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ADDENDUM TO

BASEMENT DESIGN STATEMENT

AND

REPORT ON THE STRUCTURAL IMPLICATIONS OF THE PROPOSED DEVELOPMENT ON ST GEORGE'S GARDEN BOUNDARY WALL

REF: 217017 - MAY 2017

THE OLD DAIRY, WAKEFIELD STREET, LONDON, WC1N 1PG

ADDENDUM TO

BASEMENT DESIGN STATEMENT

AND

REPORT ON THE STRUCTURAL IMPLICATIONS OF THE PROPOSED DEVELOPMENT ON ST GEORGE'S GARDEN BOUNDARY WALL

Issue	Date	Comments
Draft Issue	18.04.17	
Draft Issue 2	10.05.17	
Issue 1	12.05.17	
Issue 2	22.05.17	

Report prepared by: David Gale IEng AMIStructE (Senior Engineer)

Report authorised by: Frank Navarro BSc(Eng) CEng MIStructE (Director)

CONTENTS

1.0 INTRODUCTION

The following approved documents relating to basement construction and potential implications on the St George's Gardens Boundary Wall at the Old Dairy Site, 7 Wakefield Street, were incorporated into Planning Permission 2011/6032/P as varied by 2015/0825/P:

- Doc 14 – Report on the Implications of the Proposed Development on St. Georges Boundary Wall Dated November 2011

- Doc 16 – Basement Design Statement Dated November 2011

This document is an addendum to those reports and sets out the modifications in proposed construction methodology following appointment of a main contractor. Where amendments are proposed, the relevant sections of the previous reports are replaced.

2.0 SUMMARY OF UPDATED METHODOLGY

The areas where the methodology differs from the initial proposals outlined in Appendix 2 of the ***Basement Design Statement*** by Tibbalds (2011) are as follows:-

a. The initial proposal (2011) was to adopt a propped steel sheet piled wall tight to the North and West boundary of the site prior to forming the new basement structure. The updated proposal is to replace the steel sheet piled wall with mass concrete underpinning to the existing walls to the north and west of the site.
Refer to Sections 5.2, 5.3, and Sketches SK10, SK11, and SK30 in Appendix A for further details.

b. A piled suspended basement slab initially proposed in 2011 has been replaced with an in-situ reinforced concrete 'raft' type basement slab in the current scheme.
Refer to Section 5.2 and Sketches SK10 and SK11 in Appendix A for further details.

The areas where the methodology differs from the proposals outlined in the Packman Lucas document: ***Report on the Implications of the Proposed Development on St George's Garden Boundary Wall*** (2011) are as follows:-

c. Due to limitations on the working space and accessibility of this part of the site, mass concrete underpinning of the St George's boundary wall is to be adopted in place of the steel sheet piling that was initially proposed against the wall.
Refer to Section 5.4 and Sketches SK11 and SK30 in Appendix A for further details

d. Sketches in the initial report indicated that a two-storey basement was to be constructed adjacent the boundary wall. However, all the basements in the proposed development are single-storey including the one adjacent the St George's boundary wall.
Refer to Sketch SK11 in Appendix A for further details.

The initial Basement Design Statement by Tibbalds also made some recommendations to be considered as the project progressed which have been addressed as follows:-

I. Temporary propping to be designed by specialist contractor: Refer to the methodology statement by H Smith (Engineers) Ltd for further details of the temporary works.

II. A detailed construction methodology is to be developed: Refer to the methodology statements by H Smith (Engineers) Ltd for further details of the demolition and temporary works. Refer to methodology statements by M&K Builders Ltd for further details of the underpinning and groundworks.

III. A detailed Site Investigation be carried out: This was carried out by Site Analytical Services in January 2015, and the report dated February 2015 was used in developing the construction methodology further.

3.0 BRIEF DESCRIPTION OF THE PROPOSED DEVELOPMENT

The site is accessed from Wakefield street to the west and comprises an existing light industrial steel framed building (The Old Dairy) which covers the majority of the available footprint. To the North of the site is a masonry wall which forms the boundary with the rear gardens to properties on Tavistock Place and Regent Square. This wall returns to form part of the west boundary to the site also along with the access from Wakefield Street. To the South is the listed boundary wall to St Georges Gardens which converges with the north boundary wall at the east end of the site.

The proposed works will initially involve the demolition of the existing steel-framed, single storey dairy structure, with the exception of the boundary wall to the North and West. The proposed development includes the construction of two commercial units to the west of the site, two houses to the east, and eleven flats between, arranged over two storeys plus a basement. The basement depth varies but the maximum figure from ground level to basement FFL is approximately 4.2m.

4.0 GROUND CONDITIONS

4.1 Site Investigations

A full ground investigation was carried out on site by **Site Analytical Services Ltd** in January 2015 and included the following:

- The drilling of seven boreholes, three to a depth of 25m, and four to a depth of 3m.
- The installation of groundwater and gas monitoring standpipes to depth of approximately 10m in three boreholes.
- The excavation of twelve trial pits to a maximum depth of 2m to investigate the depth of existing foundations and samples for contamination testing.

4.2 Ground Conditions

The ground conditions encountered comprised made ground to a depth of 2.3m, underlain by Superficial Head deposits with the London Clay formation and Lambeth Group (Very stiff, silty CLAY) at depth.

Groundwater levels in the three standpipes stabilised at respective depth of 1.83m, 5.55m, and 6.83m below ground level after a period of four weeks.

The ground gas monitoring concluded that a low to intermediate gas regime was identified and recommended low level gas protection measures comprising a membrane and ventilated sub-floor be adopted.

Refer to the ground investigation report by Site Analytical Services Ltd (February 2015) for full details of the ground conditions.

