Submission to the Working Group on the Defective Blocks Grant Scheme

Introduction

Engineers Ireland welcomes the establishment of the Working Group on Defective Blocks Grant Scheme. This document provides a summary of issues identified during the first year of the Defective Concrete Block Grant Scheme experienced by Chartered Engineers who are members of the I.S. 465 Concrete Blocks and Mica Register of Engineers, (registrants), considered competent to assess houses damaged by defective blocks containing certain deleterious materials.

This submission relates to the provision of services, by the registrants, associated with the assessment of dwellings affected by defective concrete blocks in accordance with I.S. 465:2018+A1:2020 "Assessment, testing and categorisation of damaged buildings incorporating concrete blocks containing certain deleterious materials" for the purposes of supporting applications to the scheme.

Registrants from the I.S. 465 Concrete Blocks and Mica Register (maintained by Engineers Ireland) are facing increasing challenges in assessing properties and preparing reports in support of clients' applications to the scheme. This submission sets out the key issues which have been experienced by registrants. The experiences detailed in this document have resulted in several registrants calling into question the viability of continuing to provide this service. This is obviously a major concern for Engineers Ireland and the registrants.

This document has been compiled following three online meetings, hosted by Engineers Ireland, during July, August, and September of this year. It is also based on online surveys of registrants in December 2020 and August 2012 to provide feedback on topics to stakeholders.

The meetings were organised at the request of some of the registrants to provide a forum to facilitate a discussion on views and experiences, in a collective way, of Engineers experiences and observations in the provision of services associated with assessing, reporting, and supporting homeowner applications for the Defective Block Grant Scheme.

Though not represented at the meetings of the Defective Blocks Grant Scheme Working Group Engineers Ireland does welcome and acknowledge the opportunity to participate in the online discussions at the latter stages of the process with a sub-group of the Working Group comprising mostly of homeowners during the second half of August. It is hoped the issues outlined therein, in conjunction with this document will get due consideration and action in the deliberations of the Working Group.

The registrant provides a pivotal and key role in the scheme processes and a fundamental party between their client, the homeowner, and the Administrators of the scheme. The registrant is the homeowner's representative and being at the forefront of the matter, they have first-hand knowledge of the issues, and have a good understanding of the key difficulties affecting their clients.

This submission provides high-level observations during the first year of the scheme by our members, registrants on the I.S. 465 register established in 2020. This includes:

- The Role of the Engineer on the I.S. 465 Register
- Concerns regarding second remediation
- Issues for further consideration
- Discussion on the operational impact of several possible approaches

The views expressed by registrants in this document are intended to guide improvements in I.S. 465 and the operation of the 'Defective Concrete Blocks Grant Scheme' for the benefit of all stakeholders.

The engineers on the I.S. 465 register have extensive experience working as Chartered Engineers, and since the establishment of the I.S. 465 Register have surveyed more than 1,600 homes in Donegal and Mayo.

About Engineers Ireland

With over 25,000 members from every discipline of engineering, Engineers Ireland is the voice of the engineering profession in Ireland. Engineers Ireland was established in 1835 making us one of the oldest and largest professional bodies in the country. Members come from every discipline of engineering and range from engineering students to Fellows of the profession. Engineers Ireland is the registered Competent Authority in Ireland for the engineering profession under EU Directive 2005/36 and is a founding member of the International Engineering Alliance, an organisation committed to the adoption of global standards in engineering education and competence. Engineers Ireland also accredits engineering programmes at third level in fourteen Institutes of Technology and seven Universities.

Engineers Ireland awards the professional title Chartered Engineer (CEng MIEI) in line with the Institution of Civil Engineers of Ireland (Charter Amendment) Act 1969. Chartered Engineers have been assessed by their peers as professionals in their field in delivering the highest standards of quality, expertise, and innovation to serve the needs of society while ensuring public health and safety. They adhere to the Engineers Ireland Code of Ethics in all areas of their engineering practice.

Chartered Engineers are committed to solving problems by designing and implementing solutions to address the needs of customers and society in general. As required by the Code of Ethics of Engineers Ireland Chartered Engineers "shall at all times be conscious of the effects of their work on the health and safety of individuals and on the welfare of society".

