

Our ref: EJM/CH/19553~01

22nd February 2019

[REDACTED]
Pelham Structures Ltd
Brices Yard, Butts Green
Saffron Walden
Essex CB11 4RT

by email only:

Dear [REDACTED]

RE: LAND TO WEST OF MILL LANE, HATFIELD HEATH, ESSEX

Further to your request I was able to visit the above site on 21st February 2019. The purpose was to inspect seven existing structures dating from WWII which are part of a former Prisoner of War Camp (No 116), and situated to the east of the access road, as well as the Water Tower. We have numbered the huts on the attached plan for ease of reference.

Seven of the structures are of similar construction, being Ministry of War Production 18ft x 6in Standard Huts (MoWP), appearing predominantly to form guard and administrative buildings, and formed of pre-cast concrete frames, comprising posts with integral internal elbows, which then support frame rafters rising up to the ridge essentially forming portals (see photograph 2). The frames support pre-cast concrete eaves plates (see photograph 3), and then to the corners of the building are corner posts (see photograph 4) which supports an eaves plate across the width of the gables. This gable plate is in three sections with secondary posts dividing this into thirds (see photograph 5). The ridge has a steel tie extending through the half lap joint with pattress plates, either side (see photograph 6), and used to stabilise the head of the frames.

The fact that it is a modular system is confirmed by unique numbers stamped on some of the members and still visible in places (see photograph 3). In between the concrete frames is predominantly a clay hollow block (see photograph 7), although in the case of building five, this has been replaced with brickwork (see photograph 8).

The windows are predominantly timber framed with asbestos side lights/panels (see photograph 9), although Building five has steel casements and security grills (see photograph 8), The gables are either timber framed and panel finished but with a central timber louvre ventilation (see photograph 5), although again there are some variations with hollow block (see photograph 1) or brick gables, again with venting.

The roof is formed of simple corrugated asbestos sheets, supported on common purlins (see photograph 10) which then supports a plasterboard finish to the underside (see photograph 11). Internal cross walls are either in brick or hollow blocks, with pre-cast concrete lintels and sometimes thickening piers (see photograph 12). The floors are of concrete (see photograph 13) and cast in bays.

Building 7 is a Laing 16ft sectional timber building with lightweight timber trusses and timber framed walls (see photographs 14 and 15). The walls have partially collapsed with the building dropped down to half height.

The final building is the Water Tower which is brick with concrete internal floors and the tank contained at the head, although this element was not inspected (see photographs 16 and 17).

There are a number of defects with the MoWP buildings and in particular it can be seen that there is corrosion of reinforcement and failure of concrete cover to a reasonable number of reinforced concrete elements (see photographs 18 and 19). This is one of the most common defects with reinforced concrete particularly of this era and relates to carbonation of the concrete as well as moisture ingress.

However, it is possible to carry out traditional repairs, which would be to remove all loose and debonded concrete, cleaning back the reinforcement steel, paint treating this and then making good the concrete with either a proprietary mortar or a mix to match original. Alternatively, electro-chemical methods are available, such as cathodic protection to protect the bars from future corrosion, with associated concrete repairs. This defect is predominantly to posts, although there is some evidence of it also on eaves plates, eaves members and occasionally on roof principle rafters.

The infill panels are largely intact, although there are some areas of local disruption. For instance, Building 4 has been disrupted by the adjacent tree which has caused lifting of the structure centrally (see photograph 20), and some associated but surprisingly little damage to the infill. Local repairs will be needed in places at low level where blocks have been frost damaged and shattered (see photograph 21) and often caused where external ground levels have risen (see photograph 22). These should be lowered.

To Building 5 the windows are of iron with iron grilles externally (see photograph 8). Corrosion of the inbuilt sections has caused brickwork to fracture and it will be necessary to remove the grilles and ensure any new elements are appropriately treated to resist this action in the future.

