Confidential

# 85 Connaught Road

## Basement Impact Assessment

**Project Name:** **85 Connaught Road, TW11 0QQ**

**Project Number:** **L1914**

**Issue Date:** **29 July 2021**


Bridge House
141 Albany Road
CV5 6ND
Tel: 02477 719 547

**701 The Chandlery**
**50 Westminster Bridge Rd**
**SE1 7QY**
**Tel: 0207 953 7561**

Wira House
West Park
LS16 6EB
Tel: 0113 274 0721

Email: general@bridgespound.co.uk

## REVISION HISTORY

| Revision | Date | Purpose /Status | File Ref | Last Saved | Author | Reviewed |
|---|---|---|---|---|---|---|
| 00 | 29/07/2021 | Initial Issue | L1914-Connaught Road - BIA Report - 20210707 | 29/07/2021 | LY | MT |
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# CONTENTS

# 1.0 NON TECHNICAL SUMMARY

- The London Borough of Richmond requires a Basement Impact Assessment (BIA) to be prepared for the developments that include basements. We are instructed by CRD London Limited to prepare Basement Impact Assessment report. This document form the main part of the BIA and gives details on the impact of surface water flow. The scheme design for the proposed subterranean structure is also included.
- The Flood Risk Assessment is not required as noted on item 6.3.
- The archaelogical desk stusy is based on preliminary assessment.
- This report has been produced in line Richmond planning guidance and associated with supporting documents as listed in section 2.2.
- The development is therefore considered to have no detrimental impact on structural stability of adjacent properties.
- The development of the basement is unlikely to impact on groundwater, surface water or flooding, unlikely to impact on drainage or ground infiltration of rainwater.
- The redevelopment proposals would be unlikely to have a significant impact on any surviving below ground archaeological remains.

# 2.0 INTRODUCTION

2.1. **Authors**

- The authors of the assessments are
a) Lian Yeo
b) Mike Tuck (CENG MIStructE)

2.2. **Sources of Information**

The following baseline data have been referenced to complete the BIA in relation to the proposed development:

- Current/historical mapping*:*
  - Website. www.oldmap.co.uk;
  - Google map
  - historicengland.org.uk
- Geological mapping:
  - BGS
  - Desk study using Richmond website: www.mapping.richmond.gov.uk
- Hydrogeological, hydrological data and flood risk mapping
  - Desk study using Richmond website: www.mapping.richmond.gov.uk
- Archaelogical mapping
  - Desk study using https://historicengland.org.uk/

2.3. **Site Location**

- The site location is 85 Connaught Road, TW11 0QQ.
- See location of the site shaded marked red on the photo below.


*Figure 1 : Site Location (marked in red outline)*


*Figure 2 : Satellite map showing site location in red outline*

## 2.4. Existing Site and building

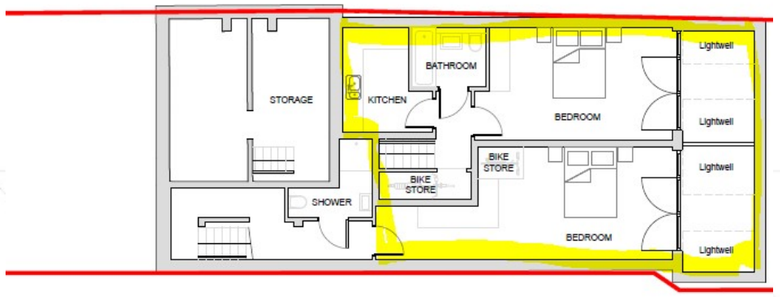
- The existing site is currently located in residential area.
- The building is a detached building comprise of flats.

*Figure 3 : Photo showing front elevation of existing building (marked in red) and surrounding buildings*

*Figure 4: Existing rear elevation*

## 2.5. Proposed development

- The development proposals for the site include conversion of an existing building composing of two dwellings into a converted and extended building comprising of six dwellings.
- The current site arrangement for basement and ground floor is as shown on photos below.
- For more details of elevation refer to appendix B.
- The Richmond planning website shows no live planning application located besides the building.



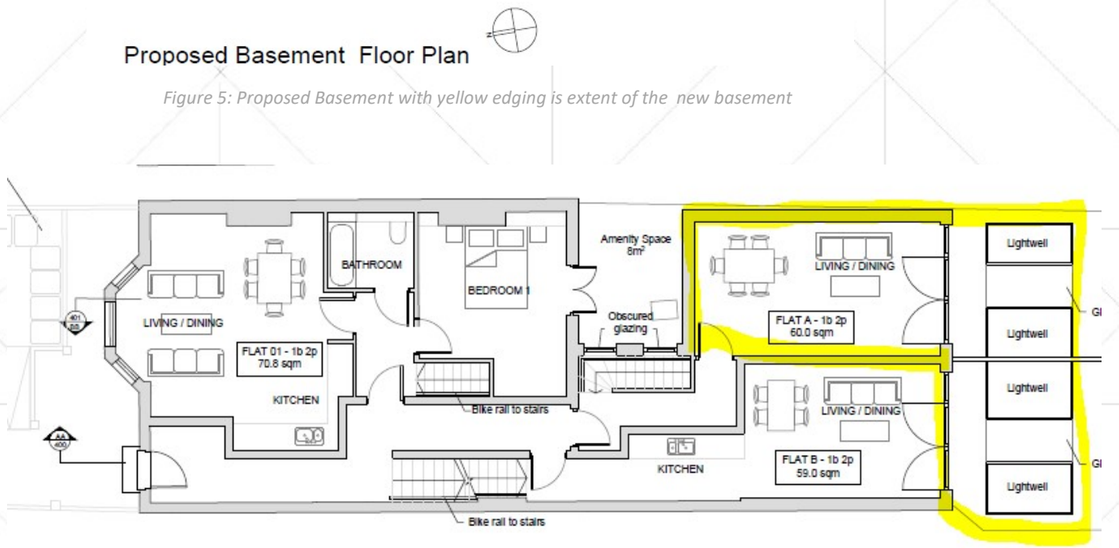




*Figure 5: Proposed Basement with yellow edging is extent of the new basement*

*Figure 6: Proposed Ground Floor with yellow edging is new ground floor/roof light*


Proposed Section A-A

*Figure 7: Proposed section A*


Proposed Section B-B

*Figure 8: Proposed section B*


Proposed Front Elevation

*Figure 9 :Proposed front elevations*


Proposed Rear Elevation

*Figure 10: Proposed rear elevation*

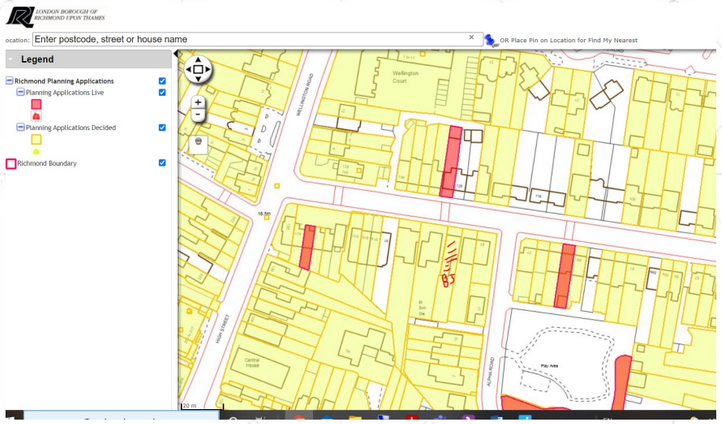



*Figure 11: Plan showing adjacent planning application*

# 3.0 DESK STUDY

## 3.1. Site History

- A search regarding the site history has been carried out. Refer to phase I desk study.
- History of the site is briefly described below.
- From the historical map website, the building was likely built between 1899 -1915.

