

Workshop 1c

Cavity Wall Insulation The Hidden Problem

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Room: Surrey



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Background to the Project

- In the mid-1980s, the NIHE carried out an extensive programme of insulating cavity walls across its housing stock.
- There was some evidence emerging that CWI installed in dwellings in the 1980s and early 1990s was no longer performing due to degradation or poor installation.
- In August 2013, the NIHE appointed South Eastern Regional College (SERC) to undertake a survey into the condition of cavity wall insulation in NIHE dwellings.
- SERC delivered its report in March 2014. The small sample of inspections that were undertaken indicated some issues with CWI in NIHE properties.
- However, it was decided that a larger survey would be required in order to inform any potential future strategy and programmes.

Objectives

- The primary aim of the Cavity Wall Insulation Research was to establish:
 1. The condition of CWI in the NIHE housing stock and the private sector: and
 2. The impact that this is having on the stock in terms of thermal efficiency and associated technical defects.

Cavity Wall Research-Project Overview

NIHE decided to undertake a research project involving a survey programme of up to 1000 NIHE dwellings and c.300 private homes

Expert technical training was also provided by CIT to selected NIHE employees to enable them to conduct basic Cavity wall insulation property inspections

Property Selection Criteria

- The social housing properties surveyed were selected by the NIHE
- The survey sample size for each property type was statistically valid
- Significant and relevant topographies were considered
- All major house types throughout the housing stock were assessed



Insulation Performance Panel (IPP)

There were four main objectives for the IPP:

- To ensure inspection methodologies employed were appropriate and produced a balanced outcome.
- To provide guidance to the research team undertaking the evaluation of any emerging research or policy issues – e.g. methodology, data sources
- Review progress of survey and make recommendations to ensure outcomes are robust
- To act as a sounding board for conclusions and any recommendations that may emerge from the research.

Survey Methodology

- Conducting a visual inspection to check
 - each external accessible elevation, recording whether the cavity wall drill pattern adheres to the specific system designer specification.
 - whether DPC (damp proof course) is present and compliant to industry requirements.
 - the outer constructed skin is in good condition
 - If there are any obvious defects that could cause an overall strain on the performance of the fabric of the property.
- Performing 3 x intrusive borescope inspections for each elevation
 - recording the cavity insulation material type
 - whether the fill is to the correct density and Industry Standard
 - to report any technical defect related findings.



Survey Methodology

- Conducting an internal visual inspection to
 - check whether there are signs of damp, condensation, mould growth and/or any obvious defects that could cause an overall strain on the performance of the fabric of the property.
 - check the roofspace for adequacy of insulation and ventilation
 - review the adequacy of combustion ventilation for any fuel burning appliances located within the property.
 - record any relevant tenant/homeowner feedback.
 - record any additional information/recommendations in regards to the property inspection records.

Class Recommendations - Definitions

Class 1 -building fabric condition is actively deteriorating, remedial works needed.

- The CWI installation is non-compliant with industry standards and the CWI product Agrément Certificate.
- Defects such as voids in the CWI fill and/or debris in the cavity have been identified.
- The CWI has been compromised by excessive water ingress caused by the condition of the external façade of the dwelling combined with defects such as voids in the insulation fill and/or debris in the cavity which has allowed moisture to bridge across the CWI to the inner leaf resulting in the formation of damp, condensation on the internal wall.
- Remediation works are required to the CWI installation.
- Remediation works are required to the maintenance related defects identified on the external façade.

Class Recommendations - Definitions

Class 2 –building fabric has been compromised but situation stable, remediation works still required.

Category A:

- The CWI installation is non-compliant with industry standards and the CWI product Agrément Certificate.
- Defects such as voids in the CWI fill and/or debris in the cavity have been identified.
- The CWI has not been compromised but remediation works are still required.
- The building fabric has been compromised by the severity of the maintenance related defects identified on the external façade and remediation works are still required.
- There is a high probability that non-compliant CWI installations will become compromised if remediation works to the CWI installation and external façade of the dwelling are not undertaken.

Class Recommendations - Definitions

Class 2 –building fabric has been compromised but situation stable, remediation works still required.

Category B:

- The CWI installation is compliant with industry standards and the CWI product Agrément Certificate.
- No remediation works are required to the CWI installation.
- The building fabric has been compromised by the severity of the maintenance related defects identified on the external façade and remediation works are still required.
- It is possible that compliant CWI installations could become compromised if remediation works to the external façade are not undertaken.

