

 SGi Consulting Engineers 45 Cross Street, Manchester M2 4JF	Project Russell Road				Job no. C1811	
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Report	Proj Ref	Orig	Zone	Level	Type	Role	Doc No	Rev
Northern Boundary Wall Survey	RUS	SGi	XX	XX	RP	S	00002	C02

Rev	Status	Date	Description
P01	Preliminary	17.07.25	Preliminary issue
P02	For Review	18.08.25	Issued for review (no changes)
C01	Construction Stage	01.12.25	Updated following further survey and investigation.
C02	Construction Stage	29.01.26	Updated following decision on remedial options.

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EXECUTIVE SUMMARY

- Plans are appended to this report which show wall references, sections through the walls and highlight walls that are recommended to either (i) have their height reduced and/or (ii) be strengthened or rebuilt
- In the centre of the boundary the wall line steps out into the adjacent site and we understand the walls surrounding this previously formed the perimeter of a substation (Walls W05 to W08). These walls are higher than the other walls along the boundary and appear to be cavity walls. They presumably were previously tied at their heads by a roof structure but this is no longer present. We advise that these wall heights are reduced to be the same as the adjacent walls and that strengthening is undertaken as described.
- There are a couple of walls that do not form the boundary and, for the reasons discussed later, we advise these are demolished (W05 and W12)
- Along the Eastern part of the wall a newer wall has been built in front of the original wall (Walls W12 and W13). This has been built off inadequate foundations, as discussed in detail later, the result of which is that the walls are leaning into the site and cracked. The agreed remedial proposals are attached to this report.

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INTRODUCTION

SGi have been commissioned by Rowlinson Construction Ltd (RCL) to carry out a visual survey of the boundary wall along the northern edge of the site. The extent of the survey is shown on the appended drawings.

The purpose of the survey is to advise on the general condition of the wall and it's suitability, from a Structural point-of-view, for being incorporated into the new development. It is not intended to be a detailed condition / defects survey.

LIMITATIONS

The report is based primarily on a visual survey of the wall carried out from ground level within the development plot.

Inspections of the opposite side of walls W12, W13 and W14 have also been carried out..

Verticality checks were carried out using a spirit level in isolated instances.

Apart from the trialpits and exploratory holes discussed in the report no further intrusive investigation was carried out.

The comments made in this report relate solely to the structural properties of the walls. We have no knowledge of the ownership of these walls or whether the Party Wall etc Act applies to any of these walls, and we have held no discussions with the adjacent land owners.

Recommendations later in this report regarding reducing wall heights, strengthening walls or demolishing and rebuilding them should only be carried out following agreement with the Client and neighbouring land owner and approval from the Client's Party Wall Surveyor.

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DRAWINGS

Please refer to Appendix A for the following drawings:-

RUS-SGI-XX-XX-DR-S-1200	Plan on wall showing wall references, trialpit and exploratory hole locations, photo locations, verticality checks, elevation on Wall W07 etc
RUS-SGI-XX-XX-DR-S-1201	Sections through the wall showing construction and thickness, trial pit details and verticality checks
RUS-SGI-XX-XX-DR-S-1202	Plan on wall highlighting walls which are recommended to be removed, reduced in height, strengthened or rebuilt
RUS-SGI-XX-XX-DR-S-1203	Options for strengthening walls W12 and W13

Please refer to Appendix C for the following drawings:-

C1811-SK01	Remedial Works to Existing Boundary Wall (1 of 3)
C1811-SK02	Remedial Works to Existing Boundary Wall (2 of 3)
C1811-SK03	Remedial Works to Existing Boundary Wall (3 of 3)

TRIALPITS

The locations of these are shown on drawing RUS-SGI-XX-XX-DR-S-1200 and section details on RUS-SGI-XX-XX-DR-S-1201.

These were dug by RCL, generally to the level of the bottom of the foundations to identify the sizes and depths of the foundations and the strata into which they sit.

EXPLORATORY HOLES

The locations of these are shown on drawing RUS-SGI-XX-XX-DR-S-1200.

These involved RCL breaking out by hand small sections of the new wall of wall W13 to expose the junction between the new wall and old wall to determine whether there was a cavity and whether ties existed between the two parts of wall.

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WALLS

Locations of the brickwork walls are shown on drawing RUS-SGI-XX-XX-DR-S-1200. They are referenced from left to right when viewed from inside the site.

As will be discussed later in this report, there are areas where walls have been built or re-faced later in brickwork that appears to be newer, and so references in the report to "old" or "new" brickwork are used to differentiate between these.

For the walls identified as old brickwork cosmetic repairs are likely to be required e.g. repointing and repairing of localised instances where brick headers have "blown", or repointing of minor cracking. For the walls identified as new brickwork this is not generally the case.

Any instances where a structural repair or intervention is considered necessary are identified in the relevant section later.

WALL W01

This length of brickwork wall forms the rear of a raised landscape bed. It is 325mm thick. The soil level in this bed is around 0.6m higher than the general ground level in this area and on the opposite side of the wall i.e. the wall acts as a small retaining wall.

It leans slightly into the RCL site i.e. in the opposite direction to what would be caused by earth pressure. The slight lean is not of concern.

WALL W02

This is a brickwork wall, minimum 325mm thick. It is around 2.6m in height at it's left hand end, there are a couple of steps up in it's top level meaning it is around 3m at it's right hand end.

Guidance document "Freestanding brick walls" issued by the Brick Development Association (BDA) gives general guidance on allowable heights of such walls of various thicknesses and locations. From this the maximum height for a 325mm thick wall on this site would be 2.5m high. The actual heights (upto 3m) exceed this somewhat but it is worth noting that the BDA document provides generic advice and so the fact the heights are exceeded is not, in itself, a concern.

The wall leans slightly away from the site (approx 10mm to 15mm when measured on a 800m spirit level), but this is not considered to be of concern.

This wall is old brickwork (as discussed earlier) i.e. cosmetic repairs are likely to be required.

WALLS W03 & W04

These walls are around 3m high and are believed to be a minimum of 325mm thick. They are buttressed by return walls at each end.

We noted no items of concern with these walls.

These are old brickwork and cosmetic repairs are probably necessary.

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WALL W05

This is the freestanding wall, the end of which can be seen in the photograph below (right of centre).



It is around 4.2m in height and only 215mm thick, with nothing buttressing the free end seen in the photograph.

We would not be able to demonstrate that this length of wall has sufficient strength to resist wind loads and recommend that it is locally dismantled, back to where wall W04 connects to it.

We understand that this area of the site is intended to be used as landscaping and so presumably dismantling this wall will also be beneficial as it opens up the area for better use.

WALL W06

This wall is believed to be a minimum of 215mm thick and is buttressed at it's ends by walls W04 and W07.

It's height is around 4.2m and, if possible, it would be preferable to reduce it to around 3.0m i.e. the same as the adjacent walls W02 and W04. A suitable capping or coping would be needed to protect the new top of the wall.

It contains a bricked up opening, refer to the comments on Wall W07 for more discussion on this.

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WALL W07

The form of construction differs in this area. It can be seen that there are three brickwork piers which project by 110mm from the main face. The brickwork is stretcher bonded and it appears that there is another leaf of brickwork visible behind this wall at the top, both of which suggest this is a cavity wall. We believe that this may have previously formed part of a substation in this area which has had it's roof removed. This wall is around 4.2m high.



In each of the 4 panels in this wall it can be seen that there is a band of concrete 3 courses high around half-way up the wall (e.g. at the top of the graffiti in the image below)



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Inspections from closer range make it clear that these are lintels over bricked-up openings as indicated below.



There are numerous such bricked up openings in walls W06, W07 and W08 but it seems to us unlikely that these were previously window openings. We suspect instead that these are actually explosion relief panels from the previous use of this area as a substation. By this we mean that these panels were deliberately built to be weaker than the surrounding structure so that, should an explosion occur in the substation, the panels would be blown out allowing the explosive forces to dissipate rather than blowing the whole building apart.

We also anticipate that the substation probably had a heavy concrete roof, the load of which applied compression into the main wall structures below and contributed to their stability. The removal of this roof has (i) removed restraint from the top of the wall and (ii) removed this compression force, both of which weaken the wall.

We advise that, if possible, this wall is also reduced in height to the 3m height discussed earlier.

Strengthening works will also be required to cope with the loss of head restraint etc and the weakness resulting from the blast relief panels all as discussed earlier. Subject to calculation checks to demonstrate the strength is sufficient, possible options for strengthening include the following:-

- a) Stitch repair the explosion relief panels into the surrounding structure and then build a new 215mm thick brickwork wall in front, fully tied back to the original wall. Construct an extension to the existing foundation to support this.
- b) As above but use a grouted cavity wall (i.e. reinforcement and concrete within a masonry cavity) rather than solid brickwork.
- c) Stitch repair the explosion relief panels into the surrounding structure. Increase the size of the existing piers, new foundations will be required to support these.

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WALL W08

This wall is of similar construction to wall W07 and the same comments apply.

