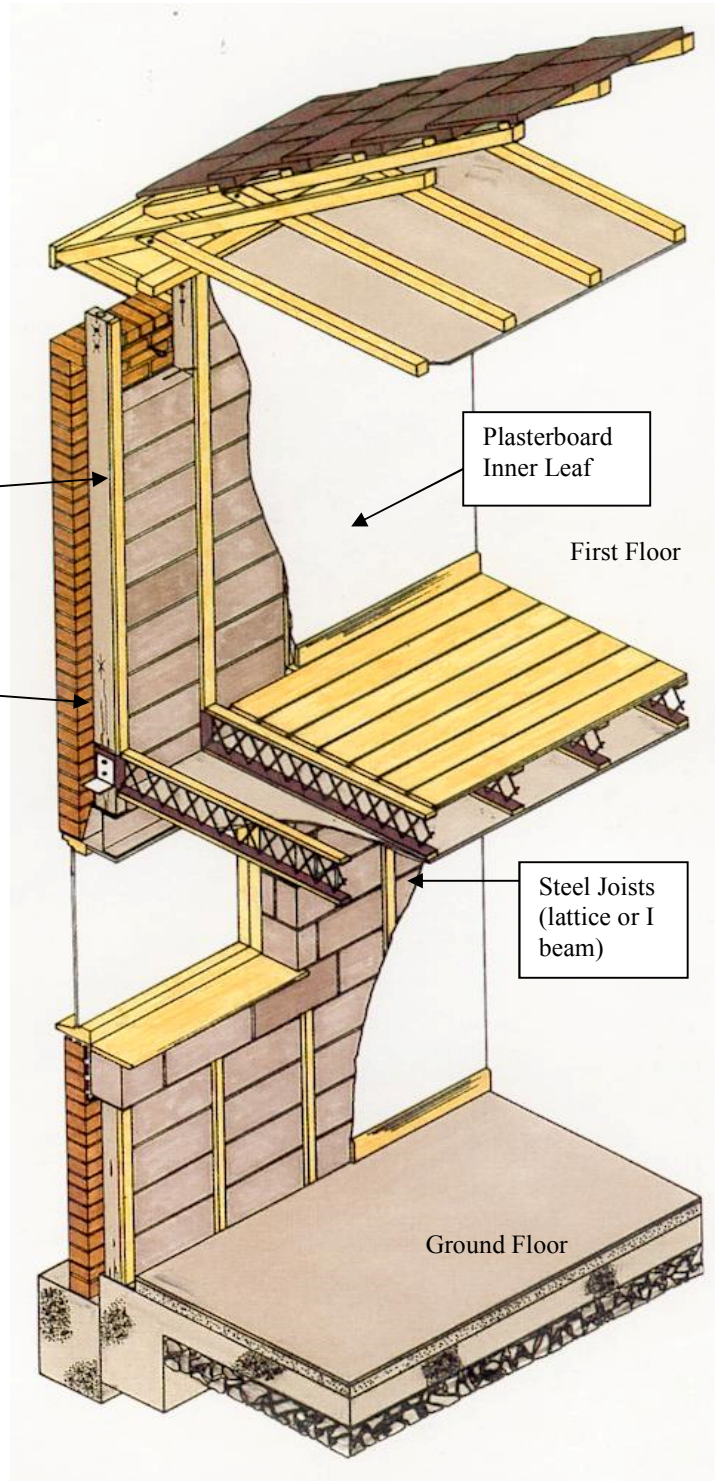
Insulated cavity walls (insulation not shown)



TYPICAL PARTY WALL  
Finishes removed showing columns



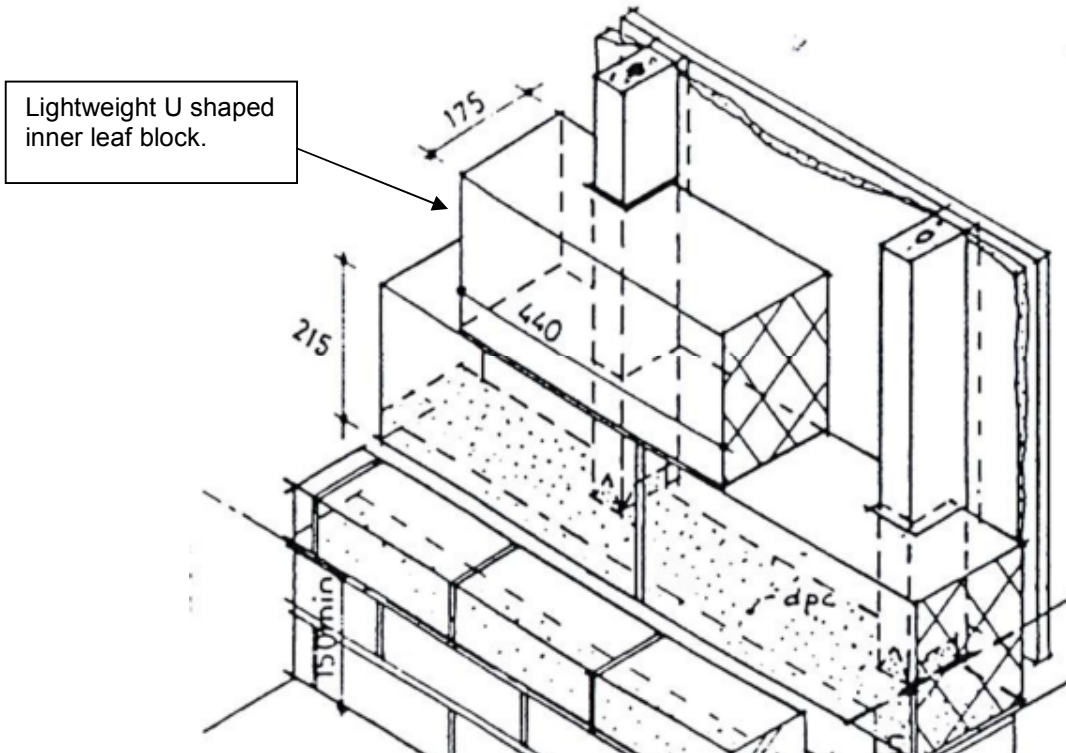
TYPICAL SPINE WALL  
Finishes removed showing columns  
& steel joists



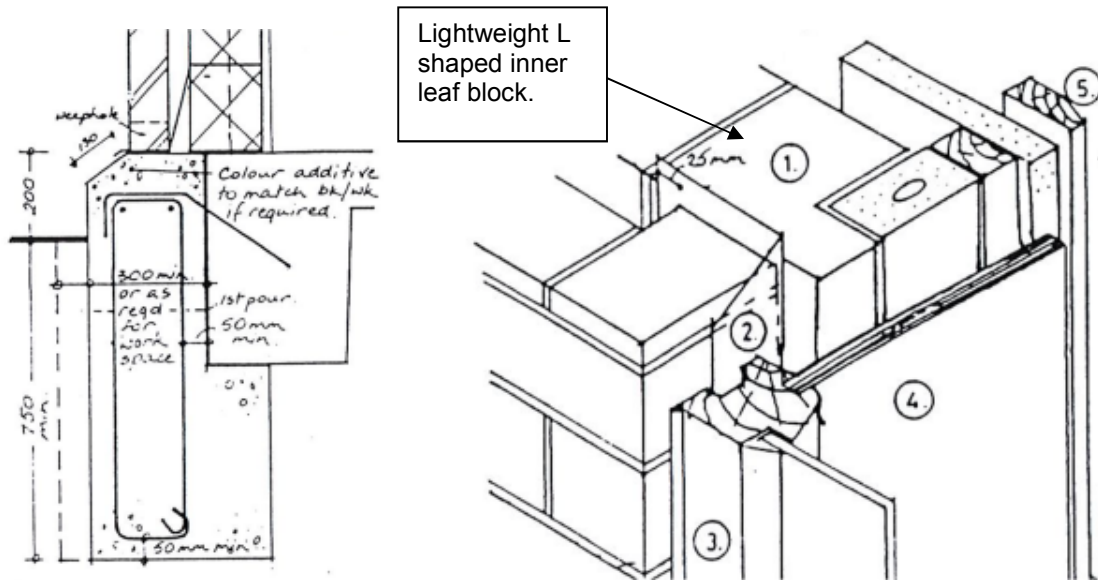
Typical Isometric View Of External Wall Scheme