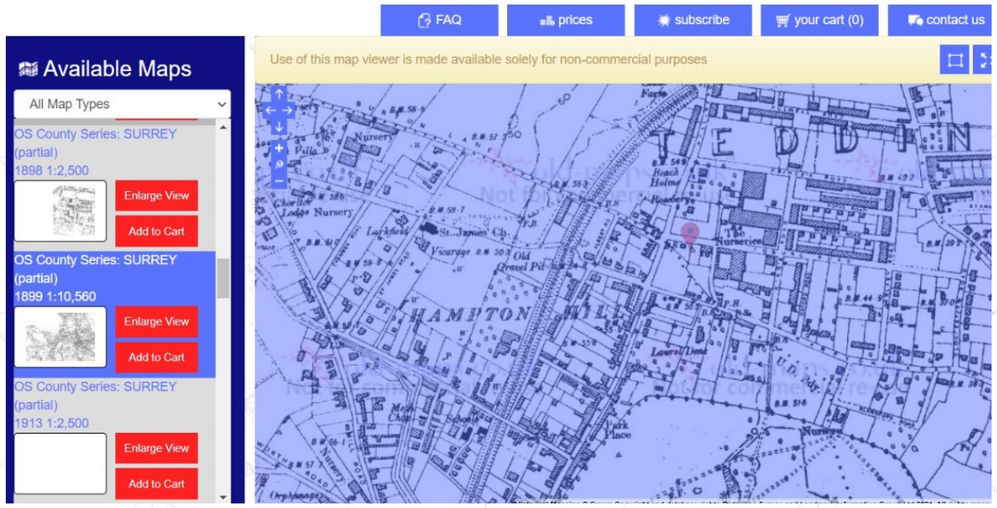



*Figure 12: Old map of 1899*


*Figure 13: Old map of 1915 showing the house was built prior to 1915*

## 3.2. Geology

- The BGS Geological Map the Teddington area revealed that the site is located on superficial deposits of the Taplow Gravel Member, underlain by bedrock deposits of the London Clay Formation.
- Refer to appendix for map obtained from BGS website.
- Refer details to appendix for the nearest borehole which is located approximate 140m from the site.
- The nearby borehole shows that the made ground is 0.5m thick, underlain by 2m thick of sand and min 2.5m thick of gravel.

## 3.3. Hydrogeology

- Hydrogeological information has been obtained from the online Magic Maps Application. These maps indicate that the site is underlain by a primary superficial aquifer, defined as "These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer."
- DEFRA record showed that the site did not fall within a groundwater Source Protection Zone.

## 3.4. Hydrology, Drainage and Flood Risk

- The nearest EA Main River to the site is the River Thames, which is located approximately 1.6km to the north east of the site.
- The nearest surface permanently flowing watercourse to the site was River Longford located ~0.5km south-west of the site.
- The nearest ordinary watercourse is ~300m north-west of the site.
- The risk of flooding from surface water are very low.
- DEFRA records showed that the site was located within a flood zone 1.

## 3.5. Services

- From the services and infrastructure maps, all services and drainage run along Connaught Road.

## 3.6. Infrastructure

- There is no tunnel or embankment in the vicinity.

# 4.0 SCREENING

Screening is the process of determining whether or not there are areas of concern which require further consideration and / or investigation for a particular project. A screening process has been undertaken and the findings are described below

## 4.1. Subterranean Characteristics

| Question | Response | Details |
|---|---|---|
| 1. Does the recorded water table extend above the base of the proposed subsurface structure? | No | Basement is approximate 3m below ground.<br>The nearest borehole shows ground water at 5.5m below ground<br>(Refer to deskstop study in appendix) |
| 2. Is the site within 100mof a watercourse, well (used / disused) or potential spring line? | No | River Longford approx. 500m to west,<br>River Thames 1600m to east |
| 3. Does the proposed excavation during the construction phase extend below the local water table level or spring line? | No | No excavation proposed beyond existing basement level |
| 4. Are infiltration methods proposed as part of the site's drainage strategy? | No | |
| 5. Is the most shallow geological strata at the site London Clay | No | The nearest borehole shows Taplow Gravel (sands and gravel) up to at least 10m below ground.<br>BGS website shows Taplor Gravel as superficial deposit at this area. |
| 6. Is the site underlain by an aquifer and/or permeable geology | Yes | The Defra Magic map shows principal aquifer at superficial drift. |

## 4.2. Land Stability

| Question | Response | Details |
|---|---|---|
| 1. Does the site, or neighbouring area, topography include slopes that are greater than 7°? | No | |
| 2. Will changes to the site's topography result in slopes that are greater than 7°? | No | |
| 3. Will the proposed subsurface structure extend significantly deeper underground compared to the foundations of the neighbouring properties. | NO | SEE SECTION 6.1 FOR DETAILS |
| 4. Will the implementation of the proposed subsurface structure require any tress to be felled or uprooted? | No | |
| 5. Has the ground at the site been previously worked? | No | The Richmond website map shows the area does not contain worked ground. |
| 6. Is the site over within any tunnels or railway lines? | No | No tunnels in vicinity.<br>Railway line is at at least 200m away from the property. |

## 4.3. Flood risk and Drainage

| Question | Response | Details |
|---|---|---|
| 1. Will the proposed subsurface development result in a change in impermeable area coverage on the site? | No | Extent of hard landscaping remain similar. Basement occurs within footprint of building. |
| 2. Will the proposed subsurface development impact the flow profile of through flow, surface water or groundwater to downstream areas? | No | |
| 3. Will the proposed subsurface development increase through flow or groundwater flood risk to neighbouring properties? | No | |

## 4.4. Non-Technical Summary of Screening Process

The screening process identifies the following issues to be carried forward to scoping for further assessment.

The site is located at primary aquifer with sand gravel as superficial deposit. The risk of contaminated water will need to be assessed.

Refer to Flood Risk Assessment for more details.

Refer to archaeological assessment for more details.

## 4.5. Archaelogical Asssessment

An archaelogical desk-based assessment has been prepared in support of the planning application for the site. See below for summary of the preliminary assessment.

- No archaeological designated heritage assets as show on Historic England are recorded on the study site.
- The study site is considered to have a low archaeological potential for the Prehistoric periods.
- A low archaeological potential is identified for Roman agricultural activity, and a low archaeological potential is considered for all other periods
- Modern development can be considered to have had a moderate severe impact on underlying archaeological deposits within the footprint of the existing buildings, through the cutting of foundations and services.
- The redevelopment proposals would be unlikely to have a significant impact on any surviving below ground archaeological remains.
- Further archaeological assessment report by archaeologist is required to confirm the above assumption.

4.6. **Flood Risk Assessment**

Flood Risk Assessment is not required due to following reasons.