The registered professional title is recognised internationally and under Irish Law. According to the Building Control (Amendment) Regulations (SI 9 of 2014 & Code of Practice), Chartered Engineers are one of the three professions which may act as Assigned Certifiers.

Engineers Ireland has also established and maintains registers of suitable qualified persons in specialist areas including:

- IS 398 Pyrite Assessment and Remediation
- Historical Landfill Waste Disposal Sites (EPA, 2007).
- I.S. 465 Mica and Pyrite

Our members contribute to the development of national standards and policies with consultative groups across industry. Recent submissions include:

- Draft Code of Practice for Fire Safety assessment of premises and buildings
- Submission to Joint Oireachtas Committee on Professional Indemnity Insurance
- Submission on Climate Action Plan Review 2021.

A list of Engineers Ireland's submissions to key stakeholders is available here: https://www.engineersireland.ie/Professionals/News-Insights/Campaigns-and policies/Submissions

For many years Engineers Ireland has proactively sought greater protection for the public through the regulation of engineering activities, in particular where there is risk associated with the delivery of engineering services. There is the potential threat to public safety, health, and welfare if engineering projects are not implemented by appropriately qualified and competent practitioners. Risks to consumers of engineering services relate mainly to financial, safety, health and welfare issues associated with engaging inadequately or inappropriately qualified persons to undertake engineering works. The consequences of misjudgement can be costly in either financial or human terms. Aside from immediate health and safety implications of engaging poor engineering services, there can be enormous financial costs to the individual with the delivery of poor engineering services.

The Role of the Engineer on I.S. 465 Register

The I.S. 465 standard (Section 1)

a) Establishes a protocol for assessing and determining whether a building has been damaged by concrete blocks containing excessive amounts of certain deleterious materials (aggregate containing free or unbound muscovite mica or potentially deleterious quantities of pyrite).
b) Describes the methods for establishing the extent of the problem and categorise dwellings.
c) Describes the scope of any testing required and the evaluation of the findings; and
d) Provides the Chartered Engineer with guidance on the selection of the appropriate remedial works to be undertaken.

The role of the registrant, an engineer on the I.S. 465 register, as set out is purely to prescribe/oversee testing and provide guidance on appropriate remedial works. By virtue of being on the I.S. 465 register a registrant is not acting as an Assigned Certifier or in any other statutory role. In practice, it is reported that the role of registrants extends beyond purely engineering-related related work.

In late 2018 Engineers Ireland was requested by the Department of Housing, Local Government & Heritage (DHLGH) to provide a training programme with the outcome of establishing and maintaining a Register of Engineers considered competent to assess buildings damaged due to precast concrete blocks containing certain deleterious materials in accordance with the Standard and hold professional indemnity insurance.

This register lists Chartered Engineers who have the necessary direct professional experience, competency, and specialist training in accordance with the requirements set out in the Standard. There are currently in or around 30 Engineers on the register – this number has reduced from 38 since the inception of the register.

Concerns Relating to Second Remediation

The primary issue with the current scheme is the liability risks associated with providing this service as defined in I.S. 465 to homeowners. Specifically, the risks are inherent with reference to options of remediation other than Option 1 Demolish & Rebuild, i.e., Options 2, 3, 4 & 5 (or a combination thereof) where blockwork is being retained (reference the standard and scheme administrative guidelines).

This is exacerbated by the fact that laboratory reports indicate that a further deleterious material, namely pyrrhotite, has been determined to be present in concrete blocks in Donegal, the significance of which is unknown.

Engineers are being asked to make recommendations on remedial works whereby the mechanism for degradation of concrete blocks requires further research. Furthermore, the scheme emphasises the engineer should make a recommended remedial option that demonstrates the "minimum feasible option" forcing a remedial option that would include retention of blockwork where the technical evidence doesn't support that option. Long term structural performance of the retained blockwork is uncertain and requires further research. This leaves potential future liability risks for the registrant which is exacerbated by the fact the scheme is limited to one applicant, one home, one grant.

Homeowners understandably want certainty in the recommended remedial option. However, in these cases, given that the mechanism for concrete block degradation is not fully understood and with wording in the standard including caveats, uncertainty has become commonplace among homeowners.