WALL W09

This wall is approx 2.6m high and is old brickwork.

It is buttressed at it's right hand end by Wall W10 and by a pier at it's left hand end.

The pier at it's left hand end is actually one of a pair of piers, the other buttresses wall W08. There is a narrow cavity between the two piers which is liable to collect debris and so we suggest this cavity is filled and the two piers stitched together using proprietary stainless steel reinforcing bars grouted into the brickwork.

WALL W10

This wall is approx 2.6m high and is old brickwork.

It is buttressed at it's left hand end by W09 and at it's right hand end by walls W11/W12. The junction at the RH end appears poorly bonded and there is cracking following the pattern of the block bonding.

We suggest this junction should be stitched together.

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WALL W11

There is significant cracking at the junction of walls W11 and W12, just to the left of the graffiti letter D below. This crack increases in width towards the top of the wall.



The W11 brickwork colour to the left of the crack appears slightly different to the W12 colour to the right of the crack.

We believe that wall W11 has probably been built at a later date than wall W12 and that, whilst it has been bonded into wall W12 at it's right hand end it appears as though the wall generally has settled due to inadequate foundations which has caused anti-clockwise rotation about it's right hand end and the opening up of the crack towards the top.

When viewed from the opposite side wall W11 does not display the same cracking, which is unusual. However, there are areas where the brickwork has been repointed and movement has also occurred where the junction has been block bonded into wall W10 as discussed earlier.

Noting that we understand this area is intended for landscaping use it seems sensible to dismantle wall W11 which would also open up the area.

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WALLS W12 & W13

These walls are around 2.6m high and consist of two leaves of brickwork. The wall facing into the RCL site is 215mm thick and the brickwork appears newer than most of the walls around the site. Behind this there is a 325mm thick wall built in older brickwork.

Both the new leaf and the old leaf lean towards the RCL site by typically 20mm to 30mm when measured on an 800mm spirit level.

At the exploratory hole locations the new and old leaves can be seen to be tight against each other i.e. just a 10mm joint between them.



Exploratory Hole



Photo P19A

However, at photo P19A the new leaf stopped and started either side of a tree (which had been growing tight against the old leaf) and the photo shows a brick return here which is approximately 300mm wide. We believe this closes off a cavity behind a 225mm brick wall. This brick return is close to the old leaf at the bottom but further apart at the top suggesting that the new leaf has moved away from the old leaf after construction.

There were no masonry ties or headers visible in the exploratory holes i.e. the two leaves are not believed to be tied together.

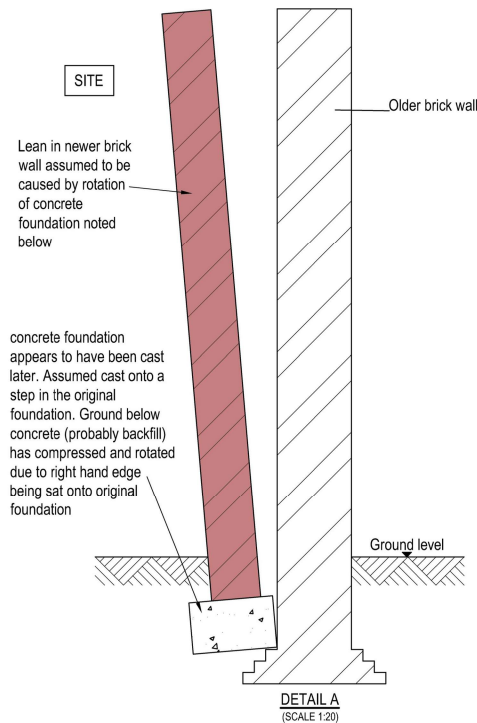
It is likely that the reason for construction of the new leaf was that the old leaf was leaning (possibly caused by bowing due to thermal expansion and a lack of expansion joints) and that the new leaf was intended to strengthen the old leaf. It appears that the new leaf was built tight against the old one i.e. where the old leaf leaned by 20mm then so would the new one.

In places the leaves have remained together (e.g. the exploratory hole locations discussed earlier) but in other places the leaves have moved apart (e.g. photo P19A).

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The trialpits in this area show that the new leaf has been built off a shallow concrete foundation which appears to have been built at the time the new leaf was constructed. This shallow foundation is perched on the edge of the original spread foundation but has not been taken down to the same depth as the original foundation, which means it is probably sat partly onto backfill following construction of the original foundation. If settlement of the fill below this newer foundation occurs this results in the foundation rotating which causes the wall to lean and the two leaves to move apart as shown in Detail A below.

We believe that the increasing gap at photo P19A has been caused by this. This does not appear to have yet occurred at the two exploratory hole locations but, as the same shallow foundation is present all along these walls, it could occur in the future.



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In Wall W13 there are also a pair of diagonal cracks as shown in the images below (highlighted red in the first image).



These are symptomatic of differential settlement and show the foundation of the wall between the cracks has settled further than those either side. This is probably due to variations in the compaction of backfill discussed earlier.

In many cases the presence of a tree, such as that shown in the photograph, can be the cause of differential settlement but, in this case, we suspect the differential settlement is occurring just in the shallow new foundation rather than the deeper old foundation. Inspections of the opposite side of the wall did not note cracking in these locations which reinforces the view that it is just the new foundation which has settled.

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On the opposite side of these walls there are 3 brick piers, the approximate locations of which are marked on the drawings. The brickwork of two of these appears similar to the wall itself i.e. they may be part of the original construction, although their purpose is unclear if that is the case.

However the pier that we have labelled pier 3 appears to have been built at a later date. The photo below shows that the width varies from approx 110mm at the base to approx 140mm at the top suggesting that the wall was leaning 30mm here and that, in an attempt to strengthen it, a pier was built with the left hand edge vertical and the right hand edge following the lean of the wall. Several courses of brickwork are missing at the base, suggesting movement continued which cracked and loosened this low level brickwork and that it has since been removed.



Pier 3



Wall W13



Wall W13

Further evidence of movement is present on the opposite side of wall W13. There is a recessed bed joint around 4 courses up from ground level suggesting that cracking may have occurred in this location, which could have loosened the mortar in this joint.

Walls W12 and W13 are around 2.6m in height. The BDA guidance referred to earlier would recommend a thickness of 325mm for walls of approximately this height i.e. the old wall would normally be compliant with this but, as noted earlier, it has developed a lean possibly due to bowing caused by thermal expansion and a lack of expansion joints. This lean compromises its strength and the newer leaf has presumably been built previously to try to mitigate this.

It's not known to SGi who owns the wall or whether both leaves are in the same ownership or whether the Party Walls etc act applies but we have been asked to include an option for how the wall can be made strong enough without needing to carry out works to the older leaf.

The agreed remedial proposals are provided on the drawings in Appendix C.

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WALL W14

This length of wall is beyond the extent of the new wall discussed in W12 and W13. The photo below shows W13 on the left and then wall W14 beyond this which is clearly in poor condition with loose bricks and inadequate pointing present. It appears as though there may previously have been another wall in front of this that has been removed for some reason.



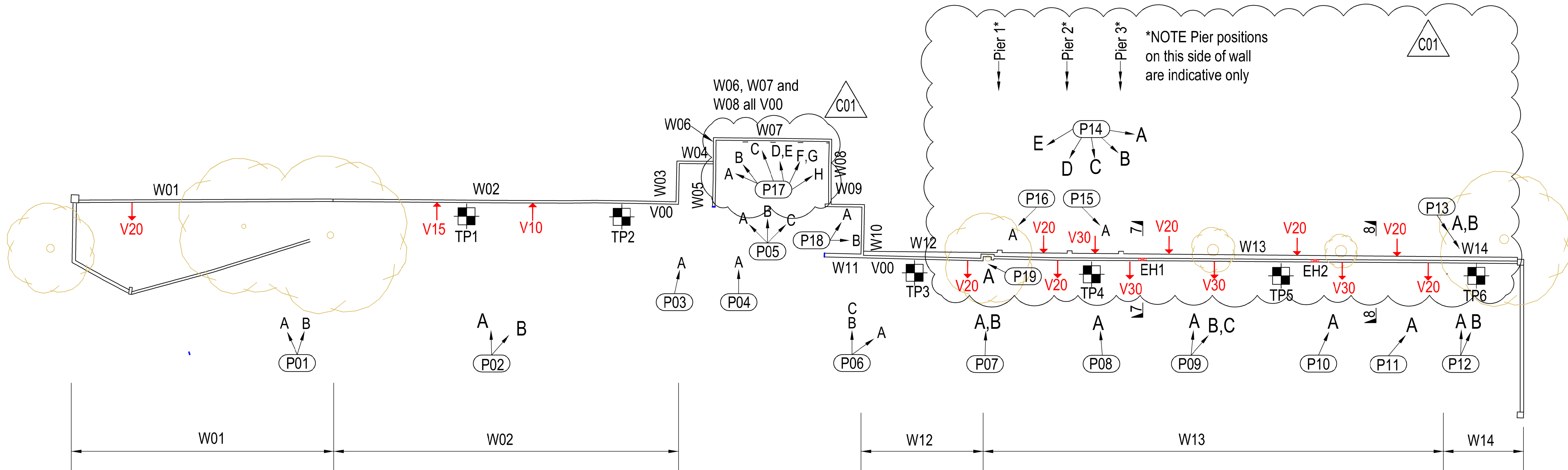
Also, at it's right hand end there is a broken end to a wall and the photo on the right shows that this is the remnants of a curved wall which has been broken out at some time.

