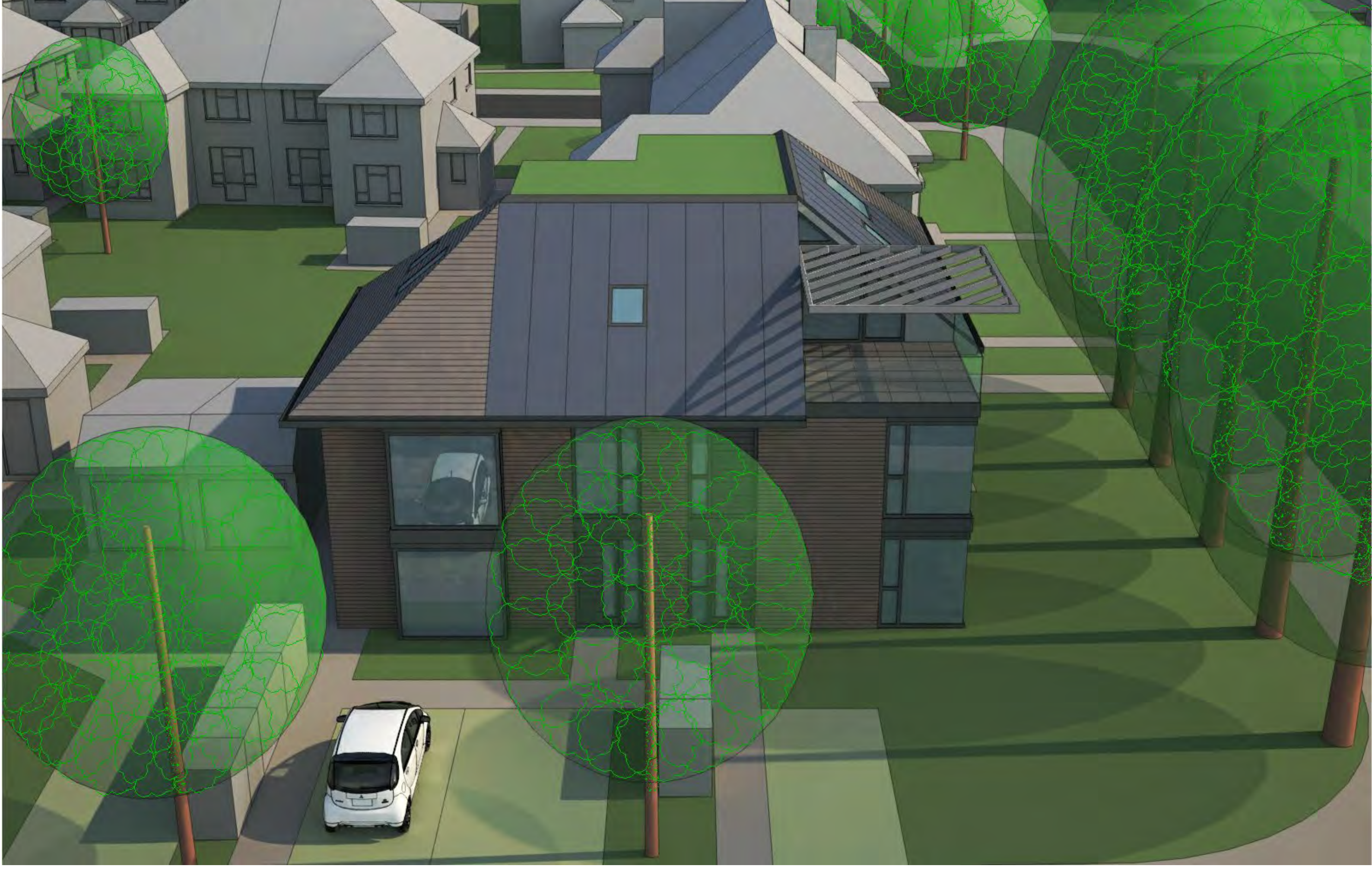


Proposed development of three maisonettes. Land at junction of Roseleigh Close and Cambridge Park, Twickenham TW1 2JT

Structural and Civil Engineering Basement Impact Assessment

Prepared by: **Omar Elnagar MEng**
Reviewed by: **Sarah Pellereau MEng CEng MIStructE**

Job Number: **29876**

Date	Revision	Notes/Amendments/Issue Purpose
January 2022	02	For Planning
March 2023	03	Minor updates, issued for planning

Consulting Engineers
37 Alfred Place
London WC1E 7DP

020 7631 5128
mail@pricemyers.com
www.pricemyers.com

Contents

1 Introduction

This Basement Impact Assessment has been prepared to accompany the planning submission for the plot of land on the corner of Roseleigh Close and Cambridge Park in East Twickenham and is intended to assess the basement construction of the proposed maisonette building. The report covers aspects related to the site's subterranean characteristics, land stability, and refers to P&M's Flood risk, surface water, SUDS and Water Storage Assessments that have been prepared in a separate report.

Materials used in preparing this report include drawings and maps from the local authority, the London Borough of Richmond Upon Thames and public domain borehole data from a site within 100m of the proposed site.

Figure 1 - Aerial View of Site taken from Google Maps, 2021

2 The Site

The site is located on the corner of Roseleigh Close and Cambridge Park in Twickenham. From historical maps it can be seen that the site previously used to be the front yard of a number of standalone houses in 1913. Between 1940 and 1960 that house was demolished and the current neighbouring residential buildings were built forming the corner where this site is located.

Currently there are several buildings around the site boundary including existing garages to the north and an existing residential building to the east. At the southern boundary of the site there are existing Horse Chestnut Trees which will be retained. The river Thames is located approximately 230m to the East of the site. See Figures 2-6 in Appendix A.

3 Ground Conditions

The ground conditions in the vicinity of the site are confirmed by a borehole within approximately 100m of the site boundary. The ground build up in that borehole is; 0 to 1m of made ground, 1m to 9.3m Kempton Park Gravel, above Clay, with ground water encountered at approximately 5.7m below ground level. The proposed basement founding level is 3.25m below ground level. This indicated that the er table does not extend above the base of the proposed subsurface structure. Furthermore, the proposed structure is not within 100m proximity of a watercourse or spring line. For Flood Risk and Drainage please refer to the surface water, SUDS and Water Storage Assessment prepared by P&M.

Excavation of the basement over a relatively small footprint will not exceed 3.25m below ground level. This is 6m above the London clay. As such it is assumed that heave impacted zone is magnified and no significant heave is considered due to the minimal reduction of weight compared to the overall weight of soil in the magnified zone.

The site is likely to be directly underlain by a Secondary Aquifer as the gravel is above clay which has very poor permeability so water will sit above it. However, from nearby bore hole data the construction work is expected to be at least 0.5-2m above any ground water. No piles are proposed so there should be no path to any aquifer. The depth of the London clay beneath the site will limit the potential for groundwater percolation into the underlying chalk primary aquifer, and so no pathway is considered likely to any Principal Aquifer.

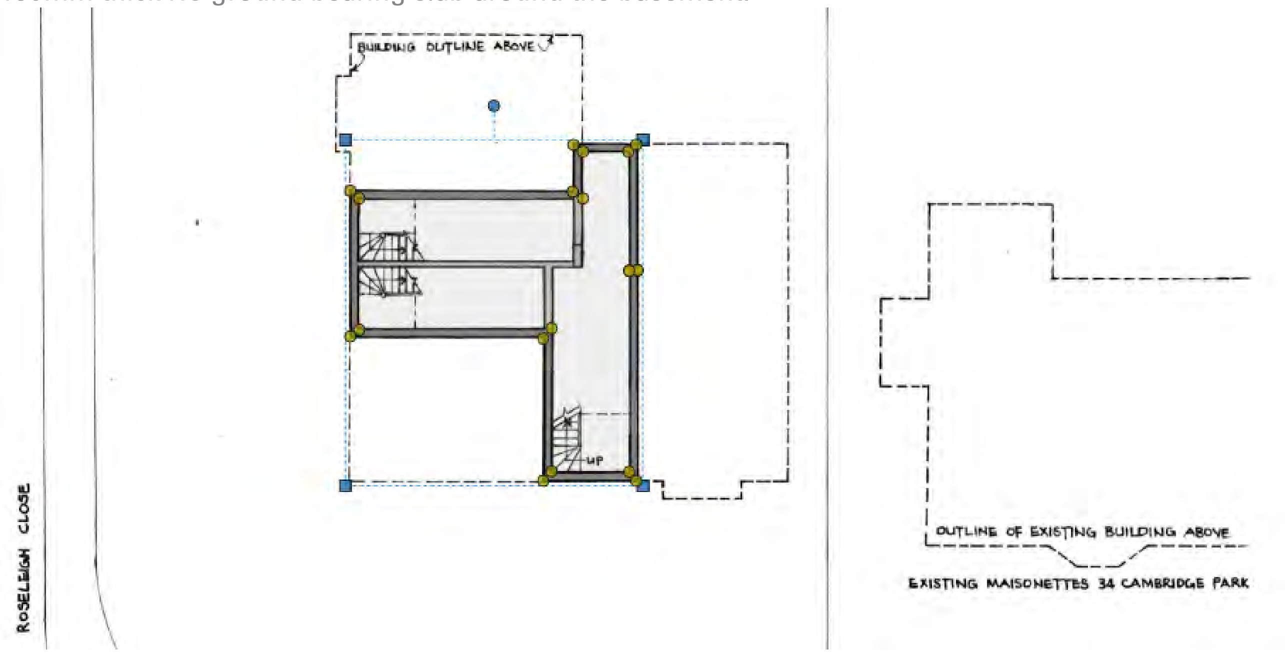
According to Area Susceptible to Groundwater Flood maps from London Borough of Richmond Upon Thames, half of the site is located in an area with less the 25% susceptibility to groundwater flood, while the other half is within a 25% to 49.9%, as shown in Figure 11 in Appendix B. Environment agency maps figure 13 & 14 show that the site is not in either river or surface water flooding zone.

It's assumed that at the extreme case of water main pipe burst, that the structure will be surrounded by water higher than the normal assumed water table level. This extreme water level is assumed to be 1.0m below ground. The basement is designed and checked for flotation and this additional surcharge load.

4 Proposed Structure

Substructure

The proposed basement is 59m^2 located in the centre of site. The basement is 3.25m deep and constructed with RC walls and base slab. The walls of the basement do not intersect with the 45 degrees line from the neighbouring foundations and are not within 3 metres proximity. The concrete box basement consists of 250mm thick reinforced concrete ground bearing slab at basement level, which is surrounded by 200mm thick RC walls and topped by a 150mm suspended RC slab, with 150mm thick RC ground bearing slab around the basement.



Plan of basement structure

Based on the nearby site investigation the strip footings have been checked for 150kN/m^2 allowable ground bearing pressure at below ground level and 250kN/m^2 for the basement raft

Superstructure

The superstructure will be formed from load bearing structural insulated panel walls supporting engineered timber joist floors, the roof will be constructed with timber rafters. Sundry timber or steel framing will be used to trim openings for staircases and the like.

5 Impact on Ground

Ground Movement

As the clay is about 9m below the basement excavation, clay heave due to the removal of load will not be felt on the structure and can be ignored.

The neighbouring buildings are always 6m or further away from the excavation and with the founding level at -3.25m below ground level no surcharge from the buildings will be imposed on the basement wall. The RC retaining walls in the permanent condition have been designed using a k_0 value for the ground assuming no movement in the ground. The wall also assumes a burst water main adjacent to it.

The basement has also been checked for flotation in the case of a burst water main considering 0.9 x the dead load of the main structure. This is conservative as there will be additional super imposed dead loads as well.

Please see supporting calculations in Appendix D.

To prevent any significant movement during the construction an outline sequence of work is described below, and props are indicated in Appendix C

Construction Sequence

It's proposed to use sacrificial trench sheeting retaining walls during the construction of the basement. The sequence involves pushing the sheet into the ground then excavating the soil within the compartment. Temporary steel waling beam supports are then used to prop the sheets that retain the soil before the concrete slab and walls are cast, which provide the final stability of the basement structure.

