

To: Anthony Johnson
From: Ryan Haselden
Date: 22nd November 2021

AMP/44733,1 Garden Centre Wall Survey

Address: Heaton Park, Middleton Road, M25 2SW



Photo 1 - Garden Centre Collapsed Wall

Site and Existing Structure

The existing listed wall is of masonry construction. The dimensions of the wall are approximately 2900mm high and 378mm thick, founding 1200mm below ground level on a sand formation. The freestanding boundary wall surrounding the garden centre suffered from a collapse at the south corner, see Photo 1.

Observations

Where the wall has collapsed there is significant evidence of root growth within the mortar joints, this appears to be the primary cause of the wall failure.

Appendix A shows verticality measurements of the wall using a plumb bob, the results show that the verticality of the wall gets progressively worse towards the corner. This suggests the large amount of tree roots found in the collapsed wall have contributed to the leaning of the wall. Temporary propping has been erected to prevent the leaning from getting progressively worse.



Photo 2 - Roots in collapsed wall



Photo 3 - Temporary Propping

From trial pits it was found that the wall was constructed directly on the competent sand formation. We recommend construction of a new concrete foundation to reduce the wall below ground level from 1.25m to 0.2m. This will ensure the wall complies to the British Standards and will also save on brickwork labour, see Appendix C for calculations.



Photo 4 - Current foundation (approx. 1.2m)

Calculations

Calculations have been undertaken to check the stability of the current design, please see Appendix B. The applied moment is less than the restoring moment, therefore the design of the wall is OK.

A calculation has also been undertaken for the design of a new concrete foundation, please see Appendix C.

Recommendations

- Tree roots / shrubs must all be removed from the wall before rebuilding.
- Existing brick to be salvaged cleaned and reused.
- The wall must be demolished where lean exceeds 28mm on Appendix A to ensure wall is rebuilt vertically and rebuilt to match existing with new foundation. (Approx. 90m of wall to rebuild).
- The addition of movement joints is recommended at spacings of 6m. Ancon Movement ties are required to restrain the masonry against lateral wind loads (See Appendix D)
- Capping to be replaced to match existing
- Designated mix for concrete foundation – GEN 3
- Cement mortar mix for masonry – Mortar class III – Compressive strength class M4 – Masonry cement: sand ratio 1:4 to 5
- Regular maintenance is required to prevent any future root ingress.
- Recommendations to be reviewed and approved by planning authorities