5.0 PROPOSED CONSTRUCTION

5.1 Demolition

The demolition of the Old Dairy structure will be undertaken by a specialist contractor and will be carried out in a manner to ensure that the structural integrity of all adjacent structures is maintained throughout the works. After the installation of the temporary works to the existing boundary wall (see section 5.3 below) the demolition works will commence in accordance with the methodology set out by the specialist contractor.

Refer to the methodology statement by H Smith (Engineers) Ltd for further details of the demolition and associated works.

5.2 Basement Construction

It is proposed to form the basement with an in-situ reinforced concrete 'raft' type slab at basement level, RC liner/retaining walls to the perimeter, and a suspended RC slab at ground floor level. There will be internal RC walls and columns at basement level to support the ground floor slab over. Based on the findings of the site investigation carried out by Site Analytical Services, the basement raft slab will be located in the stiff, high strength clay, which is located at depths of 2.0 – 3.0m below ground level across the site. A heave protection material will be adopted beneath the slab to counter the potential for ground movement identified in the Site Investigation Report.

Prior to the basement being constructed, the existing boundary walls to the north and west (which are to be retained) will be underpinned with traditional mass concrete underpins in an agreed sequence of 1m lengths. A reinforced concrete retaining wall will then be formed in front of the underpinning to resist all lateral earth pressures and surcharges. Temporary support to these walls will be required throughout these works and are summarised in section 5.3 below.

The south wall to the basement will be formed with a contiguous piled wall, which will then be lined with a reinforced concrete wall to form the basement structure. This piled wall will generally run parallel to the listed boundary wall to St George's Gardens for a length of approximately 80m, with a distance to the boundary of approximately 2.0m at its closest point. Towards the west of the site this piled wall will turn towards the existing boundary wall, where it will terminate approximately 1.0 from the face of the wall. The piled wall will be formed with 450mm and 600mm diameter Rotary Bored Piles which will be designed by the specialist piling contractor. A reinforced concrete capping beam will be formed along the top of the piled wall to tie to piles together at ground level.

The contiguous piled wall will be designed to resist all lateral earth pressures and vertical surcharge loads and will therefore provide both temporary support during the excavation works and construction of the basement, and the permanent retaining structure for the completed basement.

Works against the listed boundary wall to St George's Gardens are outlined in section 5.4 below.

Refer to Sketches in Appendix A for a plan showing the location of the underpinning and piling and typical sections through the perimeter basement walls.

5.3 Works to retain North boundary wall

The boundary wall to the north and north-west of the site is to be retained in the permanent case as part of the new development, and also in the temporary case during construction. Prior to the underpinning of the North boundary wall temporary support works will be installed to stabilise the wall during the proposed works. As the methodology of the temporary works has been developed it has been decided to adopt raking props down to temporary piled bases to provide restraint to the horizontal walings, in place of temporary steel towers on partial underpins previously proposed. We believe that this method involves less risk and provides a more rigid restraint to the existing wall during the proposed works than the initial proposal since the towers would allow more lateral deflection than the raking props which we propose to use instead. In addition, as the piled bases will be formed some distance from the boundary wall, it allows all temporary works to be installed prior to any demolition or underpinning is carried out. This methodology has been developed specifically to minimise the risk of any damage or structural instability to the existing boundary wall during the construction works.

Refer to the methodology statement by H Smith (Engineers) Ltd for further details of the temporary works.

5.4 Works against listed boundary wall to St Georges Gardens

Prior to any works being carried out against the St George's Gardens wall temporary supports will be installed to ensure that the structural integrity of the wall is maintained during the proposed works. Once the temporary supports are in place, demolition of the existing Old Dairy structure will be undertaken by a specialist contractor in accordance with the agreed methodology.

Refer to the methodology statement by H Smith (Engineers) Ltd for further details of the demolition and temporary works.

The basement to the commercial unit to the west of the site will be formed against the listed boundary wall to St George's Gardens. The existing boundary wall will initially be underpinned with traditional mass concrete underpins in an agreed sequence of 1m lengths. A reinforced concrete retaining wall will then be formed in front of the underpinning to resist all lateral earth pressures and surcharges. This section of the development is being formed adjacent to three houses which were built in circa 2010, and record information indicates that the basement to these houses was also formed in this way. We believe that the implications of the proposed works to the listed boundary wall to St George's Gardens have been fully considered, and that the temporary works, construction methodology, and movement monitoring proposed (see Section 6.0) will ensure that the structural integrity of the wall is maintained during the works.

Refer to the methodology statement by M&K Builders Ltd for further details of the underpinning works.

Refer to Sketches SK11 and SK30 in Appendix A for further details.

6.0 MOVEMENT MONITORING

A monitoring regime will be put in place to record any movement to adjacent walls and buildings, including the boundary wall to the north and west, the listed boundary wall to St George's Gardens to the south, and the existing houses to the west of the site. Monitoring targets will be placed in agreed locations, and readings taken weekly by total station theodolite to record any movement. If pre-agreed trigger values are achieved, the methodology being adopted will be reviewed and the frequency of the readings increased.