6 Conclusion

The Basement Impact Assessment has considered the proposed basement with the local ground conditions and possible ground water. The basement has been designed considering these factors and an outline sequence of works proposed to limit movement during construction.

A signed London Borough of Richmond Upon Thames 'Site and Assessment Verification Form' is in Appendix E.

Appendix A
Site Maps

Figure 2 Street View of Site, taken from Google Maps

Figure 3 Extract from historical Ordnance Survey Map 1913

Figure 4 Extract from historical Ordnance Survey Map 1936

Figure 5 Extract from historical Ordnance Survey Map 1940s- 1960s

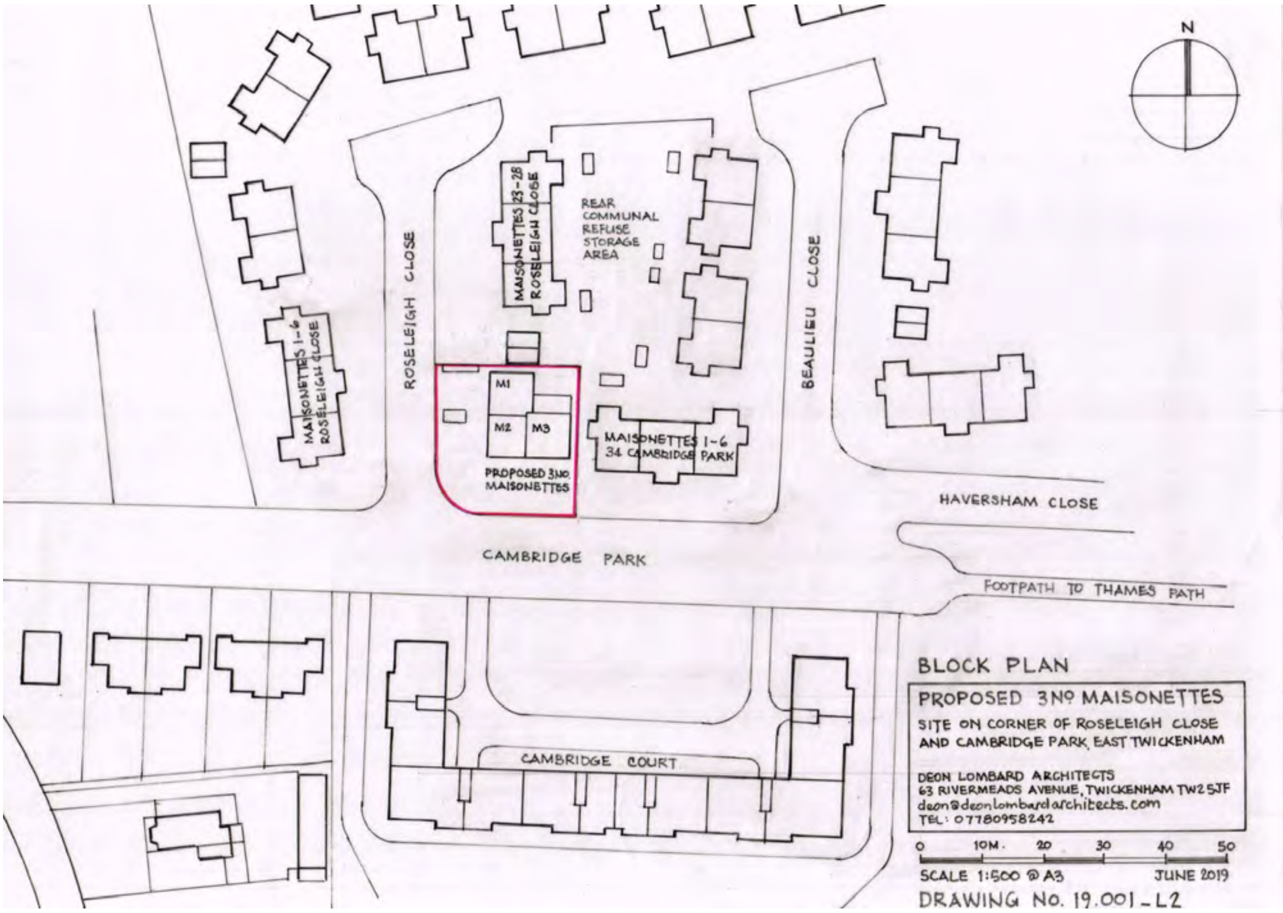


Figure 6 Site plan

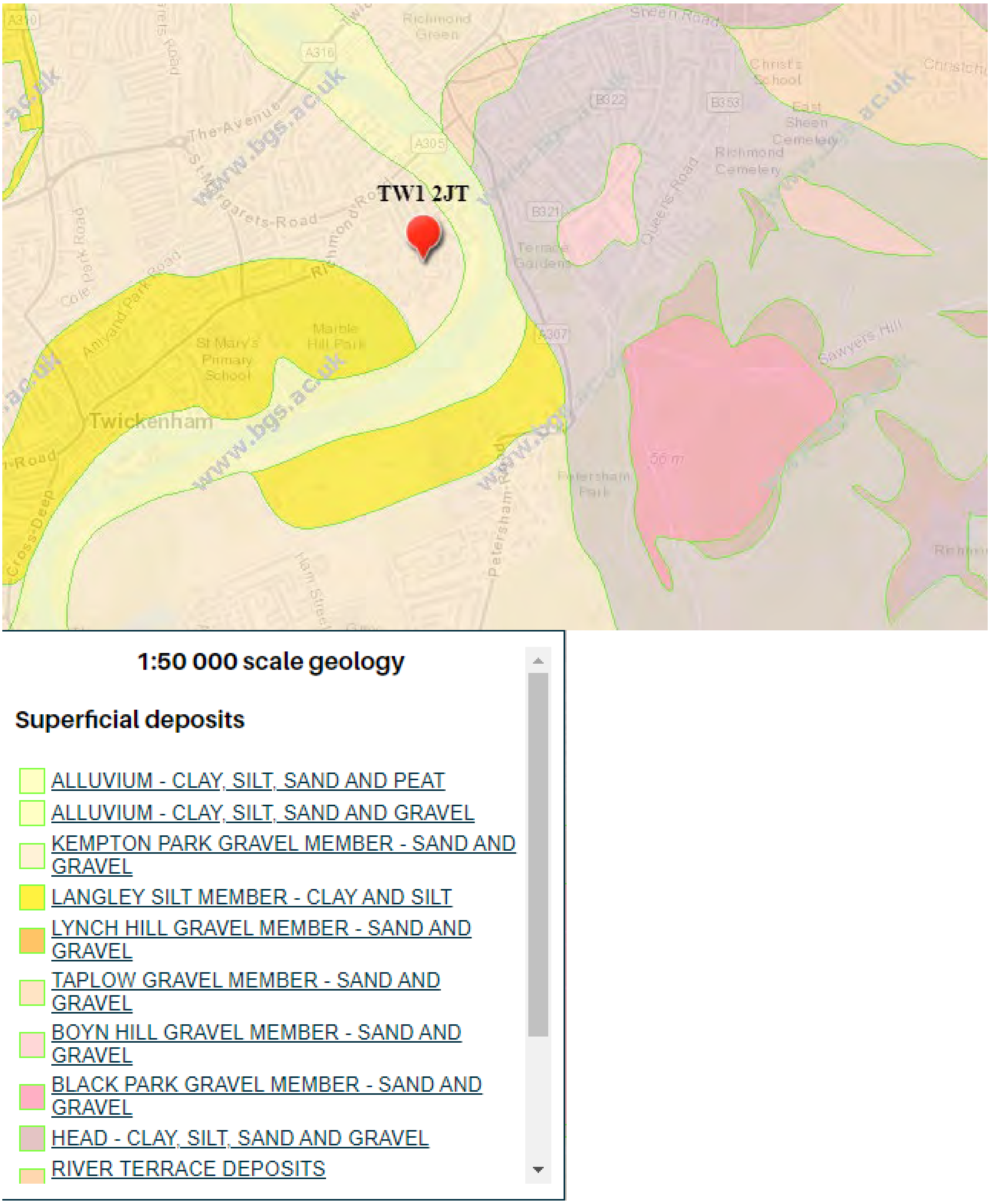


Figure 7 Extract from British Geological Survey Map

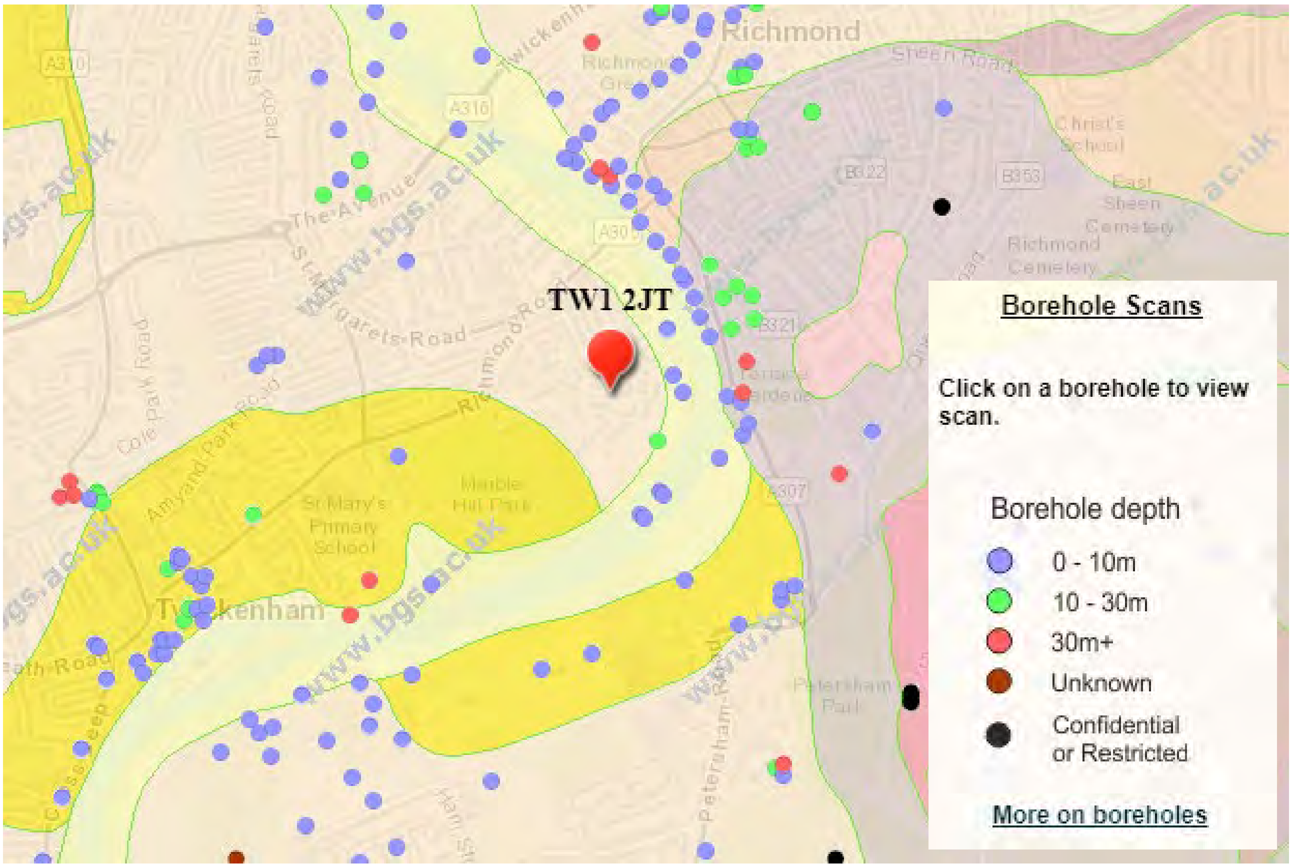


Figure 8 Extract from Geology of Britain Viewer, BGS, showing available borehole scans.