R. Haselden MSc BEng
On behalf of Capital Programmes & Procurement

Appendix A

Heaton Park Garden Centre

21/01/20

Boundary Wall survey

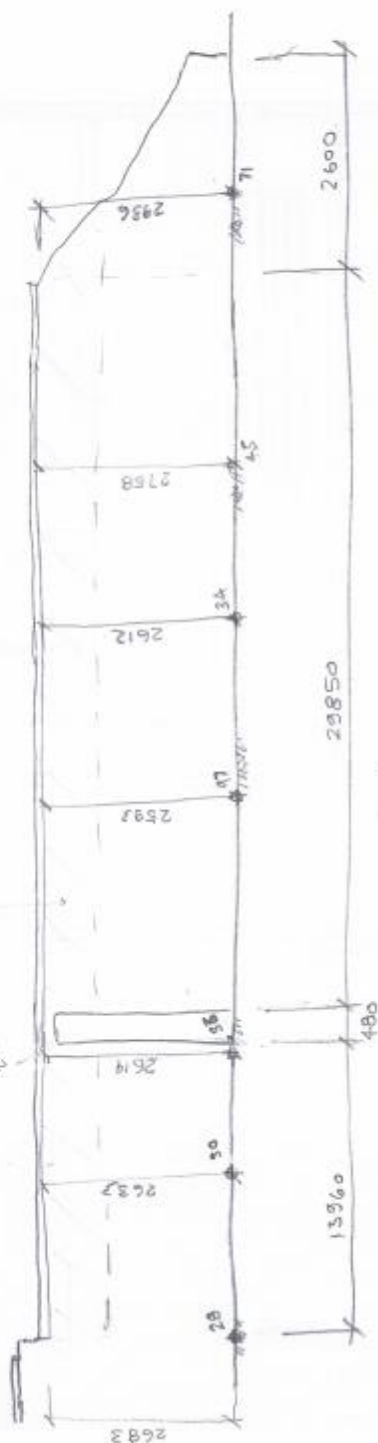
West Elevation

Wall thick - 378mm

⬆ - Plumb reading

Significant bulging & upper 1.0m

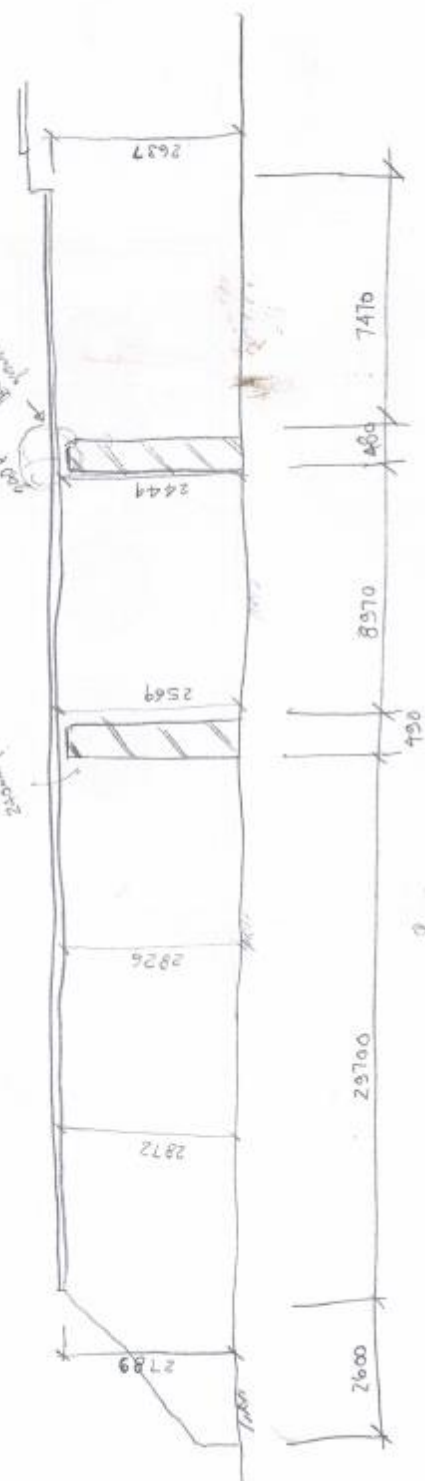
240 projection



Front

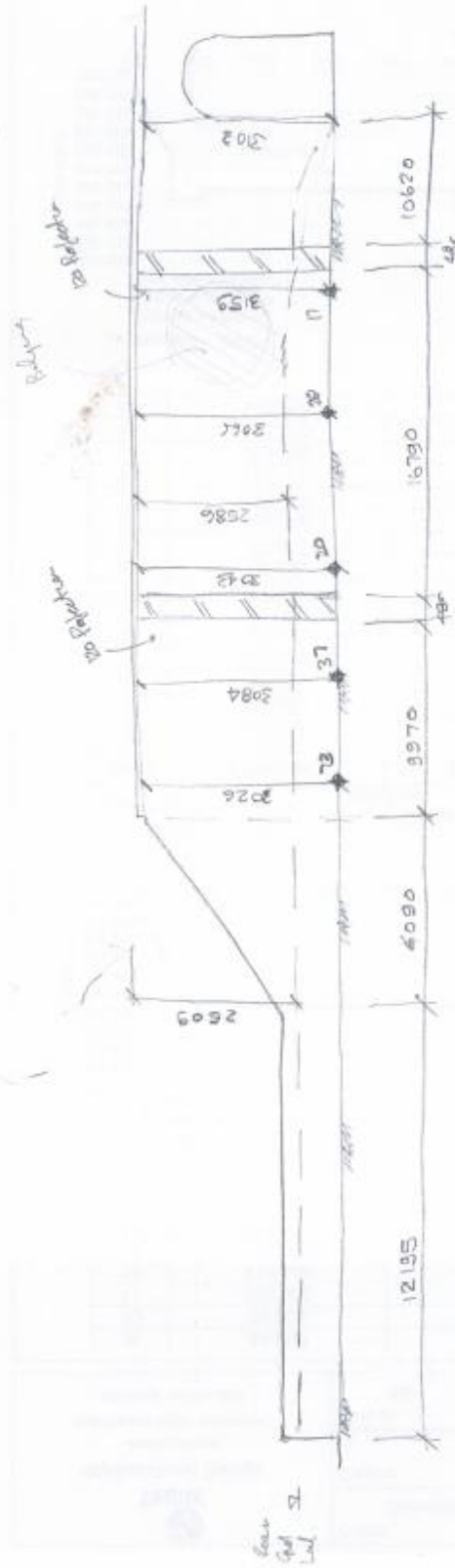
240 projection

240 projection



Back

South Elevation



Front

Rear

Appendix B



MANCHESTER
CITY COUNCIL

Calculation Sheet

Capital Programmes & Procurement Corporate Core Manchester City Council PO Box 532 Town Hall Manchester M60 2LA	Project Title					Project No	
	SURVEY WALL TO GARDEN CENTRE					AMPL4733-1	
	Calculation Title					Calculation No	
WALL SURVEY					001		
Calculation By	Date	Checked By	Date	Sheet No	Revision		
RH	28/10/21	05	28/10/21	1 of 2	1		
Reference	Calculation					Output	
	$\text{Moment at base} = \frac{PH^2}{2}$						
	$P = 644 \text{ N/m}^2$						
	$H = 3.2 \text{ m}$						
	$\text{Applied Moment} = \frac{0.644 \text{ kN/m}^2 \times 3.2 \text{ m}^2}{2}$						
	$\text{Applied moment} = 3.3 \text{ kNm}$						
	Design Parameters + Procedure						
	$\gamma_m = 3.1$						
	$f_{xx} = 300 \text{ kN/m}^2$						
	$\gamma_p = 0.9$						
	$H = 3.2 \text{ m}$						
	$W_m = 21 \text{ kN/m}^3$						
	$Z = \frac{bd^2}{6}$						
	$= \frac{1 \times 0.378^2}{6}$						
	$Z = 0.024 \text{ m}^3$						



Calculation Sheet

Capital Programmes & Procurement Corporate Core Manchester City Council PO Box 532 Town Hall Manchester M60 2LA	Project Title					Project No