# AIREY EXTERNAL WALL REPAIR SCHEME

## The Leeds Scheme



Typical External Wall Construction



Typical Foundation

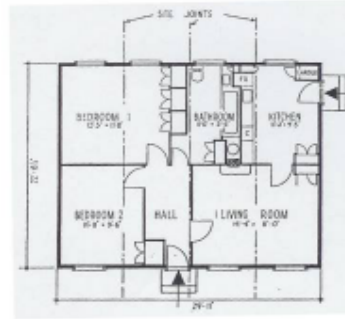
Typical Detail at Window Opening



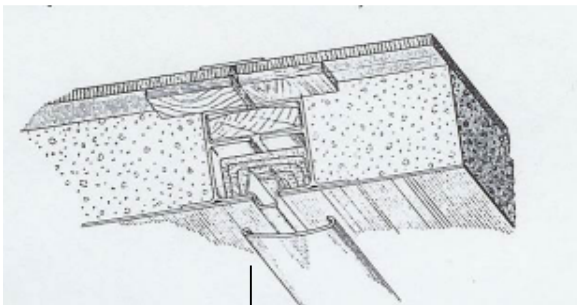
# BL8 FORM OF CONSTRUCTION



Roof construction



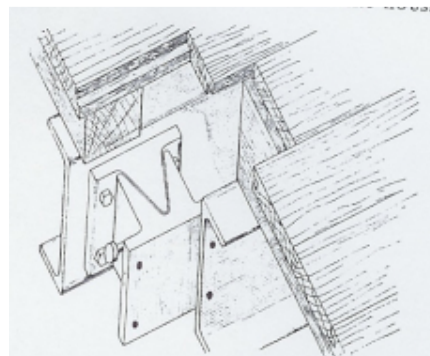
Typical Floor Plan



Typical Front Elevation



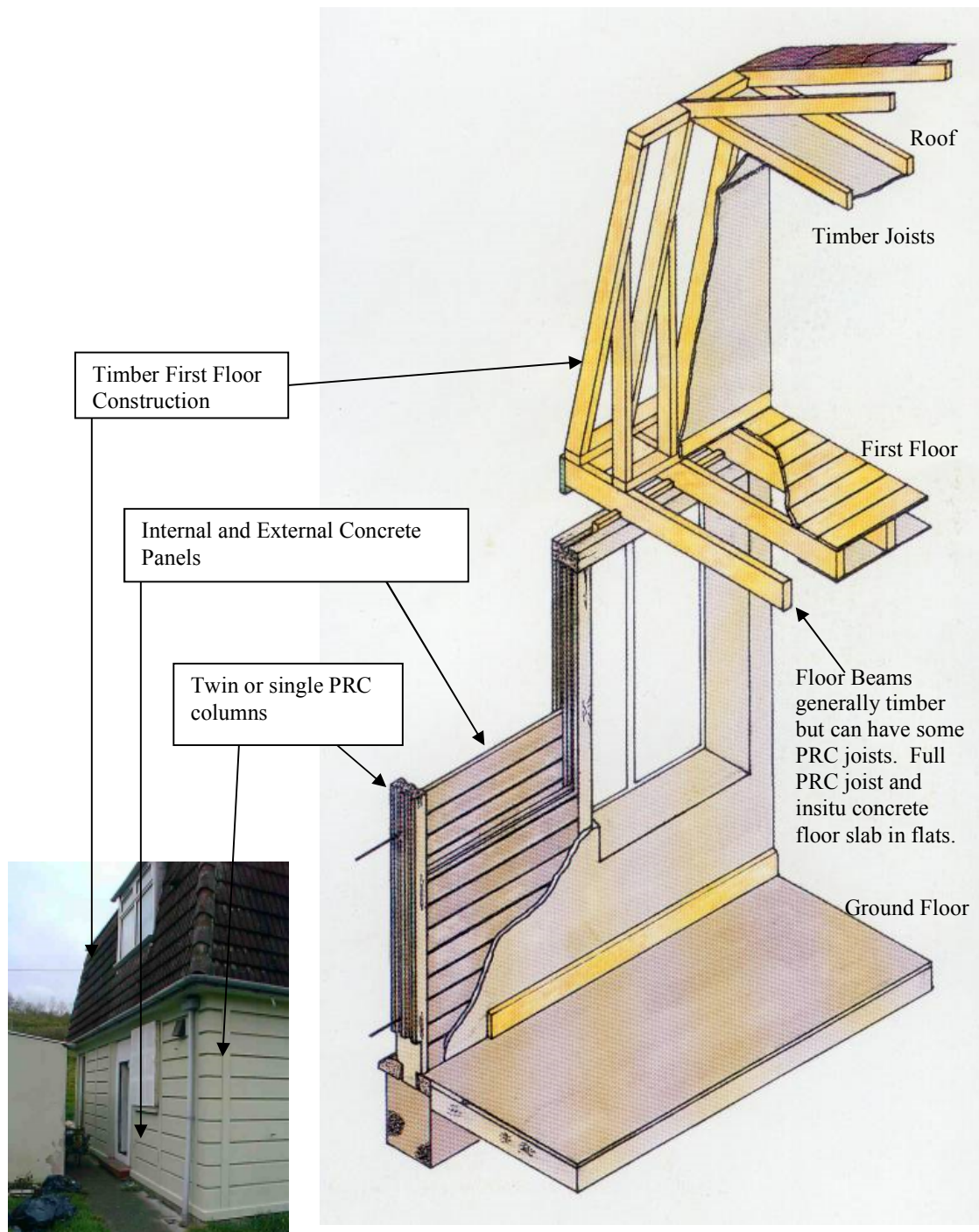
Typical Rear Elevation



## TYPICAL PREFAB BL8 CONSTRUCTION



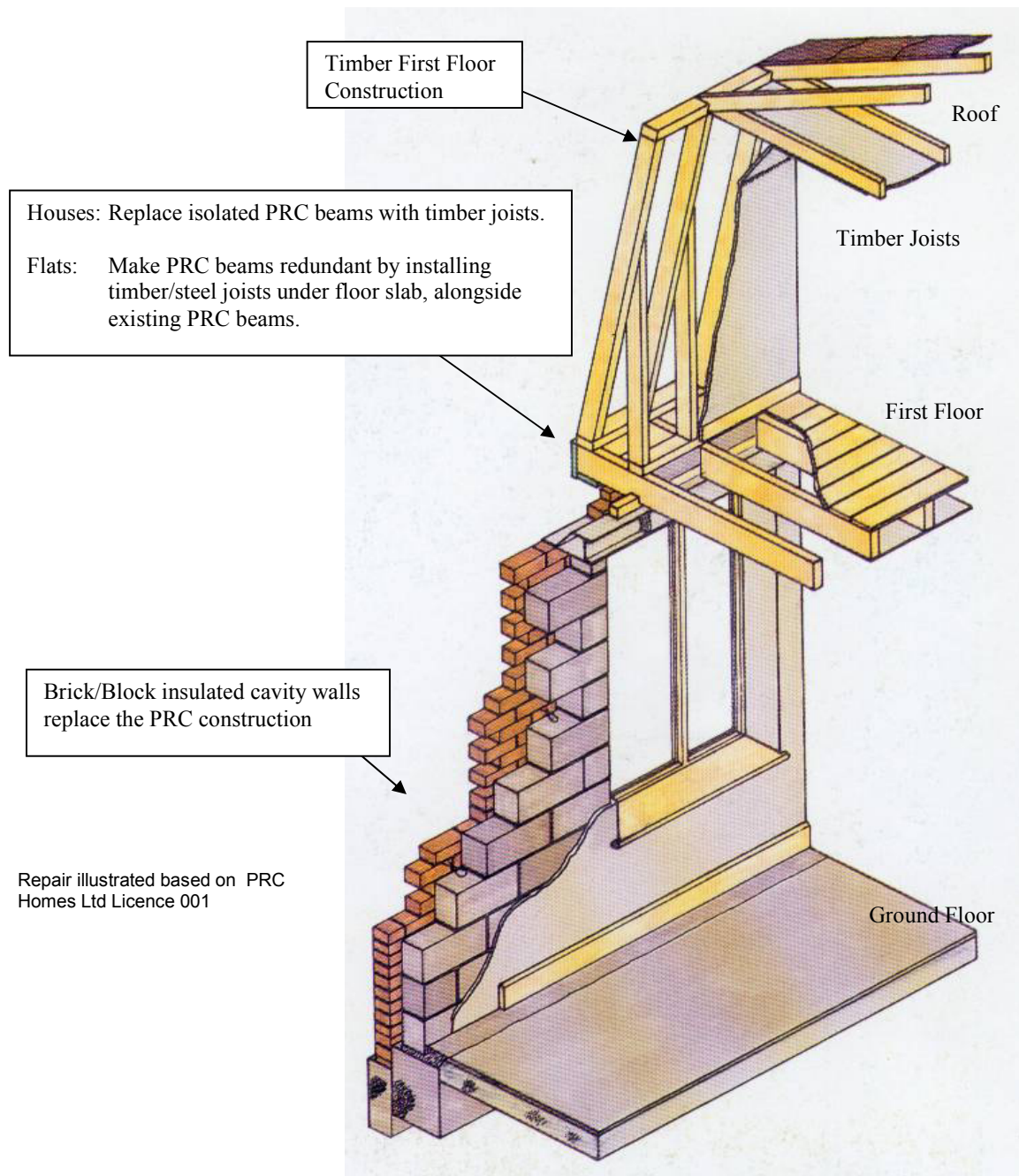
# CORNISH TYPE I FORM OF ORIGINAL CONSTRUCTION



TYPICAL ELEVATION