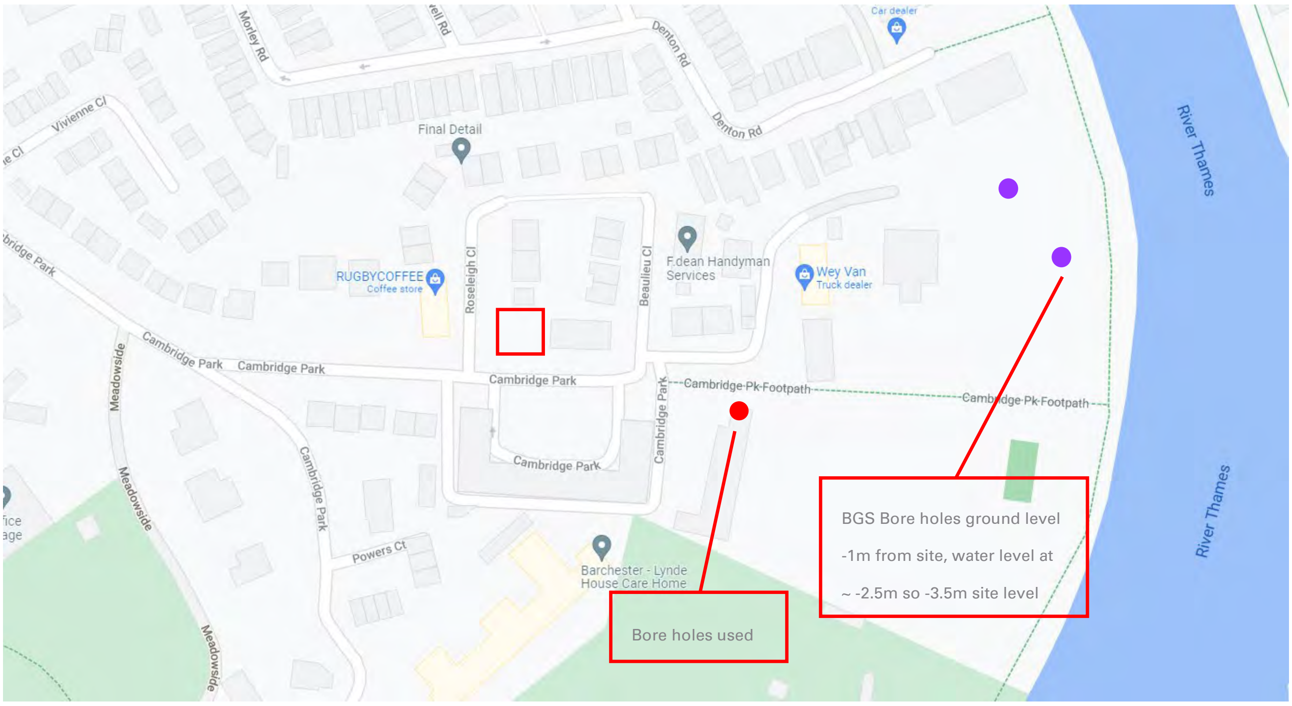


Figure 9 - Goggle Map extract showing site and borehole location

Connaughts Ltd

2 Connaught Road, Rayleigh, Essex, SS6 8UX

Tel: 01702 528098
Fax: 01702 528098

Appendix No. 2
Sheet No. 1
Job No. 106
Date. Feb 2006

BOREHOLE 1

LOCATION **The Old Garden, Twickenham, Middlesex.**

Method: Shell and Auger

Description of Stratum	(m)	Legend	Depth (m)	Samples Type	Samples Depth	Tests Type	Tests Value	Field Observations
Dark brown, sandy, topsoil with flint fragments and roots - MADE GROUND				B1	0.20			
	1		1.00m	B2	1.00	N	10	Water added to borehole from 1.00 - 7.20m (175l)
Loose / medium dense, orange brown, sandy, flint GRAVEL								
Becoming medium dense by 2.00m	2			B3	2.00	N	16	
	3			B4	3.00	N	21	
	4			B5	4.00	N	24	
Becoming dense at 5.00m	5			B6	5.00	N	33	
	6							
				B7	6.50	N	29	
	7			W1	7.50			Rapid inflow recorded at 7.20m, water rose to 5.70m after 5 mins.
	8			B8	8.00	N	29	
	9		9.10m	D1	9.10			
Firm, dark brown / grey, CLAY				U1	9.50	BL	35	Borehole cased to 9.30m
	10			D2	9.95			
Borehole 1 closed at 10.00m								
	11							
	12							

Remarks:

Client: Built Structural Engineering.

Key

U Undisturbed Sample
D Small disturbed sample
B Bulk distured sample
W Water sample
N Standard Penetration Test (C / S)
V Shear vane test
MP Nackintosh probe (blows/0.3m)
BL No. blows to obtain U100 sample