	SURVEY WALL TO GARDEN CENTRE					M-P4733-1
	Calculation Title					Calculation No.
WALL SURVEY					001	
Calculation By	Date	Checked By	Date	Sheet No	Revision	
RH	28/10/21	OS	28/10/21	2 of 2	1	

Reference	Calculation	Output
	Tension between mortar + brick	
	$= \frac{4}{3} \times 300 \text{ kN/m}^2 \times 0.024 \text{ m}^3$	
	$= 2.32 \text{ kNm}$	
	Self weight of wall	
	$= 0.9 \times 3.2 \text{ m} \times 22 \text{ kN/m}^3 \times 0.024 \text{ m}^3$	
	$= 1.45 \text{ kNm}$	
	Restoring moment	
	$= 2.32 + 1.45$	
	$= 3.77 \text{ kNm}$	
	$3.77 > 3.3 \therefore \text{OK}$	

Appendix C



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Calculation Sheet

Capital Programmes & Procurement Corporate Core Manchester City Council PO Box 532 Town Hall Manchester M60 2LA	Project Title					Project No
	SURVEY WALL TO GARDEN CENTRE					AMP44723-1
	Calculation Title					Calculation No
FOUNDATION DESIGN					002	
Calculation By	Date	Checked By	Date	Sheet No	Revision	
RH	28/10/21	OS	28/10/21	1 of 1	1	
Reference	Calculation				Output	
	Consider 1m run of wall and assume 0.75m width of foundation					
	weight of stem = $32 \times 0.378 \times 21$ = 25.4 kN					
	weight of base = $0.75 \times 1 \times 23$ = 17.25 kN					
	weight of soil = $0.75 \times 0.2 \times 17$ = 2.55 kN					
	Total = 45.2 kN					
	ground pressure = $\frac{45.2}{0.75} \pm \frac{3.3 \times 6}{0.75^2}$ = 95.5 or 25.1 kN/m ²					
	Foundation is suitable for Loose Sand.					