TYPICAL ISOMETRIC VIEW OF CORNISH CONSTRUCTION

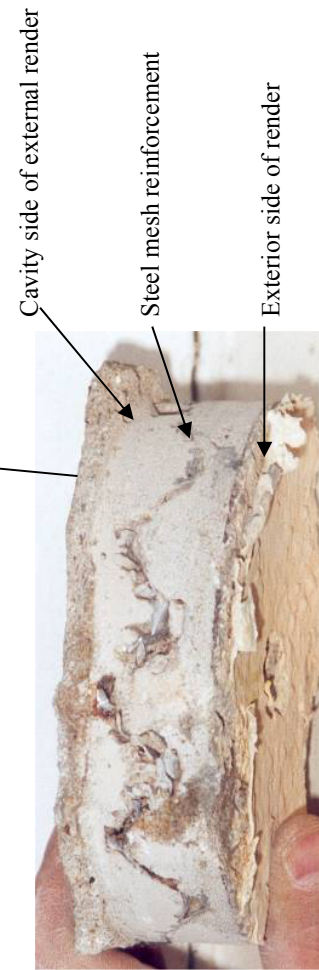
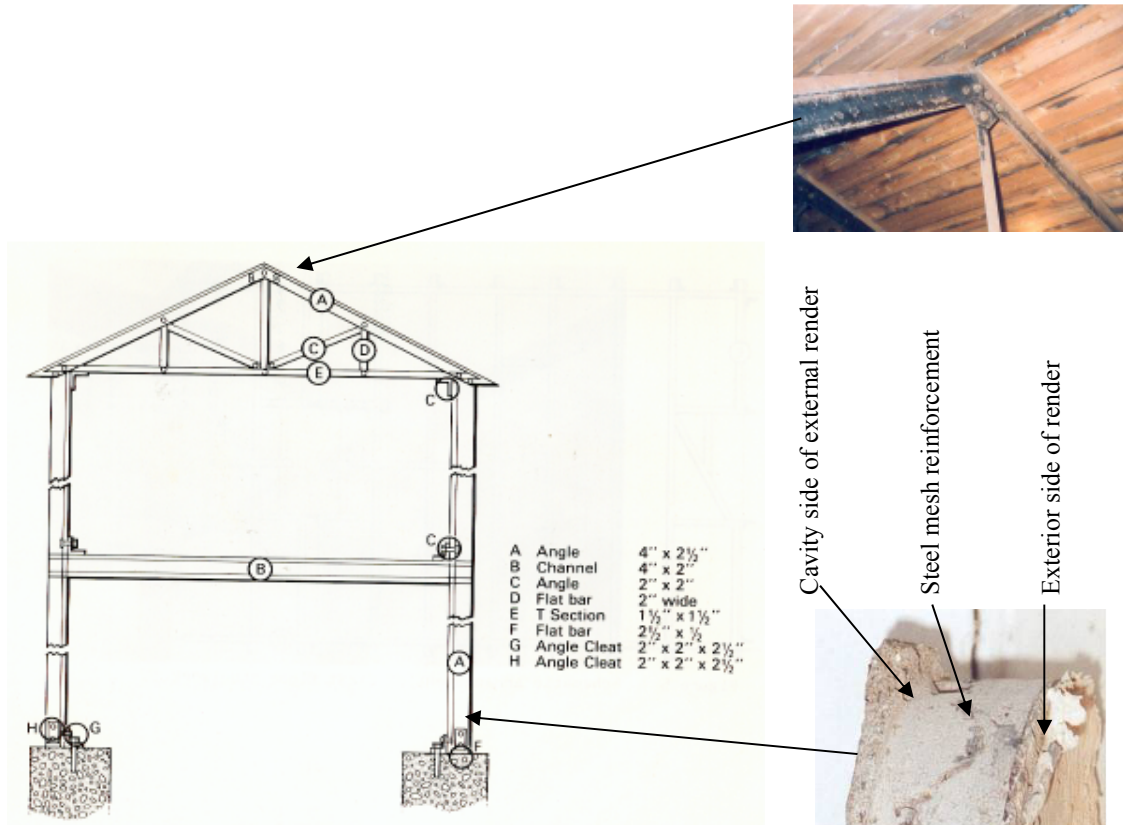
# CORNISH TYPE I WALL REPLACEMENT REPAIR SCHEME



Repair illustrated based on PRC  
Homes Ltd Licence 001

TYPICAL ISOMETRIC VIEW OF REFURBISHED CONSTRUCTION

# DORLONCO FORM OF CONSTRUCTION



TYPICAL CROSS SECTION



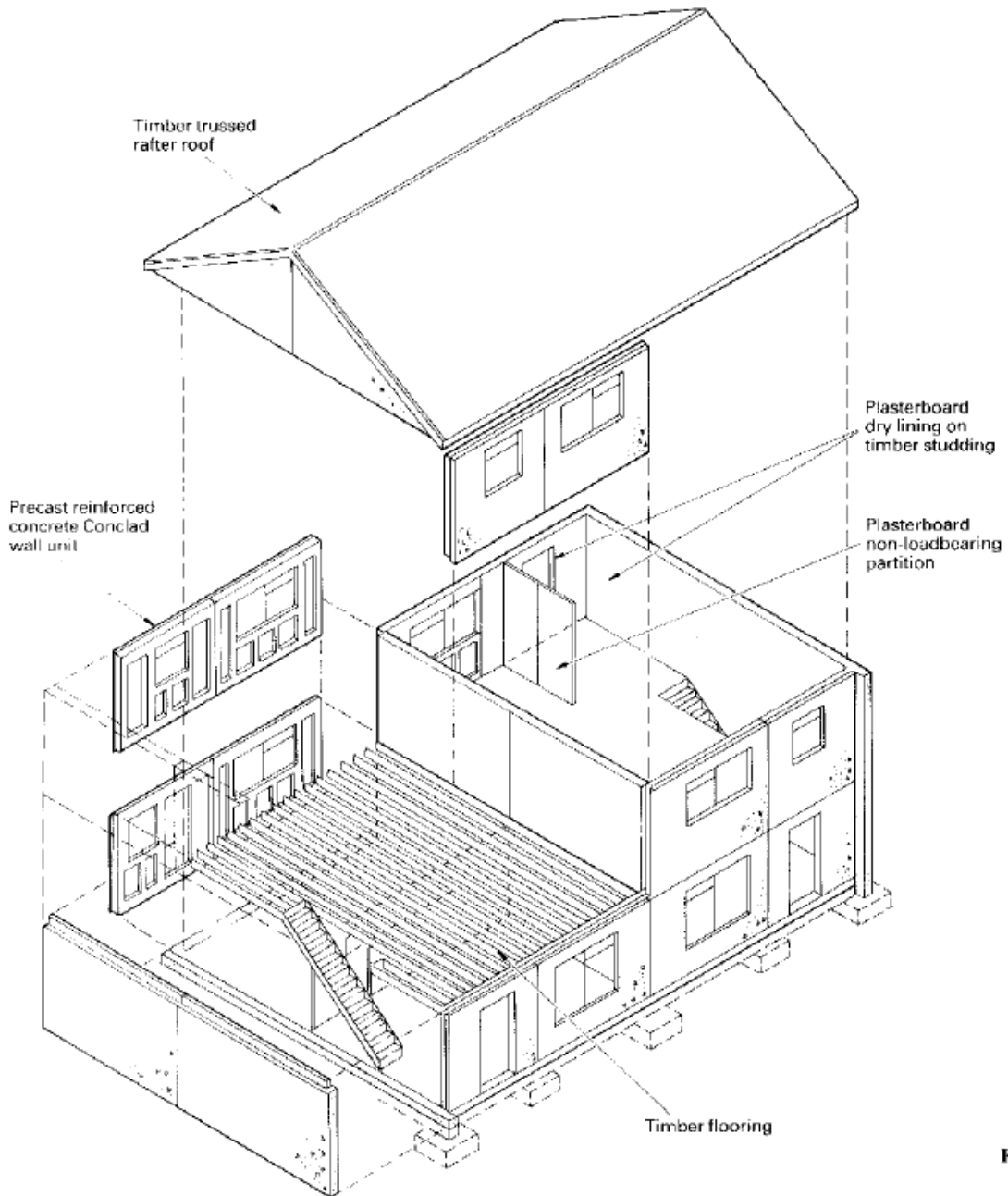
TYPICAL ELEVATION



SECTION THROUGH RENDER

Note: Rendered blockwork outer leaf as shown above left. Usual render on mesh shown above right.

