

# **J M Loades & Associates Ltd**

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NOTE NEW ADDRESS.

## **Report**

**in relation to**

Structural Assessment.

**carried out at**

Alfa Laval Pumps Limited  
Birch Road  
EASTBOURNE  
East Sussex

### **Client**

Healey & Baker  
Real Estate Consultants  
29 St. George Street  
Hanover Square  
LONDON  
W1A 3BG

ref **990605/jml**

date **23 June 1999**

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### 1. Notes

- 1.1. This '*Report*' is prepared for the sole use of the person, firm or company to whom it is addressed (together with that of any other person, firm or company whose interest was disclosed to and accepted by us prior to its preparation) and no responsibility is accepted by us to any other party whatsoever for the whole or any part of its contents.
- 1.2. Please note that this '*Report*' is not a full Structural, Building or Valuation Survey but is confined to the matters described therein.
- 1.3. We have not inspected woodwork or other parts of the structure which are covered, unexposed or inaccessible and we are therefore unable to report that any such part of the property is free from defect.
- 1.4. Abbreviations used within this '*Report*' are defined as follows:-  
  
LH or LHS               = Left-hand or left-hand side.  
RH or RHS             = Right-hand or right-hand side.  
N, S, SW,-SE etc.     = Points of the compass.  
  
Also note that, when referring to boundaries, the LHS or RHS is defined when viewing the property while facing the front elevation.
- 1.5. Reference should be made to the attached plan nod. 990605-Sk.01.
- 1.6. Where estimates of costs of building works are given these are to be taken as approximate budget figures. Accurate costs can only be assessed upon the obtainment of tenders based on full specifications and details. All figures are deemed to include professional fees as necessary but exclude Local Authority fees and VAT.

## **2. Brief**

- 2.1. We visited site on 21 June 1999 in order to carry out a brief, limited and visual inspection of the above in order to assist Healey & Baker to prepare a current valuation of the property. It should be noted that a full condition survey was not required.
- 2.2. The writer's extensive experience of the various buildings, including remedial works and structural design of the more recent elements, has been drawn upon where appropriate.

## **3. Overview of Ground Conditions**

- 3.1. Numerous borehole investigations have been carried out on the site, at least one to a depth of around 30m.
- 3.2. A top crust extends across the site, approximately 1m thick, consisting of either compacted chalk fill or firm clay. Underlying this there is a very soft silty clay with frequent pockets of peat. The firmness increases gradually after a depth of approximately 18m and it becomes fairly stiff at around 22m.
- 3.3. Ground water has often been encountered within the top 0.6m.
- 3.4. The very soft silty clay has proven to offer very little resistance to initial settlement. It would appear that the consolidation mode of settlement is never reached and that any structures founded at shallow depths would be liable to ongoing movement throughout their life.
- 3.5. Foundations supported off piles driven into the deeper, stiffer material have generally not shown any signs of excessive settlement. Recent piles have reached reasonable load sets at depths of 25-30m.

#### **4. Buildings '1' & '2'**

- 4.1. These structures are assumed to have been built at the same time, prior to 1969. We have not come across any original construction details of either.
- 4.2. Building '1' consists of a single storey portal frame with columns taken off large concrete spread foundations, assumed reinforced. The concrete floor slab appears to be of a groundbearing type but it may be integral with the main foundations, forming a raft.
- 4.3. Building '2' is of two storeys consisting of a flat roof over loadbearing masonry.
- 4.4. In Building '1', the floor surface was slightly undulating and a number of small, historic cracks were visible. A network of lightweight cranes had been installed in recent years. These had bases bolted directly to the floor but did not appear to be causing any distress.
- 4.5. There was extensive cracking within the external walls, up to 5mm in width, particularly to the SE and NW elevations of Building '1'. These could have been caused by either excessive settlement of the foundations or longitudinal racking of the portal frames, or a combination of both. Bearing in mind the age of the building it is our opinion that the damage is not sufficiently severe to adversely affect the serviceability of the structure. Periodic repairs should be carried out to maintain weathertightness.

#### **5. Buildings '3' - '6' inclusive**

- 5.1. These were constructed around 1969. According to original construction drawings they were all built off reinforced concrete raft foundations. Subsequent investigations have proved this to be correct for Building '4'.
- 5.2. Building '3' is of two storeys consisting of a flat roof over loadbearing masonry. Buildings '5' & '6' are of similar construction but single storey. All show small areas of minor cracking within masonry which would generally be attributable to small differential settlements and thermal movement of clay brickwork. Periodic repairs should be carried out to maintain weathertightness.
- 5.3. Building '4' consists of a quadruple bay, single storey portal frame structure and it has settled significantly. This is not perceived without taking physical measurements but a survey carried out within the last 5 years revealed differences of up to 200mm in the level of the floor slab. Problems have also occurred in the past due to differential movement between Buildings '4' & '5', particularly along the roof junction. However, it is our opinion that this structure is serviceable in its present condition and should continue to be so for at least another twenty years.