Following the agreed remedial proposals for Walls 12 & 13, we advise an additional 215mm wall onto a new foundation is built here and tied to the existing. Refer to SK03 in Appendix C for the detailed remedial proposal.

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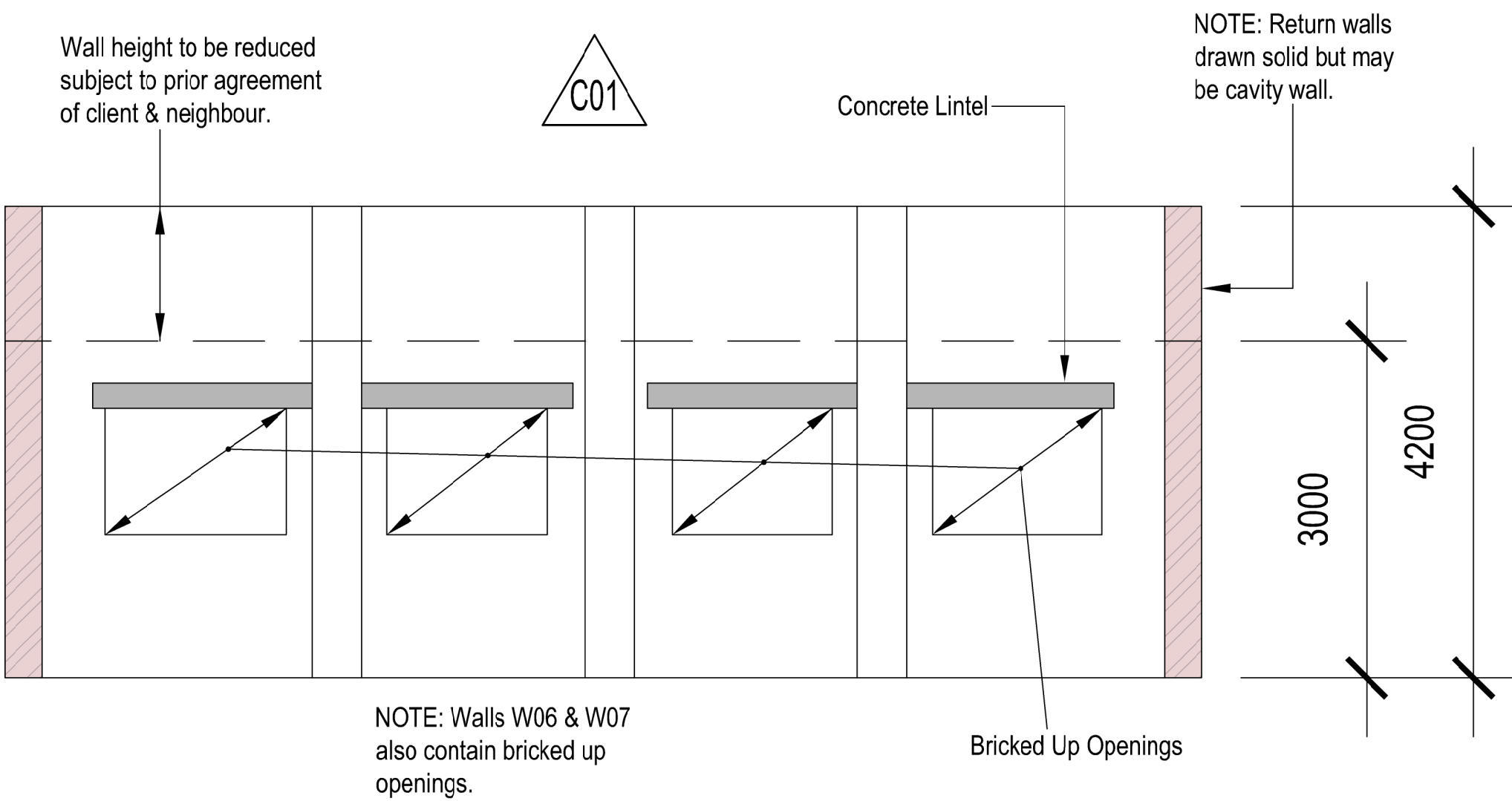
APPENDIX A

Survey Drawings

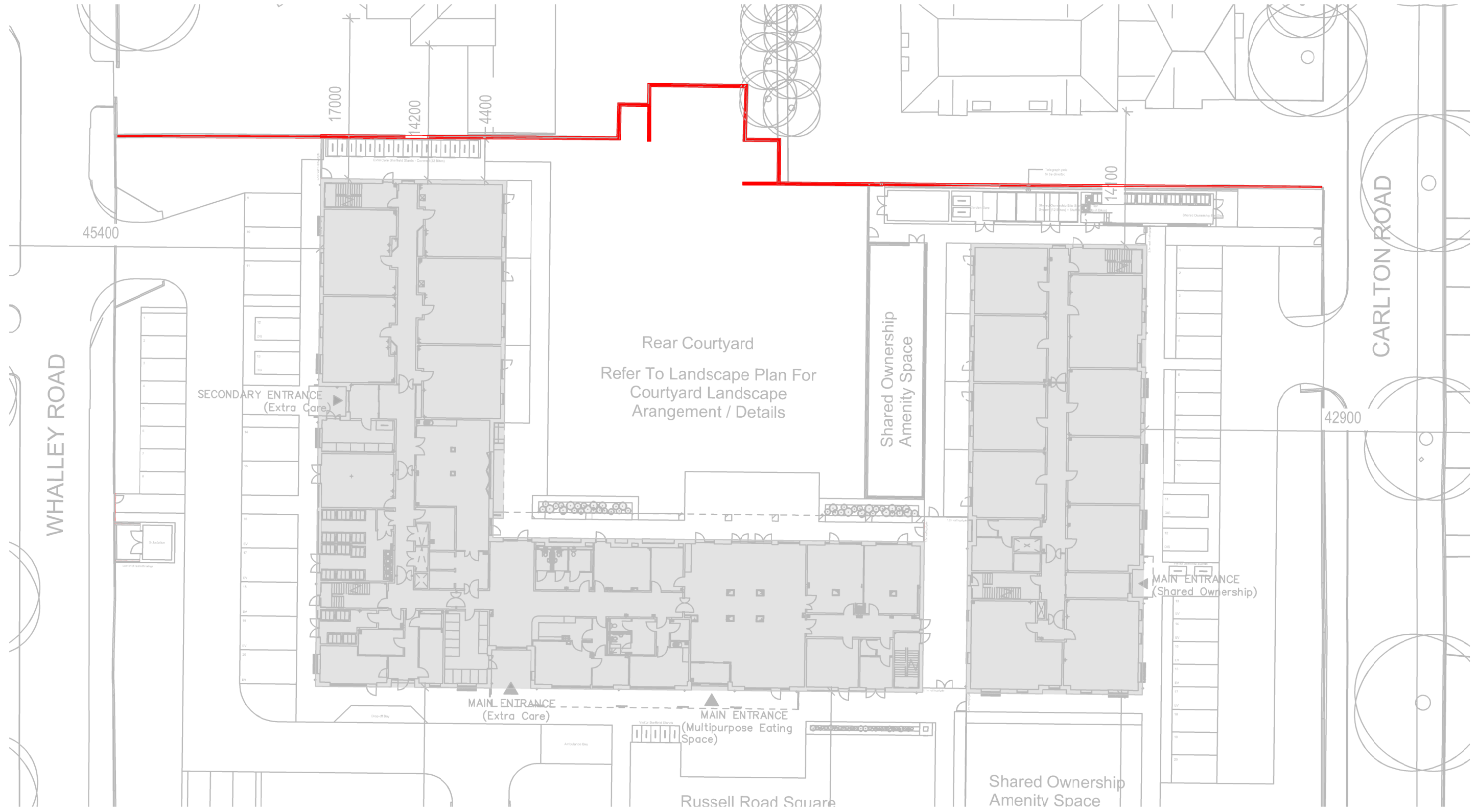


PLAN ON BOUNDARY WALL (1:200)

KEY	
	Location & direction of photos P01A & P01B
	Wall reference W01
	Trial pit reference 1
	Verticality check showing amount and direction of lean measured on 800mm spirit level
	Verticality check showed no significant lean



ELEVATION ON WALL W07 (1:50)



KEY PLAN (NTS)

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 - Significant Risks (as described in the 2007 CDM Regulations) are listed in the Pre-Construction Information Register.