Figure 10 - Bore hole log

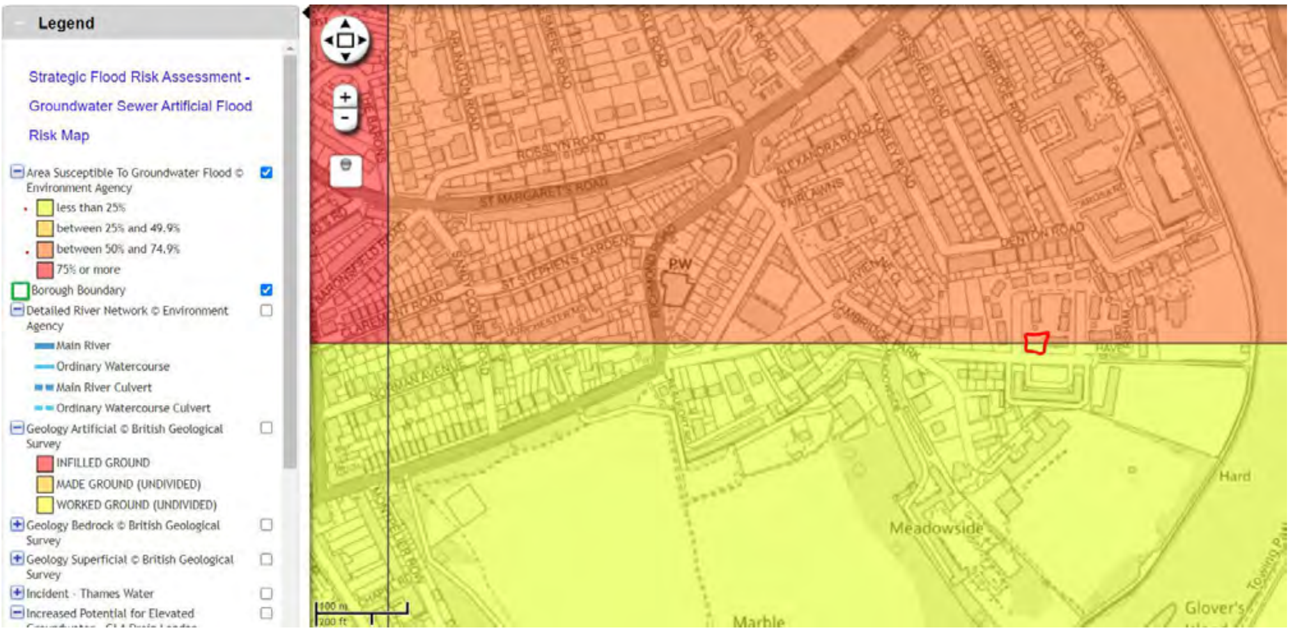


Figure 11 - LBRuT Map of Areas susceptible to Ground Water Flooding

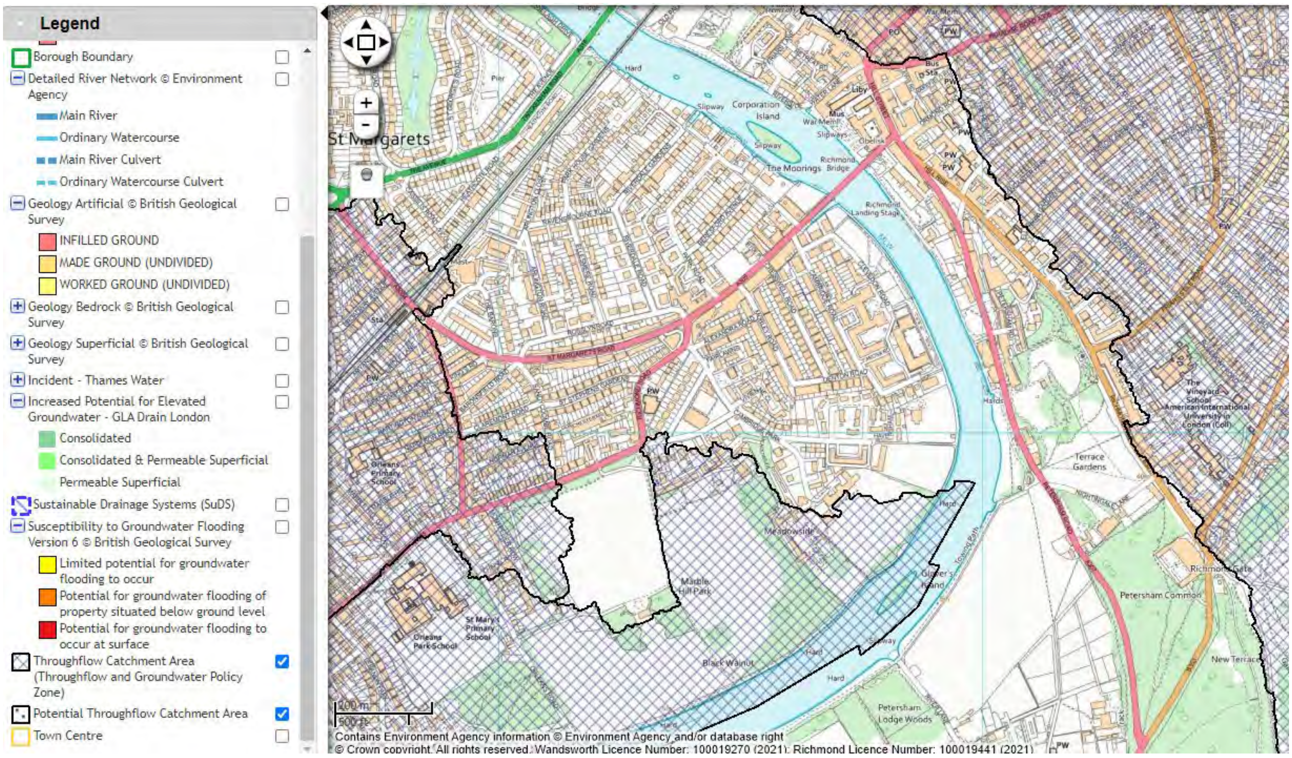


Figure 12 - LBRuT Map of Throughflow Catchment Area

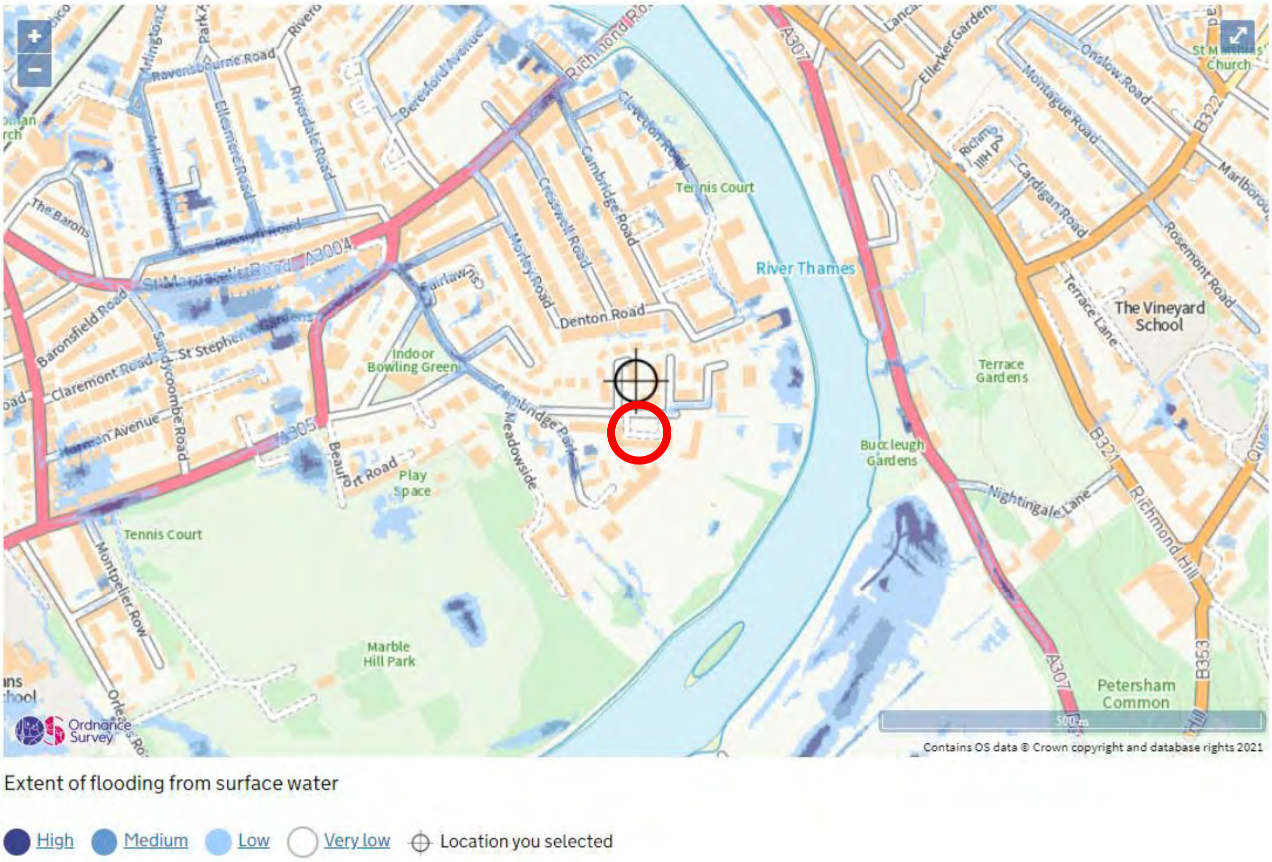


Figure 13 - Environment Agency Map of Surface Water Flooding

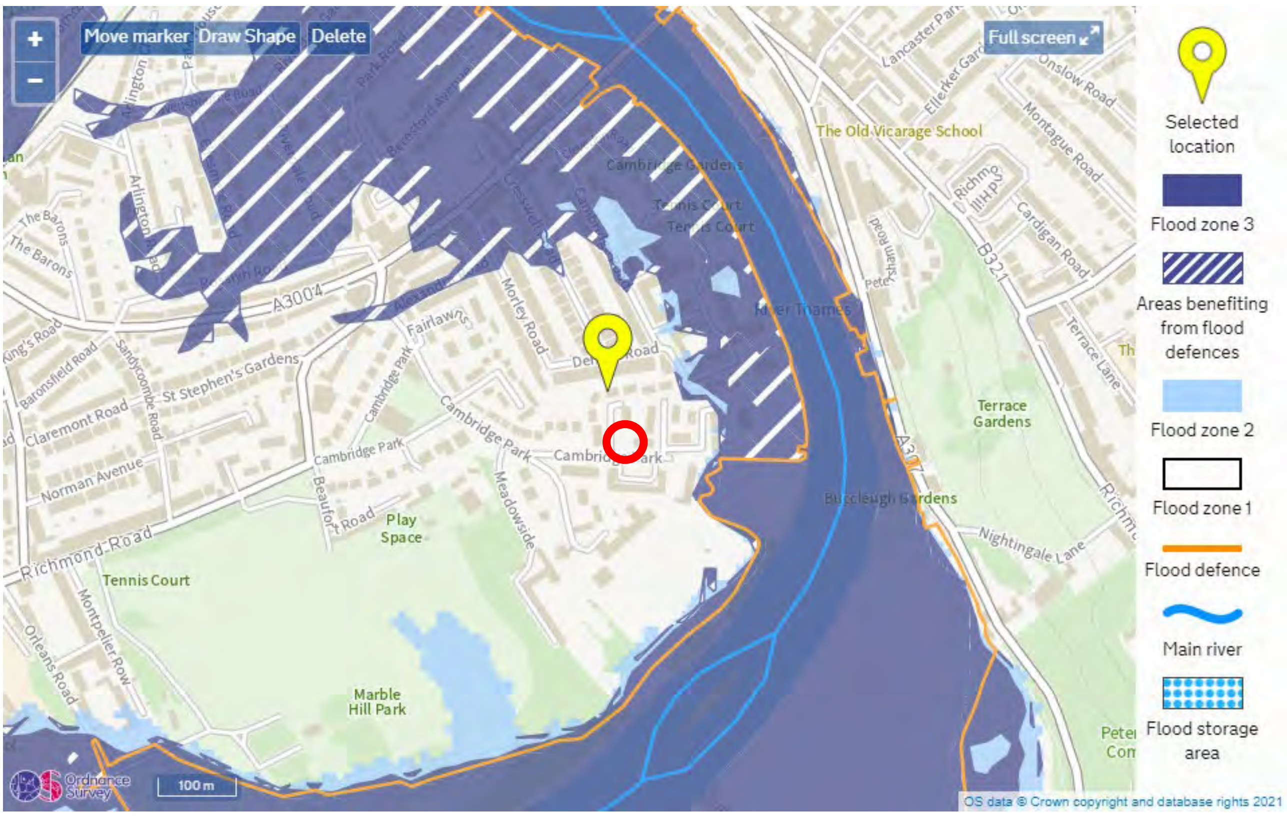
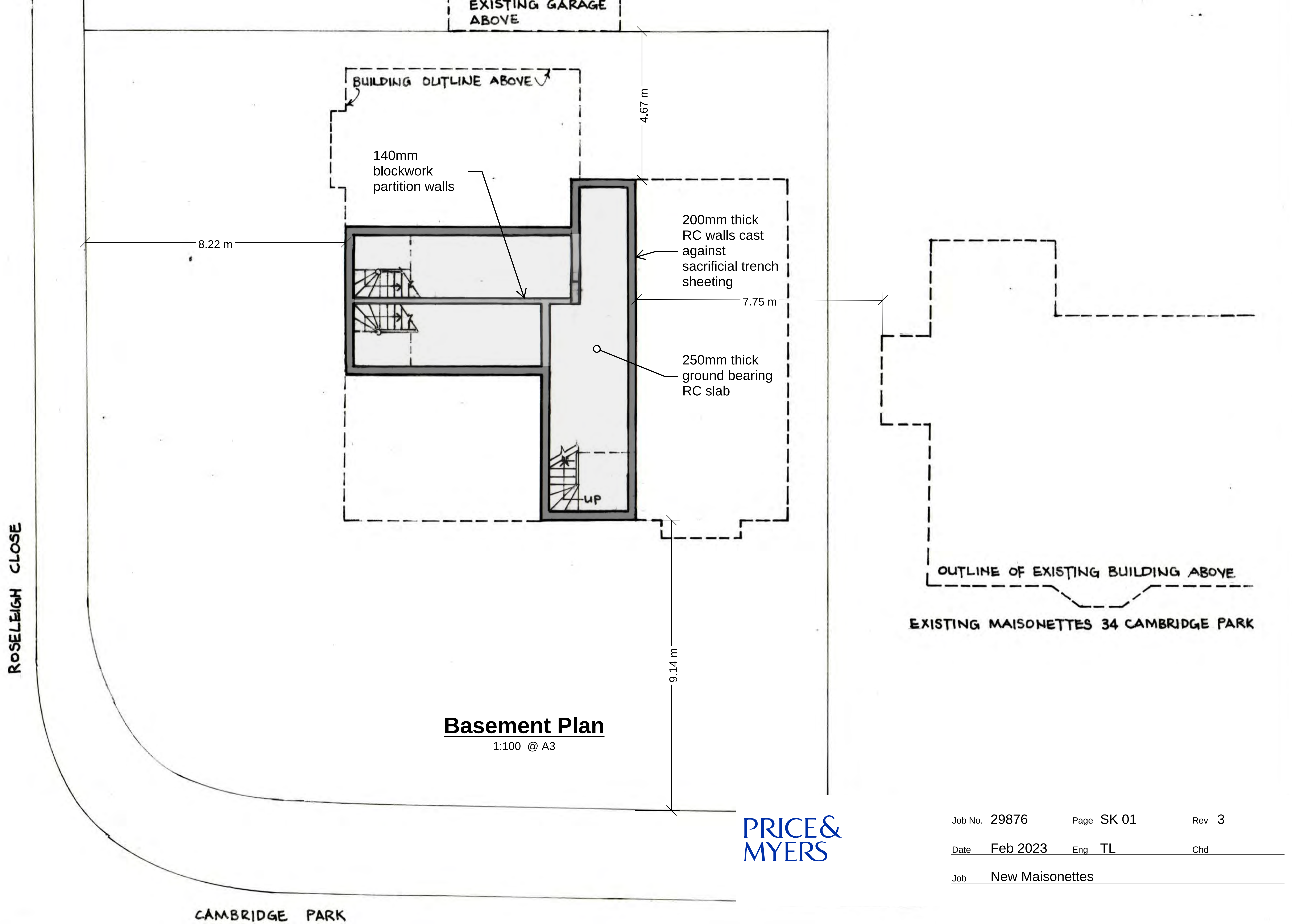


