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MILL POND ASSESSMENT

Project Number:	**15271**
Report Reference (Revision):	**MPA01 (B)**
Client:	**Mr Z Hinchcliffe**
Site Address:	**Dobroyd Mills, Holmfirth**
Date:	**July 2017**

Contents

Revision	Date	Author	Checked by;	Comments
A	07/06/2016	PC	PH	
B	31/07/2017	NT	VB CEng MICE	Initial issue updated to reflect findings of Kirklees Council's assessment

1. INTRODUCTION

This Mill Pond Assessment has been prepared by Dudleys Consulting Engineers Ltd on behalf of Mr Z Hinchcliffe (the Client). Every effort has been made to ensure that the information contained herewith is accurate at the time of creation. Any advice, opinions, or recommendations provided should be read in the context of the report as a whole.

This report provides an assessment of the Mill Pond at the site of the former Dobroyd Mills but has not been undertaken in accordance with the Reservoirs Act 1975 as the Mill Pond is not classed as a reservoir under the Act. The objective of this report is to assess the current condition, the effects of the proposed development and requirements for future maintenance of the Mill Pond.

1. THE SITE

1.1 Site Location

The site is located in Hepworth, Holmfirth. The site location is described below:

- Post Code HD9 1AF
- OS X (Eastings) 416383
- OS Y (Northings) 407225
- Nat Grid SE 16381 07225

The site location is illustrated in Figure 1 below.

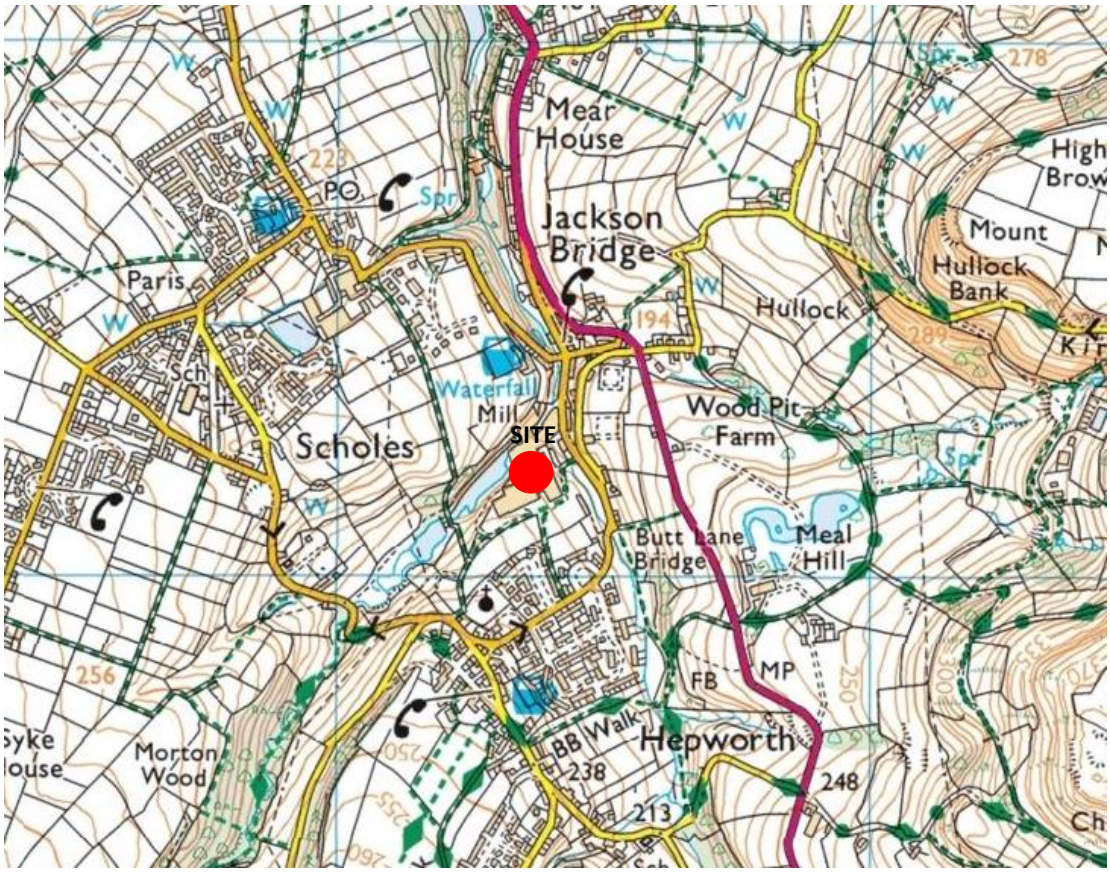

Figure 1: Site Location Plan

1.2 Site Description

The site is bounded by agricultural land to the North and West; Hepworth Road and residential properties to the East; and public open space, a residential estate and church to the South. A large proportion of the site is developed with existing mill buildings which currently have a combination of uses including a café, a used car dealership, and a fabricator.