C01	Updated following further survey. Elev Wall W07 added	AJB	01/12/25
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Client
ROWLINSON CONSTRUCTION

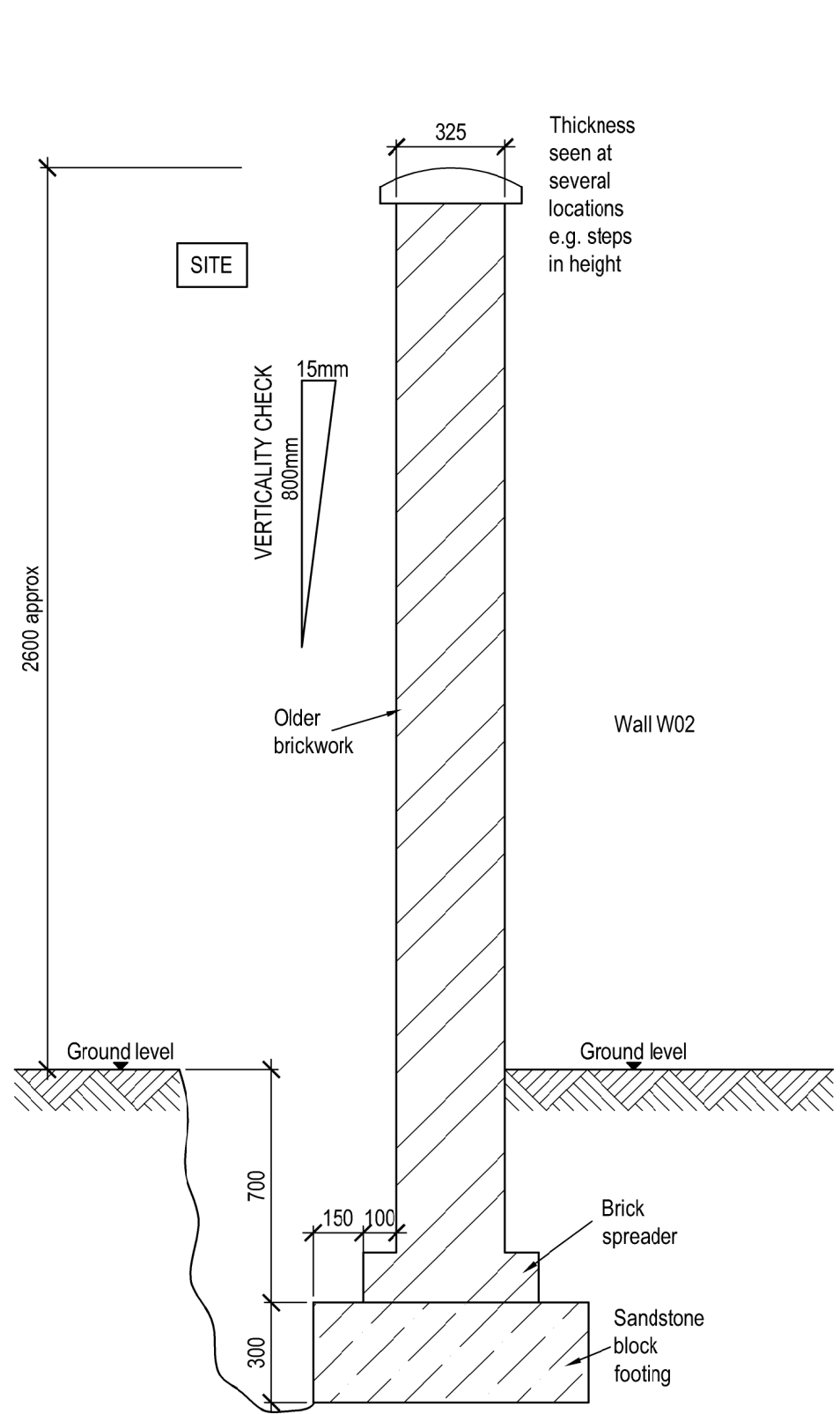
Project
RUSSELL ROAD, WHALLEY RANGE

Title
PLAN ON EXISTING NORTHERN BOUNDARY WALL

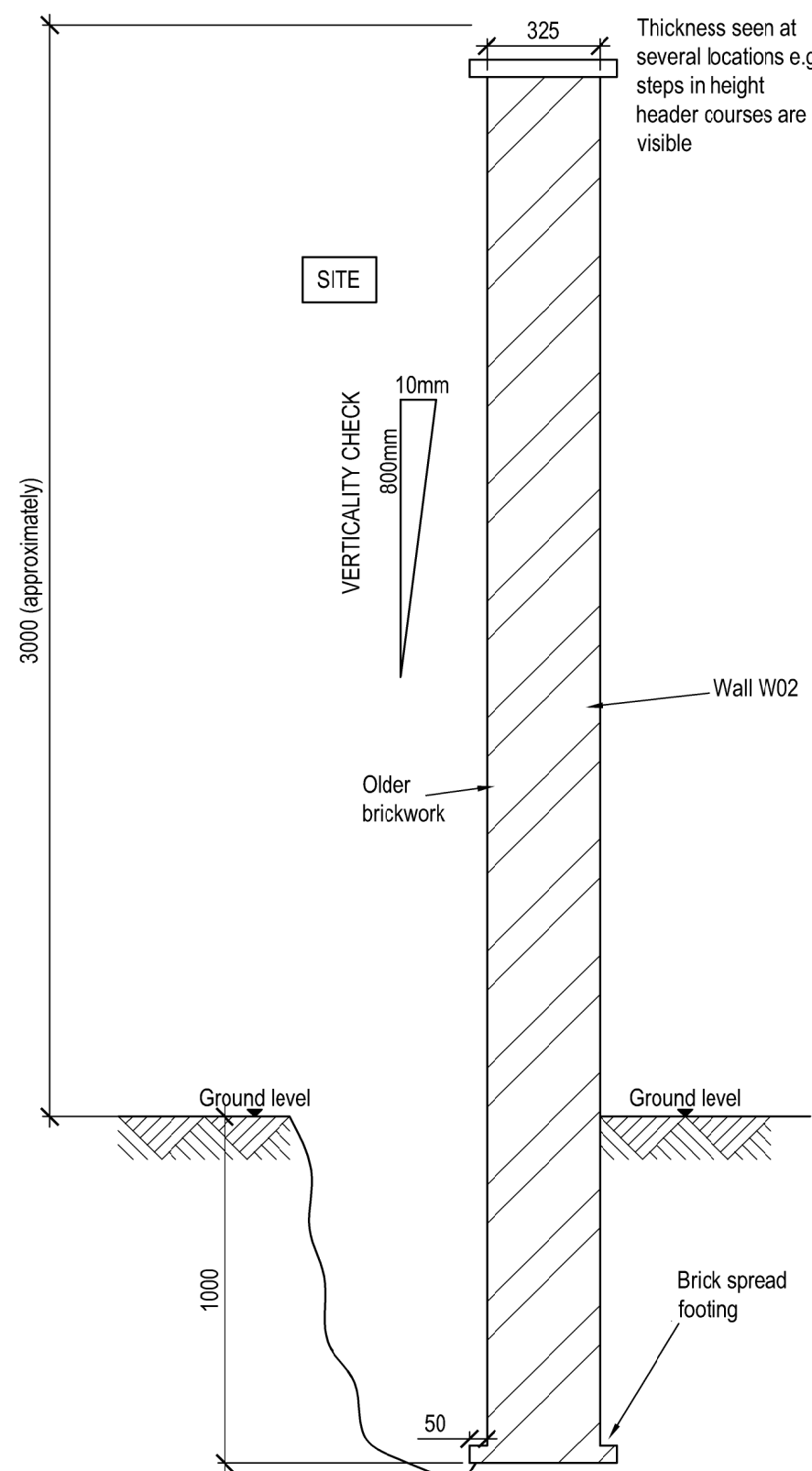