- The site is located within Flood Zone 1.
- The development is smaller than 1 hectare.
- The development is not affected by sources of flooding or in an area with critical drainage problems.
- From the Richmond website (see appendix), the property is not within flood warning area from fluvial or tidal water
- From the Richmond website (see appendix), the property is not at risk of flood from surface water.
- From the government website (see appendix), the property is at no risk of groundwater flooding. However, from the Richmond council website, the map shows the property has potential for ground water flooding in the property situated below ground level. See section 5.0 for scoping and section 6.3 for the assessment and results.

# 5.0 SCOPING

Scoping is the activity of defining in further detail the matters to be investigated as part of the BIA process. Scoping comprises of the definition of the required investigation needed in order to determine in detail the nature and significance of the potential impacts identified during screening. The potential impacts for each of the matters highlighted in tables on screening process are discussed in further detail in table below together with the requirements for further research and / or investigations. Detailed assessment of the potential impacts and actions required are provided where possible.

| Reference | Issue | Potential Impact and action |
|---|---|---|
| 4.1- Item 1 | Site occurs over primary aquifer for superficial deposit | **Impact** : Low posibility of ground water contamination.<br>**Action**: Assess the possibility of ground water being contaminated. Refer to clause 6.2 for the assessment and results. |
| 4.2- Item 2 | The site is within an aquifer and if dewatering required? | The basement does not extend beyond the ground water table and no action is required. Nearby borehole (app 140m away) is used to check the ground water level. |
| 4.2- Item 3 | The site within 5m of a highway or pedestrian right of way. | **Impact:** Damage existing services<br>**Action:** Check services in the pavement |
| 4.3- Item 4 | The site is in an area identified to limited potential to ground water flood risk | **Impact** : Flooding<br>**Action:** Assess the possibility of flooding. Refer to clause 6.3 for the assessment and results. |

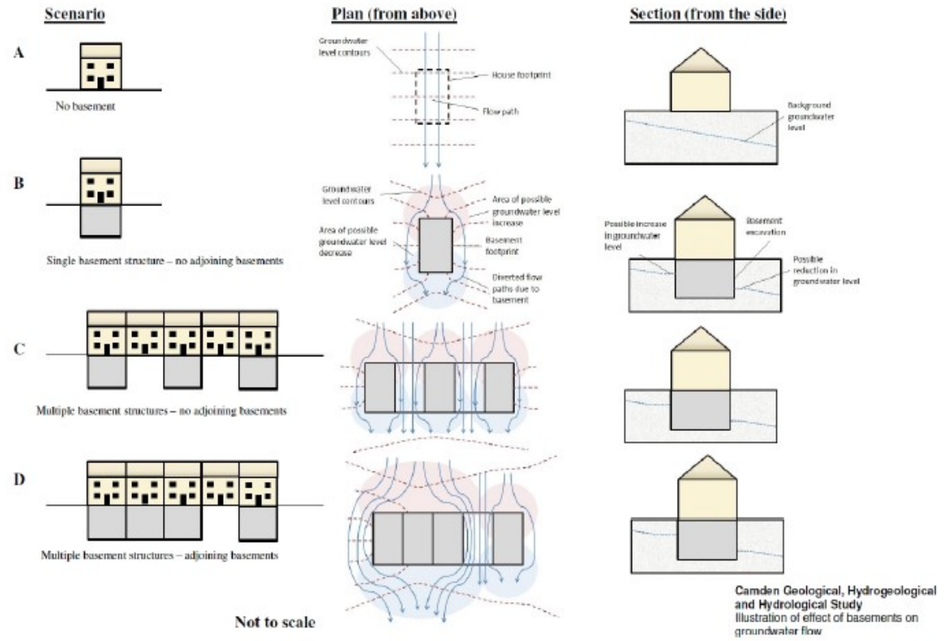
# 6.0 BASEMENT IMPACT ASSESSMENT

## 6.1. Land Stability/Slope stability

- The nearby properties are house which may have 1 storey basement and should have similar depth of basement. Further details are required after party wall surveyor appointed. Site visit is required to confirm if any basement exist and to what depth.
- From the website of Richmond council, there is no planning permission granted for basement to the adjacent building. Hence, it is highly unlikely there is any basement to the neighbours' property, but we assume they have a similar layout to the existing building.

## 6.2. Hydrogeology and Groundwater Flooding

- The site is shown to be located above the superficial deposits formed of Taplow Gravel Member Sand and Gravels, which are designated a principal aquifer.
- However, the existing site appears to be partially covered in hard standing (impermeable) and gardens. The size of impermeable area remains the same as the existing site.
- There will therefore not be an increase in the hard standing and change in run off volume of water infiltrating into the aquifer, nor will it affect the water quality of the aquifer. The lack of any potable water abstraction licences within a 100m radius of the site means that the impact on any receptors is negligible.
- The scale of the proposed basement is considered minimal in context. It will be ~ 3-3.5m below ground level and therefore has limited potential impact on the underlying aquifer.
- Based on borehole records from a nearby location from BGS record show water was encountered at a depth of 5.5m below ground level.
- A borehole record located just to the south east of the site (BGS borehole ref TQ17SW290) just beyond the railway line struck groundwater at (5.5mbgl). This data was taken in 17 Jan 1985 and is still well below the proposed basement slab.
- The impact on ground water flow would be negligible. Where required, appropriate design and construction techniques should be employed to manage this.
- Effects of basement damming on groundwater flow is illustrated in the following Diagram. (This diagram is taken from the London Borough of Camden 'Camden geological, hydrogeological and hydrological study — Guidance for subterranean development' November 2010 prepared by Ove Arup and Partners.)



Camden Geological, Hydrogeological and Hydrological Study
Illustration of effect of basements on groundwater flow

- Scenario B is relevant to this development as the small scale of basement has minimum impact on ground water flow.

## 6.3. Hydrology, Surface Water Flooding and Sewer Flooding

- The site is shown to be located in Flood Zone 1.
- Refer to section 4.6 for summary of screening regarding flood risk.
- From the screening process, the flood risk to the site from fluvial, surface water, reservoir and artificial sources is assessed as low to very low.
- From the government website, the property is at no risk of groundwater flooding. However, from the Richmond council website, the map shows the property has potential for ground water flooding in the property situated below ground level.
- The nearby boreholes (app 140m from the property) from BGS shows ground water strike at 5.5m bgl. The basement slab is formed approximate 3m bgl. Hence the property is not at risk of ground water flooding. Refer to below for more details and assumption regarding ground water flood risk.
- Groundwater flooding occurs when the water held underground rises to a level where it breaks the surface in areas away from usual channels and drainage pathways. Groundwater flooding typically occurs following long periods of sustained intense rainfall and is typically associated with low-lying areas underlain by permeable aquifers. The SFRA mapping shows that the site is located in an area with limited potential for groundwater flooding to occur at the surface. Climate change could increase the risk of groundwater flooding as a result of increased precipitation filtering into the groundwater body. If winter rainfall becomes more frequent and heavier, groundwater levels may increase. Higher winter recharge may,

however, be balanced by lower recharge during the predicted hotter and drier summers. This is less likely to cause a significant change to flood risk than from other sources, since groundwater flow is not as confined. It is probable that any locally perched aquifers may be more affected, but these are likely to be isolated. The change in flood risk is likely to be low.