A survey of registrants in December 2020 indicated that Option 1 (demolish to foundation level and rebuild) was recommended in 68% of cases in a sample size of 210. In August 2021 this figure was 62% from a sample of approximately 1,600 dwellings. Options 2 and 4 or a combination thereof are the next most frequent recommendations. Registrants are reporting a trend towards increasing recommendations for Option 1 due to the absence of

any substantiating evidence/research to mitigate risk or support a decision to opt for other remedial options.

The overwhelming sentiment regarding the scheme is the lack of certainty concerning partial remediation and the liability for any second and subsequent investigation and remediation works. It is therefore no surprise that recommending Options 2-5 creates considerable unease with registrants. Registrants feel exposed when after an initial remediation, the potential for further damage may occur. Registrants are being asked to recommend remedial works based on currently available information which lacks evidence on the long term structural performance of retained blockwork containing deleterious material including free muscovite mica or pyrrhotite. There is a concerning lack of urgency from any Government body as regards a co-ordinated approach to research into the subject – a subject which has been calling out for such research for at least 6-7 years. Further research was recommended in the report of the Expert Panel on Concrete Blocks in 2017.

Engineers strongly value their professional indemnity insurance which is essential to them conducting their practice and without which engineers cannot work. There is a perception that the current structure of the scheme could give rise to claims arising on an engineer's professional indemnity insurance arising from a second remediation. The footnotes to I.S. 465 Table 6 refer to the uncertainty of any remediation option other than Option 1 and Option 2 and contains a reference to 'limited test data'.

> "The efficacy and longevity of remedial works options other than Option1 and Option 2 of Table D.1 are as yet uncertain. **Based on limited test data available to date**, concrete blocks containing free muscovite mica will not deteriorate if they are kept dry in freezing conditions or are protected from freezing when wet.
> Any sign off in respect of such remedial works shall acknowledge the risk inherent in retaining blockwork which could be susceptible to degradation if exposed to freeze thaw conditions"

Excerpt: I.S. 465 Table 6 – emphasis added

> "Any sign off in respect of such remedial works shall acknowledge the risk inherent in retaining blockwork which could be susceptible to degradation if exposed to freeze thaw action"

Though the risk is acknowledged, the ownership of the risk remains unclear. It may be the registrant and their professional indemnity insurance that will be the first area of contact in the event of a second occurrence. In practice the only way to achieve certainty is to recommend Option1. I.S.:465 states –"Compliance with this Irish Standard does not of itself confer immunity from legal obligations". This would infer that there is no 'protection' for the registrant by following the protocols of the I.S. 465 rigorously.

The unintended consequence of not addressing the issue of remaining deleterious material is to increase the overall cost of the 'Defective Concrete Blocks Grant Scheme' as recommendations for Option 1 will predominate. This may be an important consideration if the scheme is widened to other geographic locations. Engineers Ireland provides suggestions on several adaptations to the scheme and the likely operational impacts to assist the Working Group with their analysis.

The Role of Pyrrhotite

The presence of pyrrhotite is proving significant and registrants are requesting additional expert opinions and research from geologists concerning the mechanism of reaction and deterioration. It is noted that a GSI Targeted research project – 'Pyrite/mica in construction materials' was commissioned in April 2021. This is an 18-month project and results may not be available until late 2022 at the earliest.

It is the opinion of the registrants that much more focused and coordinated detailed research and extending to pyrrhotite, must be undertaken to allow confidence in proposed remedial works.[1] To expedite this Engineers Ireland suggests the Registrants, Geologists & Laboratory Practitioners who have already undertaken analysis and findings on behalf of their clients should be commissioned to complete this research. This will be the most efficient way of progressing this issue given the extensive analysis undertaken to date by these individuals. Of note is that the Department has paid for 90% of the costs of this analysis already through the grant aid scheme. Without expert advice in this area, the ability of engineers to accurately identify causation and the mechanism of deterioration will be compromised, negatively impacting remediation of dwellings in all but Option 1 remediations. Without this robust information from the research, some of the existing remediation work may be in vain for the remaining Options 2-5. The correct course of remedials cannot be accurately prescribed if the causal mineral/s and the exact mode of degradation is not yet certain.