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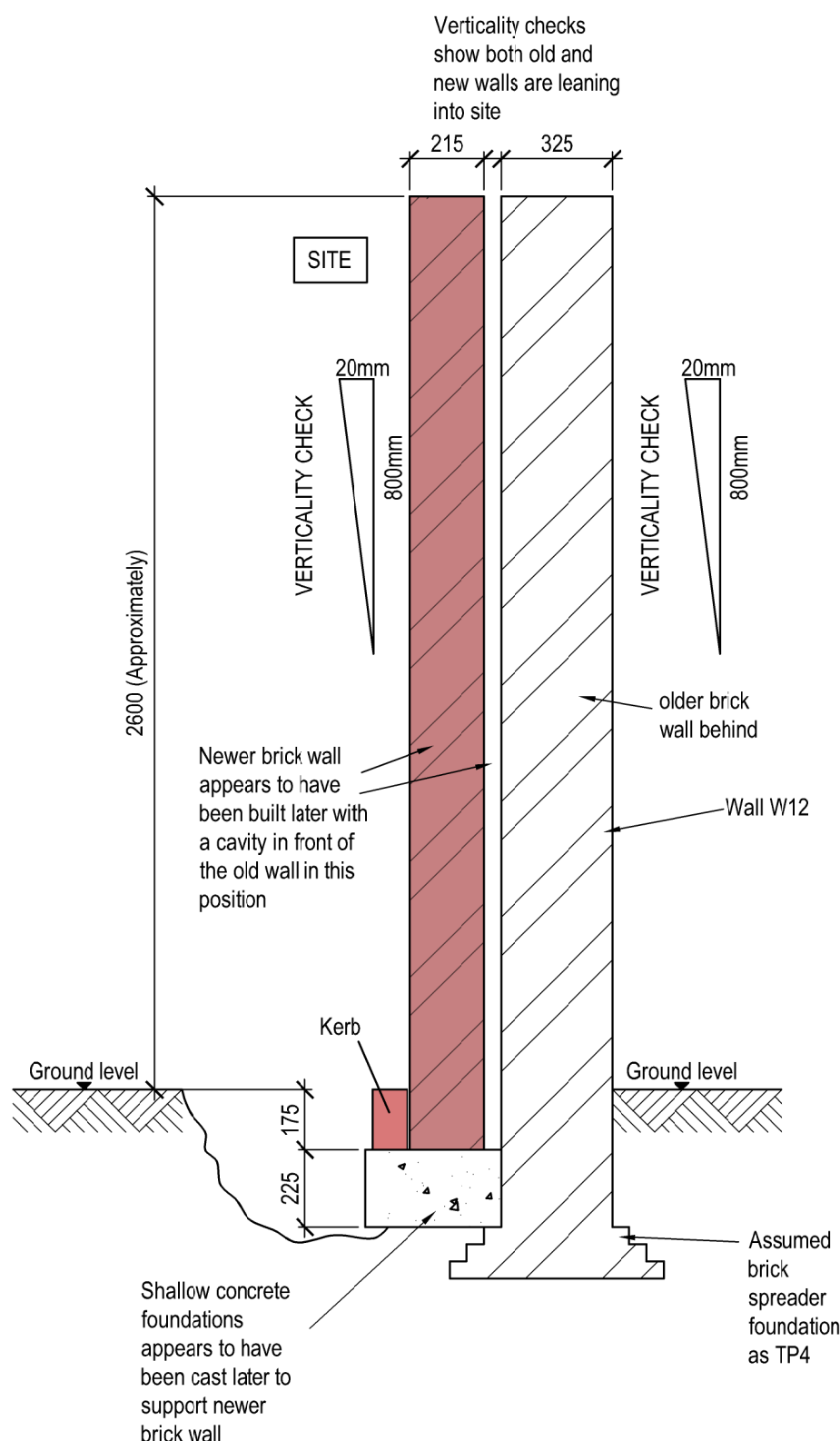
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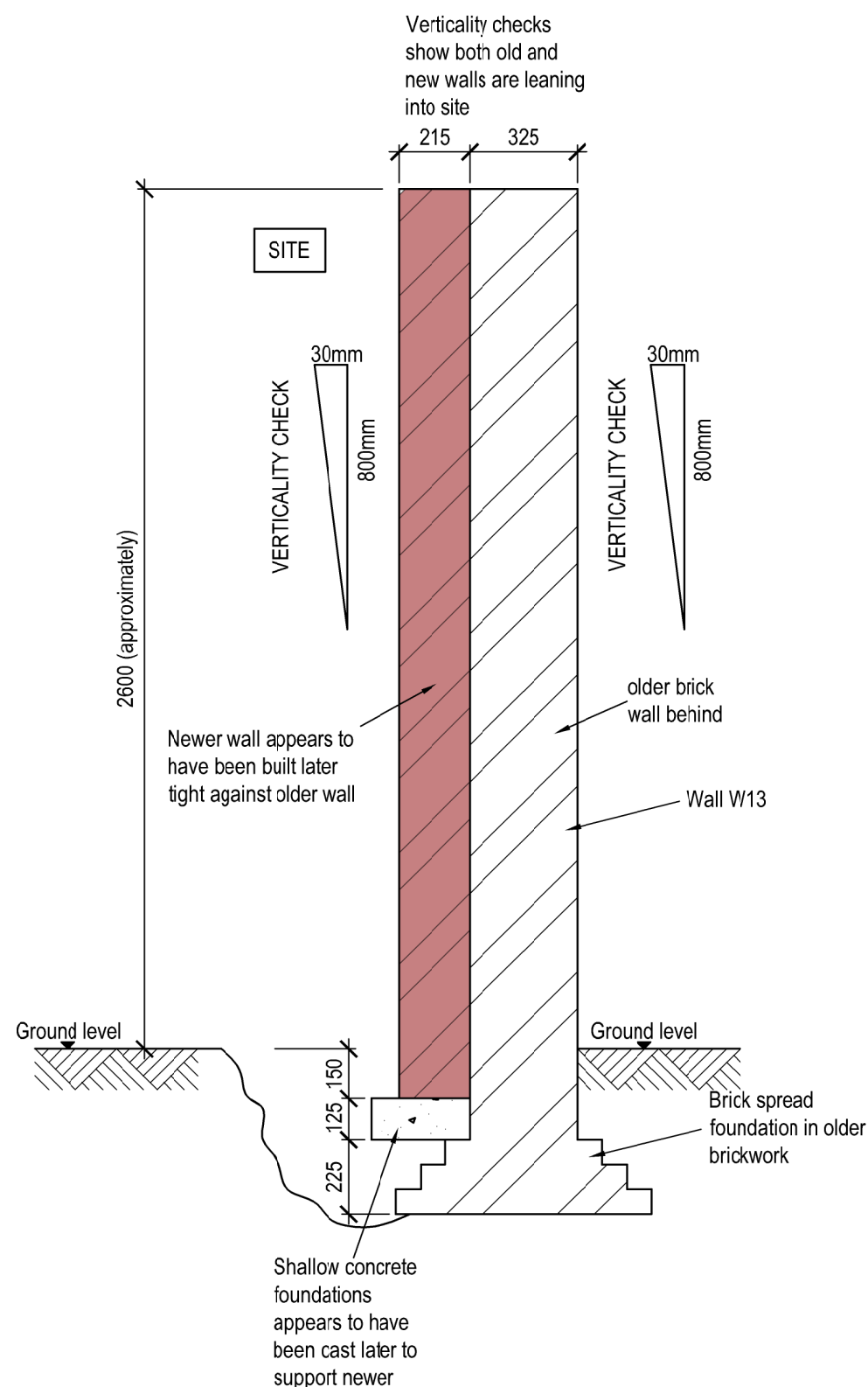
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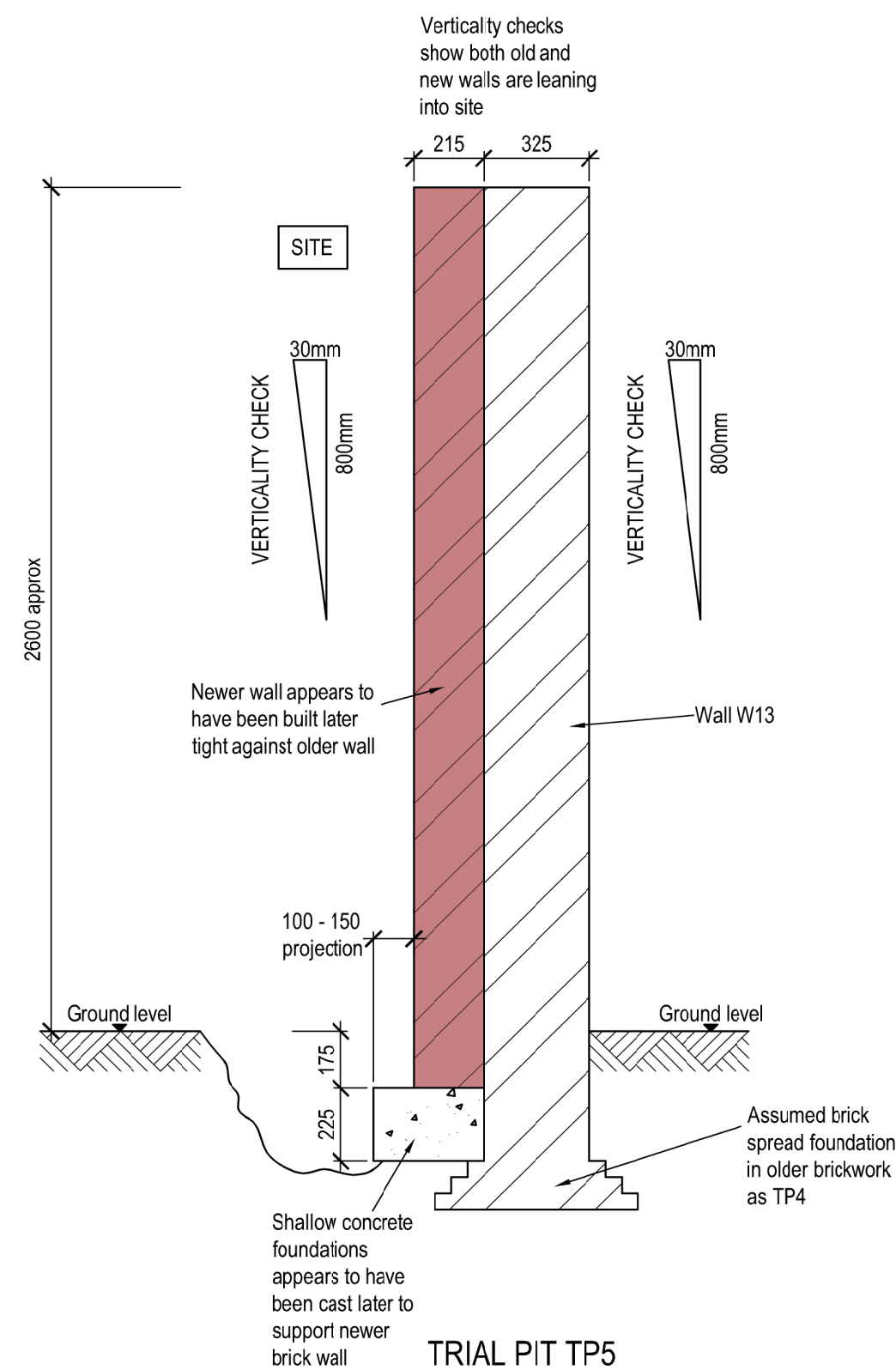
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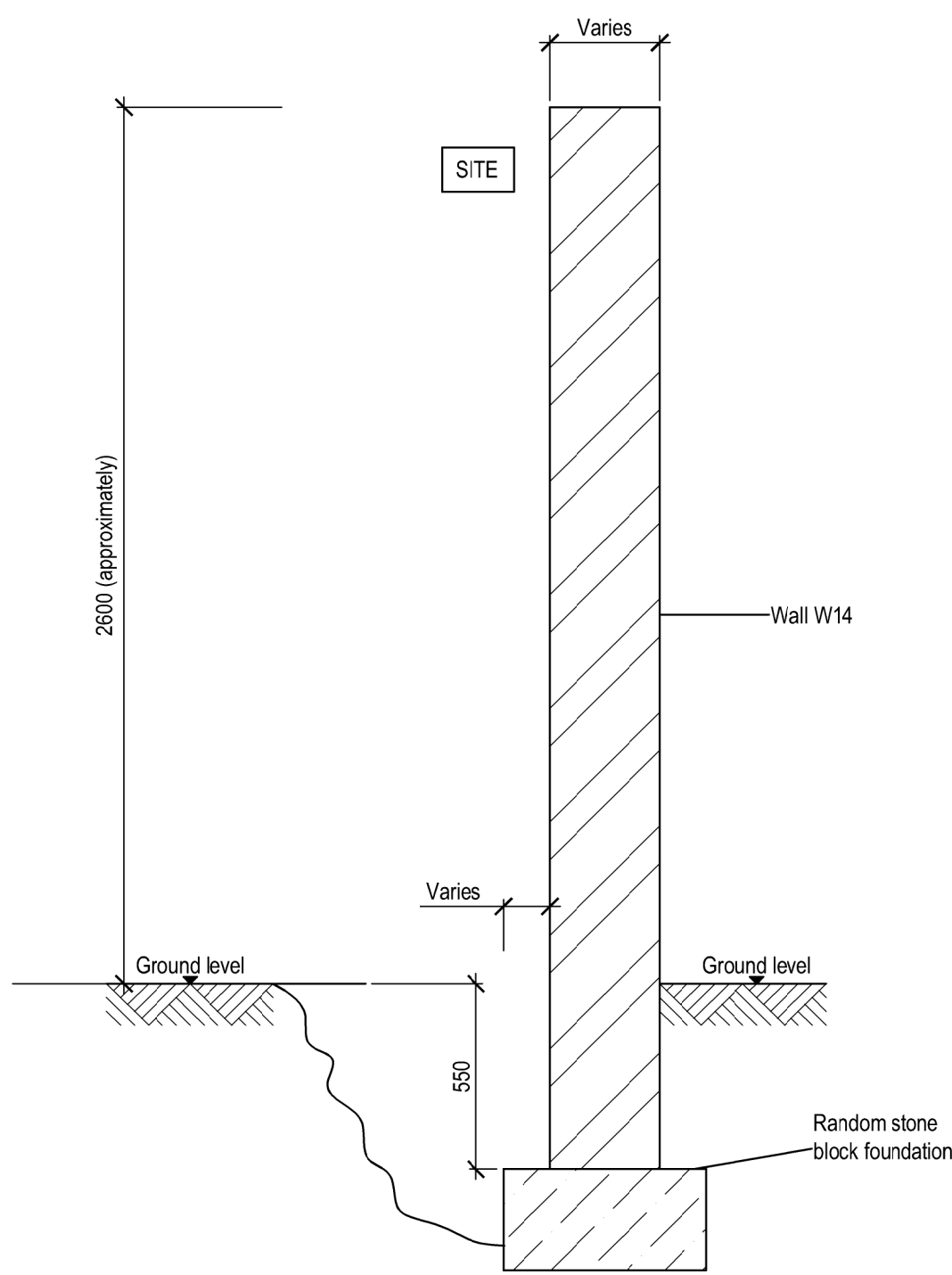
TRIAL PIT TP3
(SCALE 1:20)