# REEMA CONCLAD FORM OF CONSTRUCTION

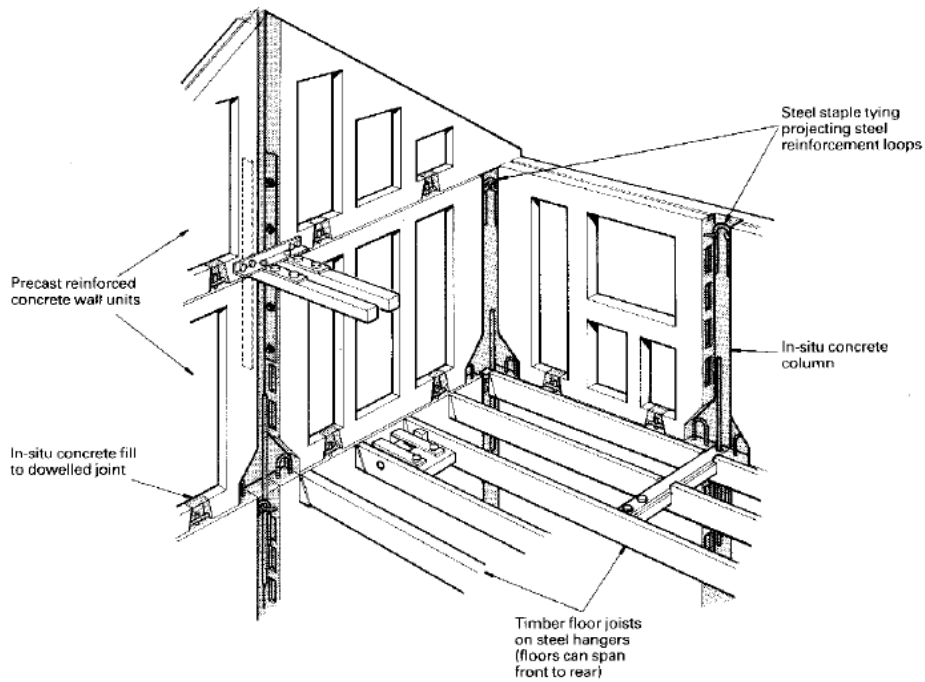


Figur

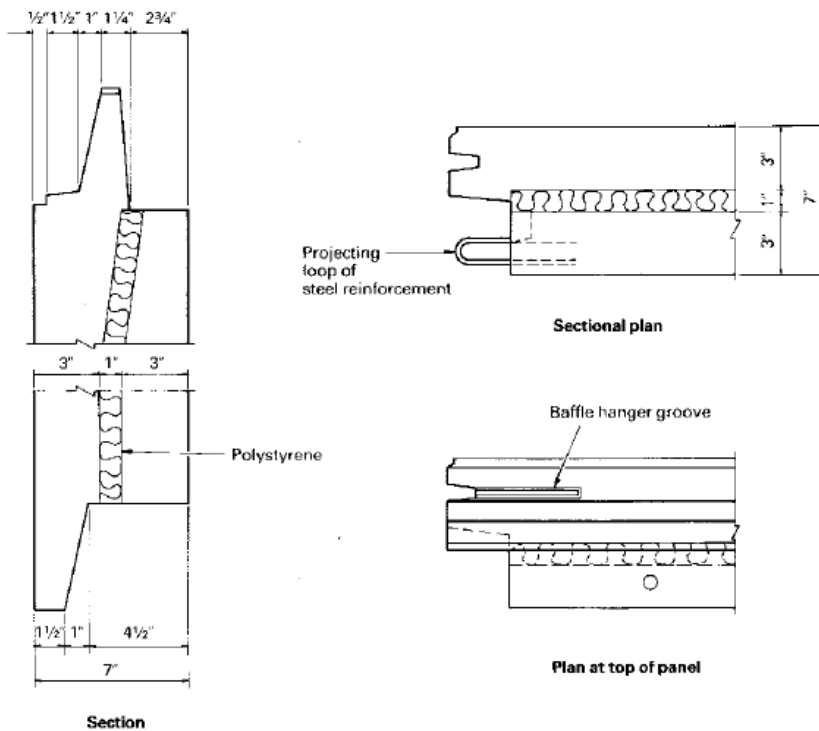
ISOMETRIC VIEW



# REEMA CONCLAD FORM OF CONSTRUCTION

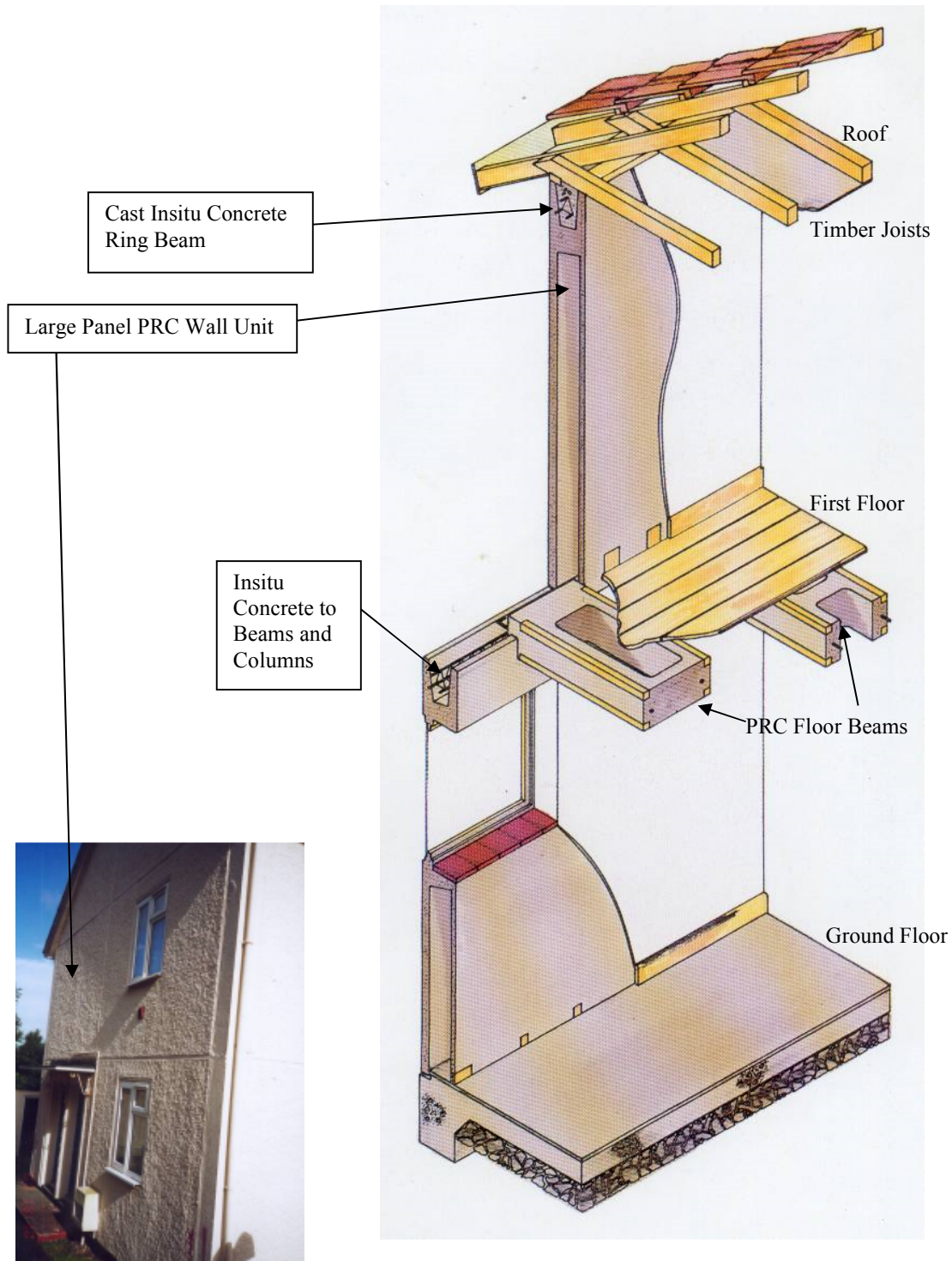


ISOMETRIC VIEW SHOWING PANEL CONNECTIONS, IN-SITU ELEMENTS, FLOOR JOISTS AND RESTRAINT STRAPS



SECTIONS AND PLANS THROUGH PANELS

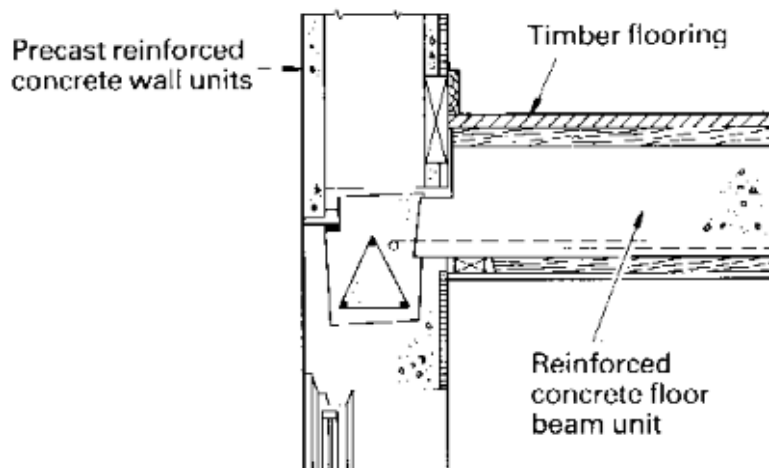
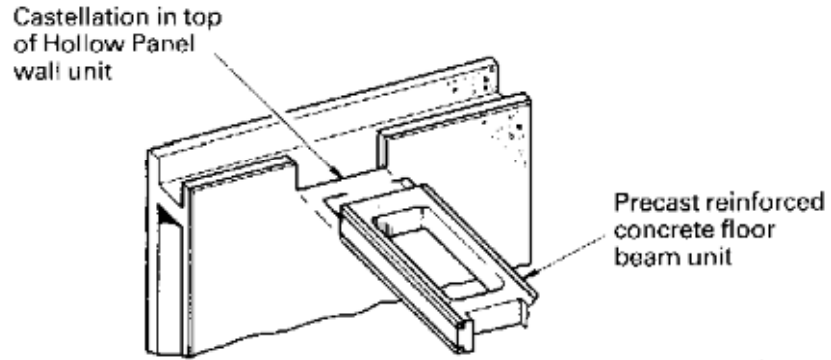
# REEMA HOLLOW PANEL FORM OF CONSTRUCTION