- The proposed development includes new-sub surface construction works with the proposed new basement level. Therefore there may be an increased risk of groundwater flooding within the site during construction. Best construction practice should be utilised to minimise risk, which could possibly include localised dewatering. Assuming appropriate basement construction techniques are employed,
- The resulting long term risk of groundwater flooding affecting the development is considered to be low as described in the screening process. The resultant groundwater flood risk is considered to be low.
- The flood risk to the site from all other sources, including fluvial, surface water, groundwater, reservoir and artificial sources is assessed as low to very low.
- The assessment concludes that the development should not be precluded on flood risk grounds.
- The flood risk to the site from all other sources, including fluvial, surface water, groundwater, reservoir and artificial sources is assessed as low to very low.

# 7.0 CONSTRUCTION METHODOLOGY/ENGINEERING STATEMENTS

## 7.1. Outline Geotechnical Design Parameters

- The geotechnical design parameters have been made based on information from nearby boreholes from BGS website.
- The nearby borehole (app 140m away from site) shows that the made ground is 0.5m thick, underlain by 2m thick of sand and min 2.5m thick of gravel.
- BGS borehole record (ref.: TQ17SW290) in similar geology ~140m southeast of the site revealed Made Ground to 0.5m bgl, overlying medium dense sand surrounded with subangular gravel to 3.5 m bgl (assumed to be representative of the Taplow Gravel Member). Medium dense, brown sandy, fine to coarse, subround to subangular was noted from 3.5m bgl to 6m bgl.
- Assume the soil properties underside the basement to be similar based on borehole TQ17SW290 from BGS website.
  - Taplow Gravel
  - Assume Ø =32
  - N = 19 at 3m bgl
  - N = 25 at 4m bgl
  - Assume bearing capacity =10N= 10*19= 190kN/m2

## 7.2. Proposed Structure

- <u>Basement Wall</u>
  - Traditional reinforced concrete wall of 300mm thk is designed to resist earth pressure and vertical load from the superstructure
  - Assuming ground water is well below the proposed basement reinforced concrete wall is suitable for this site. As a precautionary measure, the basement wall will be designed as water level 1m BGL in the permanent condition.

- <u>Foundation at basement Level</u>
  - Load bearing masonry walls are supported on 350mm thk raft foundation.
  - The raft foundation is designed based on geotechnical parameter as set out on section 7.1.
  - For a raft foundation to be suitable, it must be constructed on ground of good bearing. A site-specific soil investigation is required to determine if the ground is suitable for a raft foundation solution, if not a piled design maybe required but this will not increased flood risk of any sort.
  - From nearby boreholes record, the ground water struck on this basis at 5.5m. The proposed basement slab does not extend beyond the groundwater. No dewatering is required and if perched water is encountered, the water can be collected through local sump pump. Any water flow during the installation of concrete wall could be collected through local sump pump.
- <u>Superstructure</u>
  - Assume upper floor comprises of timber floor joist supported on load bearing masonry wall and span between side walls.
  - Assume roof to be timber rafter supported on load bearing masonry wall

## 7.3. Construction Sequence and site set up

- <u>Site Set up</u>
  - Site access is available via Connaught Road. It is assumed that all deliveries, removals and access for operatives will be made via this route. Refer to traffic management for more details.
  - The site entrance will be manned by a banksman during operational hours to ensure construction deliveries do not pose potential risk to pedestrians or cyclists.
  - Terminate and divert existing services as required.
  - Site hoarding will be constructed along the pavement boundary to provide protection from passers-by.
  - It is assumed that excavated earth can be collected by a waiting lorry or skip located within the site boundary.

- <u>Construction Sequence for substructure</u>
  - Refer to appendix for drawing showing construction sequences for substructure.

## 7.4. Ground Movement and Damage Impact Assessment

- Install temporary prop as required for propping the wall.

## 7.5. Recommendations

- This Basement Impact Assessment has been completed in accordance with the Basement & Flooding guidance document prepared by Richmond Council.
- The development of the basement is unlikely to impact on groundwater, surface water or flooding, unlikely to impact on drainage or ground infiltration of rainwater.
- Recommendations include waterproofing the basement, allowing for groundwater at the 1m below ground surface for structural design.
- It will be necessary to ensure that the basements are designed in accordance with the NHBC Standards and take due consideration of the potential impacts highlighted above. This may be achieved by ensuring best practice engineering and design of the proposed scheme by competent persons and in full accordance with the Construction (Design and Management) Regulations. This will include:
  - Mitigation/Monitoring of the likely ground movements arising from the temporary and permanent works.

- Assessment of the impact on any adjacent structures.
- Determination of the most appropriate methods of the proposed basements.
- Undertake pre-condition surveys of adjacent structures.
- Monitor any movements and pre-existing cracks during construction.
- Establishment of contingencies to deal with adverse performance.
- Ensuring quality of workmanship by competent persons.
- Groundwater level monitoring (Piezometer and/or standpipes) if required.
- Water quality monitoring.
- Inclinometers near or built into the wall.

- The development is therefore considered to have no detrimental impact on structural stability of adjacent properties.
- Construction practices and appropriate monitoring regimes are proposed to ensure the proposed Development does not have adverse impacts on neighbouring properties and validates the methodologies and assumptions made of detailed design.

## APPENDICES

| APPENDIX | DETAILS OF APPENDIX |
|---|---|
| APPENDIX A | DESK STUDY REFERENCES |
| APPENDIX B | STRUCTURAL DRAWINGS |
| APPENDIX C | STRUCTURAL CALCULATIONS |
| APPENDIX E | ARCHITECT DRAWINGS |