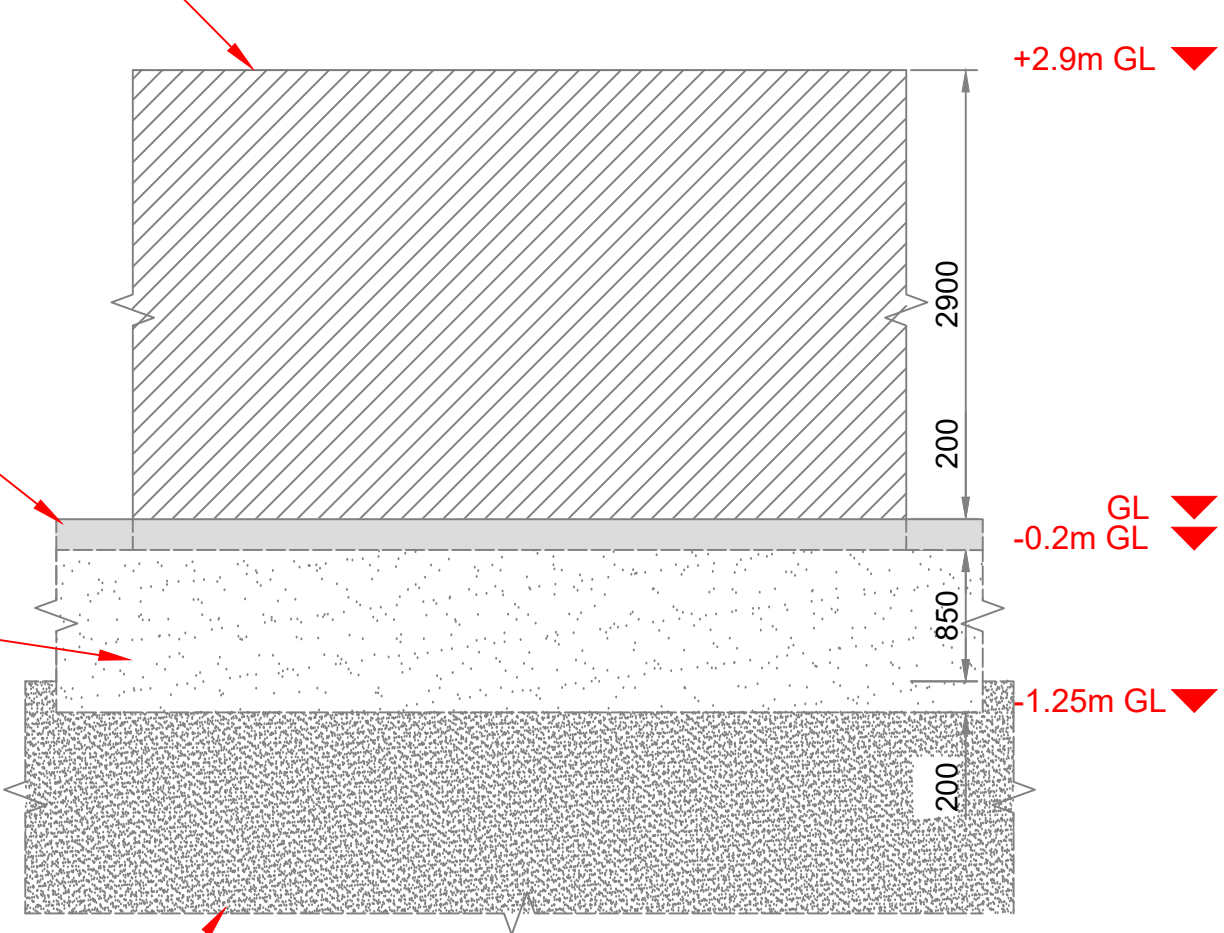
Appendix D

MATCH EXISTING COPINGS -
COPINGS TO BE RETAINED

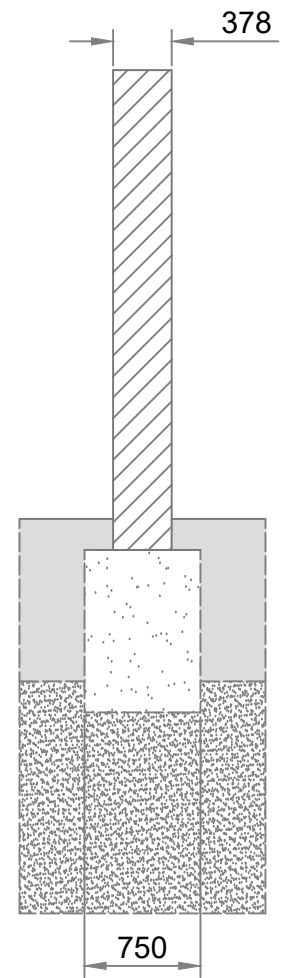
SOFT CLAY UP TO
GROUND LEVEL

GEN 3 - DESIGNATED
MIX FOR CONCRETE
FOUNDATION

PROPOSED FOOTING TO FOUND
ON SAND FORMATION, MINIMUM OF
1250MM BELOW GL.