## 6. Building '7'

- 6.1. This was constructed as an extension to Building '4', with almost identical superstructure, around 1971. Original drawings and subsequent inspection of Local Authority archives show that perimeter walls and all columns were taken off reinforced concrete ground beams/pile caps off driven piles. Driving records indicate that pile depths were in the order of 15-20m.
- 6.2. The original floor slab was of a concrete groundbearing type. It was lightly reinforced and generally 175mm thick. Significant settlements had occurred, in excess of 200mm. Some degree of frictional restraint was evident along ground beams and around pile caps thus resulting in severe dishing to the centre of slab panels and cracking around columns.
- 6.3. In the past fifteen years a number of replacement machine bases have been inserted (marked 'MB' on the attached plan). These are typically 800mm thick, reinforced concrete, semi-flexible rafts, with isolation joints around their perimeters. Settlements were to be expected and the oldest ones have sunk by more than 100mm. However, they have generally remained level and hence serve their purpose.
- 6.4. The various floor settlements have now resulted in significant differences in level. This makes circulation around the unit very difficult. A number of ramps have had to be installed to relieve the problem which, because of continued movement, have to be adjusted or re-laid occasionally.
- 6.5. Another reinforced concrete, semi-flexible raft was installed to the threshold of the NE roller-shutter door (marked 'ER' on the attached plan). This entrance was, and still is, used by fully laden HGV vehicles and severe localised damage to the former structure was being caused.
- 6.6. Remaining areas of existing floor are in very poor condition. In our opinion they are no longer serviceable.
- 6.7. Below we have outlined increasing levels of remedial works that could be considered to improve/rectify these problems. An approximate cost implication for each has also been given where appropriate (see 1.6):
  - a) Break out all remaining areas of original floor and replace with a series of isolated, reinforced concrete rafts. These would provide usable, level floor spaces but, as differential settlements would still occur, ramps would be necessary to aid circulation. *Cost £190,000.*
  - b) Break out all existing floor slabs, including machine bases and entrance raft. Install new reinforced concrete piled slab suitable for lightweight industrial use (ie. similar to Building '4'). *Cost £380,000, excluding any work in relation to relocating existing machines.*
  - c) Break out all existing floor slabs, including machine bases and entrance raft. Install new reinforced concrete piled slab suitable for machines similar to those being used currently by Alfa Laval Pumps Limited. *Cost £550,000, excluding any work in relation to relocating existing machines, providing new ones, or effects on business/production.*
  - d) Demolish whole building, break out all existing floor slabs, including machine bases and entrance raft, break out top of existing piles. Erect new basic steel-framed building for lightweight industrial use off new reinforced concrete raft. *Cost £1,500,000.*

- 6.8. Fairly recent, moderate cracking has occurred within masonry panels towards the Northern end of the NE elevation. We are minded to think that this has been caused by longitudinal racking of the portal frames and/or minor settlement of the original piles in this area. There is nothing that can be done to resolve the latter but the insertion of some diagonal bracing to the end bay of the portals and reconstruction of the worst affected panel would prevent the former from re-occurring. We would suggest that a *sum of £6,000* would cover this work.

## **7. Building '8'**

- 7.1. This was understood to have been constructed in the 1970's off a reinforced concrete raft. It was single storey with a flat roof but it has now been encompassed within Building '10'.
- 7.2. Some differential settlement has occurred where walls abut Building '10'. The damage is slight and should be made good in the course of general maintenance.

## **8. Building '9'**

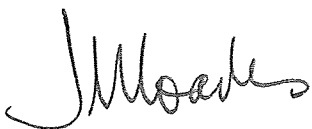
- 8.1. This was constructed in 1994. It is a two storey building with a flat roof off loadbearing walls off reinforced concrete foundations off driven piles.
- 8.2. Some differential movement has occurred at the abutment with adjoining buildings but this has generally been accommodated by the joints provided.
- 8.3. A very recent, moderate crack has appeared at high level to the NW elevation. A masonry expansion joint was provided in the parapet wall above flat roof level but the section of outer skin brickwork between this and the door/window lintel appears to have arched upwards due to horizontal expansion. The problem would be rectified fairly easily by extending the joint down to the lintels. We would suggest that a *sum of £350* would cover this work.

## **9. Building '10'**

- 9.1. This was constructed in 1996. It is a single storey, steel-framed building taken off reinforced concrete foundations off driven piles.
- 9.2. In addition to Building '8' it encompassed the former Well and its surrounding piled slab.
- 9.3. Some slight cracking has occurred at high level within an internal blockwork partition. This propagates from the corners of a void where a crane beam passes through the wall and should be repaired in the course of general maintenance.

**10. Other comments**

- 10.1. The site has suffered from problems with surface water drainage for many years, particular from the roofs of Buildings '4' & '7'. The runs have very shallow falls and the discharge points can often be submerged. During heavy rainfall the system backs-up and can result in ingress of water to the factory. It is also very likely that pipework and/or inspection chambers have been damaged by ground movements. In our opinion there is nothing that can be done to resolve this other than to design and construct a completely new system. We do not have sufficient information at this juncture to give an estimate of the possible costs involved.



**John M Loades.**