TYPICAL ELEVATION

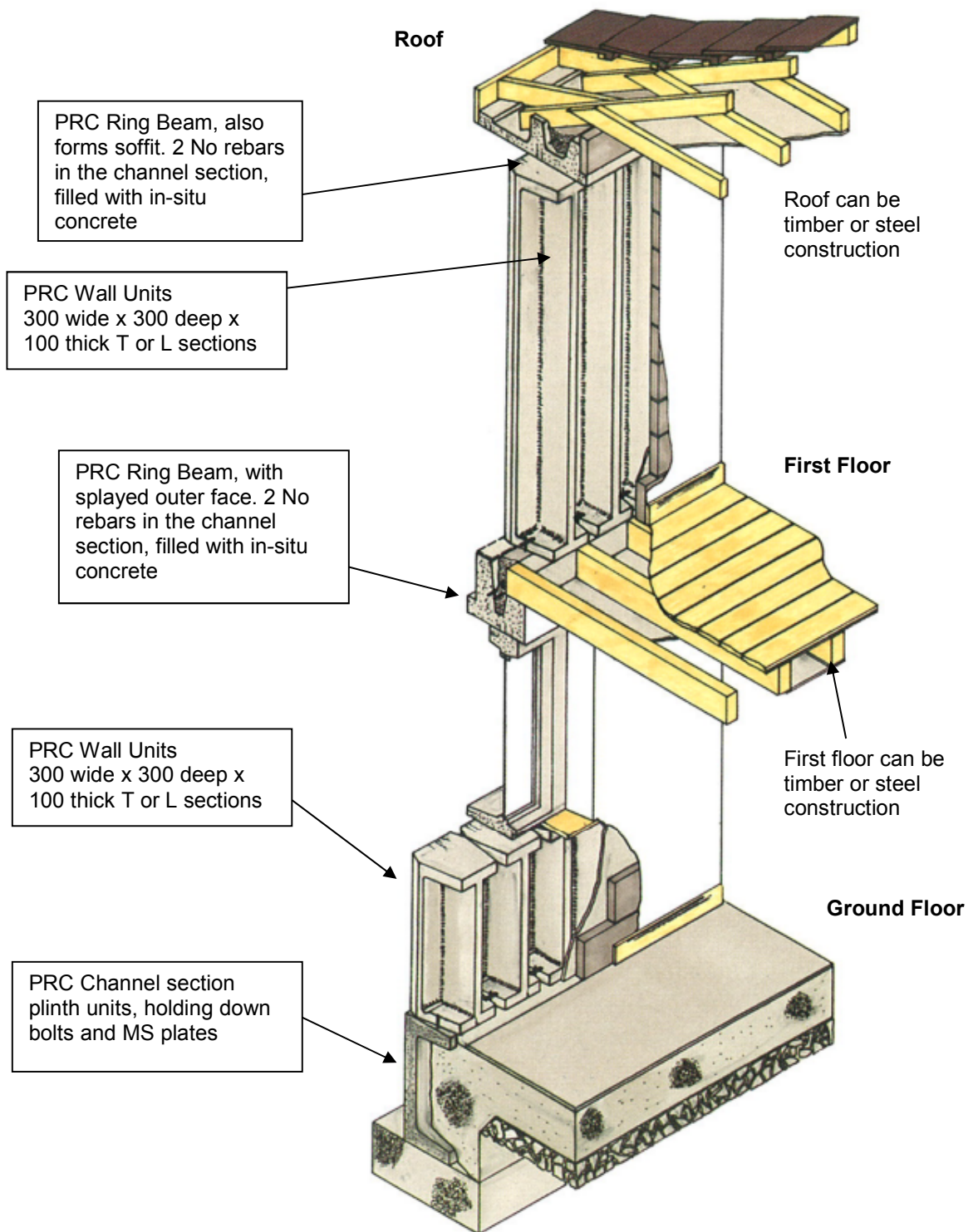
TYPICAL ISOMETRIC VIEW OF REEMA HOLLOW PANEL  
CONSTRUCTION

# REEMA HOLLOW PANEL FORM OF CONSTRUCTION FLOOR BEAMS



*Note: Photograph not taken within Stroud DC area*

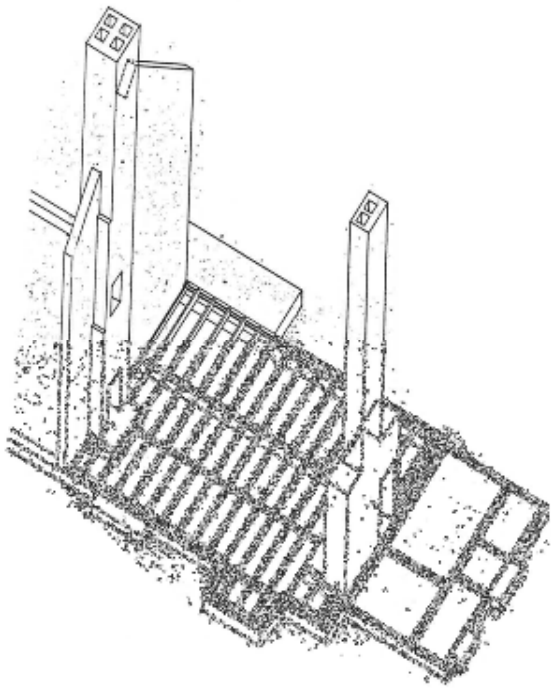
# STENT FORM OF CONSTRUCTION



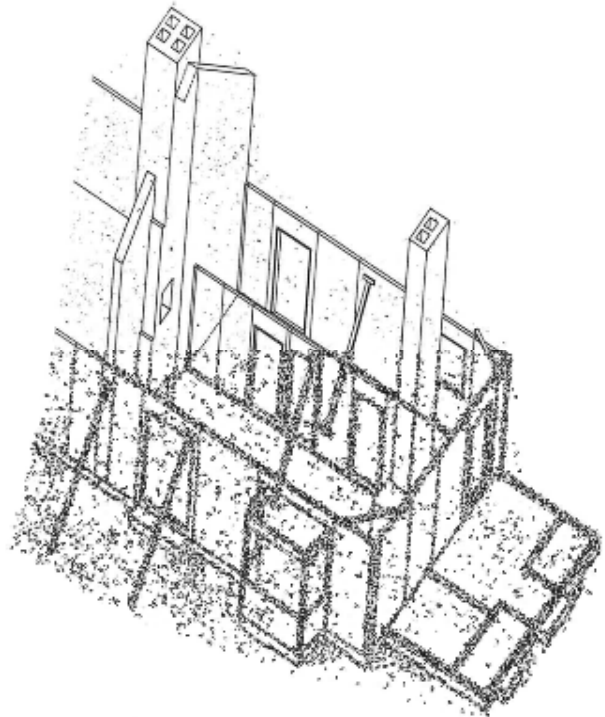
TYPICAL ISOMETRIC VIEW OF STENT CONSTRUCTION



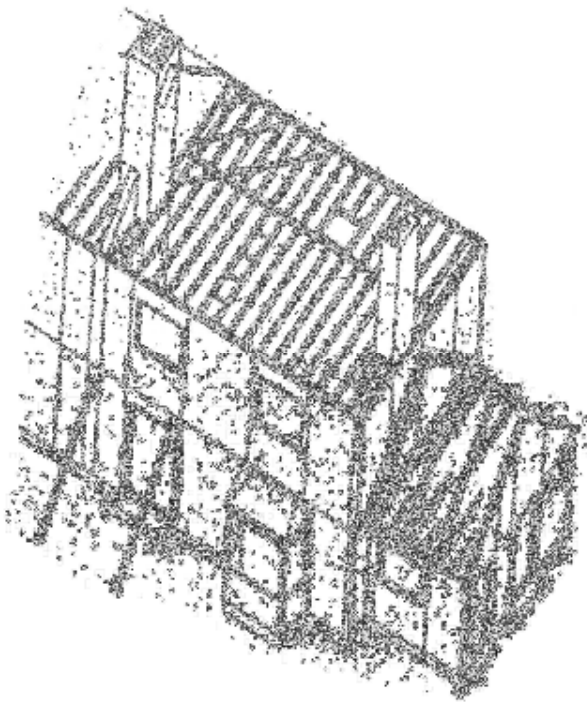
# SWEDISH TIMBER FRAME FORM OF CONSTRUCTION



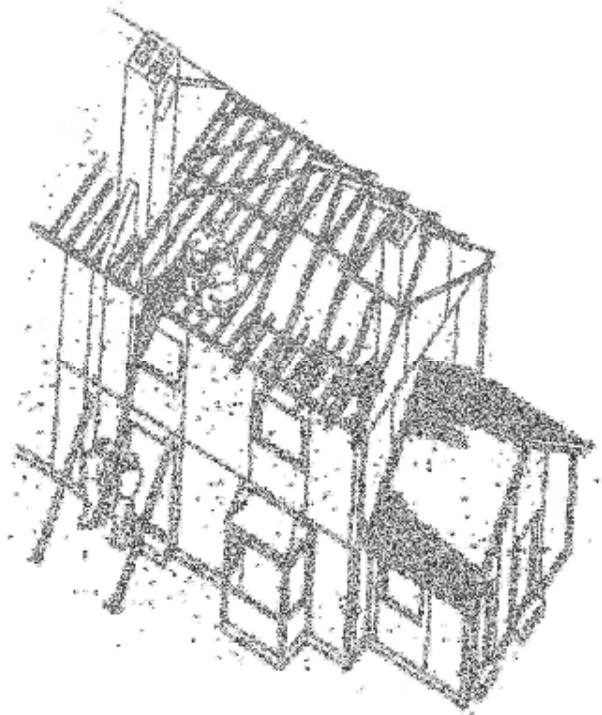
Stage 1 – Foundations & Timber Floor