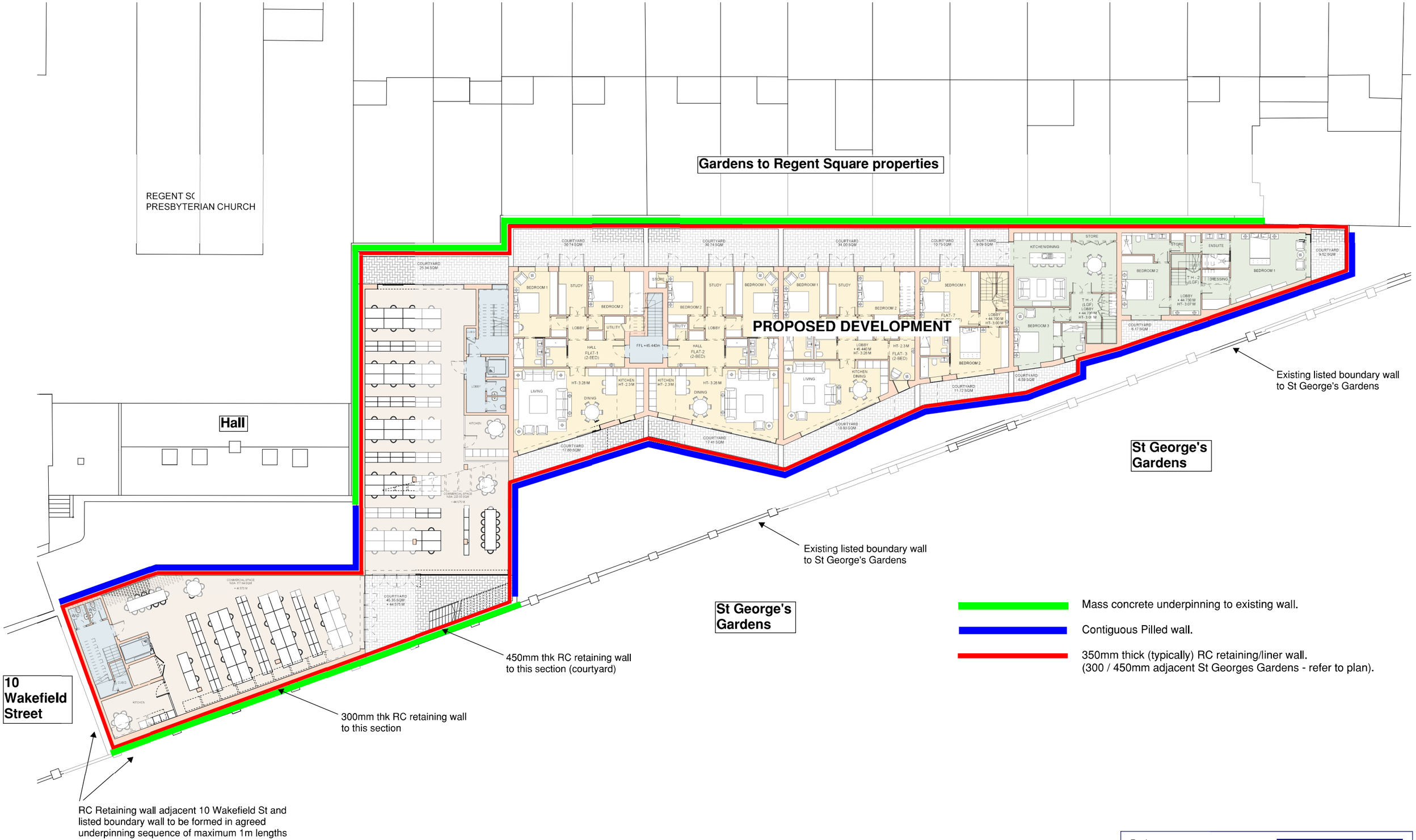
7.0 CONCLUSION

We believe that the information submitted with this report demonstrates that the implications of the proposed works on the local environment and neighbouring properties have been fully considered, and that the temporary works, construction methodology, and movement monitoring proposed will ensure that the structural integrity of the physical environment in the area will be maintained.

The current proposals do not constitute a change in the size or configuration of the basement from the approved November 2011 Basement Design Statement. The revised basement methodology does not further affect any issues relating to ground water, hydrology or land stability.

APPENDIX A

217017/SK30 -	Plan showing Proposed Underpinning and Contiguous Piling
217017/SK10 -	Typical Sections – Sheet 1
217017/SK11 -	Typical Sections – Sheet 2
217017/SK05 -	North Wall Restraint – Permanent Works
217017/SK06 -	North Wall Restraint – Temporary and Permanent Works Isometrics