No inspections of the foundations were undertaken, although to the end of Building 1 to the south side, a projecting ledge can be seen, which can perhaps suggest a concrete raft foundation (see photograph 23). Historic drawings seem to also suggest a concrete raft with a toe to the edges supporting the walls. Generally there is very little evidence of movement, so whilst some investigation will be required, there is nothing to suggest that new foundations are necessary, based on a visual assessment and the past performance of the buildings over their lives.

The timber framed windows have largely rotted out and will require replacement. Concrete slabs internally have quite a number of cracks and clear day work joints, and we suspect that the assumed screeds will need to be removed to allow insulation and new finishes.

To the roofs there is inevitably decayed to some timber purlins, but where these can be seen, for instance in Building 2, these are at regular and comparatively close centres, and should be able to support new corrugated and insulated panels and ceiling finishes. If necessary additional purlins can be added.

Building 2 also has a tree in close proximity to the west elevation which will require removal and may have locally affected foundations

Building 3 is sixteen bays long and has brick piers or brick infill every fourth or so bay, and which provide lateral stability. These positions have apparent timber trusses over (see photograph 14). One cross wall towards the east end has some movement but which is historic, and beyond this it can be seen that the concrete bay and principle rafters are tied at the ridge level with the longitudinal steel rod with plate either side (see photograph 6).

Building 5, the brick infilled MoWP has lost some of its internal brick walls which appeared to sub-divided it into cells. Similar comments exist regarding the overall structure and defects. Building 6 is clearly a latrine with internal drains running below and similar comments apply.

Building 7 is of timber framed construction, and to which the whole lower section of the structure has collapsed so that the building is now at half height (see photograph 14). The roof frames largely survive intact, except two which have been affected due to collapse and then the west one with some decay (see photograph 15), but generally being salvageable for reuse with some repairs. This includes the down braces to the posts, then with the posts and wall panels requiring replacement.

Of course, the building will need to be carefully lifted to undertake this work, but with roof finishes moved etc. this should be perfectly feasible. The gables to both end are lost and one further frame at the west end will need some repair.

We also inspected the water tower, which is a substantial brick structure, rising through three floors and then with a water tank above (see photograph 24). The walls are 18 inches thick at ground floor level and then with internal concrete floors. The windows are metal casement and of Crittal style with concrete lintels over these as well as doors (see photograph 25). There are some minor signs of movement externally (see photograph 26), probably related to differential thermal movement of the concrete floors and the structure generally, but not of any structural concern.

Both the first and second floor are of reinforced concrete construction with the timber form work lines seen clearly on the underside, and with a central crack running in both slabs, but again which is not of structural significance (see photograph 27).

There is some slight movement about the slab new brickwork to the east end, where there are cut outs either side and which may be partly responsible for the reduced lateral restraint, but again structurally it is not significant.

The tank level also has a reinforced concrete slab below which is also supported on five significant steel beams (see photograph 28). These are surface corroded but there does not seem to be any significant evidence of crack damage to the brickwork around the ends.

The external ladder to the tank was not used due to safety reasons, so the water tank itself was not inspected. Externally at the base is a slight projecting concrete apron and one assumes that this building likely to have deeper foundations.

In conclusion the MoWP huts can be described as in not unreasonable condition, bearing in mind their age and form of construction. There is surprisingly little movement around the buildings, and the majority of that which exists relates to where self-seeded trees have grown up immediately alongside. As there will be only a nominal load increase, we don't see any reason why substantial foundation works would be required but this will be subject to further checks.

Clearly there are repairs needed to the reinforced concrete to a reasonable degree, which can be either traditional concrete repairs, using either proprietary mortars or like for like mixes, or alternatively cathodic protection, and then similar mortar repairs.

The infill clay hollow blocks or brick generally survive well although the hollow blocks, where ground levels have risen, have in cases shattered through frost or damp action and some local replacement will be needed. Windows will need to be replaced and where iron frames and/or grilles are built in, these will need to be removed to resist the cracking which can occur through corrosion jacking.