Stage 2 – External & Internal Wall

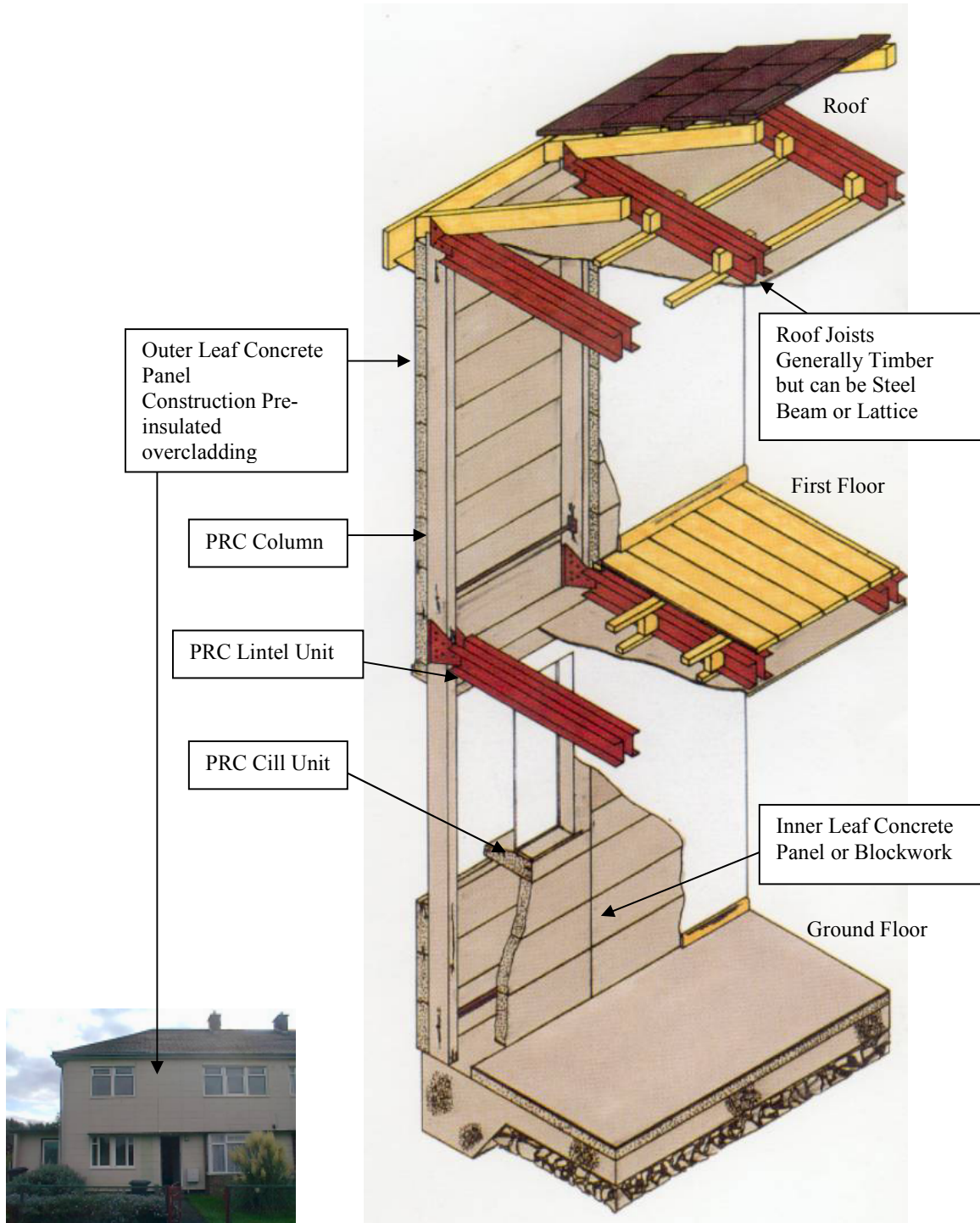


Stage 3 – Walls & Floor complete



Stage 4 – Roof

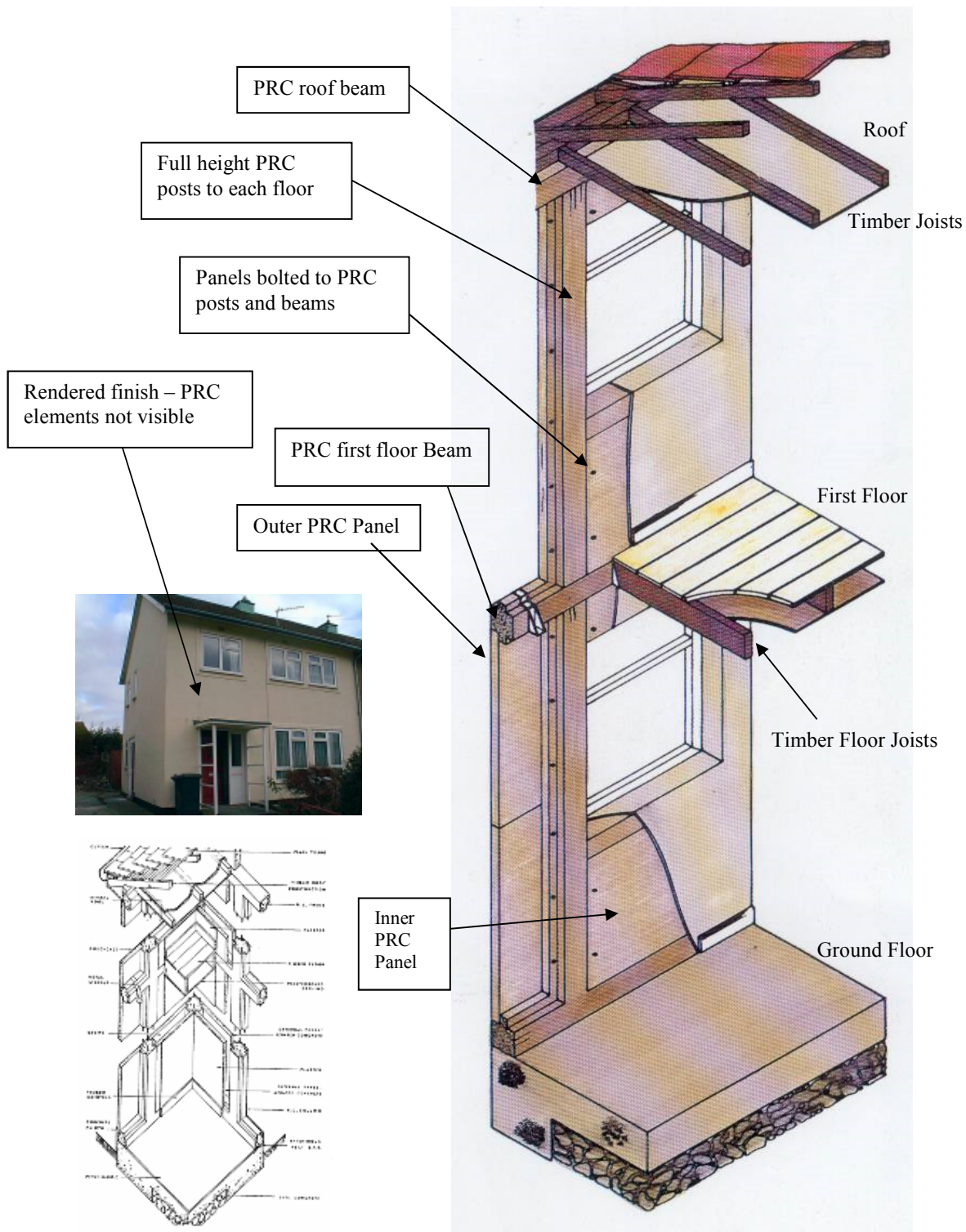
# UNITY FORM OF CONSTRUCTION



TYPICAL ELEVATION

TYPICAL ISOMETRIC VIEW OF UNITY CONSTRUCTION

# WOOLAWAY FORM OF CONSTRUCTION



## Appendix D



### Photographs

No	References	Construction
D1	P Series Photograph P1-P11	Dorlonco
D2	Q Series Photograph Q1-Q17	Reema Conclad
D3	S Series Photograph S1-S72	Reema Hollow Panel
D4	T Series Photograph T1-T41	Swedish Timber Frame

