Jackin' Houses

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Global warming is happening, and we can all see the effects in rising sea levels and extreme weather events happening more frequently. In particular, houses that are over a hundred years old and have hardly ever been flooded until a few years ago, are now more frequently affected by flooding. Many housing estates have been built on floodplains in the last few decades. These floodplains may have never flooded for many years up to the time of construction, but have had multiple flooding incidents more recently. The attitude of the insurance companies is very simple: after reimbursing the cost of multiple flooding incidents, they refuse to insure the property against flooding. They have, in effect, written the house off as no lender will mortgage a property that cannot be insured against flooding. But they often do not reimburse the owner with the full value of the property, leaving him with a mortgage to pay on an unsellable house.

I have often watched TV programmes that show buildings, usually of significant historical importance, being rescued from demolition by being jacked up and loaded onto a specially constructed trailer, transported to a new location, often just a few hundred yards away, and then lowered onto new foundations. It occurs to me that a house liable to flooding could be jacked up, raised so the damp course is above the maximum flood risk level, the foundation walls are then built up and the house lowered onto the extended foundations. There is a significant cost to this, typically around 20% of the value of the same property in a nearby area not prone to flooding, but this is far less than the write-off value of the property.

This document shows ways that this work could be done. The proposal provides business opportunities for heavy lift contractors to do the work and for architects, lawyers or other entrepreneurs that are in business to plan, facilitate and manage the whole process whilst also providing emotional support for the home-owner.

The owner needs to accept that the house will be safe from damage during any future flooding incident but that the garden and any sheds, garages or other items not raised above flood level may still be affected. He also needs to accept that, during a flooding incident, he may need to use a boat to access his home. He may also need, throughout any flood-warning period, to park his car on higher ground and then walk or row back to his house.

The principle of preparing a house for lifting to a safe level is simple, but there are some practical issues that need to be considered for some specific instances.

1. A flood risk survey will need to be done to determine a safe height to which the foundations need to be raised. In some instances this survey may indicate that the house currently exacerbates the flood risk by blocking the run-off of floodwater, a process which may be mitigated by including some ducts through the sub-floor area of the house to allow such water to flow away.
2. The house must be emptied of occupants, furniture and all belongings. The contents are put into temporary storage. The home-owner will need to move into temporary accommodation and the facilitating company may be able to assist in getting a good discount where it has several client families in the same area.
3. All services, (gas, water, electricity, sewerage and communications), are isolated externally and disconnected below floor level.
4. For a house with suspended ground floors, holes are cut in the foundation walls below the damp course and near the corners of the house for C-section steel beams to be inserted. These beams are predrilled with regularly spaced holes

and have a flexible rubber strip attached to the vertical face thick enough to accommodate any unevenness in the building fabric. A similar C-beam is placed on the outside wall, or on the inside of an internal load-bearing wall at the same level. Holes are drilled through the wall via the pre-drilled holes in the steel beam. The two beams are clamped together by bolts passing through these holes. The steel beams are attached to one another by brackets at the exterior and interior corners to form a rigid support frame for the whole house. The jacks are raised slightly to apply upwards pressure to this frame; this allows a stone-saw to cut through the foundation wall just below the steelwork so that the jacks can be raised to lift the house.

5. For houses with unusual footprints, some complex internal steelwork may be needed to properly support the house during the lift. In some rare cases, it may be necessary to place one or more jacks within the footprint of the house to ensure that it is properly supported during the extending of the foundation walls.
6. For a house with a concrete raft foundation and solid floors at ground level, trenches must be cut into the front and back gardens and horizontal boreholes are cut through the ground beneath the foundations. Steel I-beams are posted through these boreholes to support the house whilst it is lifted. For a house with a raft foundation that is very close to a road, it may be necessary to close the road and to trench across it to insert these beams. Alternatively, rubber-backed steel beams are attached to the walls just above floor level. The new foundation walls are built on top of the concrete raft with a new damp course at the appropriate level. The solid floors can then be replaced with new suspended floors once the house has been raised.
7. For semi-detached or terraced houses, either agreement must be obtained with all the neighbours to raise all of the houses simultaneously, or agreement must be reached regarding the treatment of the affected partition walls.
8. For a house with a built in garage, there are three possibilities:
    - To raise the garage with the house and to construct a ramp to drive the car into the garage.
    - To raise the ceiling of the garage but leave the floor as is, and accept having to park on higher ground whenever there is a flood risk.
    - To raise the ceiling of the garage and replace the floor with a platform car-lift, accepting that this may not work in the event of electrical power failure.
9. For access to the house, the owner needs to choose between having a ramp to each of his external access doors, having a flight of steps or providing a lift plus an emergency escape stair. The outside stair needs to allow a boat to moor alongside it and for the boat's passengers to step onto it from the boat.
10. For houses with suspended floors on the ground floor, it may be preferable to replace the dwarf walls with steel I-beams rather than build up the dwarf walls.
11. It will be necessary to check that the existing foundations will support the extra weight of the raised foundation walls; there may also be wind loading issues because of the increased height of the roof. The foundations may need to be under-pinned or otherwise reinforced to provide the required additional strength.
12. The foundation walls are built up once the house has been raised to just above the required final level. Where the flood risk assessment indicates the need,

ducts through the new sub-floor area of the house are installed to prevent build-up of floodwater and facilitate run-off.

13. The house is lowered onto and attached to the raised foundations and the steelwork is removed. The holes in the walls used to insert the steelwork are rebuilt and made good, and the new foundation walls are rendered or otherwise given an appropriate decorative finish to match or blend with the pre-existing house. Ramps, steps or lifts are installed as required for access.
14. All services are reconnected and tested.
15. The house contents are returned to the house and the owner and his family may move back in.

It is clear that this will be a disturbing and traumatic time for the owner and his family, but the process can be planned for a time of year when the weather is clement. The removal of the fear of a flooding incident during a time of severely inclement weather is surely a compensation.

The process will be expensive, and the facilitating company should be prepared to negotiate with:

- the insurer, who could benefit long-term from having fewer houses on its books that are prone to flooding, and whose previous remuneration decisions may be questionable once this proposal is on the table;
- with the Local Authority, who may be liable for permitting development on flood-prone land, or for performing flood control measures elsewhere that exacerbate flooding of the area in question;
- with the developer, who may have been remiss in failing to perform his own flood risk survey in advance of the housing development;
- with the mortgage company, bank or other lender who may be interested in turning what was a written-off asset into a desirable and saleable property once more;
- with the heavy lift contractor who may be in competition with others over similar business opportunities.

Where there is a large housing development that has become flood-prone, economies of scale may be realised. Such developments generally feature many identical houses with a small number of footprints; the same steelwork may be constructed and reused many times in working across such a site. Moreover, the workforce doing the job will become skilled and proficient in working many times with the identical house footprints.