In addition to the presence of pyrrhotite, the range and diversity of comments from registrants indicates that in the absence of underpinning research a pause in survey activity to allow time to reflect on the experience of field-based observations may be required. Some registrants observed low compressive strength on many inner leaf

[1] The incidence of pyrrhotite and crumbling of foundations in northeast USA (Connecticut) has been documented and researched. The outcomes of research in the USA occurrence of pyrrhotite may be of use to inform the Irish context. https://www.gao.gov/assets/gao-20-649.pdf

walls which is not caused by freeze-thaw action. This could also mean that blocks are inherently weak.

Similarly, it was pointed out that I.S. 465 suggests that;

> *'Ongoing maintenance and monitoring of the dwelling's structural condition would be required if Option3, Option 4 or Option 5 are implemented to assess if/when further structural action should be taken.'*

The standard does not provide guidance on the nature of the ongoing monitoring regime, the party that bears the cost of ongoing monitoring and who is responsible for any subsequent remediation. Nor does it mention Option 2, which also leaves deleterious material within the structure.

Engineers Ireland requests that this guidance is provided as a matter of urgency so that registrants may continue to address homeowners' concerns efficiently and comprehensively.

Further Items for consideration by the I.S. 465 Standard Group as part of this Engineers Ireland Submission

1. Under I.S. 465 and S.I. No. 25/2020 ('Dwellings Damaged by the Use of Defective Concrete Blocks in Construction (Remediation) (Financial Assistance) Regulations 2020'), applicability is restricted to specific geographic areas ('dwellings located in the administrative area of a relevant local authority', Co. Donegal and Co. Mayo). However, I.S. 465 registered engineers have identified damage similar to that set out in I.S. 465 and S.I. No. 25/2020 but in different geographic areas, particularly counties Clare, Limerick, and Tipperary. This suggests that the issue is not contained solely within counties Donegal and Mayo and may have a larger impact in other areas of the country.

   Engineers Ireland requests the extension of the application of the redress scheme to cover dwellings similarly affected in other counties so that those homeowners are not disadvantaged by the existing geographic restrictions. This may require amendments to I.S. 465 and SI 25 of 2020.

2. I.S. 465 registered engineers have surveyed many houses with serious cracking symptomatic of deleterious material in the concrete blocks that have had insulation installed in the cavity since the freezing conditions of 2010. Some registrants have observed that there is potential for the insulation to trap moisture, preventing the cavity from drying and thereby accelerating deterioration. There are concerns that the deployment of certain materials and processes in the retrofitting of dwellings may be causing unforeseen problems which may necessitate future remediation. There is a real danger that the retrofit pumping of wall cavities with insulation could have an unintended consequence of exacerbating the cracking of walls with blocks containing deleterious material.

   Engineers Ireland requests technical guidance on processes and materials suitable to retrofitting in these circumstances.

3. Registrants are experiencing increasing delays in obtaining test results from laboratories due to the volume of cases and required analysis. Whereas in the past results were available in three weeks, over time this has extended to over three months. Engineers Ireland requests a review of the test requirements.

4. Registrants are overwhelmed with the volume of work required under the existing scheme. The entire remediation work/project management is Engineer-led which substantially increases the workload on the cohort of registrants and will inevitably lead to delays. In similar projects other Practitioners (e.g., Architects) can fulfil design oversight roles where Option 1 demolition and rebuild applies.
   Architects are considered competent persons to provide oversight for new builds on the Building Control (Amendment) Regulations but this the scheme is required to be Chartered Engineer led whereby for Options 1 remediations it is the registrants view that Architects are competent to provide this function.
   Engineers Ireland requests that further consideration is given to professionals who could fulfil oversight roles and in doing so support the registrants in managing this quantum of work.

5. Some of the reports submitted by homeowners require further clarifications following queries from the local authority. In some cases this is causing significant delays and has resulted in non-recoverable costs for the engineers involved. One registrant has repeatedly sought, but not received, clarification that employees of the county council reviewing the engineers' reports have received training on the Defective Blocks Scheme and undertaken training on I.S.465.

   Engineers Ireland recommends that local authority personnel reviewing applications are Chartered Engineers who have completed the I.S. 465 training.