PROPOSED LOCATION OF UNDERPINNING AND CONTIGUOUS PILING TO BASEMENT WORKS

Project:
The Old Dairy

Drawing Title:
Proposed Underpinning and Contiguous Piling

Drawing No:
217017/ SK30

Drawn By: DG

Date: April 2017

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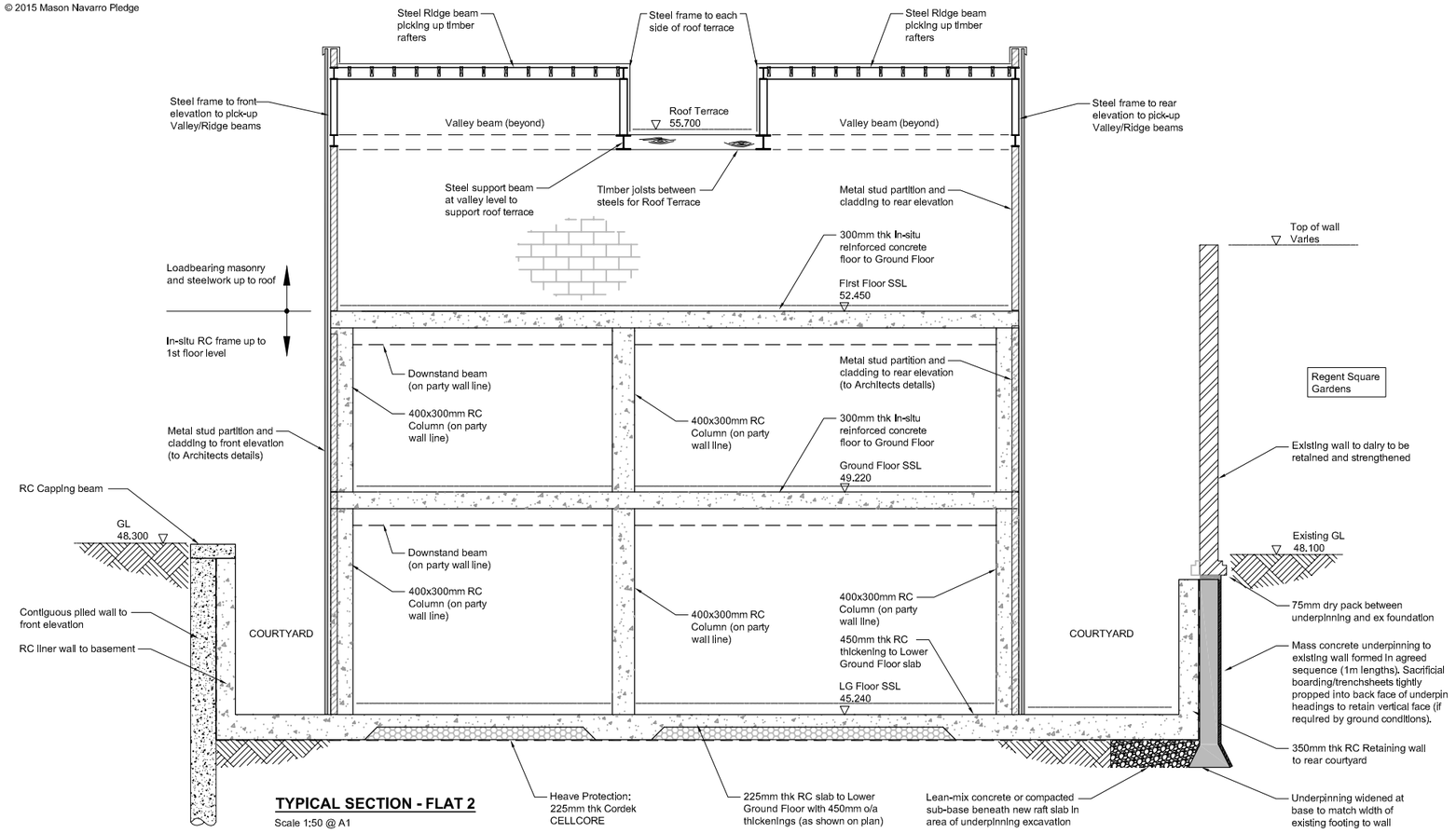

TYPICAL SECTION - FLAT 2

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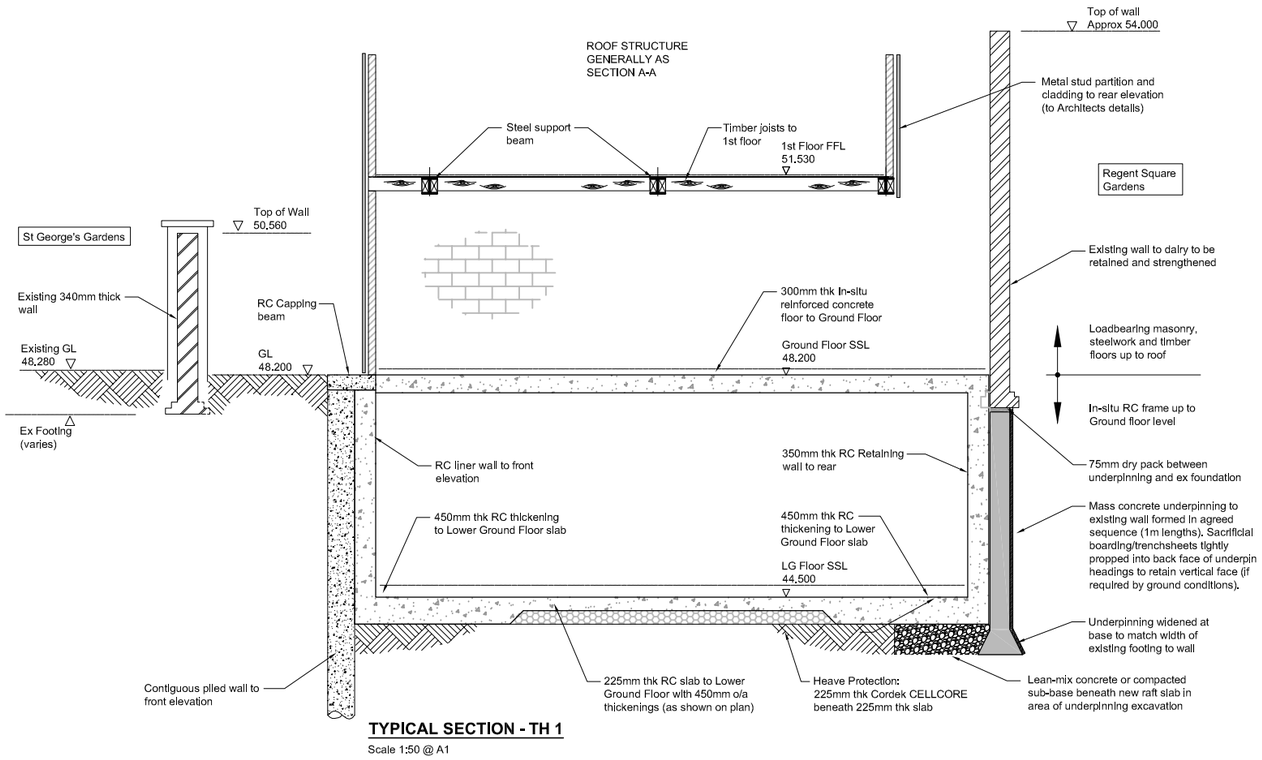

