

Information Leaflet for Homeowners

Pyrite Damage – How it occurs

In general, pyritic heave presents as a problem in dwellings with ground supported concrete floating floors (see Figure 1). This type of building construction entails placing and compacting hardcore material, under the footprint of the floor slab, to support a poured concrete ground floor slab (cast in-situ).

When pyrite is present in the hardcore material and the necessary conditions prevail, oxidation will occur. This can ultimately result in the production of gypsum which has significantly greater volume than that of the source pyrite. As a result the hardcore material will expand which may cause the ground floor slab and any supported internal partition built off the slab to lift. Consequential structural cracking of floors and other elements may result from this uplift.

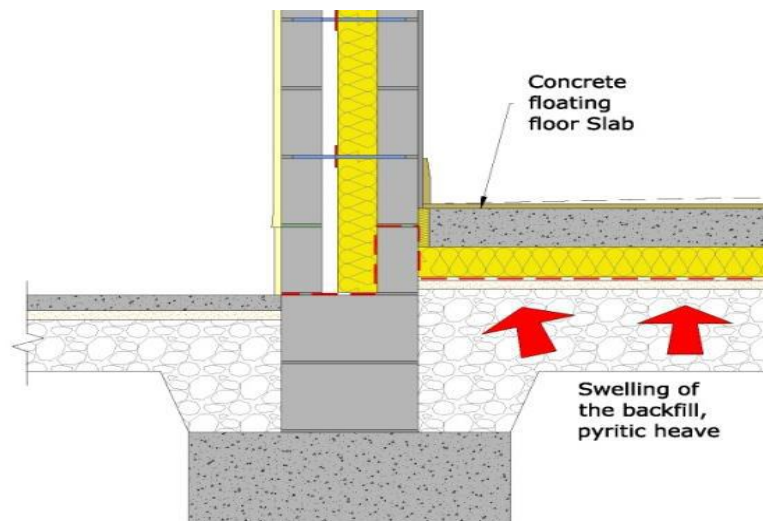


Figure 1 Concrete floating floor

Pyrite Damage – Visual damage

In general, typical examples of damage caused by pyritic heave are shown in Figure 2. These consist of:-

1. Cracking of concrete floor slabs;
2. Lifting/hogging of concrete floor slabs;
3. Differences in levels across concrete floor slabs;
4. Cracking, buckling and/or lifting of elements resting on the concrete floor slabs, e.g. partitions, doors;
5. Cracking and/or bulging of internal or external walls;
6. Lateral movement of external walls



