

TESTING, INSPECTION AND INVESTIGATION SPECIALISTS



**UNDERWATER TACTILE INSPECTION OF ROCHDALE CANAL WALL –
MANCHESTER**

October 2023

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Client:

MACE
Manchester Life Development Company
3 Ltd
Unit 5 Royal Mills
17 Redhill Street
Manchester
M4 5BA

Tel: 07881 376895

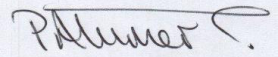
www.macegroup.com

Inspected By:

Up and Under Limited
Coppice House
Quakers Coppice
Crewe
Cheshire
CW1 6FA

Tel: 01270 589615

www.upandundergroup.com

Document Ref.: 2345884-R-01(01)**Title:** Underwater Tactile Inspection of Rochdale Canal Wall – Manchester**Client:** Manchester Life Development Company 3 Ltd**Date:** 09th October 2023**Status:** Rev 01**Author** R. Murphy**Technical Reviewer** P. TurnerSignature Signature 

Date: 09/10/2023

Date: 13/10/2023

Project Manager N. MorreySignature 

Date: 13/10/2023

Revision control sheet

Revision reference	Date	Reason for revision
Rev 00	09/10/2023	First issue
Rev 01	19/10/2023	Minor amendments

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This work has been undertaken in accordance with the quality management system of Up and Under Limited.

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1 OUTLINE SCOPE AND INTRODUCTION

- 1.1 Up and Under Limited was instructed by Manchester Life Development Company 3 Ltd to, “provide a three-person specialist access ‘wet working’ team to carry out an underwater tactile inspection of approximately 160m of Rochdale Canal Wall, Jersey Street, Manchester.” Further details of the scope may be found in the contract documents.
- 1.2 This document details the findings from the underwater tactile inspection of Rochdale Canal Wall with photographs, comments and defect sketches.

2 STRUCTURE DETAILS

Grid Reference: 385307N, 398777E

Location: Rochdale Canal Wall, Jersey Street, Manchester, M4 6ER

- 2.1 The structure is a length of canal wall at the North side of the Rochdale Canal in Ancoats, Manchester. The wall supports the adjacent land as highlighted in Figure 1 below.