TYPICAL SECTION - TH 1

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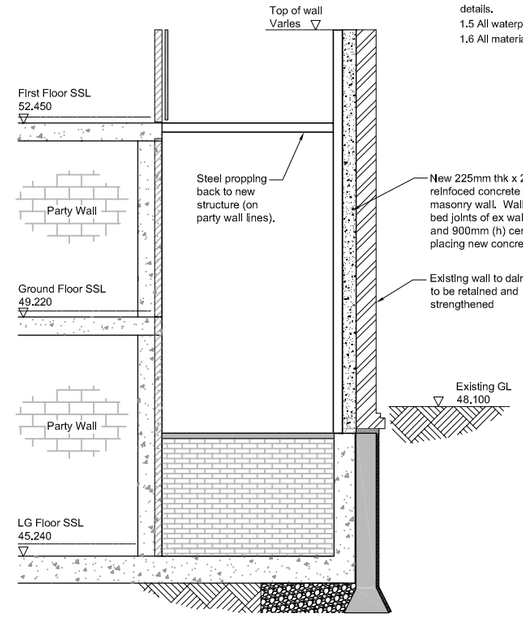

TYPICAL RESTRAINT TO EXISTING WALL (Approx 10m c/c - On party wall lines)

Scale 1:50 @ A1

General

1.1 This drawing is to be read in conjunction with all Architect's, Engineer's and Services Engineer's drawings and specifications.
1.2 Do not scale from any of the structural drawings. All dimensions to be verified on site and any discrepancies should be highlighted.
1.3 The contractor is responsible for the stability of the building and adjoining structures during construction and shall design, install, adapt and maintain all necessary propping and temporary works. A method statement for the temporary works must be submitted to the contractor administrator for comment before work begins.
1.4 Fire protection to all structural elements to Architect's details.
1.5 All waterproofing to the Architect's details.
1.6 All materials to comply with the relevant British Standard.

REV	COMMENTS	DATE	CHK
P3	Preliminary Issue	10.05.17	DG
P2	Preliminary Issue	09.03.17	DG
P1	Preliminary Issue	27.02.17	DG

STATUS
PRELIMINARY

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CLIENT

PROJECT
The Old Dairy

DRAWING TITLE
Typical Sections (Sheet 1)

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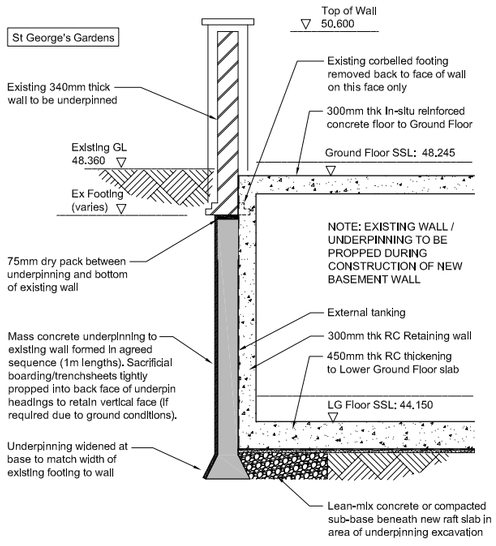
As Shown @ A1	Feb 17
DRAWN BY: DG	CHECKED BY: -
JOB No. 217017	DRAWING No. SK10	REV P3



SECTION A-A

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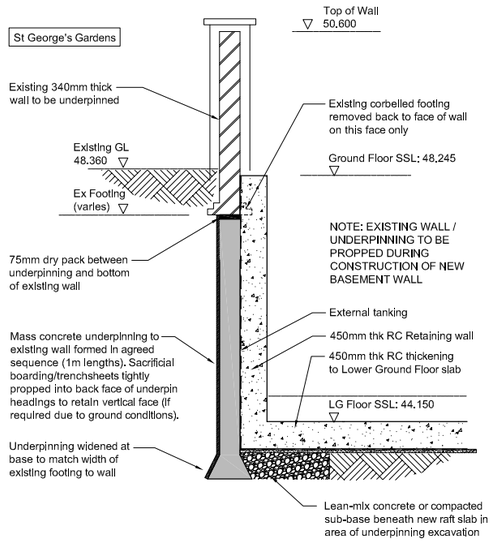

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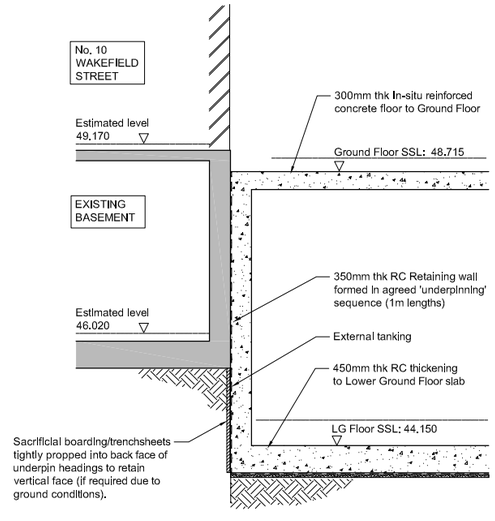