As with many former mill sites within the region the Dobroyd Mills was historically powered by water driven turbines. To facilitate a constant supply of water to the turbines, an elevated mill pond was constructed. The pond is still present on site but is not currently in use and lies redundant. Figure 2 shows an aerial view of the site.

Imagery ©2017 Microsoft

Figure 2: Aerial Photograph

1.3 Proposed Development

The planning application proposes the demolition of the majority of the existing buildings on site, however one of the traditional mill buildings is to be reduced in size and retained and converted for commercial use. The building is a traditional mill dating from the 19th Century.

It is the intention under the scheme proposals to restore the operability of the inlet and outlet mechanisms for the Pond as well as any overflow structures to minimise any future flood risk on and off site as well as maintain any environmental benefits of the Pond.

The mill pond will be maintained and protected from future deterioration as part of the management of the proposed development by an appointed management company.

1.4 Mill Pond Description

The Mill Pond is located to the Northwest of the existing mill buildings (Figure 2) and has an area of approximately 3500m^2 and is approximately 120m long and 30m wide. A Mill Pond Assessment undertaken by Kirklees council indicates that the Pond has a capacity of approximately 1933m^3. The pond is contained within the base of a valley and its boundaries are formed largely by masonry retaining walls. The Pond is fed by a secondary pond immediately up stream and outfalls to a culvert which passes beneath the mill buildings.

2. MILL POND APPRAISAL

2.1 Condition of Infrastructure

A walkover survey was undertaken on 16th March 2015. The bank profile is irregular in level and slope and the mill pond is surrounded by dense vegetation, refer to Appendix A for photographs.

2.1.1 Inlet Structure

The Mill Pond is fed via a sluice gate within a masonry channel at the southern end of the Pond. Immediately upstream of the Pond is a secondary Mill Pond which is fed from the South by Dean Dike. Given the current condition of the Pond it is unlikely that the gate has been operated for some time and hence may be seized in its current position.

Condition: Unproven

Recommendation: Further investigations are required to assess the operability of the gate. The sluice gate is the primary means of controlling incoming flow to the Pond in the event of an emergency drawdown and as such must be periodically tested and repaired or replaced.

2.1.2 Reservoir

As previously noted, the pond is contained within the base of a valley and its boundaries are formed largely by masonry retaining walls. The Pond is fed by a secondary pond immediately upstream and outfalls to a culvert which passes beneath the mill buildings. The Northern and Southern extents of the pond are formed by earth dams, faced with masonry. The condition of the earth dam and masonry retaining walls beneath the water level are currently unproven. It is noted however that small areas of wall situated within the woodland have collapsed.

The Pond is heavily silted in areas and small islands of vegetation have formed. Immediately downstream of the inlet to the Pond are two silting basins, approximately 10m in diameter. Given the condition of the Pond it is assumed that these are also heavily silted.

Kirklees Council's Mill Pond Assessment notes that a protruding pipe, with in-built control, is present at the crest of the downstream earth dam. It is suggested that this may be a historic water supply for fire-fighting within the mill.

Condition: Poor

Recommendation: Further investigations are required to assess the structural integrity of the masonry walls around the perimeter of the Pond following the repair of the flow control mechanisms and a full drawdown of the stored water. The walls should be repaired or replaced where required. The extent of silting within the pond and surrounding the control mechanisms should also be further assessed following a full drawdown.

2.1.3 Outlet Structure

The primary outlet mechanism for the Pond is via a valve controlled by a hand wheel at the Northeast corner of the Pond. Given the current condition of the Pond it is unlikely that the valve has been operated for some time and hence may be seized in its current position.

Condition: Unproven

Recommendation: Further investigations are required to assess the operability of the gate. The valve is believed to be primary means of drawing down the Pond in the event of an emergency and as such must be periodically tested and repaired or replaced.