BRIDGES POUND CONSULTING ENGINEERS

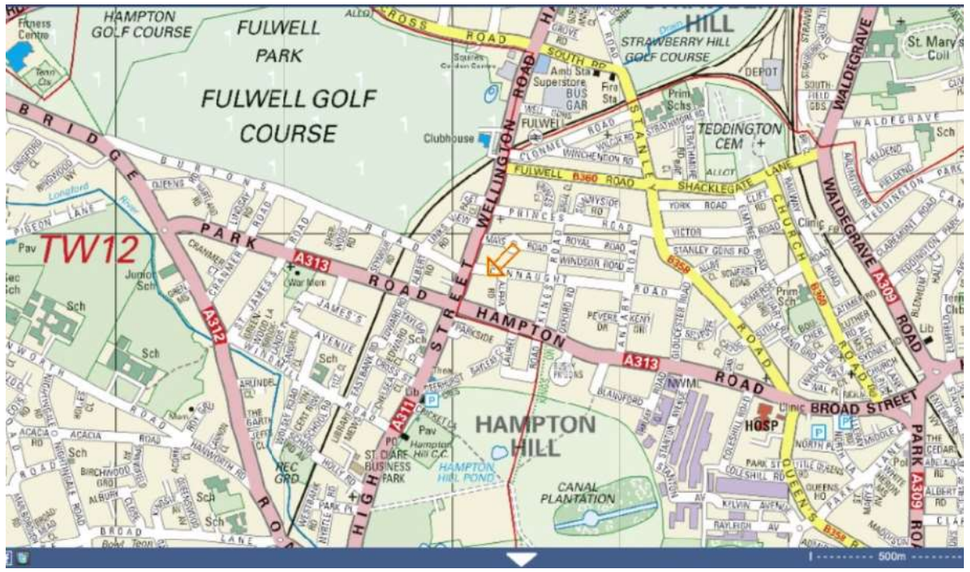
# APPENDIX A

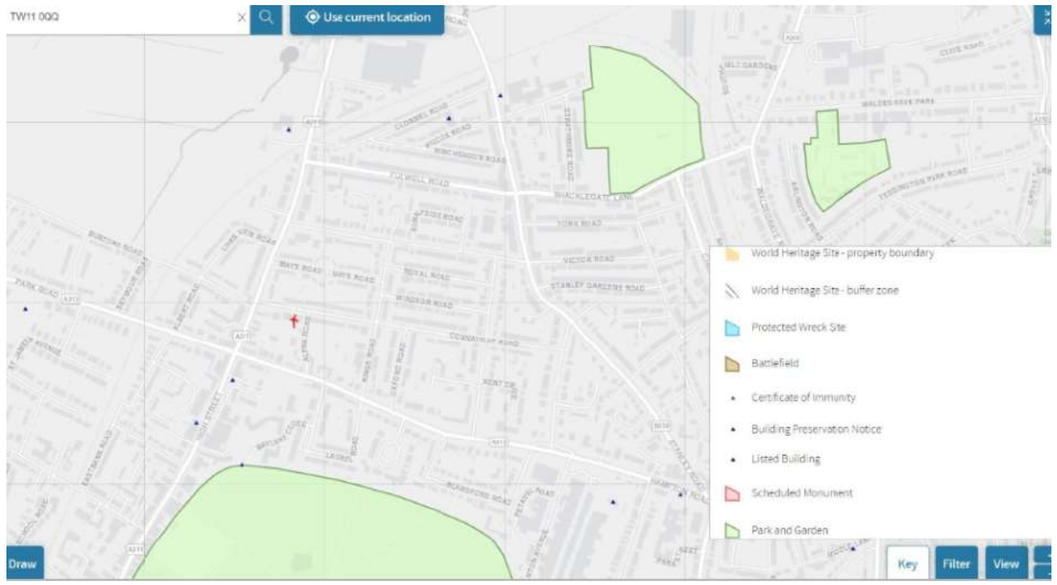
**L1914-CONNAUGHT ROAD**

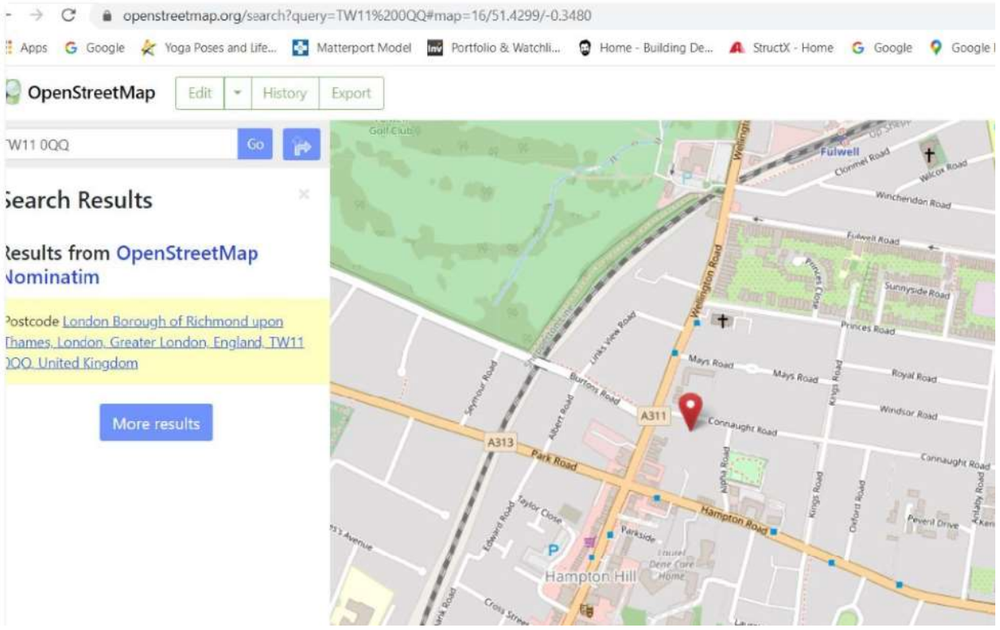
BRIDGES POUND CONSULTING ENGINEERS

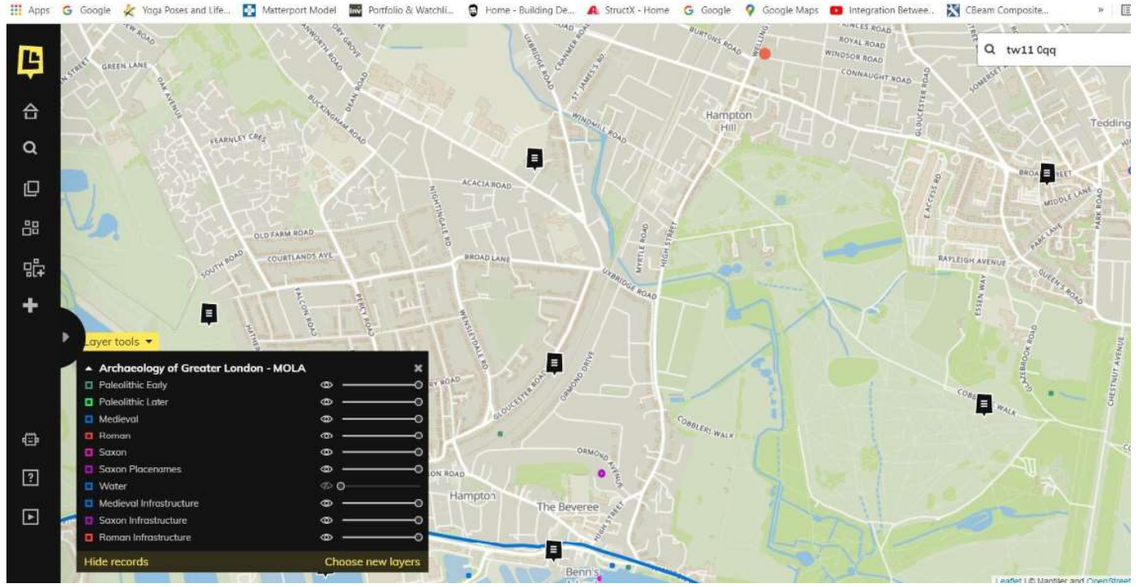
FOLLOWING MAPS SHOWING LOCATION , HISTOTICAL, ARCHAELOGICAL , OLD MAP, BOMB MAP, RAILWAY LINE

(SITE LOCATION IS MARKED WITH CROSS, ARROW, RED DOT)