SECTION C-C

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General

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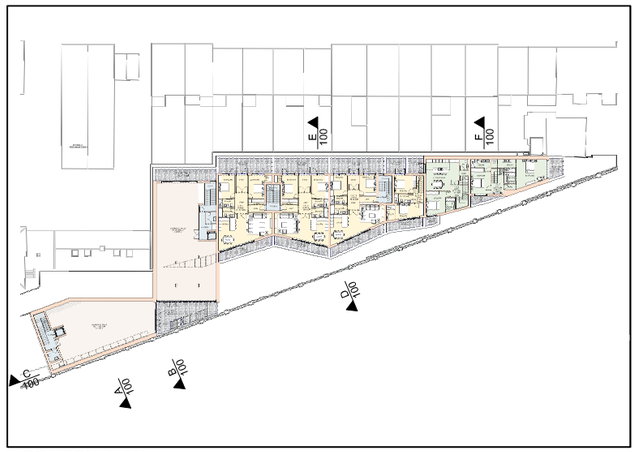
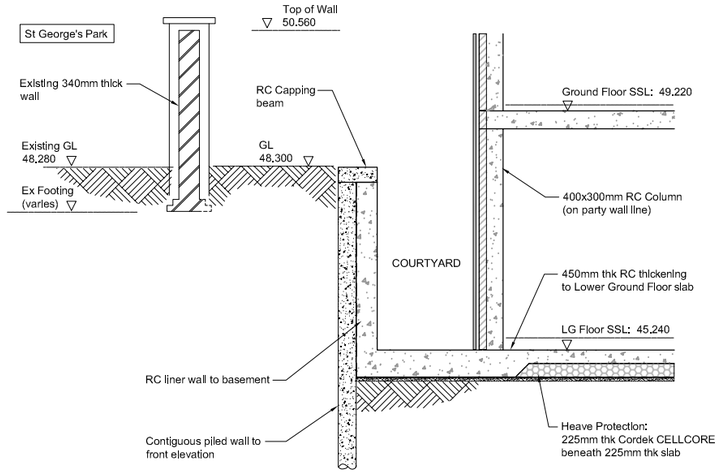


LOCATION PLAN

NOT TO SCALE



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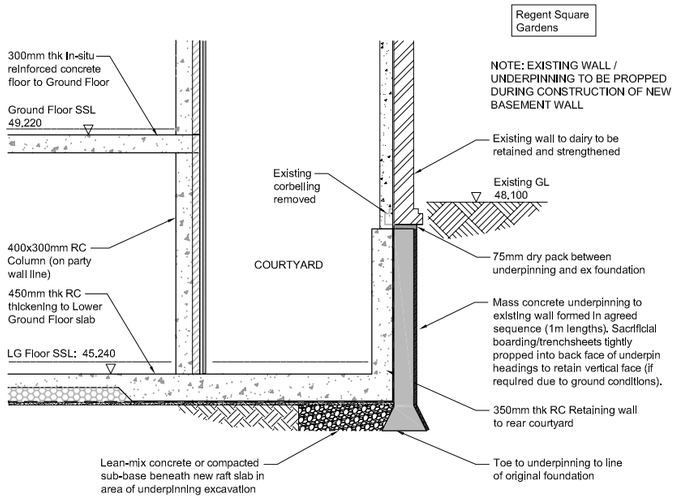

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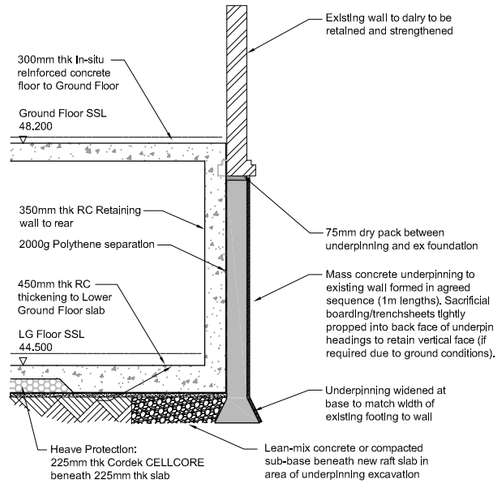

SECTION F-F

Scale 1:50 @ A1

REV	COMMENTS	DATE	CHK
P2	Preliminary Issue	10.05.17	DG
P1	Preliminary Issue	09.03.17	DG

STATUS
PRELIMINARY

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PROJECT
The Old Dairy

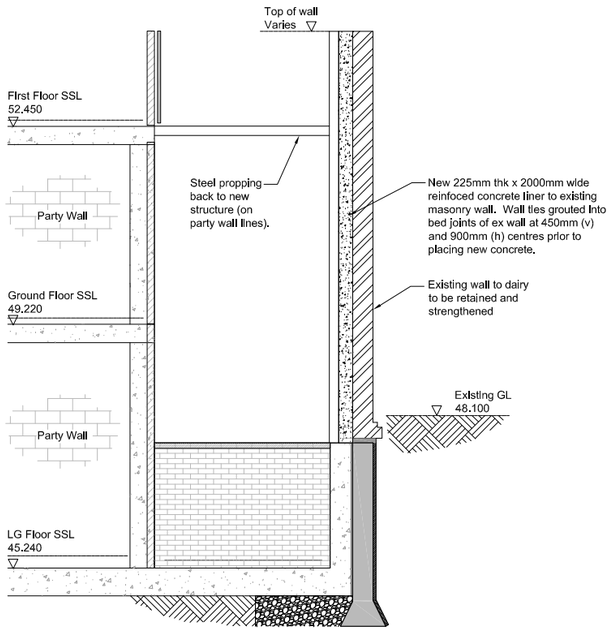
DRAWING TITLE
Typical Sections (Sheet 2)

SCALE @ A1	DATE
As Shown @ A1	Feb 17
DRAWN BY	CHECKED BY
DG	-
JOB No.	DRAWING No.	REV
217017	SK11	P2

GROUND FLOOR PLAN

2000mm wide x 225mm thk RC Liner to existing wall with ties grouted into wall at 450mm (v) and 900mm (h) centres

Steel 'Picture frame' fixed between new liner and main structure. Thermal break material required against new structure.