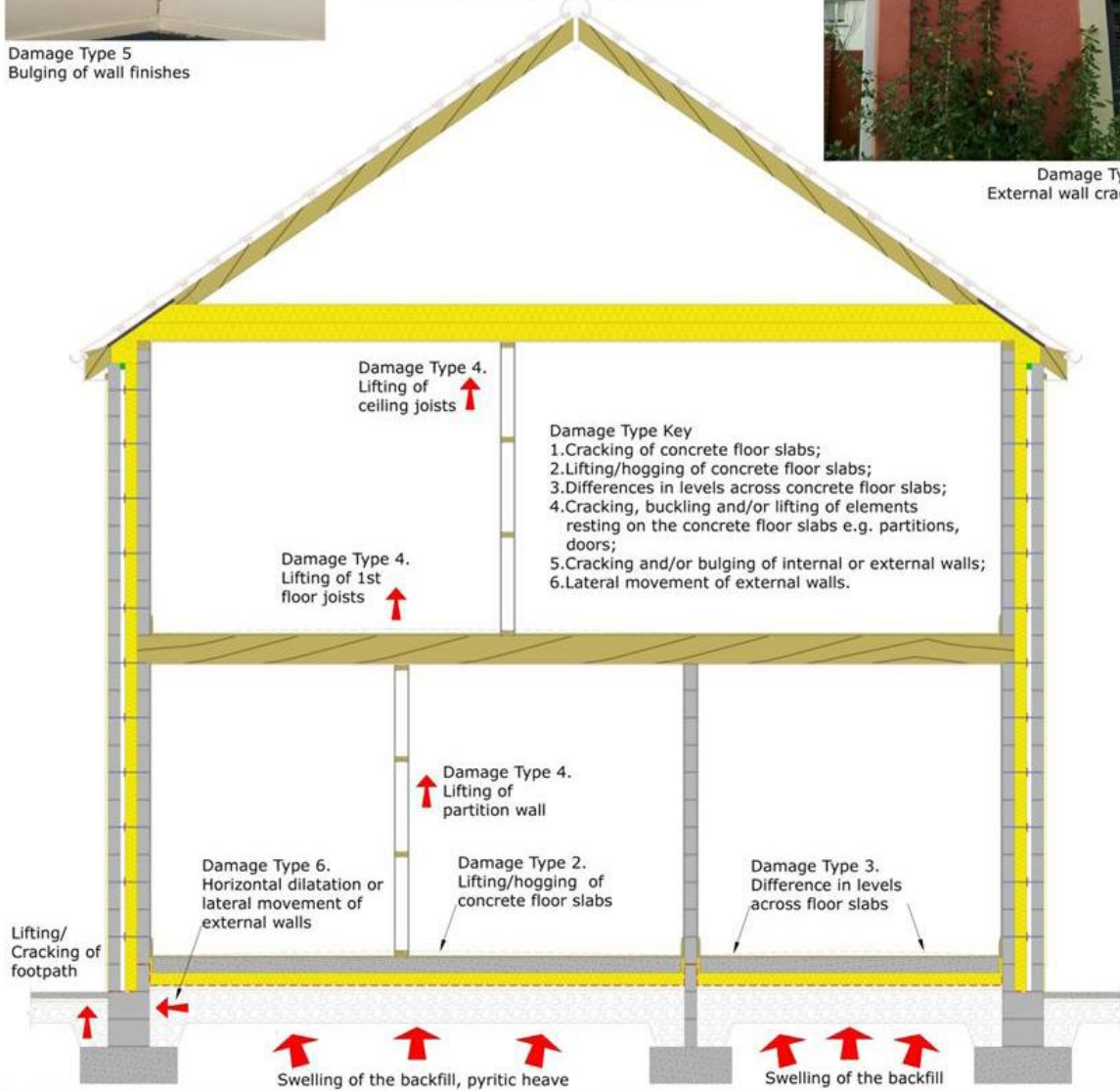
Damage Type 5
Bulging of wall finishes



Damage Type 4
Cracking and Buckling of internal partition



Damage Type 5
External wall cracking



Damage Type 2
Lifting/Hogging of floor slab



Damage Type 1
Cracking of floor slab



Damage Type 6
Lateral movement of external wall



Damage Type 4
Cracking and Buckling of internal partition

I.S. 398-1:2013 identifies five building element groups which are visually inspected during the Building Condition Assessment of a dwelling. The groups are listed below and damage to ground floor surfaces receives the highest priority when assigning an overall damage level as described in the standard.

I.S. 398-1:2013 Element Groups:

1. Ground floor surface level;
2. Fixtures and Fittings;
3. Walls/Partitions on ground floor;
4. Ground floor ceilings;
5. External Walls.

The Assessment, Verification and Recommendation Process

- (a) The Building Condition Assessment is undertaken to establish a Damage Condition Rating recorded on the level of damage assessed. This involves a desk study and a visual inspection of the dwelling to establish whether the damage visible in the dwelling is indicative of pyrite-induced damage.
- (b) The Damage Condition Rating is classified as follows:

0	None (no damage or aesthetic damage only identified that could be attributable to pyrite-induced heave)
1	Minor (some damage that could be attributable to pyrite-induced heave or other causes)
2	Significant (significant damage identified that is consistent with pyrite-induced heave).

As a guide, a **Damage Condition Rating of 2 will require certain minimum levels of damage in at least three of the Element Groups** listed above (damage values in the range of 0 to 10 are assigned depending on severity).

If the application is considered eligible it will progress to the second stage.

- (c) The second stage of the process , Verification and Recommendation Process, confirms that the damage recorded in the Building Condition Assessment Report is attributable to pyritic heave. This may involve **taking samples** of the hardcore from beneath the ground floor of

the dwelling for **laboratory testing** by an accredited laboratory and **confirmation of the damage**.

N.B. To be included in the Scheme, a dwelling must have a damage condition rating of 2, as defined in the Irish Standard I.S. 398-1:2013 Part 1, consistent with pyritic heave and it must be verified that the damage is attributable to pyritic heave following the Damage Verification Process.