Roofs where the common purlins have not decayed can be retained and reused, if necessary supplemented with additional purlins of similar sizes if new insulated corrugated finishes require this related to their weight. Some timber framed gable panels may need to be rebuilt where they are affected by decay, and some connectivity between eaves elements will need to be improved.

With regards to the Laing type Building 8, it is possible to retain and jack up and reuse the majority of the roof trusses, although at least three of them would require some repairs or replacement. The walls will need to be largely rebuilt on a like for like basis and clearly a new sole plate ideally raised above ground level to prevent re-occurrence of low level decay.

With regards to the Water Tower, this is a substantial robust building with no significant structural issues, although with some minor evidence of movement but which is not of structural concern.

In conclusion we do not see any reason why the existing buildings cannot be retained and reused, and with the majority of the existing fabrics surviving and being reused within any new use.

Our Insurers require us to say that it should be stated that we have not inspected woodwork or other parts of the structure unless specifically detailed in the report, which are covered, unexposed or inaccessible and we are therefore unable to report that any such part of the property is free from defect. This report has been carried out to the Client's requirements and no liability is intended or will be accepted from any third party whatsoever.

The limits of liability are restricted to the contents of this report. No opening up or investigation of foundations etc was carried out, the inspection being visual only. No checks on load bearing capabilities have been carried out.

I hope the above is clear but please do not hesitate to call me if you have any queries.

Yours sincerely

FOR THE MORTON PARTNERSHIP LIMITED,



EDWARD MORTON B.Eng(Hons), C.Eng, FICE, IHBC

Engineer Accredited on Conservation

Encls – Plan and Photographs



1:500 Proposed Site Layout

Land West of Mill Lane, Hatfield Heath, Essex, CM22 7AA

Rev B - Feb 2019 - Redesign of Site Plan to LA Comments
 Rev A - June 2018 - Redesign to retain elements of POW camp structures

Pelham Structures
 LIMITED
Unit 3, Brass Yard, Butts Green, Clavering, Essex CB11 4RT.

Project name:	Land at Mill Lane	
Drawing title:	Proposed Site Layout	
Scale:	Date: 04.10.2016	Drawing no: 471.601B
Paper: A1 Paper	Drawn: CJH	
<small>Dimensions are in millimeters unless otherwise stated. Do not scale from this drawing. If in doubt, ask.</small>		



Photograph 1: Typical Ministry of War Production Standard Hut



Photograph 2: Pre-cast concrete post with integral elbow and pre-cast frame rafter above



Photograph 3: Pre-cast concrete eaves plates



Photograph 4: Corner post with eaves plates above



Photograph 5: Typical gable with tie at eaves level in three sections and secondary posts



Photograph 6: Ridge tie with patten plates either side of frame



Photograph 7: Hollow blocks used as infill and some intermediate walls



Photograph 8: Building 5 with brick infill



Photograph 9: Timber windows with side panels in asbestos board



Photograph 10: Purlins at regular centres to support roof covering and internal finishes