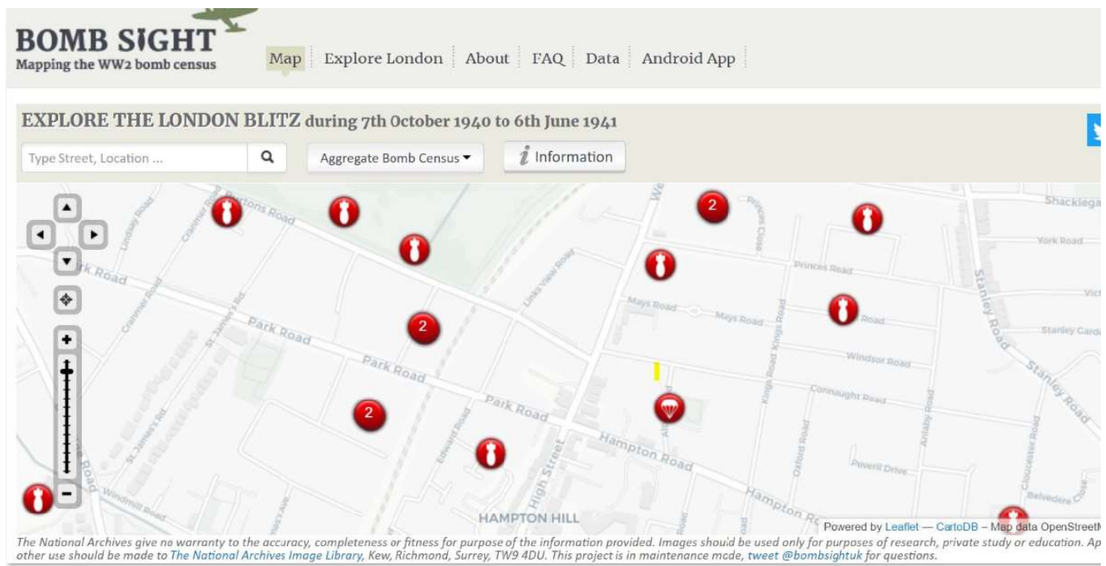



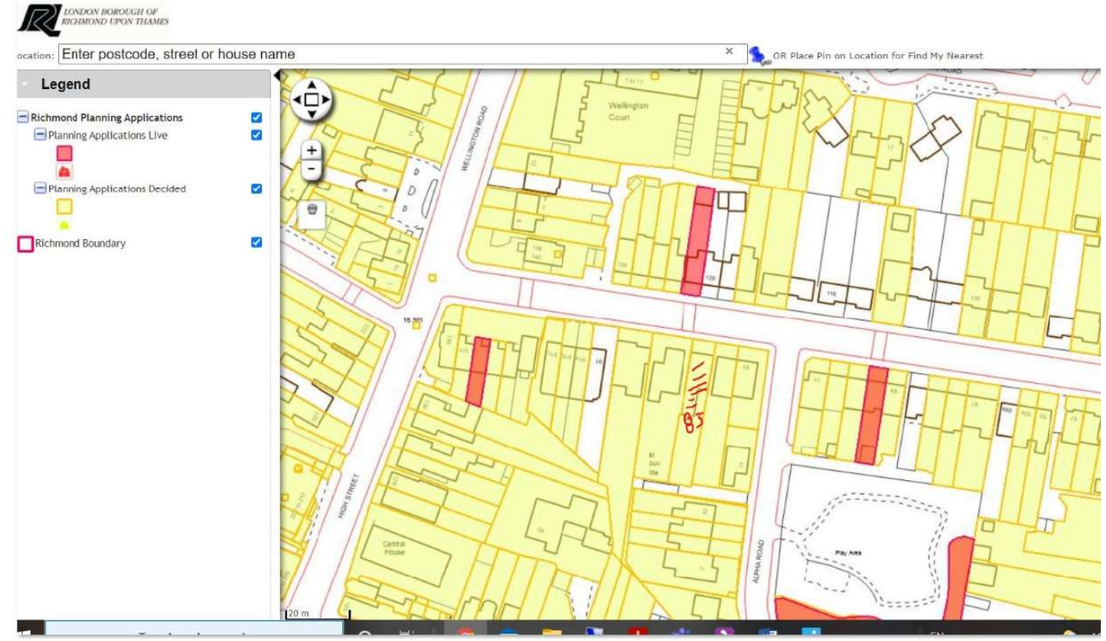



**L1914-CONNAUGHT ROAD**

BRIDGES POUND CONSULTING ENGINEERS

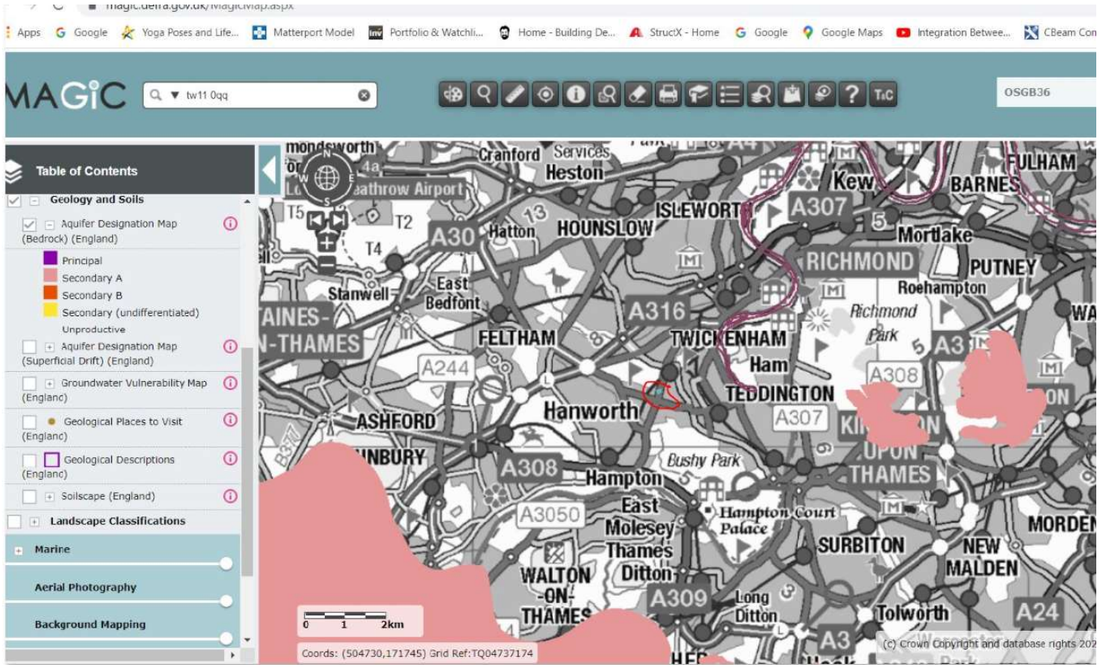



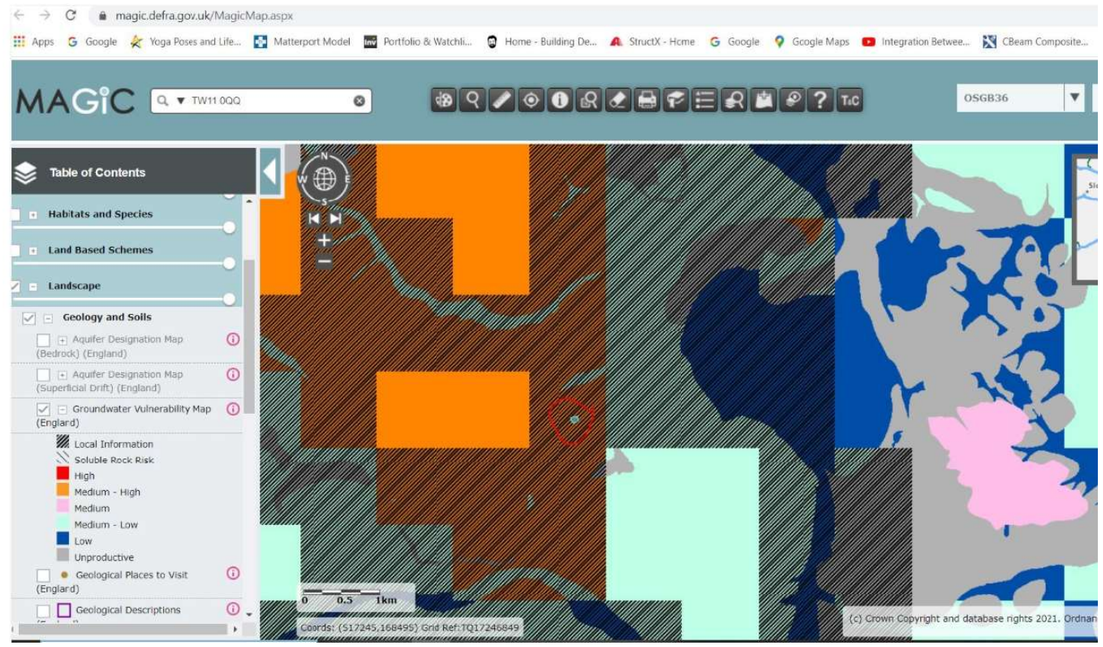


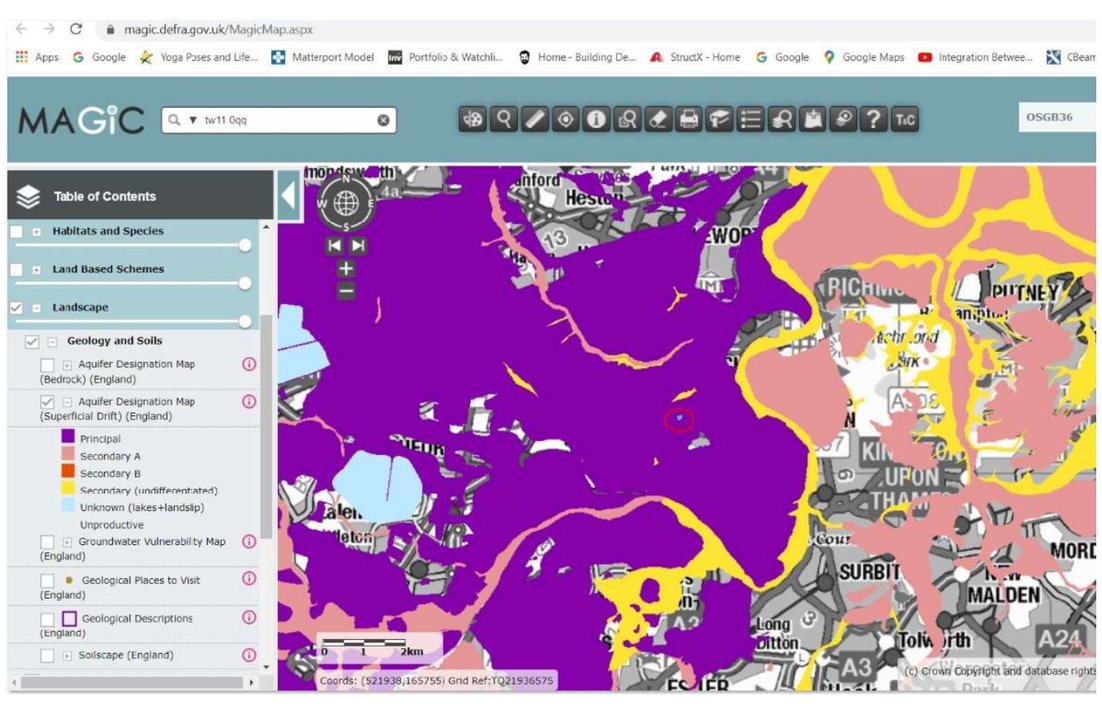


BRIDGES POUND CONSULTING ENGINEERS

FOLLOWING MAPS OR SCREE NOT SHOWS INFORMATION OF HYDROGEOLOGY




BRIDGES POUND CONSULTING ENGINEERS

FOLLOWING MAPS OR SCREE NOT SHOWS INFORMATION FOR FLOOD RISK ASSESSMENT

Environment Agency

# Flood map for planning

| Your reference | Location (easting/northing) | Created |
|---|---|---|
| **85 Connaught** | **514600/171374** | **18 Apr 2021 19:46** |