TYPICAL RESTRAINT TO EXISTING WALL
(Approx 10m c/c - On party wall lines)
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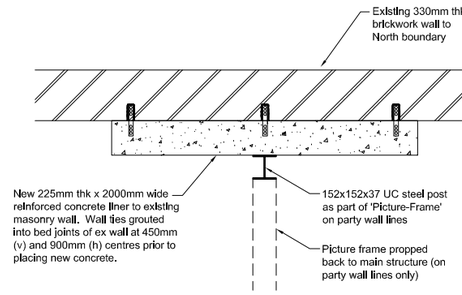

PLAN ON RESTRAINT DETAIL
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Project:
The Old Dairy

Drawing Title:
North Wall Restraint

Drawing No:
217017/ SK05 P4

Drawn By: DG

Date: March 2017

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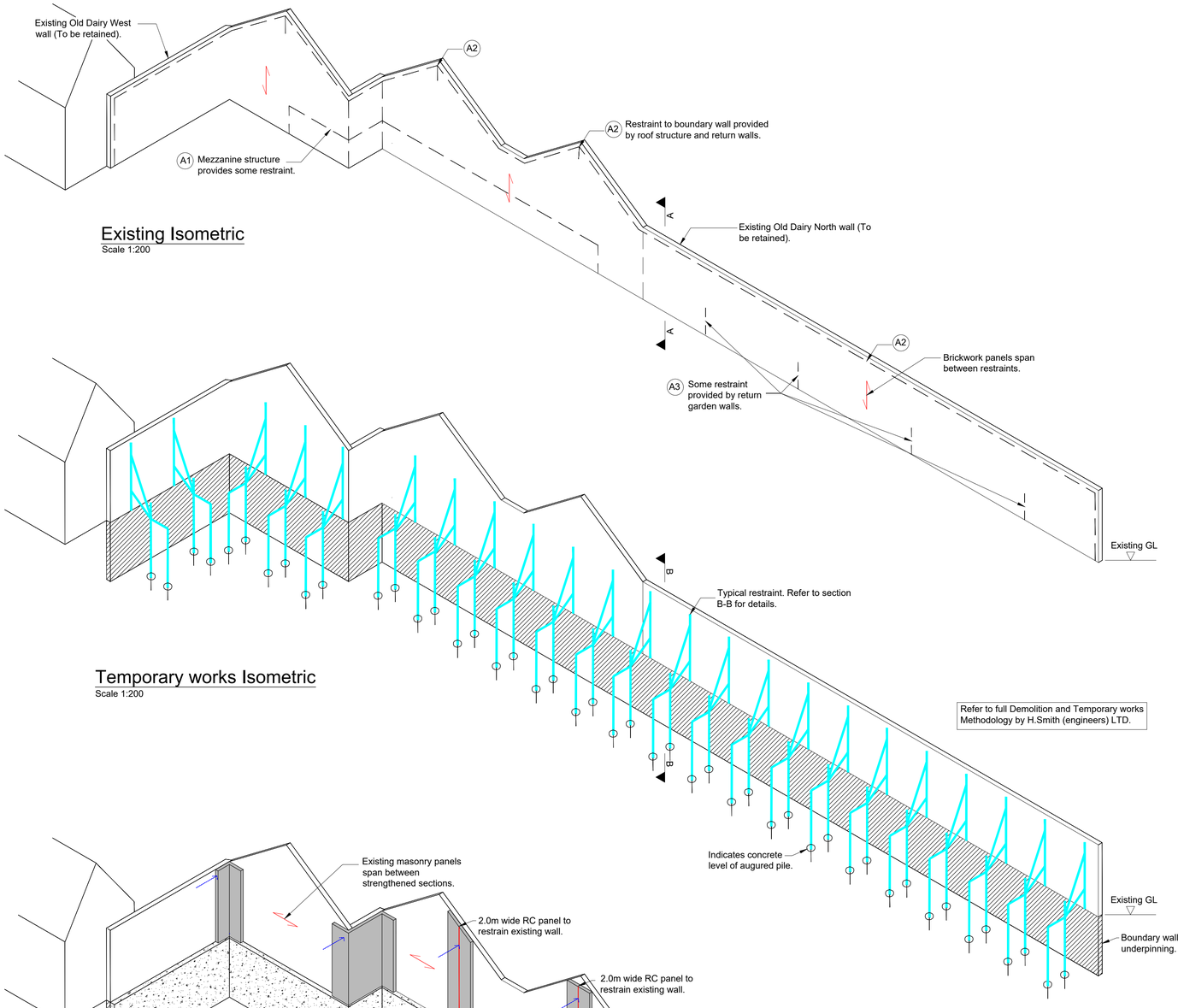
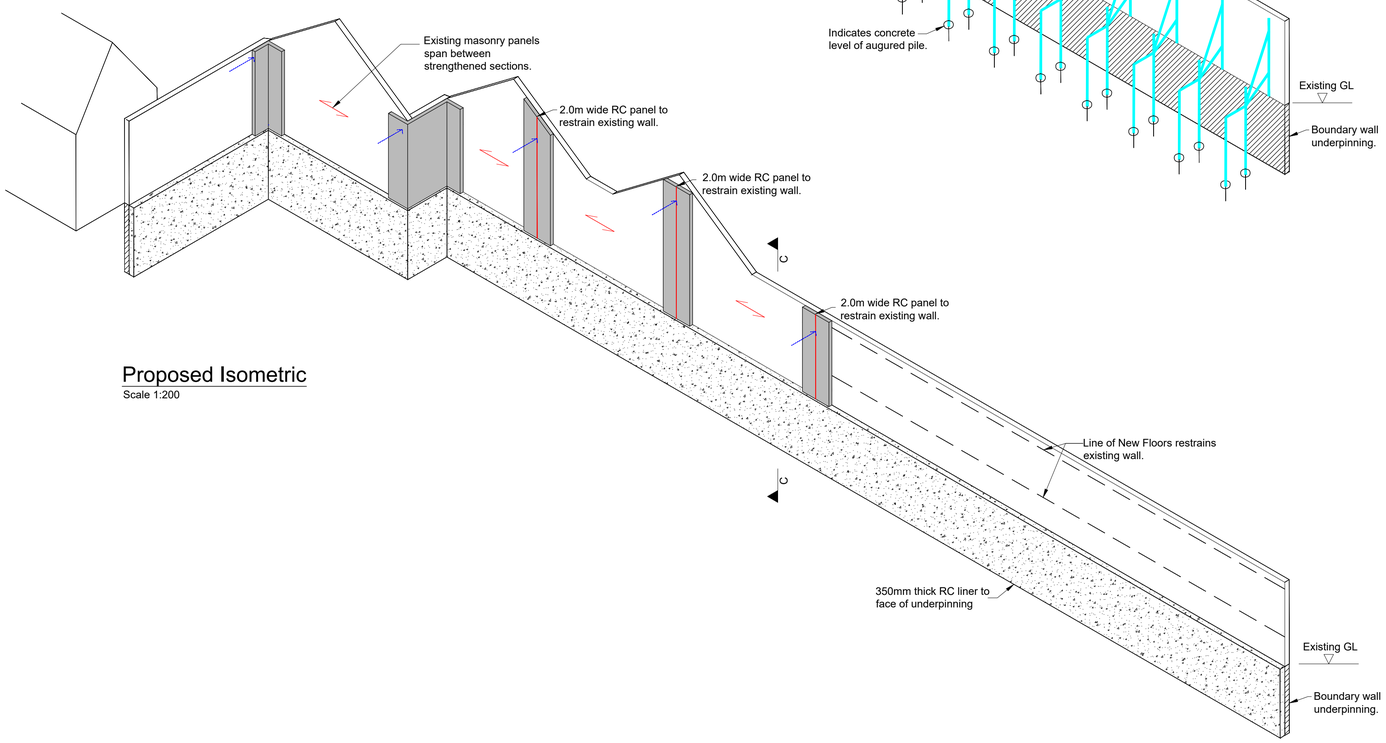