Photograph 11: Roof with internal plasterboard between purlins



Photograph 12: Internal cross wall in brick with thickening pier



Photograph 13: Concrete floor in Building 3



Photograph 14: Building 8 with part collapsed walls



Photograph 15: Roof trusses to Building 8



Photograph 16: Water Tower



Photograph 17: Internal concrete floors to Water Tower



Photograph 18: Reinforcement corrosion and concrete cover lost to post



Photograph 19: Cracking to post suggesting reinforcement corroded below



Photograph 20: Local damage to structure from self-sown tree



Photograph 21: Locally damaged hollow blocks due to damp



Photograph 22: Locally damaged blocks due to high external ground levels



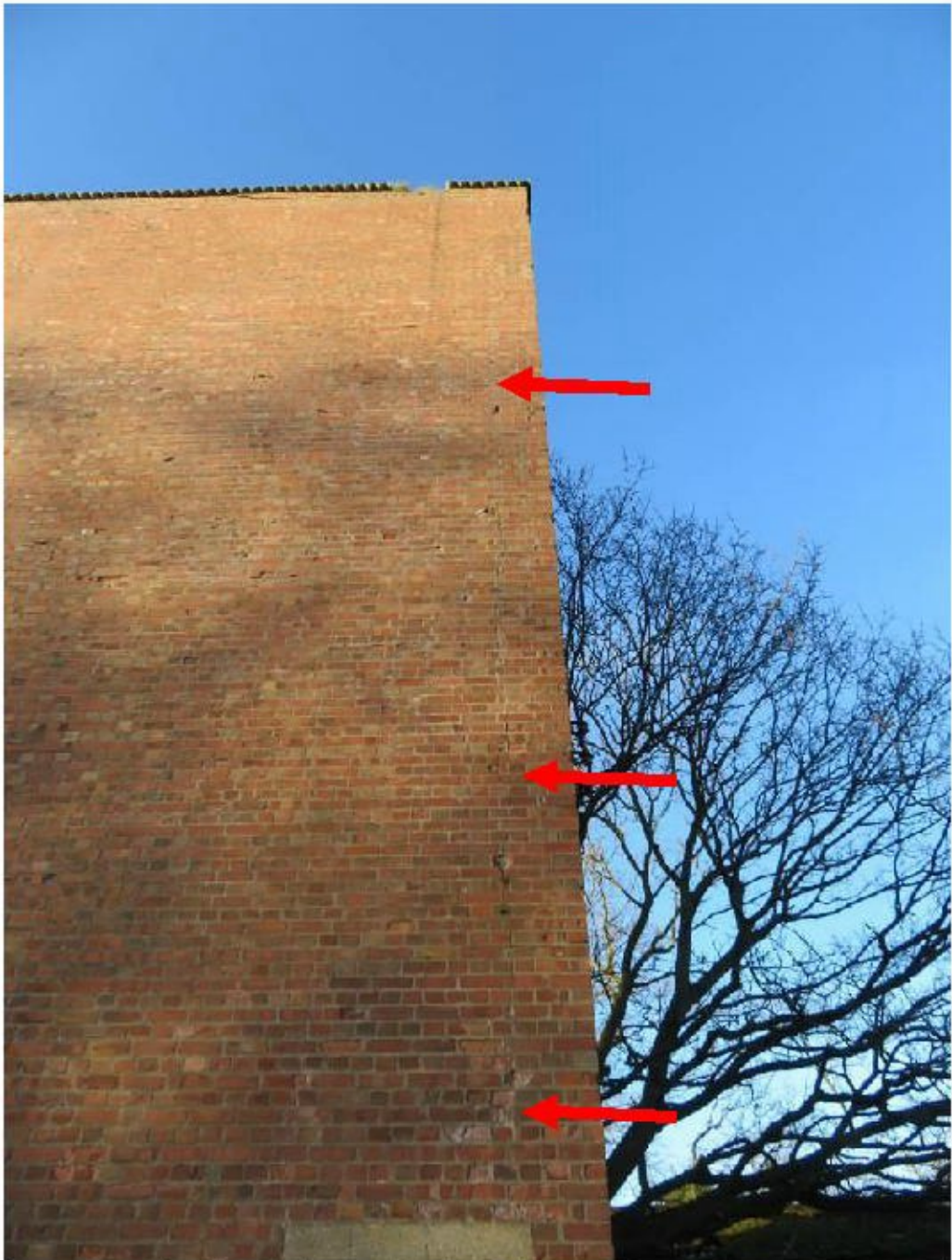
Photograph 23: Projection at ground possibly suggesting concrete raft foundation



Photograph 24: Water tower east facing elevation



Photograph 25: Crittal window to Water Tower



Photograph 26: Movement to south elevation to east end



Photograph 27: Internal concrete slab with central crack



Photograph 28: Steel beams below water tank level with concrete floor over