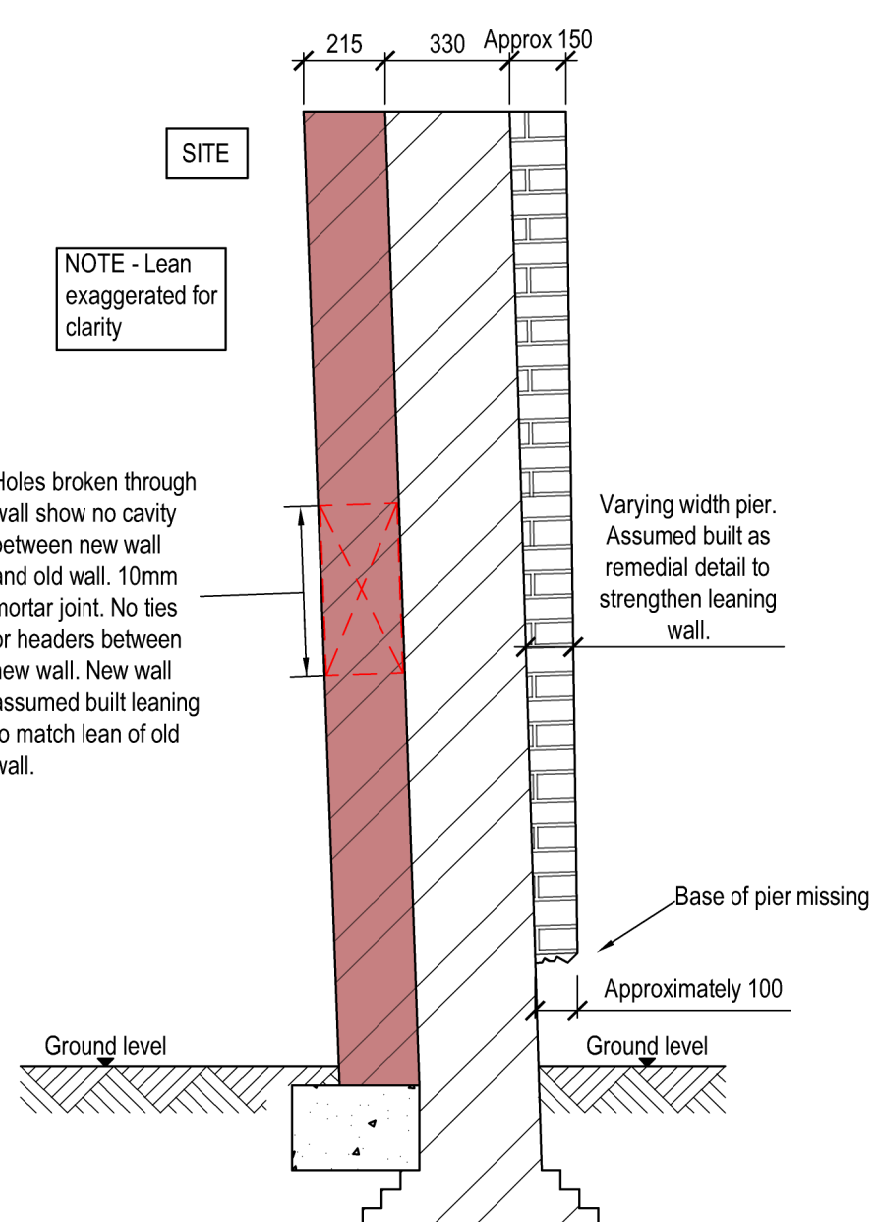
TRIAL PIT TP4
(SCALE 1:20)