Existing Isometric
Scale 1:200

Temporary works Isometric
Scale 1:200



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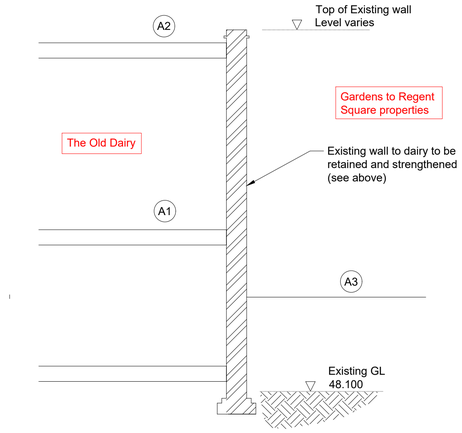

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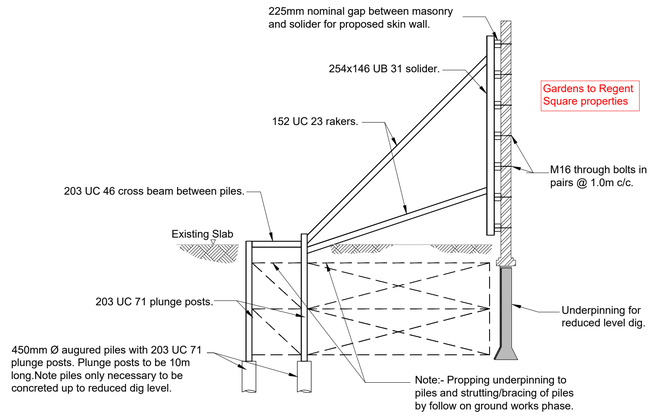

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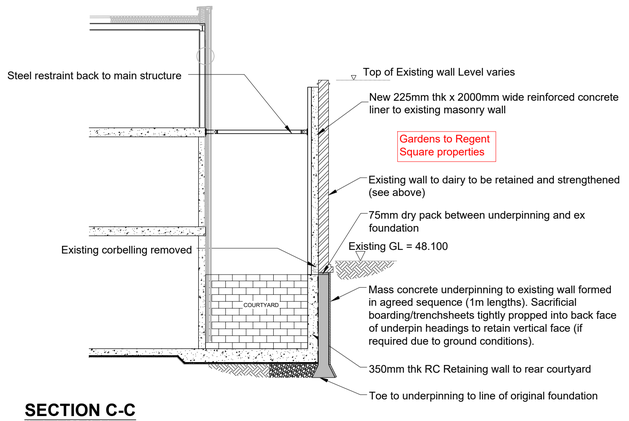

SECTION C-C
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P1 Preliminary Issue 10.05.17 DG

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CLIENT

PROJECT
THE OLD DAIRY

DRAWING TITLE
NORTH WALL RESTRAINT PERMANENT & TEMPORARY WORKS

SCALE @ A1	DATE
As shown	MAY 17
DRAWN BY	CHECKED BY
LDH	DJG

JOB No.	DRAWING No.	REV
217017	SK06	P1