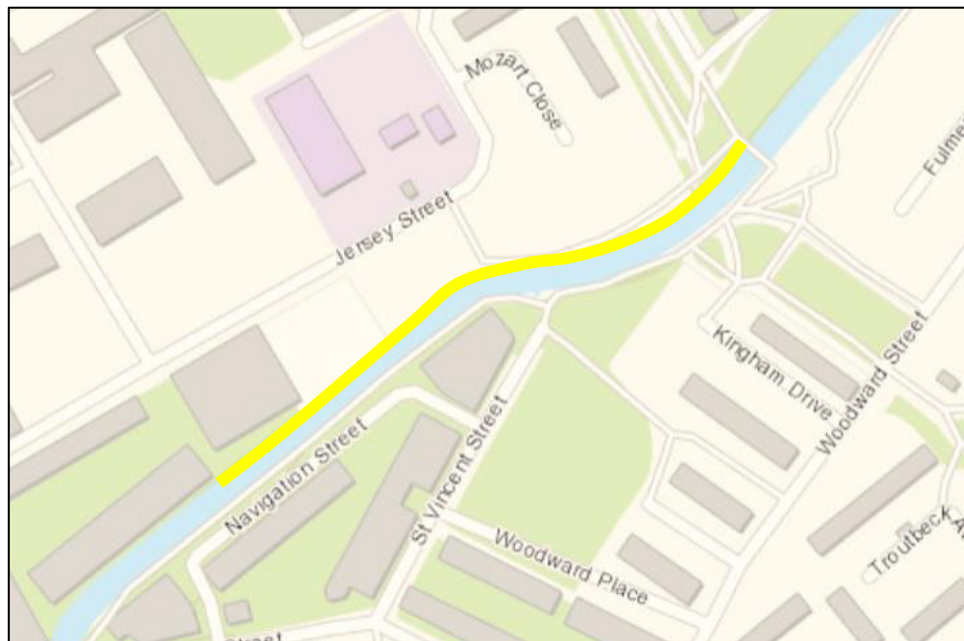


Figure 1: Location Plan

- 2.2 The area inspected (as shown in figure 1) is 238.5m in length and is a masonry retaining wall (stonework and brickwork). There are small sections throughout which have a concrete skim coat/render over the stonework which was added either during construction or at a later date but this was not able to be determined at this inspection.
- 2.2 The height of the canal wall varies throughout as shown on the schematic drawing in Appendix B, however the average height is approximately 1.8m.

3 INSPECTION DETAILS

Date of inspection: 04/10/2023
Inspection team: N.Morrey (Project Engineer)
R.Murphy (Trainee)
L.Podmore (Trainee)
Weather conditions: Clear and dry, 14°C

- 3.1 The inspection team arrived at the site on Wednesday 4th October 2023. The team parked on Mozart Close and walked to the structure along the designated towpath and footbridge. A 2 man inflatable boat was used to gain direct access to the canal wall.
- 3.2 The inspection was undertaken to satisfy the scope outlined in the contract document and comprised of the following: Inspection from within touching distance of visible and safely accessible elements of the wash wall noting (where possible) defects with respect to their location, extent and severity. An initial underwater remote camera survey was undertaken where possible and all underwater sections of the wall were probed using a ranging rod to check for missing masonry/erosion.
- 3.3 After liaising with the client on site, it was determined that the initial 160m section as detailed within the brief did not cover their full works site and it was agreed that an extended 238.5m section was to be inspected.
- 3.4 The chainage was taken from Southwest (0m) to Northeast (238.5m), Southwest is referred to as left hand (LH) and Northeast is referred to as right hand (RH) throughout the report.

4 SUMMARY OF FINDINGS

- 4.1 Below is a summary of the findings. Detailed inspection findings and defect dimensions in the form of defect sketches, can be found in Appendix B. Referenced photographs can be found in Appendix A.
- 4.2 Foundations
- 4.2.1 The foundations were not exposed for this inspection, however no evidence was found to indicate settlement or distress.
- 4.3 Canal Wall
- 4.3.1 Multiple localised areas of joint mortar loss to both the brickwork and stonework was noted throughout as detailed in Appendix B, these areas ranged from 20mm up to 100mm in depth.
Refer to photos: 12, 15, 23, 34, 41 & 44.
- 4.3.2 Isolated spalls to the concrete skim coat and brickwork, as well as missing sections of masonry were also present throughout several locations ranging from 15mm up to 200mm in depth.
Refer to photos: 14, 16, 19, 22, 25, 28, 30, 35, 37, 40, 43, & 45.

- 4.3.3 Vertical stepped cracking was found to the brickwork at chainage 13m and 22m, both cracks were 0.4mm wide.
Vertical cracking was also found at three locations to the concrete sections (chainage 56.5m, 88.5m & 207.3m) ranging from 0.2mm wide and up to 1.1mm wide.

Refer to photos: 13, 17, 24, 31 & 42.

- 4.3.4 Overgrown vegetation was noted at various locations, some of which affected access and visibility during the inspection (chainage 20m – 36.5m).
There were two particular areas where vegetation growth was causing upwards displacement of the wall, one at chainage 42m (brickwork displaced by up to 65mm) and the other at chainage 145.1m (stonework displaced by up to 45mm).

Refer to photos: 11, 20, 21, 33, 38 & 39.

4.4 Invert

- 4.4.1 The invert at the base of the wall was generally found to comprise silt and stones. Localised areas of debris and branches were also identified.

Refer to photos: 47 & 48.