Figure 14 - Flood Risk Map from postcode search on Government Flood Map service

Appendix C
Supporting Drawings



Basement Plan

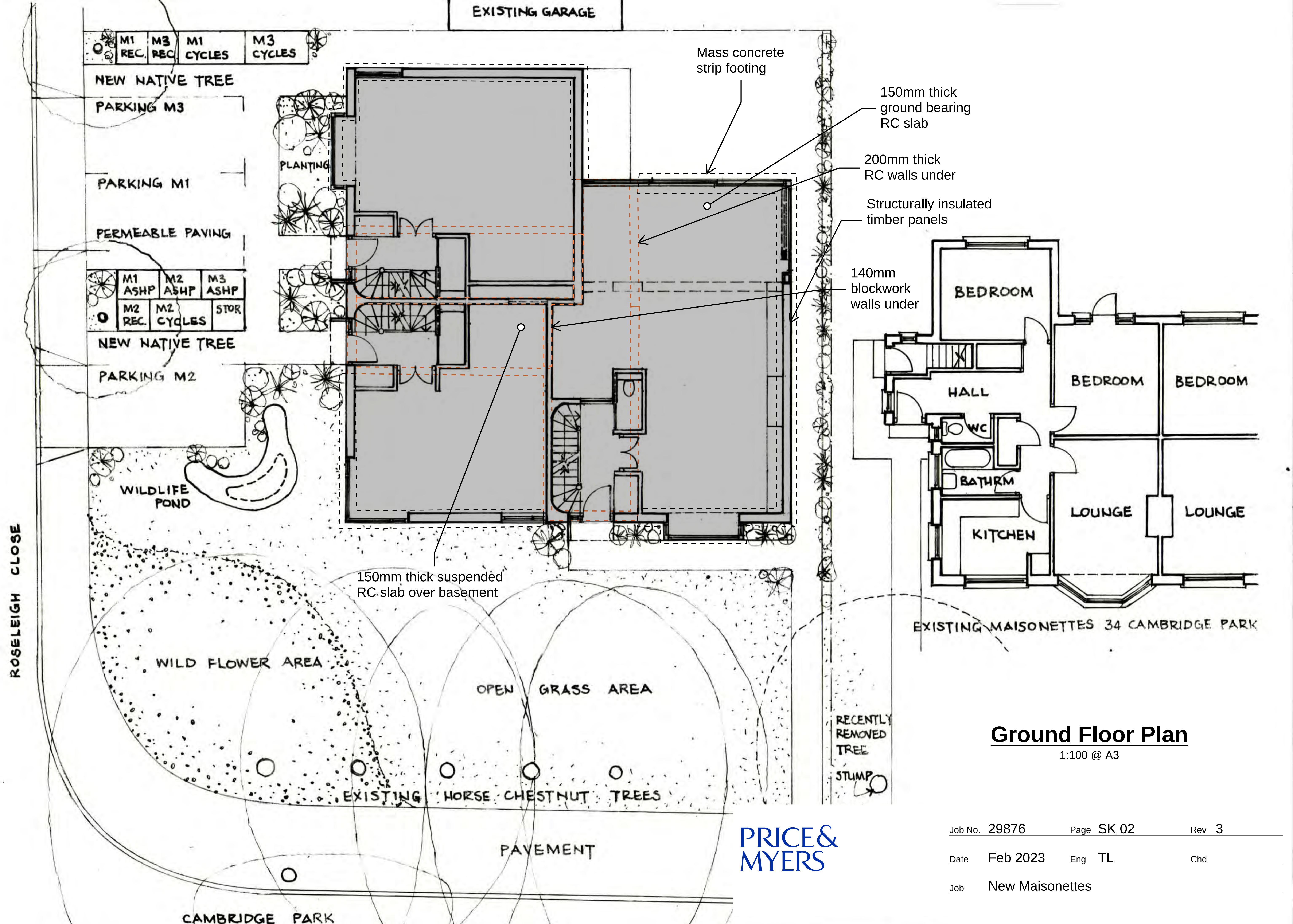
1:100 @ A3

PRICE & MYERS

Job No. 29876 Page SK 01 Rev 3

Date Feb 2023 Eng TL Chd

Job New Maisonettes

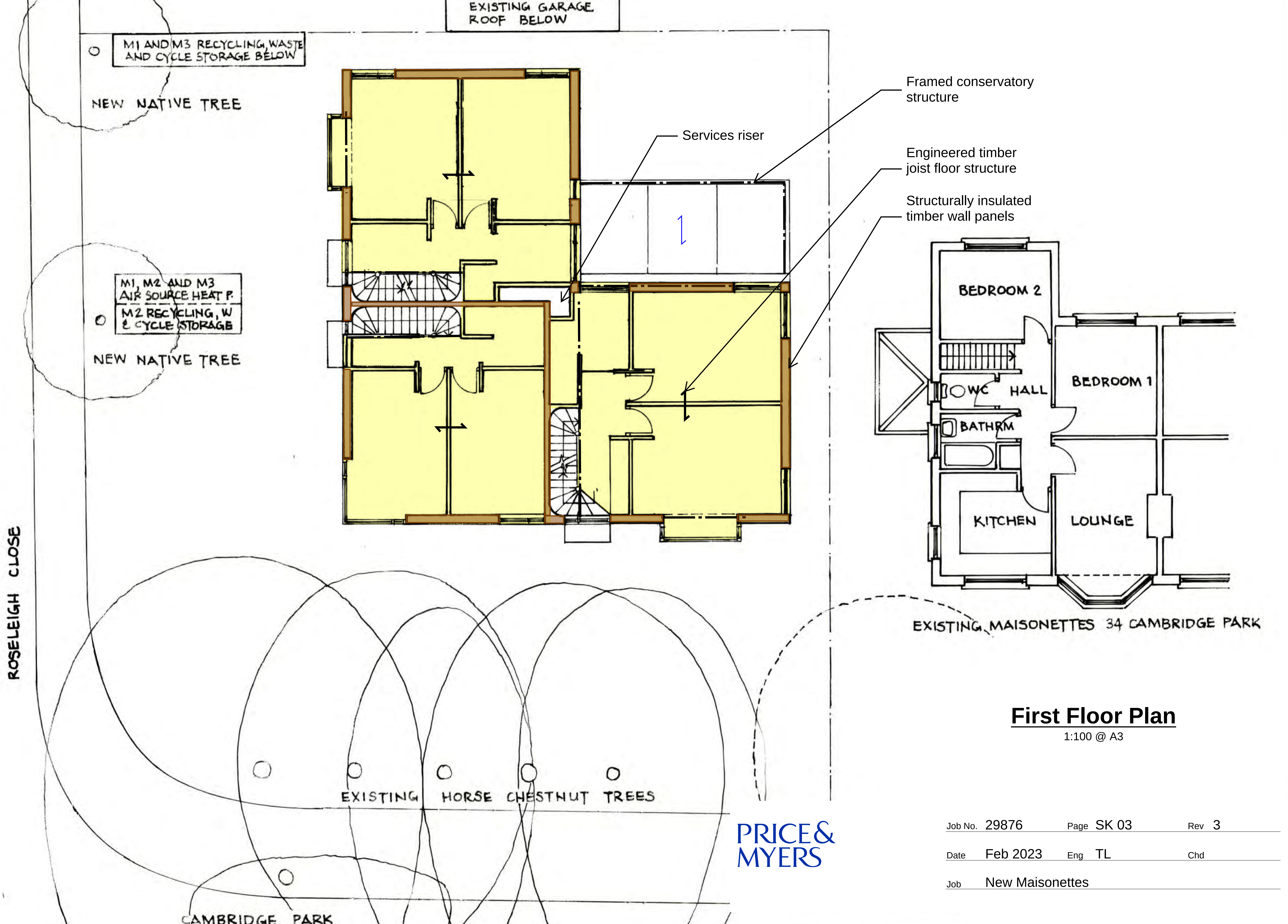


Ground Floor Plan

1:100 @ A3

PRICE & MYERS

Job No.	29876	Page	SK 02	Rev	3
Date	Feb 2023	Eng	TL	Chd	
Job	New Maisonettes				

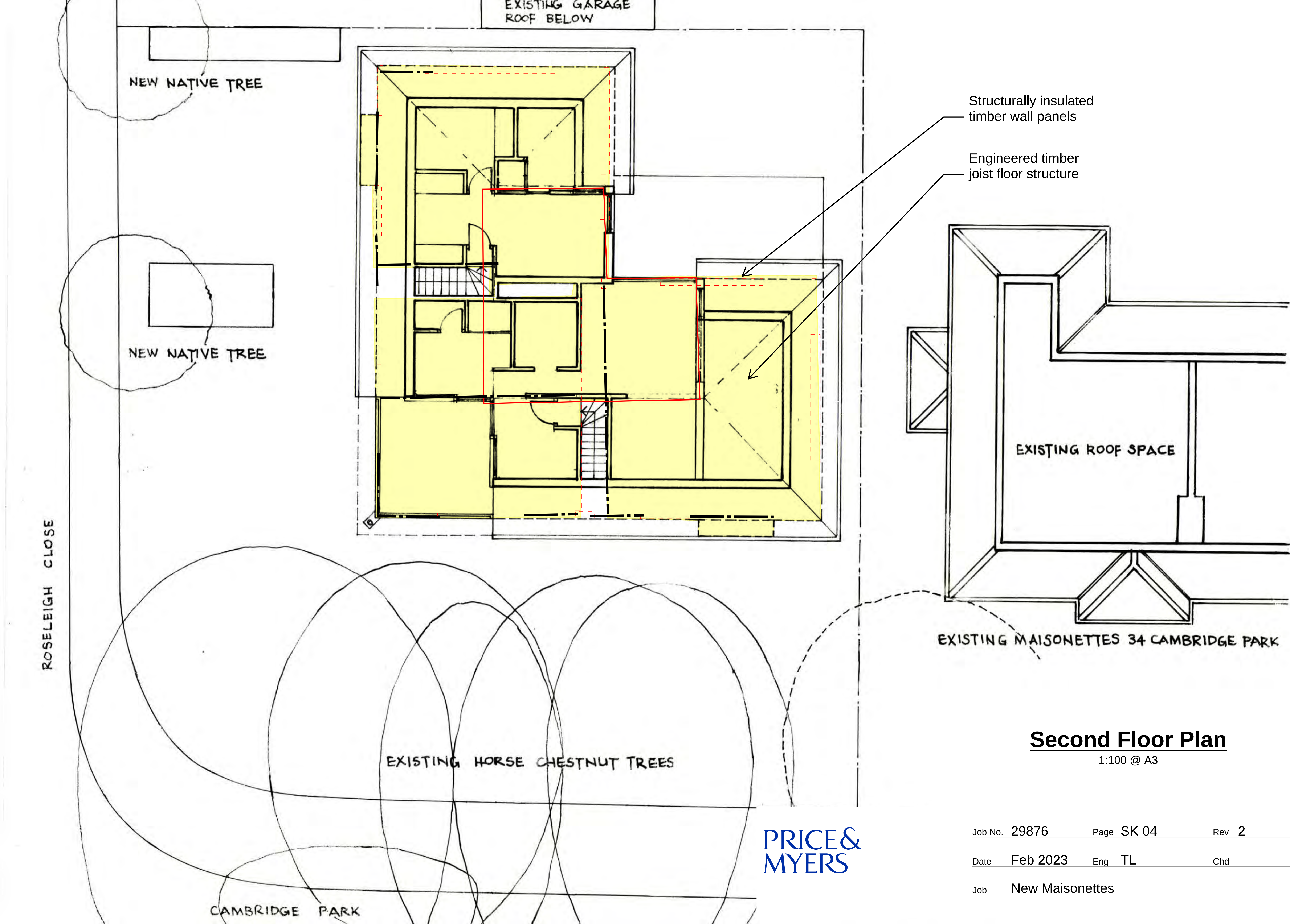


First Floor Plan

1:100 @ A3

PRICE & MYERS

Job No.	29876	Page	SK 03	Rev	3
Date	Feb 2023	Eng	TL	Chd	
Job	New Maisonettes				

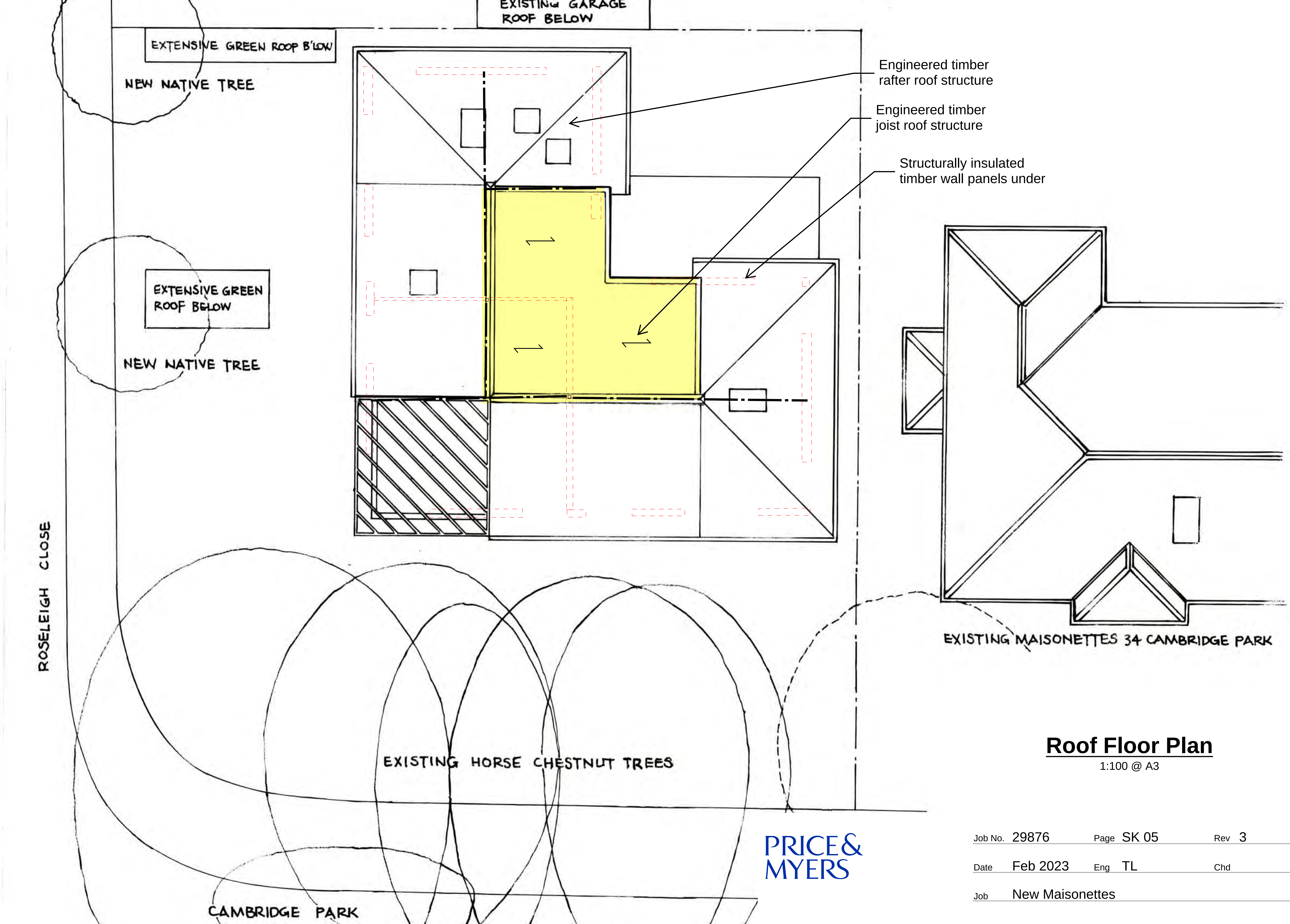


Second Floor Plan

1:100 @ A3

PRICE & MYERS

Job No.	29876	Page	SK 04	Rev	2
Date	Feb 2023	Eng	TL	Chd	
Job	New Maisonettes				

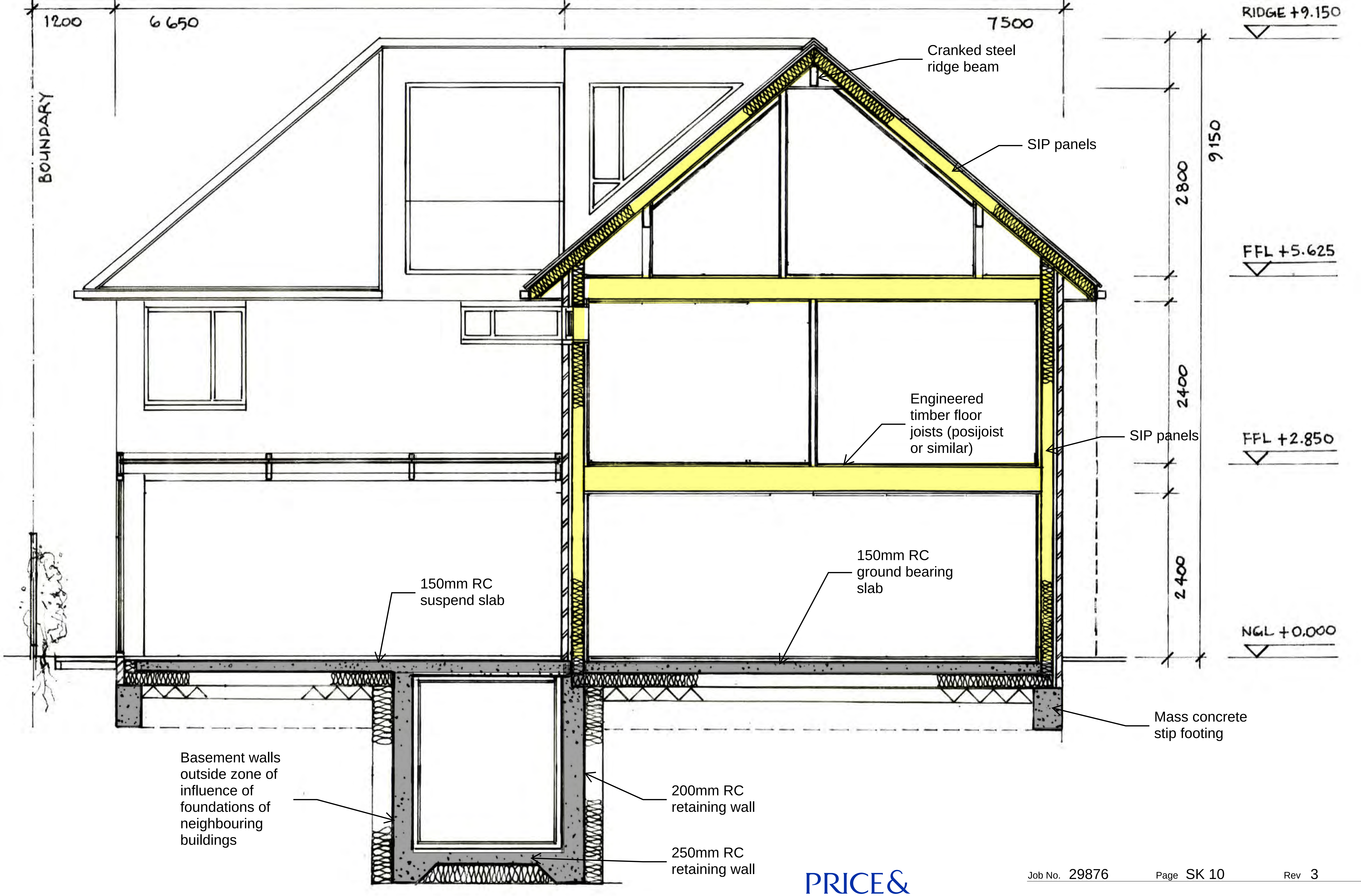


Roof Floor Plan

1:100 @ A3