6. To optimise the review process going forward, Engineers Ireland recommends consideration of a centralised application section administered by Central

7. Government rather than separate Local Authorities. The occurrence of process delay will increase should further counties be included in the redress scheme. A centralised approach would mitigate inconsistencies in the assessment of applications and the processing section would include qualified engineers trained under I.S. 465 to meet the competency requirements.
   Similarly, a centralised Appeals Section would address appeals in a consistent manner.

8. Engineers Ireland recommends that regular workshops are held between Local Authority staff and assessing Engineers to discuss any issues arising which will mitigate requirements for further information requests with the goal of streamlining the application and assessment process.

9. There are reports that laboratory report results are being rejected based on photographs of properties, apparently without inspection of the property by a local authority representative. Engineers Ireland requests a review of local authority practices in reviewing applications from homeowners to ensure that they are in keeping with the principles of the scheme.

10. The completion of stages of the 'Defective Concrete Blocks Grant Scheme' are in practice not clean-cut, and considerable post survey administration work can be generated for the registrant.

11. The payment of contractors for remediation work using staged payments(stages 2 and 3) may need clarification particularly regarding payments to contractors. There is concern regarding retention of 25% by the Local Authority. This may only serve to inflate the cost as contractors may reflect this in their tender response and the perceived risk of any payment uncertainty may significantly increase tender prices.

Conclusion

The above submission provides a summary of the key experiences of registrants operating the 'Defective Concrete Blocks Grant Scheme' during the last year. Many of the registrants' observations to date may require further investigation and registrants can assist in this work. If required, Engineers Ireland can facilitate meetings with registrants to expand on any of the topics.

Engineers Ireland recommends that a review of the operation of the scheme and the content of the I.S. 465 standard be undertaken to benefit from the most recent field-based experience. The registrants have suggested several improvements for the operation of the Defective Concrete Block Scheme and an analysis of the possible technical and operational impacts. This analysis is provided in the annex to this submission.

Engineers Ireland supports the need for a register of competent persons to support the scheme. In its current form, however, there is a high likelihood that individual professionals will discontinue any further involvement with the Scheme. Several registrants have already indicated their intention to withdraw from the scheme. In reality, on the ground, the Scheme has already stalled due to uncertainty, and it will draw to a halt very soon if the registrants' concerns are not addressed.

Damien Owens
Registrar
21 September 2021

Annex 1: Operational Analysis of Potential Changes to the Defective Concrete Block Scheme.

	Description of Change	Potential Operational and Technical Implications
1	**Retain existing scheme (No change)**	• Many, if not all Chartered Engineers on the Engineers Ireland panel may conclude that it is not feasible to continue to provide services in the current scenario. Note there is a significant reduction already and it is Engineers Ireland reading of the situation amongst current Registrant's is that this is likely to continue. The current situation is seen as a "high risk" service. • Even where Engineers are willing to provide the service the cost and availability of PI insurance may become prohibitive. • Homeowners will continue to be uncomfortable with options other than complete demolition increasing pressure on Engineers and Local Authorities, and greatly increasing the cost to the Grant Scheme. • Homeowner issues with sale of properties, insurance etc would continue. • Ultimately if there are few, or no private sector engineers to provide the necessary services the continued operation of the Grant Scheme in its current form may become impossible.
2	**Demolish all properties affected due to the ongoing uncertainty.** Considering the uncertainty around the long-term impacts of these deleterious materials as outlined above, and the need for further research and guidance in assessing affected properties, Engineers may take the view that they are unable to recommend any other Option than full demolition in these cases.	• This may not be accepted as a rationale for Option 1 remedial schemes by the Local Authorities, leading to an ongoing series of further information requests or refusal of Stage 1 applications. If this was accepted as rationale for Option 1 then: • Certainty and confidence of homeowners in the remedial solutions would be achieved in all cases. • Homeowner ability to sell, mortgage and insure remediated properties – in tandem with a programme of education and

