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**The Chairman and Members of
North Central Area Committee.**

**Report on presence of pyrite in stone hardcore used in the construction of units in
Beaupark Clongriffin**

In February of this year a cracking problem was first identified in units in an estate in Fingal County Council – Drynam Hall. Following an investigation by the developer the cracking was identified as being caused by the presence of pyrite in the hardcore, which is placed below the floor slabs. The houses affected by the presence of pyrite have been constructed with what are called ground bearing floor slabs. These concrete floor slabs as the name suggests are fully supported by the ground via crushed stone aggregate, which has been placed on the excavated subsoil. The design and construction of these slabs is a standard method of construction used throughout the country.

Following this the City Council met with the developer to ascertain whether this problem was likely to arise in the units constructed in Beaupark by the developer - Menolly. We were advised at that time that a small number of houses were affected but that the majority of the units remained to be checked to ascertain the magnitude of the problem. The developer undertook to keep the City Council informed on the matter. We also confirmed at that point that no property acquired under Part V in Beaupark was affected by this contamination as a different developer had constructed those units.

At our most recent meeting with a representative from Menolly we outlined the frustrations felt by the residents at what they perceived to be a lack of information on the level of the problem within Beaupark and the apparent slowness of response. The representative advised that the company had spent a considerable amount of time and resources on researching the problem to ensure that when they approached residents they could give them the most accurate information possible. We however conveyed the concerns felt and whilst appreciating the need to provide accurate information expressed the parallel need to keep the residents of the area appraised of the background, level and the nature of the problem and a programme for the response by the company at the earliest possible juncture.

The representative accepted this and advised that Menolly Homes are writing to all households this week. This letter will outline the background to the problem and the measures that Menolly Homes are putting in place to resolve the issue. In view of the scale of the problem and the number of houses possibly affected it has taken time to formulate a strategy to deal with the issue.

At this point in time Menolly Homes estimate that 184 houses they constructed in Beaupark, Clongriffin are affected by the presence of pyrite. As stated above the same builder has encountered similar problems in Drynam Hall, which is a development in Fingal County Council's area. In order to definitively establish the number of houses affected the developer has been surveying the houses and testing the under floor stone aggregate. To date 80 houses have been tested and testing is continuing at a rate of approximately 20 per week on the remainder. Testing involves drilling a hole in the floor slab (usually in down stairs toilet) and taking a sample of the stone aggregate for laboratory analysis.

In summary the problems have arisen as a result of the presence of pyrite in the crushed stone aggregate used to support the concrete slabs. This aggregate contains between 1 and 3% fine-grained pyrite. Rock material containing pyrite can be potentially deleterious when used as a construction aggregate in a confined application because it may expand. The swelling of the compacted stone beneath the slabs, following the transformation of the pyrite present in the aggregate, causes the heaving and cracking phenomenon of the floor slabs. The circumstances causing the aggregate to expand included:

- High Pyrite concentrations (greater than 1%)
- Very fine-grained framboidal pyrite with a high surface area to volume ratio that is widely distributed throughout the material.
- Abundance of reactive minerals such as calcite present throughout the aggregate that will react expansively with soluble sulphate ions to form gypsum
- A friable aggregate with a high fines content that packs very tightly under mechanical compaction and so leaves very few voids.
- High humidity environment and warm temperatures.

Menolly Homes have engaged a number of consultants to advise them and to oversee this sampling and testing of the stone and the surveying of the houses to determine the extent of cracking and damage. In conjunction with the above Menolly Homes are writing to each household this week and distributing an information booklet, which they have produced. The booklet outlines among other things:

- Details of ground floor slab construction
- Geological information on pyrite and how it can cause expansion of aggregate.
- House survey and testing procedure
- Detailed seven stage method statement for carrying out of remedial works
- Background information on pyrite and details on Canadian experience
- Series of answers to frequently asked questions.

The developer is undertaking to test and carry out a structural survey of each house and to furnish a copy of the report to the householder. Subject to the agreement of the householder they will commence remedial work on the houses in batches of six as outlined in their method statement. It is estimated that this work will take 12/14 weeks per house to complete. During the remedial work householders will be required to relocate. The developer is offering to provide suitable alternative accommodation or to pay for reasonable costs associated with obtaining alternative accommodation. All works are being carried out in conjunction with HomeBond who provided 10-year structural guarantees for the houses. Menolly Homes are arranging with HomeBond for the extension of these guarantees.

The developer acknowledges that the consent of the householders is a pre requisite to Menolly Homes being in a position to resolve the problem. They state that they wish to work as partners with the householders and responsible professionals that the householders engage, to resolve the issue in the earliest possible time frame.

We attach a copy of the booklet being circulated and will continue to engage with the developer to assist in the resolution of the problem.

Céline Reilly
Area Manager