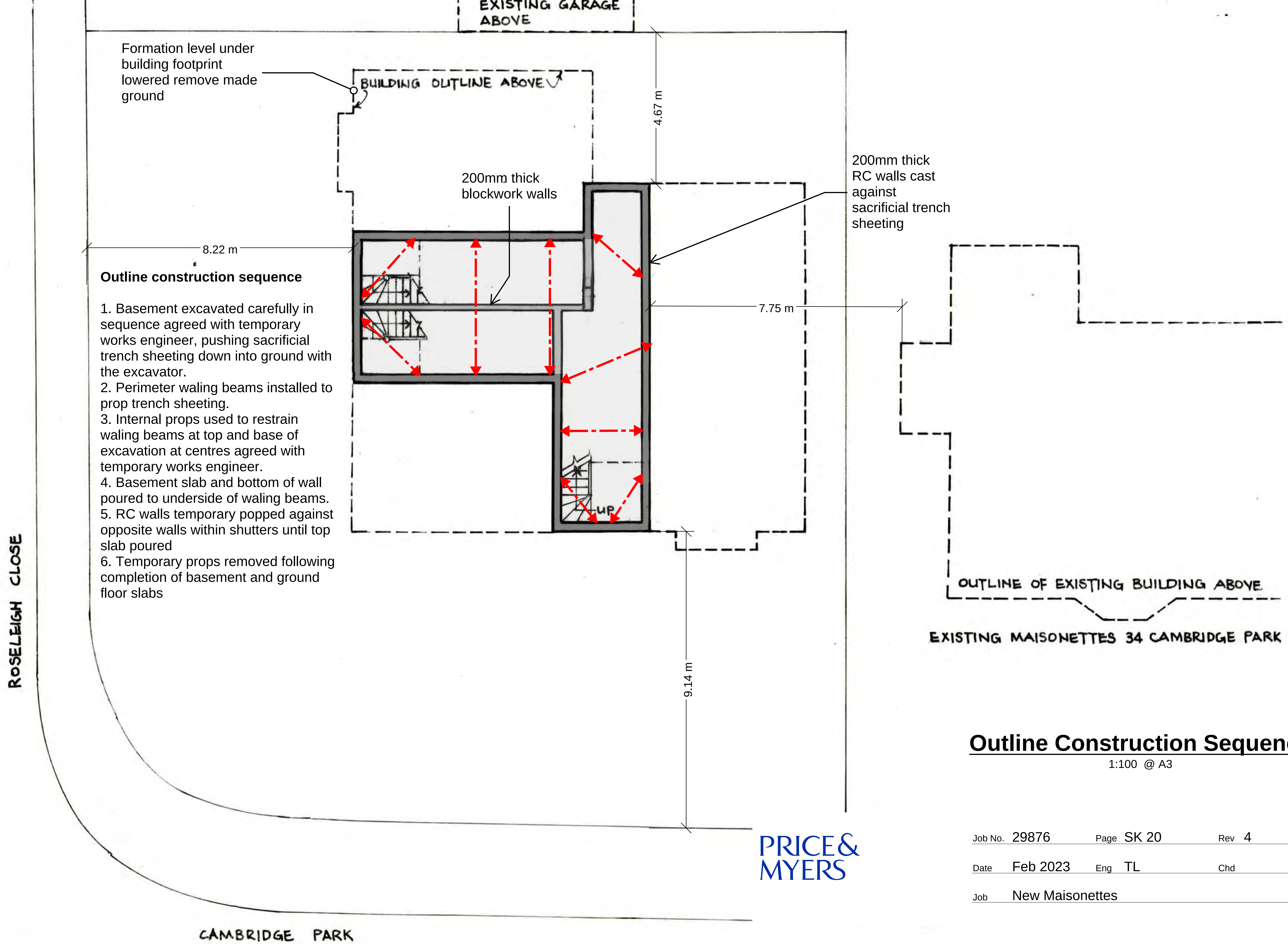
PRICE & MYERS

Job No.	29876	Page	SK 05	Rev	3
Date	Feb 2023	Eng	TL	Chd	
Job	New Maisonettes				



PRICE & MYERS

Job No.	29876	Page	SK 10	Rev	3
Date	Feb 2023	Eng	TL	Chd	
Job	New Maisonettes				



Outline construction sequence

1. Basement excavated carefully in sequence agreed with temporary works engineer, pushing sacrificial trench sheeting down into ground with the excavator.
2. Perimeter waling beams installed to prop trench sheeting.
3. Internal props used to restrain waling beams at top and base of excavation at centres agreed with temporary works engineer.
4. Basement slab and bottom of wall poured to underside of waling beams.
5. RC walls temporary popped against opposite walls within shutters until top slab poured
6. Temporary props removed following completion of basement and ground floor slabs

