

Project No: 12986
Project: Eagle Parade, Drinking Cistern
Engineer: Stephen Swinbank
Date of visit: 16/03/26
Present: Adam Bench / Warren McFadden
Weather: Cold but dry

Report No: **12986/0551**
Page: Page 1 of 5

Introduction

Mann Williams have been engaged by Buxton Civic Association to undertake an inspection of the historic drinking cistern located on Eagle Parade, Buxton.

The cistern (Photo 1) is Historic England Grade II listed and dates from early C19.

With reference to British Geological Survey online mapping the bedrock geology underlying the structure is Bee Low Limestone Formation. No superficial deposits are recorded.

A detailed repair scheme has been prepared for the cistern with input from ourselves. Commentary on the repair proposals are included in the second part of this report.

Summary Findings from Visual Inspection

Visual inspection was undertake to the exterior of the cistern and within, to a limited degree, through the use of a digital endoscope. It is noted that the interior and external workings of the cistern have been removed in the past. It would appear access was gained into the core of the cistern via removal of the lower stone panel on the west side.

Trial pits, archaeologically recorded, were excavated ahead of our visit adjacent north and south sides of the cistern masonry. The north side of the cistern is founded at approximately 650mm below the current finished ground level (Photo 2). The cistern was shown to be founded on the natural bedrock in both trial pits. The foundation depth was marginally shallower on the south side (Photo 3) owing to variation in the bedrock profile. There are some open joints beneath the base stones and the rock profile.

The perimeter of the cistern has a previously disturbed backfill beyond its perimeter comprising predominantly clay. The perimeter stone slabs currently bear over this fill material.

The cistern is constructed from local gritstone ashlar. Many of the stone units are badly weathered with contour scaling and surface spalling. A number of the ashlar units are also fractured.

The cistern has suffered from significant structural movement and is need of prompt repair. The large ashlar format of the side walls of the cistern are considered likely to have originally be held together by iron cramps although evidence of these was not encountered. It may be that there were of modest thickness and have corroded losing

Distribution	Client	☐	Project Manager	☐
	Architect	☒	Quantity Surveyor	☐
	Landscape Architect	☐	M&E	☐
	File	☐	Contractor	☐

Project No **12986**

Report No **12986/0551**

Project Eagle Parade, Drinking Cistern

Page Page 2 of 5

all integrity without fracturing the external exposed stone face. Loss of restraint has allowed the ashlar units to displace and some to fracture. It is likely that the mass of the stone cap keeping the bulk of the stone in compression is currently the key component in preventing the cistern from collapse.

The design of the cistern incorporated a stone urn over the centre of the capping stone but this has been removed in the past for safety reasons with its remnants retained recorded and photographed by others. The centre of the cap has an aperture where water previously piped through into the urn and drained back down.

The exposed stone plinth to the base of the cistern comprises two large format stones around approximately 250mm high. These stones have separated in the region of 15mm (Photo 4). We suspect they have been jacked apart owing to corrosion (and expansion) of ferrous metalwork within the joint between them (possibly where pipework passed through under the cistern base). Movement of the plinth stones will also have resulted in separation of the ashlar side walls. Past repairs are evident, poorly executed in unsympathetic cementitious mortar; fractures and joints have opened up considerably since this cementitious mortar was applied (Photos 5 and 6).



Photo 1 – East elevation of cistern



Photo 2 – Trial pit to north side of cistern

Site Visit Report

Project No **12986**
Project Eagle Parade, Drinking Cistern

Report No **12986/0551**
Page Page 3 of 5



Photo 3 - Trial pit to south side of cistern



Photo 4 – Separation of plinth stone



Photo 5 – Severe displacement and fracturing to north-east corner of cistern; past cementitious repairs noted



Photo 6 – Severe displacement to south-east corner of cistern; past cementitious repairs noted

Project No **12986**

Report No **12986/0551**

Project Eagle Parade, Drinking Cistern

Page

Page 4 of 5

Conclusion and Commentary on Repair Proposals

The cistern is potentially unstable and it is clear careful dismantling and repair is an urgent priority. A temporary lifting frame will be needed to safely dismantle the structure.

Temporary strapping around the cistern in the form of nylon ratchet straps is needed to avoid uncontrolled collapse during dismantling. Without temporary strapping in place, when the stone cap is lifted the structure would likely collapse. Soft packing should be introduced beneath the straps at corner positions to prevent damage to the stone. Before the straps are fastened, timber wedges should be placed into the open joints in the stonework to avoid displacement of the stone.

With the capping stone removed, the stone mason undertaking this work will need to introduce temporary lateral restraints to the elevations of the cistern (utilization of tubular scaffold, with soft protective packs at interfaces with the stone is envisaged for this purpose) such that the ratchet straps can be progressively removed and the ashlar side walls dismantled stone by stone. Any tubular scaffold arrangement would also best incorporate a lifting beam to allow controlled lifting and lowering of all stones.

Stones are to be individually protected and stored on pallets for final review ahead of repair and reconstruction. A detailed combination of stone replacement and repair has been proposed on Bench Architects drawings.

The expectation is that the plinth stones will need to be raised and re-bedded with any ferrous metalwork that is causing them to separate being removed. The plinth stones should be cramped together with a pair of inert grade 316 stainless steel cramps as noted on the architectural drawings.

Open joints in the founding stones should be deep pack pointed in hydraulic lime mortar as should the bedding joint over the bedrock.

Architectural proposals involve renewal of the paving to the perimeter of the cistern stonework. We advise the made ground, comprising predominantly clay, beneath the current paving be removed down to the bedrock (nominal 400mm layer) and replaced with Highways Agency Type 3 specification fill (graded granular stone with reduced fines) compacted in 150mm layers to provide a stable base for the paving.

Beyond the paving the foundation stones to the railing plinth are to be reused and consolidated with supplementary stone all in hydraulic lime mortar. Beyond the railing plinth two sockets for poles associated with the annual well dressing event are to be renewed cast in modest concrete pads extending down to the bedrock. The modest concrete pads will be clear of the historic structure.

It is recognised that even after these works are completed isolated stone repairs will be needed to the cistern in years to come. It is therefore proposed to construct an internal brick core to the structure that the perimeter stone units can be cramped back to utilising inert grade 316 stainless steel cramps. This approach allows future removal of individual stones for repair / replacement without further wholesale dismantling of the cistern. The presence of the brickwork will also improve the overall

Site Visit Report



Project No **12986**

Report No **12986/0551**

Project Eagle Parade, Drinking Cistern

Page Page 5 of 5

robustness of the structure and mean certain stones would not currently need replacement as they would if the stone structure were reassembled without the core and just stone to stone cramps. A frost-resistant conservation brick is proposed for the core material.