5 **COMMENTS**

- 5.1 The defects observed do not appear to present an immediate cause for concern with regards to the overall stability and integrity of the structure. However, there are defects that are likely affecting the durability of the structure.
Localised integrity and performance of some sections is becoming compromised, therefore consideration should be given to undertaking minor repairs/maintenance as discussed below.
- 5.2 As no previous inspection records were available for review, the rate of deterioration and therefore urgency of works is unclear.
Overgrown vegetation should be cut back to help with the access for any future inspections, with larger saplings removed / poisoned to prevent any further structural damage to the wall.
Localised masonry/concrete repairs to any spalled, missing or loose sections of the wall, as well as repointing works to any sections of mortar loss should also be considered to help prolong the longevity of the structure.
- 5.3 There is typically frost and environmental weathering to the brick and masonry faces along the wall.
- 5.4 All sections of the wall below water level were probed with a ranging rod and underwater camera footage was gathered where possible, no significant areas of erosion or missing masonry were found below water level at the time of inspection.
- 5.5 Debris on the invert does not appear to present immediate cause for concern due to its localised nature.
- 5.6 During the inspection, various third party security / boundary fences were noted along some sections of the wall. In order to undertake some of the remedial works, consultation will be required with the owners to request temporary removal as not all works may be feasible from a waterborne works barge.

Appendix A

Photographs



Photo 1: View looking LH at chainage 0m



Photo 2: View looking RH at chainage 0m



Photo 3: View looking LH at chainage 60m



Photo 4: View looking RH at chainage 60m



Photo 5: View looking LH at chainage 120m



Photo 6: View looking RH at chainage 120m



Photo 7: View looking LH at chainage 200m



Photo 8: View looking RH at chainage 200m



Photo 9: View looking LH at chainage 238.5m



Photo 10: View looking RH at chainage 238.5m



Photo 11: Overgrown vegetation covering wall and affecting full inspection at ch.0.7m (defect no.1)



Photo 12: Typical example of joint mortar loss to stonework between ch.10m & ch.50m (defect no.2).



Photo 13: Vertical stepped crack to brickwork at ch.13m (defect no.3).



Photo 14: Spall to stonework at ch.15m (defect no.4).



Photo 15: Typical example of joint mortar loss to brickwork between ch.0m & ch.20m (defect no.5).



Photo 16: Typical example of face loss to brickwork between ch.0m and ch.20m (defect no.6).



Photo 17: Vertical stepped crack to brickwork at ch.22m (defect no.7).



Photo 18: Area of hollow sounding and loose brickwork at ch.22m (defect no.8).



Photo 19: Spall to brickwork at ch.30m (defect no.9).



Photo 20: Overgrown vegetation covering wall and affecting full inspection between ch.20m & ch.36.5m (defect no.10).



Photo 21: Displaced brickwork and associated root growth from ch.39m to ch.42m (defect no.11).



Photo 22: Missing brickwork at ch.50.2m (defect no.12).



Photo 23: Typical example of joint mortar loss to brickwork between ch.50m & ch.100m (defect no.13).



Photo 24: Vertical crack to concrete plinth at ch.56.5m (defect no.14).



Photo 25: Area of face loss to brickwork at ch.61m (defect no.15).



Photo 26: Area of bulged brickwork and associated tree growth from ch.63.6m to ch.65m (defect no.16).



Photo 27: Area of outward displacement to brickwork at ch.82.1m (defect no.17).



Photo 28: Missing section of brickwork at ch.84m (defect no.18).



Photo 29: Vertical stepped crack to brickwork at ch.84.7m (defect no.19).



Photo 30: Missing brickwork at ch.85m (defect no.20).



Photo 31: 2 no. vertical cracks to concrete plinth at ch.88.5m (defect no.21).



Photo 33: Tree growth adjacent to wall at ch.115m (defect no.22).



Photo 34: Typical example of joint mortar loss and displacement to brickwork between ch.115m and ch.117m (defect no.23).



Photo 35: 2 no. areas of spalling to concrete skim over existing stonework at ch.118.6m (defect no.24).



Photo 36: Poor construction joint at ch.120m (defect no.25).



Photo 37: 2 areas of spalled concrete at ch.124m (defect no.26).