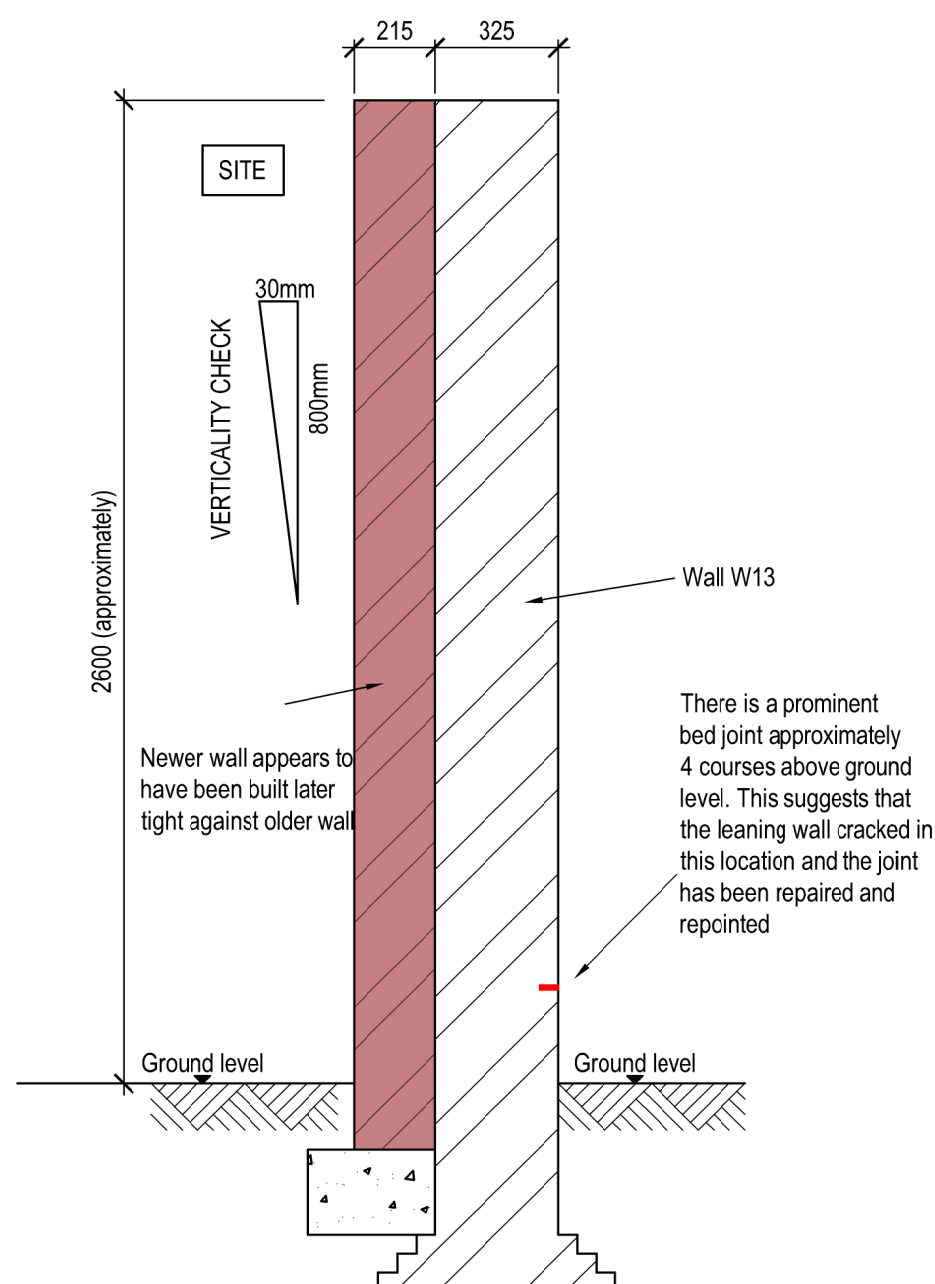
TRIAL PIT TP5
(SCALE 1:20)



TRIAL PIT TP6
(SCALE 1:20)



7-7
(SCALE 1:20)



8-8
(SCALE 1:20)

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 - Significant Risks (as described in the 2007 CDM Regulations) are listed in the Pre-Construction Information Register.
 - Read in conjunction with report RUS-SGI-XX-XX-RP-S-00002

C01	Updated following further survey. Small cavity between new and old walls removed. 7-7 & 8-8 added	AJB	01/12/25
P01	Preliminary Issue	AJB	17/07/25
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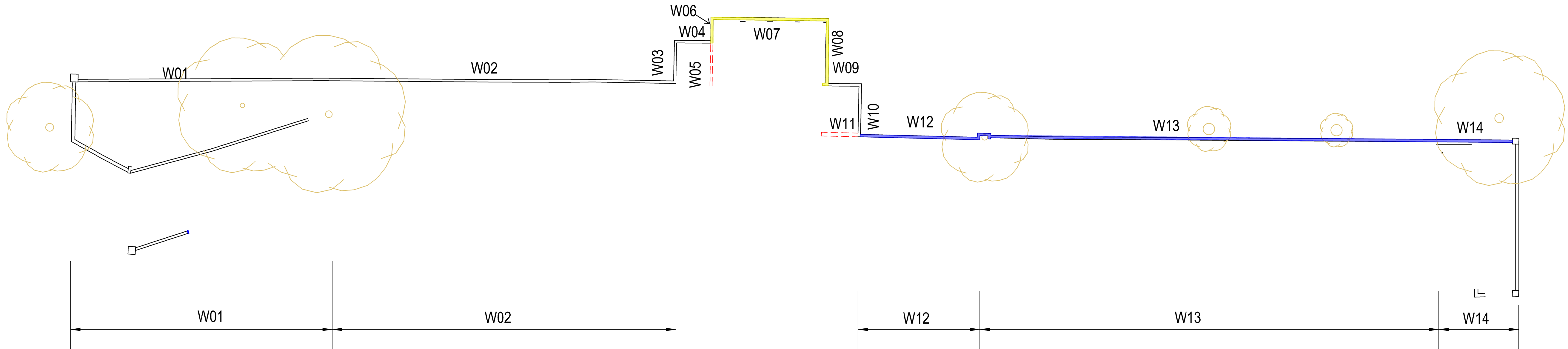
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Client
ROWLINSON CONSTRUCTION