Outline Construction Sequence

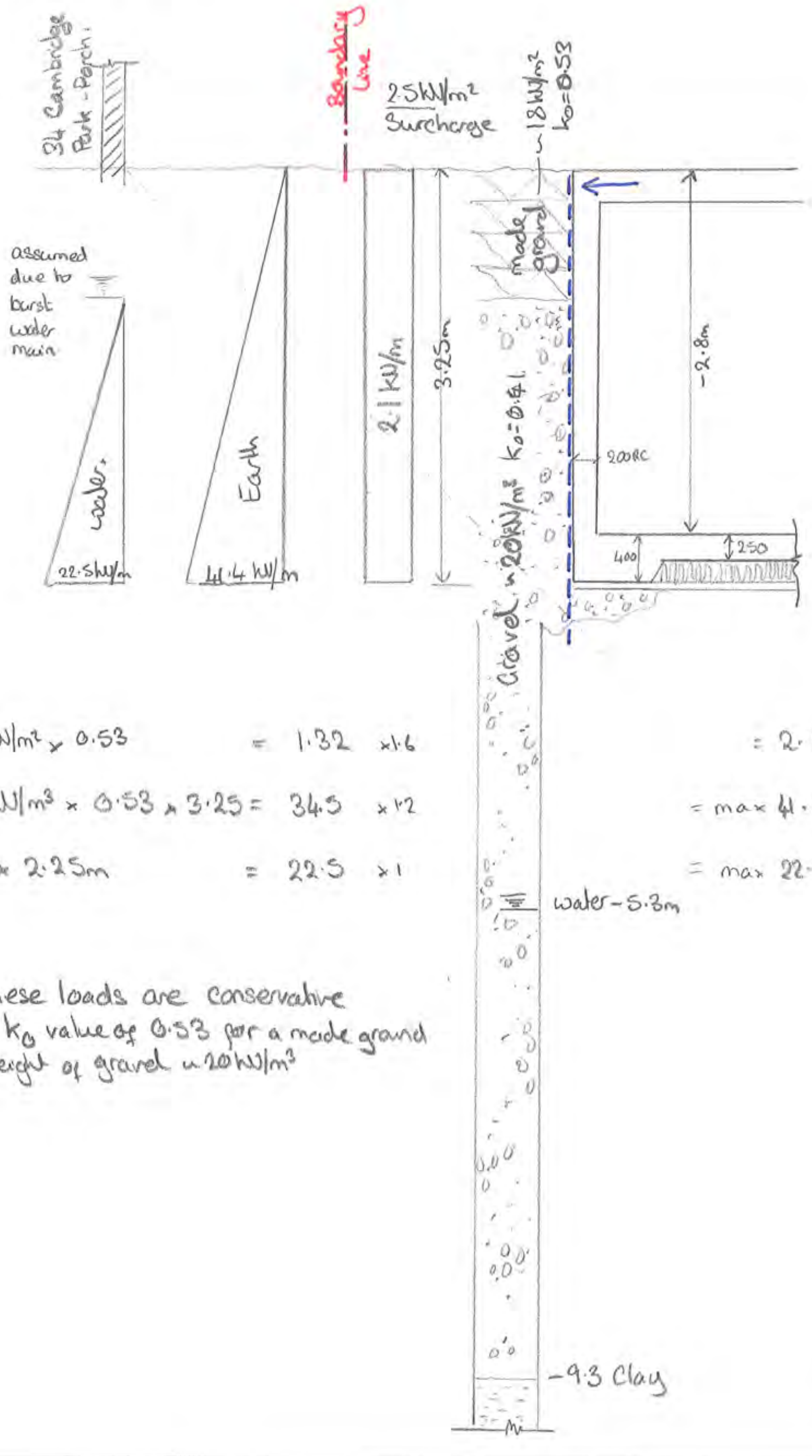
1:100 @ A3

PRICE & MYERS

Job No.	29876	Page	SK 20	Rev	4
Date	Feb 2023	Eng	TL	Chd	
Job	New Maisonettes				

Appendix D
Supporting Calculations

Loading on Retaining Wall



Surcharge $2.5 kN/m^2 \times 0.53$ = 1.32 ×1.6 = 2.1 kN/m^2

Earth $20 kN/m^3 \times 0.53 \times 3.25$ = 34.5 ×1.2 = max 41.4 kN/m

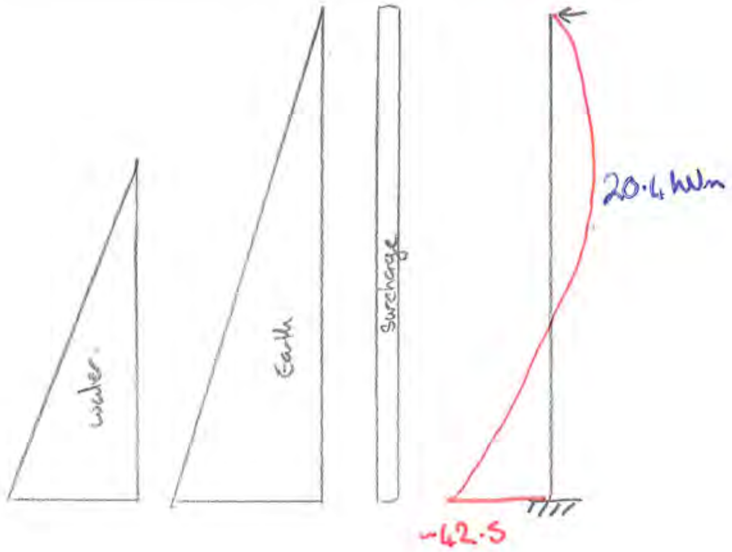
water $10 \times 2.25m$ = 22.5 ×1 = max 22.5 kN/m

Please note these loads are conservative as used worst k_0 value of 0.53 for a made ground with a bulk weight of gravel ~20 kN/m^3

PRICE & MYERS

Job No.	29876	Page	Calc 3	Rev	
Date	Dec 21	Eng	SJP	Chd	
Job	Corner of Roseleigh Close & Cambridge Park				

Retaining Wall Design. – Robot check.



$M_{surcharge}$ (heel) $= 2.1 \times \frac{3.25^2}{8} = 2.8$ kNm

(leg) $= \frac{9 \times 2.1 \times 3.25^2}{128} = 1.6$ kNm

M_{earth} (heel) $= 2 \times \frac{41.4 \times 3.25^2}{2 \times 15} = 29.2$

(leg) $= \frac{41.4 \times 3.25^2}{2} \times 0.0596 = 13$

M_{water} (heel) $= \frac{22.5 \times 2.25^2}{2} \frac{\quad}{60 \times 3.25^2} (116.75) = 10.5$

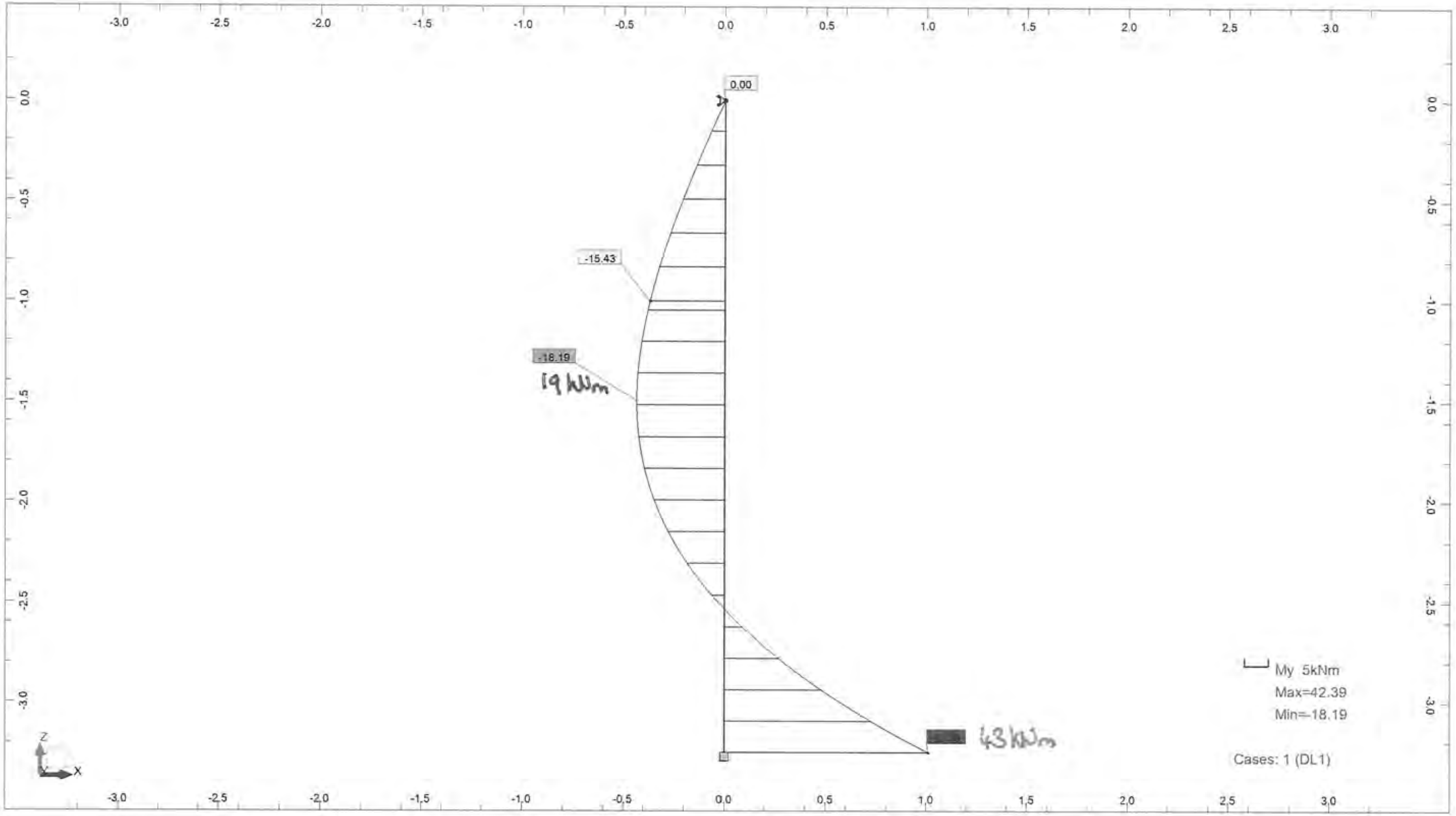
(leg) $= \frac{22.5 \times 2.25^2}{2} \times \frac{1}{3 \times 3.25} = 5.8$

M_{max} @ base $= 2.8 + 29.2 + 10.5 = 42.5$ kNm / m run

@ mid ht $= 1.6 + 13 + 5.8 = 20.4$ kNm / m run

Calc 4

View - MY, Cases: 1 (DL1)



Reinforcement Retaing wall

$M = \underline{43\,kNm}$

$b = 1000$

$d = 200 - 40 - 10 = 150$

$f_{cu} = 35\,N/mm^2$ FND

$k = \frac{43 \times 10^6}{1000 \times 150^2\ 35} = 0.054 \leq 0.156$ ∴ no comp re required

$z = 140.8\,mm$

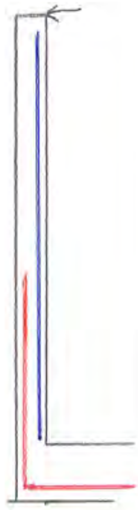
$As_{req} = 701\,mm^2$

$As_{prov} = 1006\,mm^2$ 16@200 c/c

$f_s = 213$

$M_{F_T} = 1.33$

$\delta\ check = \frac{3250}{150 \times 1.33} = 16 \leq 20$ ∴ Ok.



∴ Use 200 RC retaining wall with H16 @ 200c/c in heel

$M = 19\,kNm$
$b = 1000$
$d = 150$
$f_{cu} = 35$
$k = 0.024 \leq 0.156$ ∴
$z = 145$
$As_{req} = 298$

$As_{prov} = 393$ 10@200c/c
$M_F = 1.71$

$\delta\ check\ \frac{3250}{150 \times 1.71} = 12.6 \leq 20$ ∴ ok

∴ Use 200 RC retaining wall with H10@200c/c in leg

PRICE & MYERS

Job No. 29876 Page Calcs 6 Rev

Date Dec 21 Eng SJP Chd

Job Roseleigh Close & Cambridge Pk

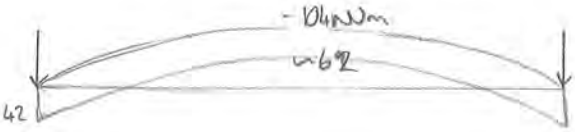
Basement Slab - Uplift design

Loading

water $2.25 \times 10 =$ 22.5 kN/m²
Slab $0.25 \times 24 \times 0.9 =$ 5.4

17.1 kN/m²

$M = \frac{17.1 \times 7^2}{8} = 104\,kNm$



b = 1000

d = 250 - 25 - 10 - 5 = 210

conservative as fixed on edges and span 2 ways.

fcu = 35
K = 0.068 < 0.156
Z = 192mm
As req = 1246

As prov = 1571 20@200c/c

MF = 1.14

δ check = $\frac{7000}{210 \times 1.14}$ = 29.3 ≮ 26. MF_c = 12@200c/c = 1.083 $\frac{29.3}{1.083}$ = 27.

load span 2 way
so load shared
∴ W ≤ 12kN/m² ∴ δ check ≃ 22 ∴ ok

M = 62 kNm
b = 1000
d = 210
fcu = 35
K = 0.040 ≤ 0.156
Z = 200
As req = 708

As prov = 1006 16@200c/c
MF = 1.49

δ check = $\frac{7000}{210 \times 1.49}$ = 22.3 MF_c (12@200) 1.083

δ check = $\frac{22.3}{1.083}$ ≤ 26 for continuous slab Ok

PRICE& MYERS

Job No. 29876 Page 1 Rev 01

Date NOV 2021 Eng OE Chd

Job Rose leigh Close

FLOATATION CALCULATION

Assumptions:

- Water burst 1m below ground
- Concrete basement
  - Area = $94m^2$
  - Walls = 200mm thick
  - Basement Slab = 200mm thick
  - Ground level slab = 250mm / 150mm thick
- Loads:
  - SDL = $1 kN/m^2$
  - LL = $1.5 kN/m^2$

UPWARDS FORCE (BUOYANCY)

$m^3 = 94m^2 \times 2.19m = 205.9m^3$

$F = 9.81 \times 205.9m^3 = \underline{2019.88 kN}$

STABALISING FORCE

Walls Force: volume × density (SW) $= 47m \times 0.2m \times 2.8m$ (L T H)

$= 26.32 m^3 \times 24 \frac{kN}{m^3}$

$= \underline{631.68 kN}$

Basement Slab (SW): $94m \times 0.2m \times 24 \frac{kN}{m^3} = \underline{481.2 kN}$

Ground Slab 0.25m (SW): $65 m \times 0.25m \times 24 \frac{kN}{m^3} = \underline{390 kN}$

Ground Slab 0.15m (SW): $29m \times 0.15m \times 24 \frac{kN}{m^3} = \underline{104.4 kN}$

foundation 0.8×0.25 (SW): $0.8m \times 0.25m \times 47m \times 24 \frac{kN}{m^3} = \underline{225.6 kN}$

Ground Slab outside Basement wall boundary (SW): $(6.5m^2 + 8.05m^2) \times 0.15 \times 24 = \underline{52.38 kN}$

Selfweight of frame (assume):

FRAME = $3m^3 \times 8 \frac{kN}{m^3} = \underline{24 kN}$

FLOOR = $176 \times 2 \times 0.35 \frac{kN}{m^3} = \underline{123.2 kN}$

Assume SDL of $1 kN/m^2$ = $(176 \times 2) + (94 \times 2) \times 1 = \underline{540 kN}$

Σ STABALISING = 631.68 + 481.2 + 390 + 104.4 + 225.6 + 52.4 + 123.2 + 540 = 2542.08 > BUOYANCY ∴ OK.