Note: Full sized copies of the Photographs in this Appendix are provided on the accompanying disk. For the Reema Hollow Panel properties there were too many photographs to include in Appendix D3, so on the accompanying disk we have provided additional photographs in folders as follows

Folder Name	Sub-Folders	Sub-Folders
A - Photographs in Appendix D3		
B - Typical Elevations	One for each Town/Village	
C - Defects	One for each Town/Village	One for each road
D - EWI Issues	One for each Town/Village	One for each road

The additional photographs (in folders B, C & D) are not specifically cross referenced in the body of the Report. The photographs in folder A are cross referenced.



# Appendix D1 – Dorlonco

## Photographs



P1 – Typical Front Elevation



P2 – Typical Side Elevation



P3 – Typical Rear Elevation



P4 – 14 Hyett Road, Cashes Green, Rear single storey extension



P5 – 14 Hyett Road, Cashes Green, Rear single storey extension



P6 – 14 Mosley Crescent, Cashes Green, ground level at rear too high

# Appendix D1 – Dorlonco

## Photographs



P7 – 14 Mosley Cresnet, Cashes Green, mould in front ground floor room used as bedroom



P8 – 14 Mosley Cresnet, Cashes Green, mould on window frame in rear bedroom



P9 – Typical overhead power supply cables between buildings (this one at 14 Mosley Cresnet, Cashes Green)



P10 – Overhead power supply fixing at wall, at 10 Kingley Road, Cashes Green



P11 – Overhead power supply fixing at wall, at 14 Hyett Road, Cashes Green

Note:

A disk containing full sized copies of these photographs is included with the paper copy of the Report.



# Appendix D1 – Reema Conclad



## Photographs



Q1 – Typical Front Elevation House



Q2 – Typical Side Elevation House



Q3 – Typical Rear Elevation House



Q4 – Typical Front Elevation Flats



Q5 – Typical Side Elevation Flats



Q6 – Typical Rear Elevation Flats

# Appendix D1 – Reema Conclad

## Photographs



Q7 – Typical front porch with door



Q8 – Typical front porch without door



Q9 – 6 Badgers Way, Forest Green, broken panel section to right of front door (within porch)



Q10 – 3 Nortonwood, Forest Green, mould in single storey entrance porch



Q11 – 19 Nortonwood, Forest Green, mould in bathroom above window & over bath



Q12 – 19 Nortonwood, Forest Green, mould in bathroom in window reveal



# Appendix D1 – Reema Conclad

## Photographs



Q13 – Example of porch door away from rainwater downpipe & corner



Q14 – Example of porch door close to rainwater downpipe & corner (problem with EWI)



Q15 – Example of roof verge close to external wall (need to extend roof for EWI)



Q16 – Example of Radon Pump (to 1 No in Badgers Way, and 3 No in Woodpecker Way)



Q17 – Example of Radon ducting from pump

Note:

A disk containing full sized copies of these photographs is included with the paper copy of the Report.

# Appendix D3 – Reema Hollow Panel

## Photographs



S1 – Typical Front Elevation, semi-detached house A



S2 – Typical Side Elevation, semi-detached house A



S3 – Typical Rear Elevation, semi-detached house A



S4 – Typical Front Elevation, semi-detached house B



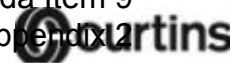
S5 – Typical Side Elevation, semi-detached house B



S6 – Typical Rear Elevation, semi-detached house B



# Appendix D3 – Reema Hollow Panel



## Photographs



S7 – Typical Front Elevation, bungalow



S8 – Typical Side Elevation, bungalow



S9 – Typical Rear Elevation, bungalow



S10 – Typical Front Elevation, flats

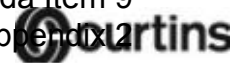


S11 – Typical Side Elevation, flats



S12 – Typical Rear Elevation, flats

# Appendix D3 – Reema Hollow Panel



## Photographs



S13 – Flats in Lawnside, Forest Green



S14 – Flat & Shop in Lawnside, Forest Green



S15 – Site at Wharfedale Way, Bridgend, two Reema houses demolished (Nos 8 & 10)



S16 – Brimley, Leonard Stanley, three houses (Nos 53, 54 & 55) not Reema construction



S17 – 12A Lawnside, Forest Green, Hall mould in square shapes on front & alleyway walls



S18 – 12A Lawnside, Forest Green, Bedroom mould to right of window high level



# Appendix D3 – Reema Hollow Panel

## Photographs



S19 – 12A Lawnside, Forest Green, Bedroom  
mould to left of window high level



S20 – 12A Lawnside, Forest Green, Bedroom  
mould to left of window mid height



S21 – 12A Lawnside, Forest Green, Bedroom  
mould to right of window mid height



S22 – 12A Lawnside, Forest Green, Bedroom 2  
mould on window reveal & head



S23 – 18 Lawnside, Forest Green, crack/spall on  
gable elevation just above eaves level



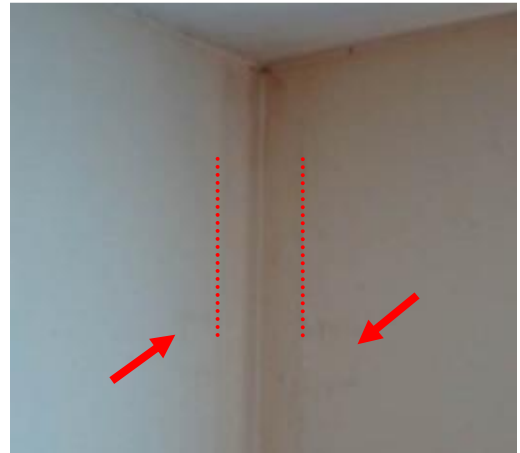
S24 – 45 Lawnside, Forest Green, bedroom gable  
wall, two small square areas of staining  
(arrowed). Photo S26 is to the right side.

# Appendix D3 – Reema Hollow Panel

## Photographs



S25 – 45 Lawnside, Forest Green, bedroom gable wall, left hand staining detail



S26 – 45 Lawnside, Forest Green, bedroom gable rear corner, two vertical cracks (dotted), floor to ceiling, and two small stains (arrowed)



S27 – 56 Lawnside, Forest Green, front spalling to right of front door. Corroded steel & crack



S28 – 18 Lawnside, Forest Green, paving to left of front door too high



S29 – 39 Mankley Road, Leonard Stanley. Mould in window reveal at sill



S30 – 39 Mankley Road, Leonard Stanley. Mould in window reveal at head (one of many windows affected)

# Appendix D3 – Reema Hollow Panel

## Photographs



S31 – 51/52 Mankley Road, Leonard Stanley. Crack on door step extending up onto reveal



S32 – 51/52 Mankley Road, Leonard Stanley. Mould on external wall at bottom of stairs to first floor flat.



S33 – 39 Mankley Road, Leonard Stanley. Rear conservatory.



S34 – 39 Mankley Road, Leonard Stanley. Gas meter box & pipework



S35 – 51/52 Mankley Road, Leonard Stanley. Gas pipework on external wall



S36 – 38 Glebe Road, Minchinhampton. Outbuilding of Reema panel construction jointed to bungalow

*Note: Photographs S28, and S33 to S37 illustrate issues to be dealt with if EWI is installed; ground level too high, conservatories and covered ways, gas meters and pipework.*



# Appendix D3 – Reema Hollow Panel

## Photographs



S37 – 38 Glebe Road, Minchinhampton. Overhead electric cables to gable



S38 – 6 Upper Park Road, Nailsworth. Side extension (in blockwork) & porch



S39 – 6 Upper Park Road, Nailsworth. Side extension from rear



S40 – 6 Upper Park Road, Nailsworth. Cracking at junction of side extension & main house



S41 – 6 Upper Park Road, Nailsworth. Cracking at dpc to side of door



S42 – 6 Upper Park Road, Nailsworth. Cracking above door



# Appendix D3 – Reema Hollow Panel

## Photographs



S43 – 6 Upper Park Road, Nailsworth. Side extension, cracking at dpc level



S44 – 6 Upper Park Road, Nailsworth. Side extension, cracking at dpc level detail



S45 – 6 Upper Park Road, Nailsworth. Rear corner main house. Cast in-situ concrete (arrowed) & blockwork suggests underpinning



S46 – 3 Upper Park Road, Nailsworth. First floor construction (S47 circled)



S47 – 3 Upper Park Road, Nailsworth. First floor, suspended cast in-situ concrete slab under floorboards and battens.