ELEVATION 1 (1:50)



ELEVATION 2 (1:50)

- GENERAL NOTES:
1. ALL DIMENSIONS ARE IN MM AND ALL LEVELS ARE IN M UNITS.
 2. THE CONTRACTOR IS RESPONSIBLE FOR THE ACCURACY OF ALL SITE DIMENSIONS AND THE CORRECT SETTING OUT OF WORK ON SITE.
 3. EXISTING STRUCTURE TO BE EXPOSED BY THE GENERAL CONTRACTOR AS REQUIRED BY THE ENGINEER FOR CHECKING PRIOR TO COMMENCING ANY STRUCTURAL WORK.
 4. FINAL STRUCTURAL DETAILS TO BE DETERMINED BY THE ENGINEER AFTER THE EXISTING STRUCTURE HAS BEEN EXPOSED AND INSPECTED.
 5. NO VARIATION TO THE STRUCTURAL DETAILS SHOWN ON THE DRAWINGS IS ALLOWED WITHOUT PRIOR APPROVAL BY THE ENGINEER.
 6. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR THE TEMPORARY WORKS DESIGN INCLUDING THE STRUCTURAL STABILITY AND INTEGRITY OF THE EXISTING WALL THROUGHOUT THE DURATION OF THE WORKS.

KEY

	BRICKWORK
	CONCRETE
	SAND
	SOFT CLAY

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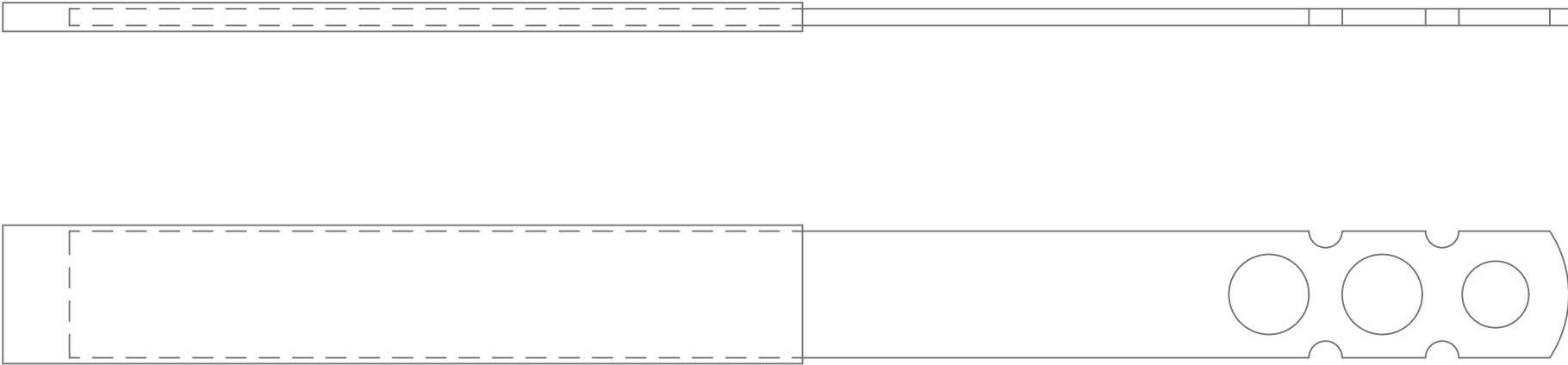
Capital Programmes Division

Manchester City Council
PO Box 532, Town Hall
Manchester
M60 2LA

DRAWING STATUS			Information		
PROPERTY TITLE HEATON PARK GARDEN CENTRE HEATON PARK, PRESTWICH M25 2GT					
UPRN 010090241973		DFE NO. -			
PROJECT TITLE HEATON PARK - GARDEN CENTRE WALL NEW WALL & FOUNDATION					
DRAWING TITLE Wall Elevations					
JOB NO. AMP/44733/1		DATE 25/10/2021		REV 1	
SCALE 1: 50 @ A3	AUTHOR RH	CHECKED BY OJ	APPROVED BY		
DRAWING NO. 001					

ANCON PPS WALL TIE - 225MM
SHOWN WITH A 120MM DEBONDING SLEEVE
STANDARD TIE LENGTHS = 200, 225MM

DEBONDED TIES SHOULD BE INSTALLED WITH A
10MM GAP AT THE END OF THE SLEEVE TO
ALLOW FOR EXPANSION OF THE MASONRY



POLYSULPHIDE EXPANSION JOINT SEALANT IS
REQUIRED FOR SEALING ALL MOVEMENT
JOINTS.

10MM AEROFILL IN EXPANSION / CONTRACTION
JOINT

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HEATON PARK, PRESTWICH
M25 2GT

UPRN 010090241973 DFE NO. -

PROJECT TITLE
HEATON PARK - GARDEN CENTRE WALL
NEW WALL & FOUNDATION

DRAWING TITLE
Ancon Wall Tie

JOB NO. AMP/44733/1 DATE 22/11/2021 REV 1

SCALE 1: 1 @ A3 AUTHOR RH CHECKED BY OJ APPROVED BY

DRAWING NO. 002