		awareness in the financial services industry. • Huge increase in potential cost to the State of remediation of affected properties. • Logistical issues in the affected counties in relation to industry capacity, temporary accommodation etc.
3	**Defer remediation of properties which do not otherwise meet technical justification for Option 1.** In this scenario, the decision could be taken, either by individual engineer, by Registrant engineers collectively, or by the State in administering the grant scheme that there is insufficient information currently available to make sound robust recommendations without undue levels of potential liability, on properties which do not clearly have technical justification for demolition.	• Negative reaction from affected homeowners to being required to continue living in damaged and deteriorating properties. • Homeowner issues with sale of properties, insurance etc would continue. • Further delays in remediation properties which will continue to deteriorate would be likely to increase the final cost of the scheme. • Issues with homeowners seeking to submit Option 1 applications regardless of technical justification would persist, or potentially increase, placing further pressure on assessing Chartered Engineers and on Local Authorities. • Positives would be, in the event of homeowner cooperation based on the Engineer collaboration, would give further time to evaluate the property over a defined period to determine how the building is performing. In the event there is no evidence of further internal deterioration could potentially give the Engineer and homeowner reassurance on the overall performance of the building and therefore lead to some comfort in adapting a remediated option lesser than option 1. Alternatively, should the internal fabric of the build deteriorate it may substantiate an application for an Option 1. • This approach has the potential to avoid applications for remedial Option 1 where the technical justification doesn't support this and therefore will reduce stress points for the homeowner, Engineer and Administrators with further consequential reduction in the

		processing of applications. • Note: this approach would include actions by the homeowner to mitigate the damage as specified by the Engineer.
4	**Defer remediation of properties which do not otherwise meet technical justification for Option 1 & allocation of an Interim State Bond.** In this scenario, the decision could be taken, either by individual Engineer, by Registrant Engineers collectively, or by the State in administering the grant scheme that there is insufficient information currently available to make sound robust recommendations without undue levels of potential liability, on properties which do not clearly have technical justification for demolition. In this scenario the Stage 1 application would be completed and approved Stage 1 eligibility by the scheme administrators based on an option other than Option 1. The State would allocate a bond amount to cover future remediation costs should they occur. This sum would apply to the building rather than the applicant.	The possible outcomes of this are: • Negative reaction from affected homeowners to being required to continue living in damaged and deteriorating properties. • Homeowner issues with sale of properties, insurance etc would continue. • Further delays in remediation properties which will continue to deteriorate would be likely to increase the final cost of the scheme. • Would allow the engineer and homeowner further time to assess how the building is performing over time with potential reduction in Option 1 applications being made and/or approved. • The homeowner maybe in a position to sell the house if the bond applies to the building rather than the applicant. • Note: an alternative approach to this would be the scheme provides funding for replacement of the outer leaf only and an allowance is made for fees for the Engineer to undertake a BCA at an agreed period as part of the monitoring process. A bond would then cover future further works should they be deemed necessary by the Engineer.
5	**Provision of some form of State or Insurance Backed Guarantee for remediated properties.** In this scenario, pending further research and certainty regarding the technical issues outlined above, the State could directly, or through an underwritten insurance fund, provide a Structural Warranty for remediated properties.	• Increased confidence among homeowners to accept technical recommendations other than Option 1. • Improved homeowner ability to sell, mortgage and insure remediated properties – in tandem with a programme of education and awareness in the financial services industry. • Reduced liability for Engineers in relation to cases where due diligence and robust assessment has underpinned a

		recommendation (inadequate or negligent assessment or services would obviously not be covered). • There may be a need for the State or Insurer to provide a technical resource or oversight to ensure recommended remedial schemes were suitable before warranty could be extended. • Reduction in homeowner preference or pressure for Option 1 remedial schemes where not necessary from a technical perspective could dramatically reduce the ultimate cost to the Grant Scheme as well as reducing cost to affected homeowners.
6	**Provide an alternative approach to assessment of properties.** If it is no longer feasible for private sector Engineers to provide services for assessment of affected properties, in may be necessary to revert to a centralised or state provided service model if the provision of a Grant Scheme is to be possible. This could be provided either by Engineers employed directly by the Department or Local Authorities, or by the State retaining the services of competent private sector engineers on the basis that indemnity was extended to retained service providers.	• It would remain possible to provide and administer a Grant Scheme. • Homeowner issues with sale of properties, insurance etc would continue. • Availability of Engineer resources either directly employed or on a consultancy basis are unknown. • Homeowner confidence in service providers employed or provided by the State may be very low. Therefore, acceptance of recommendations other than Option 1 is likely to continue to be low, or potentially even lower than currently, due to mistrust of the Engineering service provider. • May therefore be very unpopular with homeowners

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