Photo 38: Displaced stonework and associated root growth at ch.145.1m (defect no.27).



Photo 39: 4 no. areas of sapling growth through stonework between ch.148.5m and ch.160m (defect no.28).



Photo 40: Area of spalled and loose brickwork at ch.154m (defect no.29).

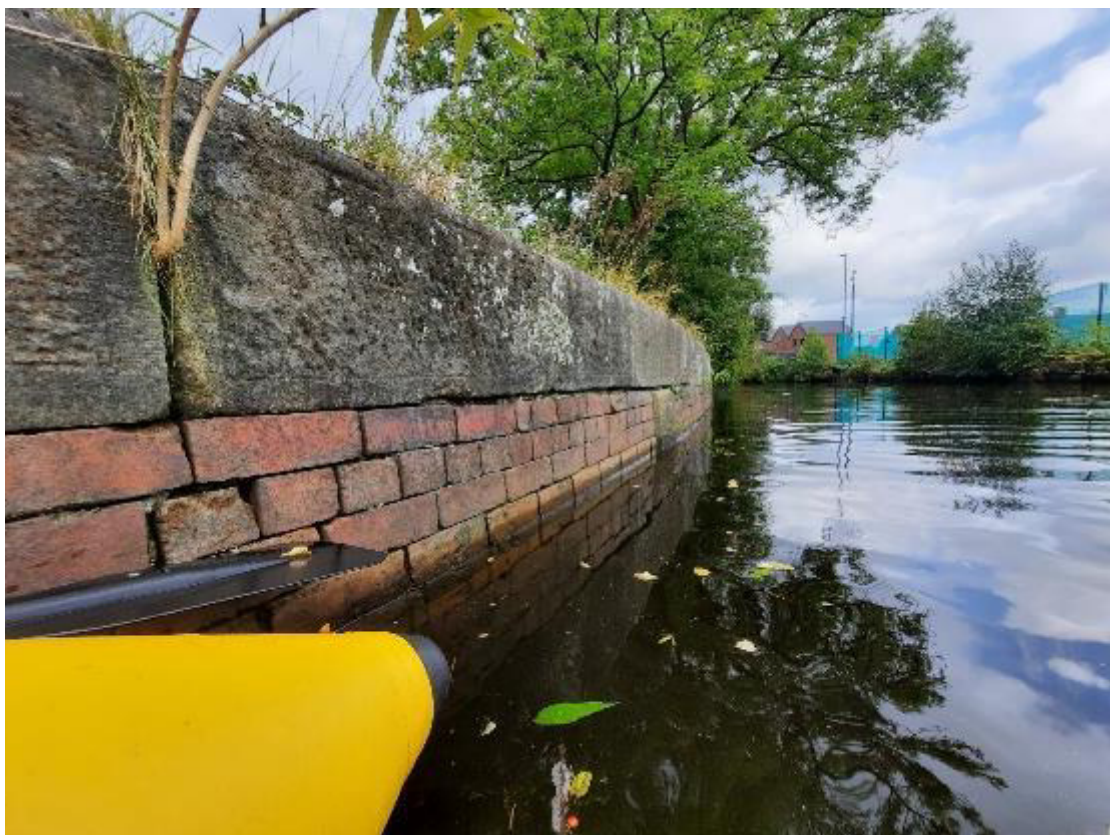


Photo 41: Typical example of joint mortar loss to brickwork between ch.151m and ch.185m (defect no.30).



Photo 42: Vertical crack to concrete at ch.207.3m (defect no.31).



Photo 43: Area of missing stonework below water level at ch.219.5m (defect no.32).



Photo 44: Typical example of joint mortar loss to stonework between ch.219m & ch.230.5m (defect no.33).



Photo 45: Missing section of stonework at ch.227.5m (defect no.34).



Photo 46: General underwater view of brickwork and concrete plinth below water level at chainage 44m.



Photo 47: General underwater view of invert at chainage 148m.



Photo 48: General underwater view of stonework and debris to invert at chainage 150m.

Appendix B

Defect Sketches