Project
RUSSELL ROAD, WHALLEY RANGE

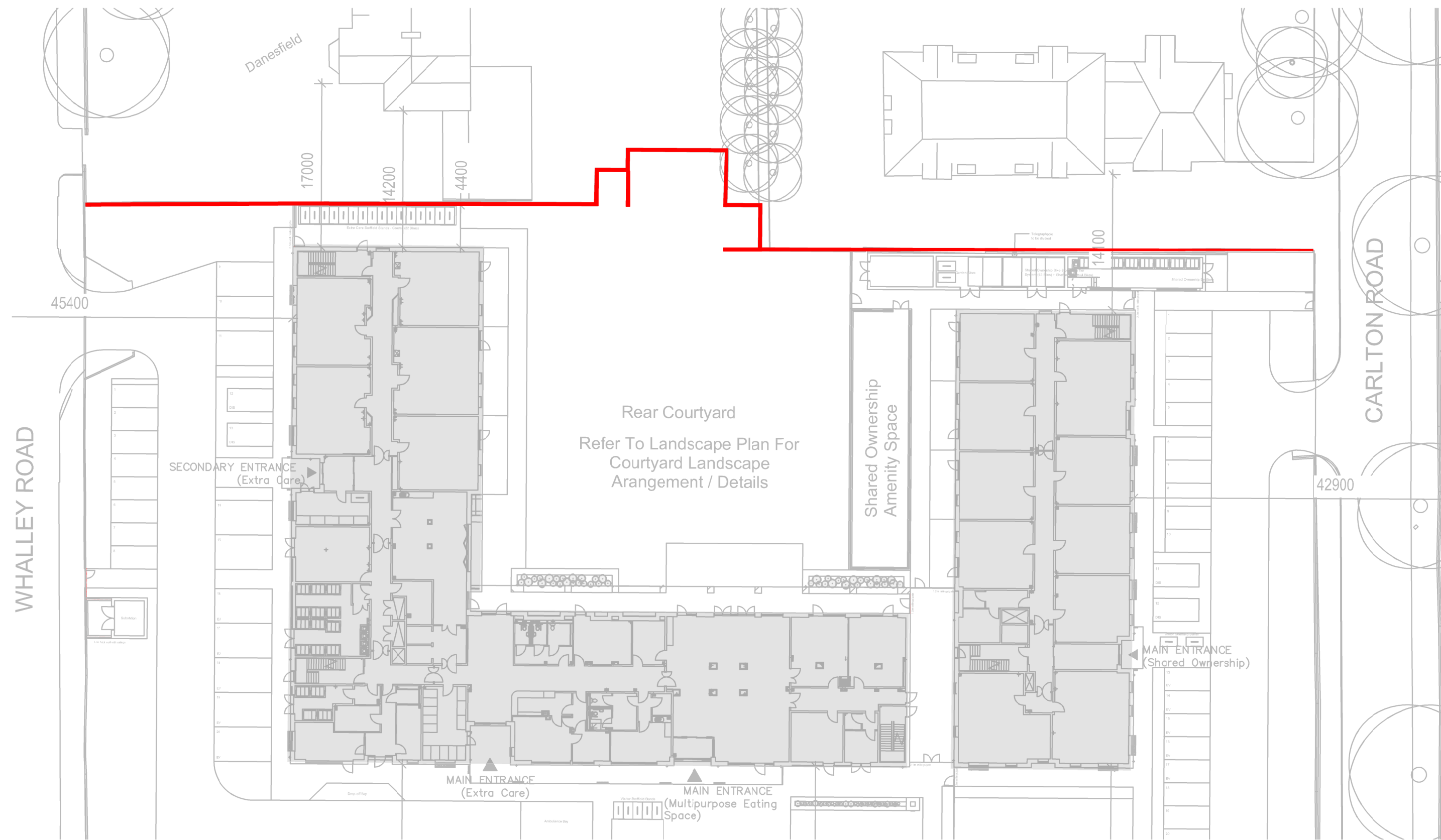
Title
WALL SECTIONS

Date	JUL'25	Drawn By	AJB				
Size	A1	Checked By	IDB				
Scale	As Shown	Approved By	IDB				
SGI Proj No.	RIBA	Status					
C1811	4	CONSTRUCTION					
Proj No.	Orig.	Zone.	Level.	Type.	Role.	Dwg No.	Rev.
RUS -SGI-XX-XX-DR-S- 1201-C01							



PLAN ON WALLS W01 TO W14

- Wall to be removed.
- Wall height to be reduced from 4.2m to 3.0m. Strengthening also required.
- Wall to be rebuilt / strengthened



KEY PLAN

- NOTES
- This drawing is copyright and the property of Shepherd Gilmour and must not be copied in whole or part without their prior written permission.
 - This drawing is to be read in conjunction with the appropriate Architect's and M&E Engineer's drawings, together with any other relevant Shepherd Gilmour drawings, sketches and specifications etc.
 - This drawing must not be scaled, the Contractor must report any dimensiona discrepancies and errors or omissions to the Engineer prior to construction commencing.
 - Significant Risks (as described in the 2007 CDM Regulations) are listed in the Pre-Construction Information Register.
 - Read in conjunction with report RUS-SGI-XX-XX-RP-S-00002

C01	Minor updates following further site survey	AJB	01/12/25
P01	Preliminary Issue	AJB	17/07/25
Rev.	Description	By	Date
 <div>Shepherd Gilmour Consulting Engineers Phoenix House, 45 Cross Street, Manchester, M2 4JF t: 0161 837 1500 w: www.sgiconsulting.co.uk</div>			
Client ROWLINSON CONSTRUCTION			
Project RUSSELL ROAD, WHALLEY RANGE			
Title BOUNDARY WALL REMEDIALS			
Date JUL'25	Drawn By AJB		
Size A1	Checked By IDB		
Scale As Shown	Approved By IDB		
SGI Proj No. C1811	RIBA 4	Status CONSTRUCTION	
Proj No.	Orig.	Zone.	Level.
Orig.	Zone.	Level.	Type.
Role.	Draw No.	Rev.	
RUS -SGI-XX-XX-DR-S- 1202-C01			

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	Russell Road				C1811	
	Calcs for				Start page no./Revision	
	Northern Boundary Wall Survey - Appendix B				B/ 1	
	Calcs by	Calcs date	Checked by	Checked date	Approved by	Approved date
	AJB	17/07/2025	IDB	17/07/2025	IDB	17/07/2025

APPENDIX B

Photographs

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	Russell Road			C1811	
	Calcs for			Start page no./Revision	
	Northern Boundary Wall Survey - Appendix B			B/ 2	
	Calcs by	Calcs date	Checked by	Checked date	Approved by
	AJB	17/07/2025	IDB	17/07/2025	IDB
					Approved date
					17/07/2025



Photo P01A (Wall W01)



Photo P01B (Walls W01 & W02)

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	Calcs for			Start page no./Revision	
	Northern Boundary Wall Survey - Appendix B			B/ 3	
	Calcs by	Calcs date	Checked by	Checked date	Approved by
	AJB	17/07/2025	IDB	17/07/2025	IDB
					Approved date
					17/07/2025



Photo P02A (Wall W02)



Photo P02B (Wall W02)

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	Russell Road			C1811	
	Calcs for			Start page no./Revision	
	Northern Boundary Wall Survey - Appendix B			B/ 4	
	Calcs by	Calcs date	Checked by	Checked date	Approved by
	AJB	17/07/2025	IDB	17/07/2025	IDB
					Approved date
					17/07/2025



P03A (Walls W05& W06)



P04A (Walls W04, W05 & W07)



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45 Cross Street, Manchester
M2 4JF

Project Russell Road				Job no. C1811	
Calcs for Northern Boundary Wall Survey - Appendix B				Start page no./Revision B/ 5	
Calcs by AJB	Calcs date 17/07/2025	Checked by IDB	Checked date 17/07/2025	Approved by IDB	Approved date 17/07/2025



P05A (Walls W05, W06 & W07)



P05B (Wall W07)

 SGi Consulting Engineers 45 Cross Street, Manchester M2 4JF	Project			Job no.	
	Russell Road			C1811	
	Calcs for			Start page no./Revision	
	Northern Boundary Wall Survey - Appendix B			B/ 6	
	Calcs by	Calcs date	Checked by	Checked date	Approved by
	AJB	17/07/2025	IDB	17/07/2025	IDB
					Approved date
					17/07/2025



P05C (Walls W07, W08, W09 & W10)



P06A (Wall W12&W13)



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45 Cross Street, Manchester
M2 4JF

Project Russell Road				Job no. C1811	
Calcs for Northern Boundary Wall Survey - Appendix B				Start page no./Revision B/ 7	
Calcs by AJB	Calcs date 17/07/2025	Checked by IDB	Checked date 17/07/2025	Approved by IDB	Approved date 17/07/2025



P06B (Wall W12)



P06C (Wall W12)

 SGi Consulting Engineers 45 Cross Street, Manchester M2 4JF	Project			Job no.	
	Russell Road			C1811	
	Calcs for			Start page no./Revision	
	Northern Boundary Wall Survey - Appendix B			B/ 8	
	Calcs by	Calcs date	Checked by	Checked date	Approved by
	AJB	17/07/2025	IDB	17/07/2025	IDB
					Approved date
					17/07/2025



P07A (Wall W12)



P07B (Wall 12)

 SGi Consulting Engineers 45 Cross Street, Manchester M2 4JF	Project			Job no.	
	Russell Road			C1811	
	Calcs for			Start page no./Revision	
	Northern Boundary Wall Survey - Appendix B			B/ 9	
	Calcs by	Calcs date	Checked by	Checked date	Approved by
	AJB	17/07/2025	IDB	17/07/2025	IDB
					Approved date
					17/07/2025



P08A (W13)



P09A (Wall W13)

 SGi Consulting Engineers 45 Cross Street, Manchester M2 4JF	Project			Job no.	
	Russell Road			C1811	
	Calcs for			Start page no./Revision	
	Northern Boundary Wall Survey - Appendix B			B/ 10	
	Calcs by	Calcs date	Checked by	Checked date	Approved by
	AJB	17/07/2025	IDB	17/07/2025	IDB
					Approved date
					17/07/2025



P09B (Wall 13)



P09C (Wall W13)

 SGi Consulting Engineers 45 Cross Street, Manchester M2 4JF	Project			Job no.	
	Russell Road			C1811	
	Calcs for			Start page no./Revision	
	Northern Boundary Wall Survey - Appendix B			B/ 11	
	Calcs by	Calcs date	Checked by	Checked date	Approved by
	AJB	17/07/2025	IDB	17/07/2025	IDB
					Approved date
					17/07/2025



P10A (Wall W13)



P11A (Wall W14)

 SGi Consulting Engineers 45 Cross Street, Manchester M2 4JF	Project			Job no.	
	Russell Road			C1811	
	Calcs for			Start page no./Revision	
	Northern Boundary Wall Survey - Appendix B			B/ 12	
	Calcs by	Calcs date	Checked by	Checked date	Approved by
	AJB	17/07/2025	IDB	17/07/2025	IDB
					Approved date
					17/07/2025



P12A (Wall W14)



P12B (Wall W14)

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	Russell Road			C1811	
	Calcs for			Start page no./Revision	
	Northern Boundary Wall Survey - Appendix B			B/ 13	
	Calcs by	Calcs date	Checked by	Checked date	Approved by
	AJB	17/07/2025	IDB	17/07/2025	IDB
					Approved date
					17/07/2025



P13A (W14)



P13B (W14)