Class Recommendations - Definitions

Class 3 –evidence of minimal building fabric stress, with no serious underlying causes, remediation can be undertaken as part of a normal maintenance plan.

Category A:

- The CWI installation is non-compliant with industry standards and the CWI product Agrément Certificate.
- Defects such as voids in the CWI fill and/or debris in the cavity have been identified.
- The CWI has not been compromised and remediation works can be undertaken as part of a normal maintenance plan.
- The building fabric is showing signs of minimal stress due to the maintenance related defects identified on the external façade of the dwelling.
- It is possible that non-compliant CWI installations could become compromised if remediation works to the external façade are not undertaken.

Class Recommendations - Definitions

Class 3 –evidence of minimal building fabric stress, with no serious underlying causes, remediation can be undertaken as part of a normal maintenance plan.

Category B:

- The CWI installation is compliant with industry standards and the CWI product Agrément Certificate.
- No remediation works are required to the CWI installation.
- The building fabric is showing signs of minimal stress due to the maintenance related defects identified on the external façade and remediation works can be undertaken as part of a normal maintenance plan

Class Recommendations - Definitions

No Class

- The CWI installation is compliant with industry standards and the CWI product Agrément Certificate.
- The building fabric is showing no signs of stress.
- No maintenance related defects have been identified on the external façade of the dwelling.

Non-compliant CWI



Non-compliant CWI



Damp & Condensation



Mortar & Pointing



Guttering



Soffit & Fascia



Damp Proof Course (DPC) Level



Roof Tiles



Render & Brickwork



Verge Boards



Doors & Window Seals



Blocked Eaves



Research Outcomes

Social housing – 825 surveys

Private homes – 113 surveys

Class	Category	Definition	% of sample
1	N/A	Building fabric condition is actively deteriorating, remediation works needed	1%
2	A	Building fabric has been compromised but situation stable, remediation works still required (Non-compliant CWI installation)	24%
2	B	Building fabric has been compromised but situation stable, remediation works still required (Compliant CWI Installation)	8%
3	A	Evidence of minimal building fabric stress, with no serious underlying causes, remediation can be undertaken as part of a normal maintenance plan (Non-compliant CWI Installation)	38%
3	B	Evidence of minimal building fabric stress, with no serious underlying causes, remediation can be undertaken as part of a normal maintenance plan (Compliant CWI Installation)	13%
No	N/A	No evidence of building fabric stress or other related property technical defects	16%

Class	Category	Definition	% of sample
1	N/A	Building fabric condition is actively deteriorating, remediation works needed	1%
2	A	Building fabric has been compromised but situation stable, remediation works still required (Non-compliant CWI installation)	6%
2	B	Building fabric has been compromised but situation stable, remediation works still required (Compliant CWI Installation)	9%
3	A	Evidence of minimal building fabric stress, with no serious underlying causes, remediation can be undertaken as part of a normal maintenance plan (Non-compliant CWI Installation)	28%
3	B	Evidence of minimal building fabric stress, with no serious underlying causes, remediation can be undertaken as part of a normal maintenance plan (Compliant CWI Installation)	15%
No	N/A	No evidence of building fabric stress or other related property technical defects	41%

Research Outcome Summary – Social Housing

CWI installations

- 63% had CWI installations that were non-compliant with industry standards and the requirements of the CWI system Agrément Certificate.
- 37% had CWI installations that, based on the assessment methodology, were discovered to be compliant with industry standards and the requirements of the CWI system Agrément Certificate.

Property maintenance

- 84% demonstrated evidence of not being adequately maintained and were showing varying levels of stress in the condition of the external façade.

Research Outcome Summary – Social Housing

Class recommendations

- 1% where the external façade was identified as actively deteriorating and damp and/or condensation had formed on the internal fabric with urgent remediation required.
- 32% had building fabric that had been compromised but the situation was stable with remediation works required.
- 51% had minimal building fabric stress with no serious underlying causes with remediation works that can be undertaken as part of a normal housing maintenance plan.
- 16% had building fabric that was showing no signs of stress, and no maintenance-related defects were identified on the external façade of the dwellings surveyed.

Research Outcome Summary – Private Housing

CWI installations

- 36% had CWI installations that were non-compliant with industry standards and the requirements of the CWI system Agrément Certificate.
- 64% had CWI installations that, based on the assessment methodology, were discovered to be compliant with industry standards and the requirements of the CWI system Agrément Certificate.