Appendix E
Site & Assessment Verification Form

Basement Assessment User Guide

1. Basement Assessment Process:

This guidance applies to all development proposals that feature basements, cellars, or other subsurface structures (collectively termed as 'basements' within this document). This includes new structures and extensions to existing structures. This document is designed to guide users through the requirements of the Basement Assessment process for a range of environmental impacts. This guide should be used in conjunction with the London Borough of Richmond upon Thames' Strategic Flood Risk Assessment (SFRA) and associated Further Groundwater Investigations document.

Planning applications which feature basements will need to provide supporting information regarding the potential level of impact the proposed development will have. The applicant will need to show that the proposal will not adversely impact the site, neighbouring properties, and the wider natural environment. This includes impacts to groundwater and water transferred via throughflow.

Applications may require a Screening Assessment (as a minimum) depending on the location of the proposed development. See Section 3 for further information.

2. Stages of a Basement Assessment:

The Basement Assessment process needs to enable the London Borough of Richmond upon Thames to assess the potential impacts of a proposed subsurface development. Depending on the predicted level of impact, applicants will need to produce and submit information in line with the following stages of the Basement Assessment process. All documentation must be provided within the proposed development's planning application submission.

1. **Screening Assessment** – A Screening Assessment is used to identify any potential matters that may have an adverse impact and determine if a Basement Impact Assessment is required. If the answer to any of the screening questions (see Section 4) is "yes", or is currently unknown, matters relating to that question will need to be addressed as part of a Basement Impact Assessment. Accompanying information to justify responses included within the Screening Assessment should be provided and signed off by the chartered professional who carried out the assessments for the supporting evidence (see Section 6).

Ahead of preparing a Basement Impact Assessment, a scoping step should be carried out to determine the extent of the potential impacts identified as part of the Screening Assessment. Scoping should be used to set the boundaries of the Basement Impact Assessment and establish what the assessment will address. Additional information may be collected to help with this process. To further gain a better understanding of the site and the immediate area, desktop, and field surveys (where required) should be carried out. The type and degree of such site investigations carried out is dependent on what was identified as part of the Screening Assessment. These will support the Basement Impact Assessment.

2. **Basement Impact Assessment** – The Basement Impact Assessment should evaluate the potential direct and indirect impacts of the proposed development. It is required that a Basement Impact Assessment is carried out and signed off by a chartered professional, depending on the type of expertise required (see Section 5 and Section 6).

Whether it is a Screening Assessment or a Basement Impact Assessment, the London Borough of Richmond upon Thames will rely on the professional integrity of the person signing off the assessment to ensure that the construction of the basement can be undertaken safely. To support with their decision making, the London Borough of Richmond upon Thames may choose to consult, at the applicant's expense, an independent chartered structural engineer with expertise in historic structures for specific cases where particularly vulnerable historic buildings or structures may be affected. Further consultation may also be sought from an independent chartered professional or specialist regarding any of the three categories covered by the Screening Assessment. This would normally be carried out as part of the consideration of the planning application.

3. Screening Assessment Guidance

The following steps explain how users can identify whether a proposed development requires the submission of a Screening Assessment during the planning process.

Step 1:

Determine through the London Borough of Richmond upon Thames' SFRA map if the proposed property falls within one of the two following borough designations:

- an area with >= 25% susceptibility to groundwater flooding
- one of the four throughflow catchment areas

If the proposed development falls within one (or both) of these two designations, and contains a basement, then the applicant needs to complete a Screening Assessment.

Step 2:

The type of information required within a Screening Assessment is determined by the answers to the set of questions set out in Section 4 of this User Guide.

For all questions where the response is "yes", or where the answer is currently unknown, these matters should be taken forward and investigated as part of the Basement Impact Assessment. Questions where the response is "no" should have accompanying information / supporting evidence to justify the response, structured within a Screening Assessment document that addresses each of the questions. For further guidance on the requirements of a Basement Impact Assessment, see Section 5.

Step 3:

In instances where the accompanying information / supporting evidence provided as part of the Screening Assessment was undertaken by a chartered professional, the information should be signed off by the specialist who carried out the works (see Section 6). A completed version of the form should be provided as part of the Screening Assessment to confirm that the supporting information provided aligns with the answers provided in response to the Screening Assessment questions.

4. Screening Assessment Questions

The purpose of the Screening Assessment is to identify if there are any potential issues which would require a more detailed investigation into the suitability of a proposed development due to groundwater influenced flood risk factors. If so, a Basement Impact Assessment should be carried out. To identify if this is required, the following categories of information should be covered as part of the Screening Assessment:

- Subterranean characteristics
- Land stability (including site slope)
- Flood risk and drainage (including throughflow, groundwater and surface water)

Analysis undertaken by the applicant should be based on the proposed development site's characteristics and focus on the impact on the site, neighbouring properties, and the wider natural environment. The following questions, split into the above three information categories, should also be addressed within the Screening Assessment:

Subterranean Characteristics

- Does the recorded water table extend above the base of the proposed subsurface structure? No
- Is the proposed subsurface development structure within 100m of a watercourse or spring line? No
- Are infiltration methods proposed as part of the site's drainage strategy? Yes See FRA
- Does the proposed excavation during the construction phase extend below the local water table level or spring line (if applicable)? No
- Is the most shallow geological strata at the site London Clay? Yes see BIA
- Is the site underlain by an aquifer and/or permeable geology? Yes see BIA

Land Stability

- Does the site, or neighbouring area, topography include slopes that are greater than 7˚? No
- Will changes to the site's topography result in slopes that are greater than 7˚? No
- Will the proposed subsurface structure extend significantly deeper underground compared to the foundations of the neighbouring properties? Yes see BIA
- Will the implementation of the proposed subsurface structure require any trees to be felled or uprooted? No
- Has the ground at the site been previously worked? No
- Is the site within the vicinity of any tunnels or railway lines? No

Flood Risk and Drainage

- Will the proposed subsurface development result in a change in impermeable area coverage on the site? Yes See FRA
- Will the proposed subsurface development impact the flow profile of throughflow, surface water or groundwater to downstream areas? No
- Will the proposed subsurface development increase throughflow or groundwater flood risk to neighbouring properties? No

As part of answering the Screening Assessment questions, applicants are required to provide information to justify their answers. Examples of information that is expected as part of the Screening Assessment include, but is not limited to:

- Description of the proposed basement, cellar, or other subsurface structure development.
- Construction methods proposed.

- Characteristics of the site, including geological information (bedrock, superficial deposits, and aquifer confirmation) and topographical information.
- Site borehole information with water levels. Historical borehole data from sources such as the British Geological Survey may be acceptable to help justify answers provided within the 'Subterranean Characteristics' section of the Screening Assessment. If historical borehole data is used, the borehole location must be within 100m of the site and have been conducted within the last 20 years to best capture the current local conditions. However, singular borehole measurements may not provide information on what subterranean conditions might look like at a different time in the year. Groundwater flow and throughflow may be subjected to seasonal influences. Therefore, it will be necessary to monitor subterranean water levels over a period of time in areas that may be more susceptible to groundwater and throughflow. For further information on monitoring subterranean water level conditions as part of an impact assessment, see Section 5.
- Characteristics of potential impacts (including the impact on soils, water quality and hydrology).
- Details of mitigation measures (where appropriate).

5. Basement Impact Assessment

For all Screening Assessment questions where the response is "yes", or where the answer is currently unknown, these matters should be taken forward and investigated as part of the Basement Impact Assessment. Depending on what categories of information which need to be covered, the Basement Impact Assessments must be carried out by a chartered professional who can carry out the required assessment(s). Examples of specialists that have the required skills and qualifications to carry out assessments necessary for a Basement Impact Assessment include:

- Civil engineer
- Geotechnical specialist
- Geologist
- Hydrologist
- Hydrogeologist

Guidance provided under 'Structural Impact Assessments' as part of the Good Practice Guide on Basement Developments (2015) should be followed to produce a Basement Impact Assessment. It must include a detailed geotechnical site investigation, site plans outlining the subsurface structure, and engineering information detailing the potential impacts of the proposed development. Depending on the matters flagged up as part of the Screening Assessment, other content that may be included or referenced as part of the Basement Impact Assessment include a:

- Flood Risk Assessment
- Demolition and Construction Management Plan
- Site Waste Management Plan
- BREEAM Assessment
- Environmental Impact Assessment / Environmental Statement

The Basement Impact Assessment should be signed off by the specialist who carried out the investigatory works (see Section 6). The submission should also demonstrate that the level of risk posed to neighbouring properties and the wider environment is low. It must also include, but is not limited to, the following details:

- Detailed borehole information on-site or from nearby to the development site. At least two data recordings should take place within at least a 12 month period to demonstrate any potential seasonal variations. As subterranean water conditions are subject to various seasonal and yearly influences, it is important to monitor any potential changes over a period of time. The subterranean measurements should identify the geological conditions on or close to the development site, the infiltration potential, and the height of any local groundwater.
- Mitigation if the identified potential impacts of the proposed subsurface development are not acceptable. If, for example, the assessment identifies that the proposed development may result in water ingress to the new development and/or to neighbouring properties, then mitigation measures should be proposed to reduce and/or alleviate the risk of flooding. Flood risk must not be worsened as a result of the proposed development. Examples of flood risk mitigation include, but are not limited to, the following:
    - Underground corridors with a high permeability
    - Controlled subsurface structure drainage systems (including pumps)

6. Site and Assessment Verification Form

This Site and Assessment Verification form should be completed and submitted as part of the planning application. The 'Chartered Professional Verification' table should be completed by the specialist that undertook the required assessment(s) (Screening Assessment and / or Basement Impact Assessment). If chartered professionals from different expertise areas carried out parts of the assessment(s), please ensure that separate Site and Assessment Verification forms are completed and submitted.

Site Details

Site Details	Applicant Information
Site name	Corner of Roseleigh Close & Cambridge Park
Planning application reference (if applicable)	
Address & postcode	Cambridge Park, East Twickenham TW1 2JS
Brief description of the proposed works	3 new build maisonettes with a part single storey basement extending up to an attic second floor
Geology type	Kempton Park gravel over London clay approx -9m
Presence of aquifer?	Yes a Secondary Aquifer
Total site area (Ha)	0.056Ha
Is the site currently known to be at risk of flooding from any sources?	No - not according to Environment agency maps. LBRuT Map shows part of the site is 25% risk other part 50% risk

Chartered Professional Verification

Professional Details	Applicant Information
Name	Sarah Pellereau
Profession / area of expertise	Structural Engineer
Chartered institution and membership level	MEng CEng MIStructE no. 021074457
Brief description of assessment involvement	Desk study of local water and geology in relation to the proposed development considering the proximity of the neighbours
Brief summary of the assessment results	See BIA
Declaration of assessment results	See BIA
Signature