2.1.4 Overflow Structure

The water level in The Pond is restricted to a maximum level by means of a broad crested weir of approximately 4.5m wide. The maximum level within the pond is restricted so that a minimum freeboard of approximately 900mm is maintained at all times. Excess flows from the pond are conveyed back to the downstream watercourse by a masonry lined channel. The Mill Pond Assessment undertaken by Kirklees Council highlights that leakage was observed at a high level on the right-hand bank. A photo of this overflow structure is contained within Appendix A. It can be seen that this structure was clogged with debris at the time of surveying. It should also be noted that the structure appears to have historically allowed for some control of maximum levels within the pond by adjusting the height of the weir.

Condition: Poor

Recommendation: The overflow weir should be cleared of all debris on both the upstream and downstream sides prior to further investigation of the condition of the operating mechanism for this structure and the surrounding walls and embankment. The weir must be returned to full working order by repair or replacement as it is a critical mechanism for mitigation of flood risk to the site and downstream properties. The operation of this structure should be assessed regularly and kept clear at all times.

2.2 Environmental Condition

The environmental condition of the Pond is considered to be average. The reservoir margins provide a variety of habitat.

2.3 Effects of the Proposed Development

The Mill Pond is currently accessible on foot from the Southeast through densely vegetated woodland. The proposed development should provide suitable access to the periphery of the pond in order for remediation works and future maintenance to be carried out.

The proposed development will not affect the pond or its immediate surroundings. The environmental and biodiversity benefits of the Mill Pond can therefore be retained.

3. RECOMMENDATIONS

It is recommended that the following measures are undertaken:

3.1 Further Investigation

- Re-inspection of the Pond following removal of vegetation.
- Investigation to confirm the operability of the Pond's flow control mechanisms.
- The condition of the masonry retaining walls should be fully assessed.

3.2 Remedial Works

- Suitable access should be provided to allow for further investigation and remedial works.
- Vegetation should be cleared back to the perimeter of the Pond.
- The existing inlet structure must be repaired or replaced.
- The existing outlet structure must be repaired or replaced.
- The existing overflow structure must be repaired or replaced.

3.3 Long Term Maintenance

The Mill Pond Should be maintained and protected from future deterioration as part of the management of the proposed development by an appointed management company.

The following items should be undertaken periodically as part of the routine maintenance plan:

- Clearance of debris with regular inspection to ensure free flow of water at all times.
- Annual drawdown of the reservoir and inspection of the retaining walls and earth dams to ensure the structural integrity of the Pond.
- Annual inspection and testing of the inlet sluice gate to ensure that the reservoir can be filled.
- Inspection and testing of the drawdown valve twice a year to ensure that the reservoir can be emptied in an emergency.
- Desilting of silting basins twice a year in Spring and Autumn to reduce the risk of obstruction to downstream flow control mechanisms.
- Maintenance and management of bankside trees and vegetation twice a year in Spring and Autumn to maintain the structural integrity of the mill pond.

4. CONCLUSIONS

The redundant Mill Pond on-site is approximately 120m long and 30m wide.

The mill pond contains approximately 1933m^3 of water.

A walkover survey of the site was carried out on 16th March 2016.

The Mill Pond is fed via a sluice gate at the Southwest corner of the pond. It is likely that the gate is inoperable and seized in its current position. It is recommended that this gate is repaired or replaced and routinely inspected to assess its operability.

The reservoir is contained within the base of a valley by earth dams faced with masonry. The condition of these walls is unproven below the waterline and hence should be fully assessed following a full drawdown. The collapsed walls above the waterline should be rebuilt. Further investigation into the extent of silting within the Pond is required. Silting basins should cleared and routinely inspected.

The Mill Pond is believed to be drawdown by a valve at the Northeast corner. The condition of this valve is unknown, although it is likely that this is seized in its current position. It is recommended that this valve is repaired or replaced and routinely inspected to assess its operability.

In its current condition, the Pond is maintained at a constant level by an overflow weir. The control mechanism for the weir should be repaired or replaced.

The Mill Pond should be maintained and protected from future deterioration as part of the management of the proposed development by an appointed management company.

5. APPENDICES

Appendix A: Site Survey Photographs

APPENDIX A: SITE SURVEY PHOTOGRAPHS