Property maintenance

- 59% demonstrated evidence of not being adequately maintained and were showing differing levels of stress in the condition of the external façade.

Research Outcome Summary – Private Housing

Class recommendations

- 1% were non-compliant with industry standards and the requirements of the CWI system Agrément Certificate, and the external façade was identified as actively deteriorating and requiring remediation.
- 15% had building fabric that had been compromised but the situation was stable with remediation works required.
- 43% had minimal building fabric stress with no serious underlying causes with remediation works that can be undertaken as part of a normal housing maintenance plan.
- 41% had building fabric that was showing no signs of stress, and no maintenance-related defects were identified on the external façade.

Research Recommendations

Monitoring

- A system for monitoring and checking the accurate completion of remediation works arising should be set up and overseen by an independent monitoring group.
- Rigorous monitoring will ensure that remediation work is carried out to the correct standard.
- The monitoring group would need to have
 - specialist CWI knowledge (i.e. extraction and cavity cleaning) and
 - be able to assess the suitability or otherwise of properties for cavity wall re-insulation works using the same property survey methodology adopted in this research.

Research Recommendations

Prioritise Class 1 Remediation

- Remediation of Class 1 Recommendation social housing properties (9 in total) should be top priority.
- Before Class 1 Recommendation remediation takes place, it would be prudent to consider social housing stock that adjoins the Class 1 properties.
- Applying remediation across groups of neighbouring homes, rather than pursuing one-off responses, would likely prove cost-effective as some remediation could be undertaken as part of a routine maintenance programme.

Research Recommendations

Class 2 and Class 3 Dwelling Remediation

- Class 2 and Class 3 recommendation properties (689 in total) require remediation work which can be carried out as part of a normal planned maintenance and repair programme.
- Assessments should be carried out on Class 2's and Class 3 recommendation adjoining properties –for the same reasons as with Class 1 properties, detailed above.
- A strategy should be drawn up for carrying out these new assessments on both an estate and regional basis.
- Class 2 and Class 3 remediation should be integrated into the NIHE's existing property maintenance programme as far as practicable. This is because a number of the defects identified in these properties are related to external façade maintenance issues.

Research Recommendations

Training NIHE Employees

- In addition to the technical class-room and on-site training CIT provided to 30 NIHE employees, they should have access to
 - appropriate expertise when assessing the suitability of properties proposed for CWI installations and be able to assess the property fabric and identify defects on the external façade.
 - demonstrate the required competence to assess the compliance and performance of installations and have an understanding of the relevant industry standards and building regulations.

Research Recommendations

Installation overview

- To ensure that remediation and new CWI installation work is carried out to the correct standard, all current and future CWI wall installation programmes should be closely overseen and monitored by the NIHE.
- It should be carried out in the following way:
 - All properties proposed to receive new CWI installations must be independently verified through a valid and recognised industry process before installations take place.
 - Quality assurance assessments of CWI installations should be conducted during and after installation.
 - The NIHE should conduct appropriate reviews of the performance of organisations responsible for delivering CWI installations with a specific focus on data gathered on the quality assurance and compliance of CWI installations.

Research Recommendations

Advice for residents

- Residents who have CWI installed should be given guidance on how to both maintain and manage their properties following installation and also have access to experts who can provide assistance with any matters relevant to this area.
- put in place a 'residents' voice' Scheme that overtly (or in confidence) allows home dwellers to raise concerns about the condition or effects of CWI in their homes.

Regular stock surveys

- Housing stock should be inspected at regular intervals to gauge the condition of the external façade and performance of CWI installations.

Research Recommendations

Contracts and Guarantees

- The NIHE should review the suitability of installation guarantees issued for CWI installations to its housing stock. Guarantees should be insurance-backed to ensure good governance and oversight.
- The NIHE should maintain an ongoing assessment of its CWI installation contracts to ensure their technical specifications and contractual requirements are in line with industry standards and best practice.
- The NIHE should maintain adequate records of all future CWI remediation and installation works undertaken to their housing stock (on a per property basis) on an asset management database.

Action – Post Publication

- Presentation to Insulation Industry and Elected Reps
- Further analysis of research data to include Estate Descriptors and Asset Groups
- Cavity Wall Research Action Group formed

Next Steps

- A round of meetings organised with Insulation Industry
- A small research project planned to test the heat loss through the cavity with the current insulation using heat flux monitoring and on completion of new installed insulation.
- An Action Plan to be prepared for NIHE Board.

Thank you.

See you at the
next conference!