S48 – 6 Upper Park Road, Nailsworth. First floor construction, PRC ladder beams (see S49 for general view, taken in another house not in SDC stock)

# Appendix D3 – Reema Hollow Panel

## Photographs



S49 – View of typical PRC "ladder" beams from below (not SDC stock photo)



S50 – Typical PRC beam defect (not taken in SDC stock)



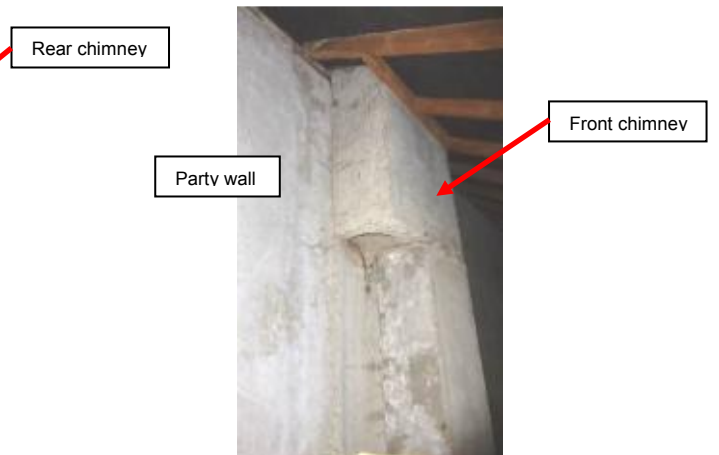
S51 – 3 Upper Park Road, Nailsworth. General View in Loft towards the party wall (S52 circled)



S52 – 3 Upper Park Road, Nailsworth. Roof purlin at party wall. Hole through to other side of wall, risk of fire spread.



S53 – 6 Upper Park Road, Nailsworth. General view in loft towards rear & party wall



S54 – 6 Upper Park Road, Nailsworth. General view in loft towards party wall showing front chimney.



# Appendix D3 – Reema Hollow Panel

## Photographs



S55 – 5 Upper Park Road, Nailsworth. Flat roof side extension (compare with S39, lean-to roof No 6)



S56 – 3 Upper Park Road, Nailsworth. Overhead electric cables



S57 – 6 Upper Park Road, Nailsworth. Overhead electric cables



S58 – 22 Willow Road, Stonehouse. Outbuilding joined to the bungalow (note: Outbuilding is of Reema panel construction)



S59 – 26 Willow Road, Stonehouse. Outbuilding joined to the bungalow (note: Outbuilding is blockwork construction)



S60 – 31 Victory Road, Whiteshill. Side extension view from front

# Appendix D3 – Reema Hollow Panel

## Photographs



S61 – 31 Victory Road, Whiteshill. Side extension view from rear



S62 – 31 Victory Road, Whiteshill. Side extension cracking above window (S63 circled)



S63 – 31 Victory Road, Whiteshill. Side extension cracking above window detail



S64 – 31 Victory Road, Whiteshill. Side extension cracking above window viewed internally



S65 – 31 Victory Road, Whiteshill. Side extension cracking above window viewed internally, detail



S66 – 31 Victory Road, Whiteshill. Side extension general view of concrete ceiling (note: S67 is just off picture to right)



# Appendix D3 – Reema Hollow Panel

## Photographs



S67 – 31 Victory Road, Whiteshill. Side extension spalling concrete to ceiling



S68 – 31 Victory Road, Whiteshill. Side extension poor finishes to ceiling



S69 – 31 Victory Road, Whiteshill. Side extension mould & damp ingress staining in front corner



S70 – 26 Victory Road, Whiteshill. Power lines close to the building



S71 – High Field, Woodchester, general view

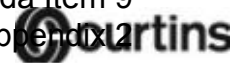


S71 – High Field, crack under front window

Note:

A disk containing full sized copies of these photographs is included with the paper copy of the Report.

# Appendix D4 – Swedish Timber Frame



## Photographs



T1 – Typical Front Elevation Chalet Bungalow



T2 – Typical Side Elevation Chalet Bungalow



T3 – Typical Rear Elevation Chalet Bungalow



T4 – Typical Front Elevation House



T5 – Typical Side Elevation House



T6 – Typical Rear Elevation House

Note: The elevations shown above are not from the same property. T1 is No 3 Mount Pleasant, Wotton, T2 & T3 are No 7 Mount Pleasant. T4 & T6 are No 6 The Knoll, Uley, and T5 is No 8 The Knoll



# Appendix D4 – Swedish Timber Frame

## Photographs



T7 – 32 Barrs Lane, North Nibley. Front gutter disconnected at downpipe bracket (arrowed)



T8 – 32 Barrs Lane, North Nibley. Side, extensive ivy growth



T9 – 32 Barrs Lane, North Nibley. Outbuilding side, ground level too high (circled). Rot to outer boards at dpc level (T10 circled)



T10 – 32 Barrs Lane, North Nibley. Outbuilding side, rotten timber outer boards & keel plate



T11 – 32 Barrs Lane, North Nibley. Incoming mains electrics on side elevation



T12 – 32 Barrs Lane, North Nibley. Rear, poor timber to dormer side and architrave

# Appendix D4 – Swedish Timber Frame

## Photographs



T13 – 32 Barrs Lane, North Nibley. Rear party wall chimney capping broken away (arrowed)



T14 – 3 Bushey Beeches, The Camp. Distortion of roof tiles on line below chimney (arrowed)



T15 – 3 Bushey Beeches, The Camp. Front first floor window, rot to architrave



T16 – 3 Bushey Beeches, The Camp. First floor window, rot to window cill



T17 – 3 Bushey Beeches, The Camp. First floor outer boards, board "sprung" due to failed fixing



T18 – 3 Bushey Beeches, The Camp. Side elevation, algae growth on outer boards



# Appendix D4 – Swedish Timber Frame

## Photographs



T19 – 3 Bushey Beeches, The Camp. Flashing at junction of Outbuilding & main house. Original flashing covered by “flashband” type repair, starting to disintegrate (arrowed)



T20 – 3 Bushey Beeches, The Camp. Incoming mains electrics on side elevation



T21 – 6 The Knoll, Uley. Front, replacement canopy leaves untreated timber outer boards



T22 – 6 The Knoll, Uley. Outbuilding front roof, slipped & missing tiles



T23 – 6 The Knoll, Uley. Outbuilding roof, poor repair to verge fascia at eaves



T24 – 6 The Knoll, Uley. Side, rot & woodworm to outer boards at dpc level

# Appendix D4 – Swedish Timber Frame

## Photographs



T25 – 6 The Knoll, Uley. Rear, rot to bay window corner architrave



T26 – 6 The Knoll, Uley. Rear, blocked off vent to underfloor void



T27 – 6 The Knoll, Uley. Rear, example of rot & split outer boards above patio doors



T28 – 6 The Knoll, Uley. Rear, example of rot & split outer boards near party wall



T29 – 8 The Knoll, Uley. Outbuilding front, slipped & missing roof tiles



T30 – 8 The Knoll, Uley. Rear, rotten timber architrave above patio doors



# Appendix D4 – Swedish Timber Frame

## Photographs



T31 – 3 Mount Pleasant, Wotton-Under-Edge. Front, extensive ivy growth



T32 – 3 Mount Pleasant, Wotton-Under-Edge. Front corner, rot & woodworm to outer boards & keel plate.



T33 – 3 Mount Pleasant, Wotton-Under-Edge. Side, rot to window architrave



T34 – 3 Mount Pleasant, Wotton-Under-Edge. Incoming mains electrics on side elevation



T35 – 3 Mount Pleasant, Wotton-Under-Edge. Gable chimney taken down



T36 – 3 Mount Pleasant, Wotton-Under-Edge. Rear dormer window poor paint finishes to framing & architrave



# Appendix D4 – Swedish Timber Frame

## Photographs



T37 – 7 Mount Pleasant, Wotton-Under-Edge. Front porch, cracking at verge (arrowed)



T38 – 7 Mount Pleasant, Wotton-Under-Edge. Rear slipped tiles (arrowed) & gap between gutter & roof (circled)



T39 – 7 Mount Pleasant, Wotton-Under-Edge. Rear, rotten outer boards at dpc level



T40 – 7 Mount Pleasant, Wotton-Under-Edge. Rear, poor timber to dormer side, and architrave rotten near roof tiles (arrowed)



T41 – 7 Mount Pleasant, Wotton-Under-Edge. Rear, gutter vegetation & dead/dormant ivy growth

# Appendix D4 – Swedish Timber Frame

## Photographs

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Note:

A disk containing full sized copies of these photographs is included with the paper copy of the Report.