**Your selected location is in flood zone 1, an area with a low probability of flooding.**

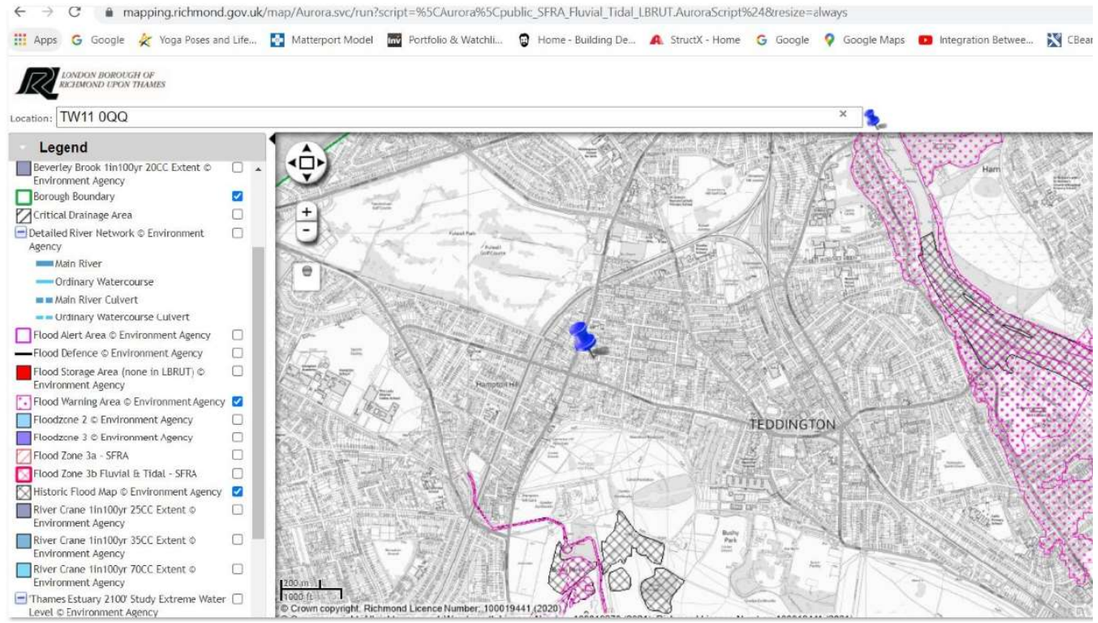
**This means:**

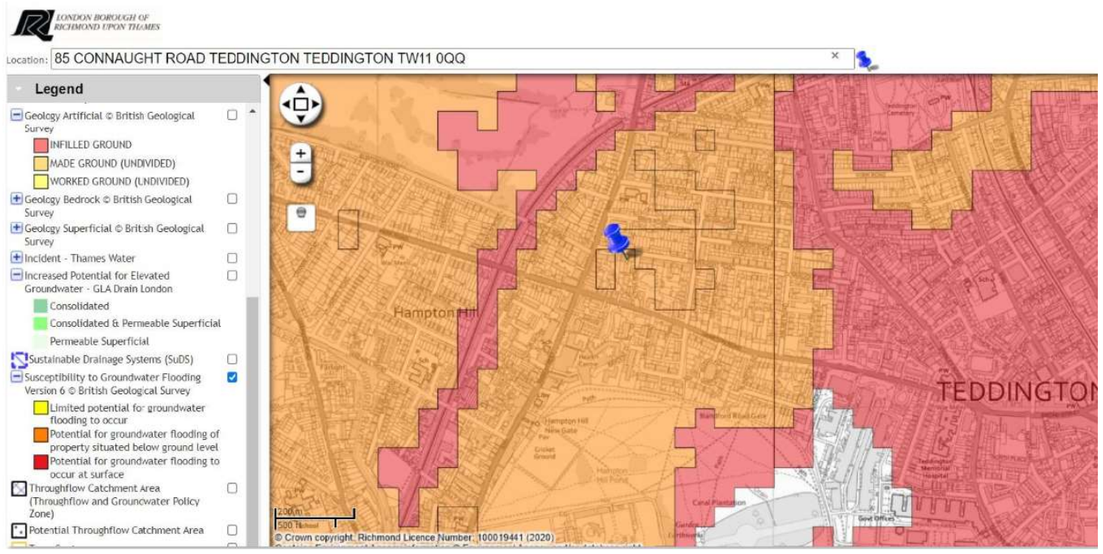
- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems



**FLAT 1, 85, CONNAUGHT ROAD, TEDDINGTON, TW11 0QQ**

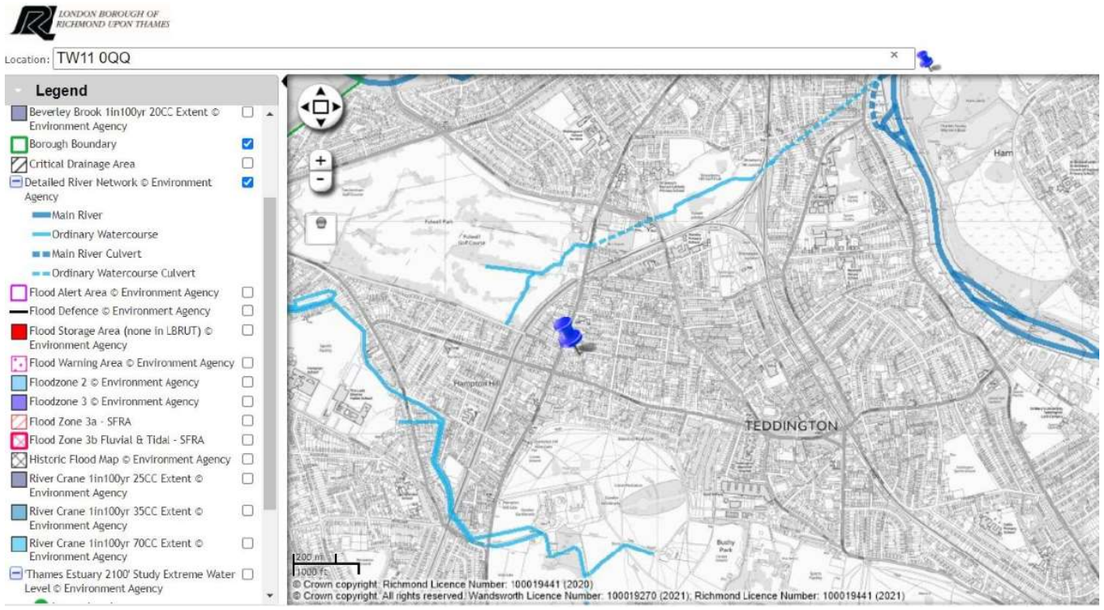
| | |
|---|---|
| **Rivers and sea risk** | **Very low risk**<br>Very low risk means that each year this area has a chance of flooding of less than 0.1%. |
| **Surface water risk** | **Very low risk**<br>Very low risk means that each year this area has a chance of flooding of less than 0.1%.<br><br>Lead local flood authorities (LLFA) manage the risk from surface water flooding and may hold more detailed information. Your LLFA is **Richmond upon Thames**. |
| **Reservoir risk** | There is no risk of reservoir flooding |
| **Groundwater risk** | No risk of groundwater flooding |

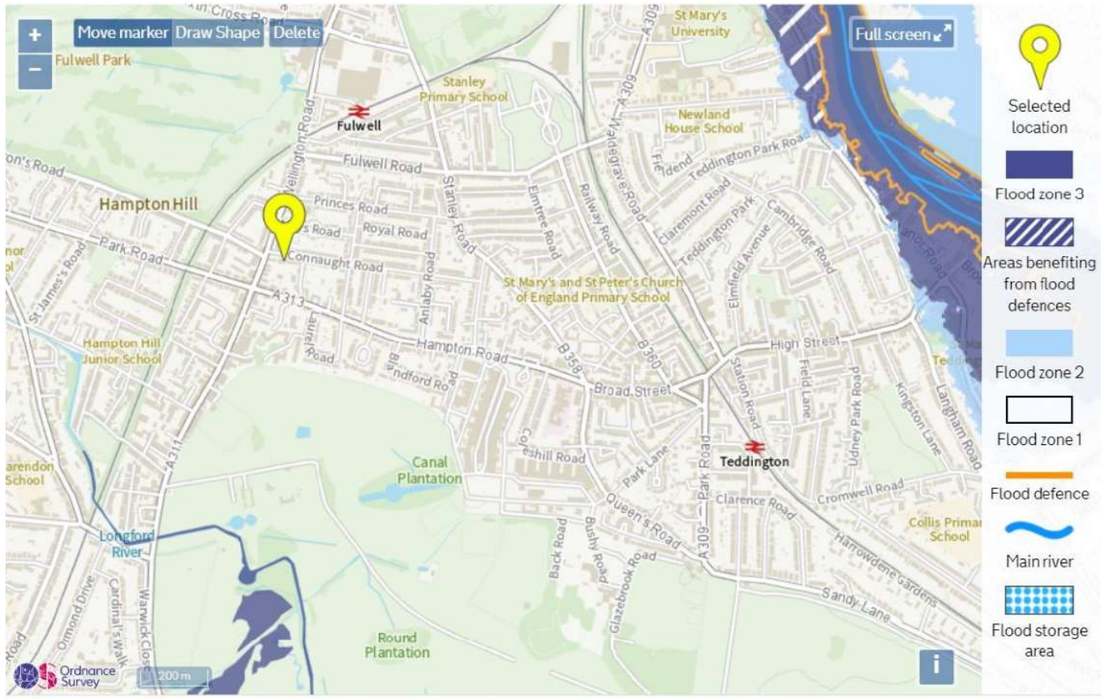


## L1914-CONNAUGHT ROAD

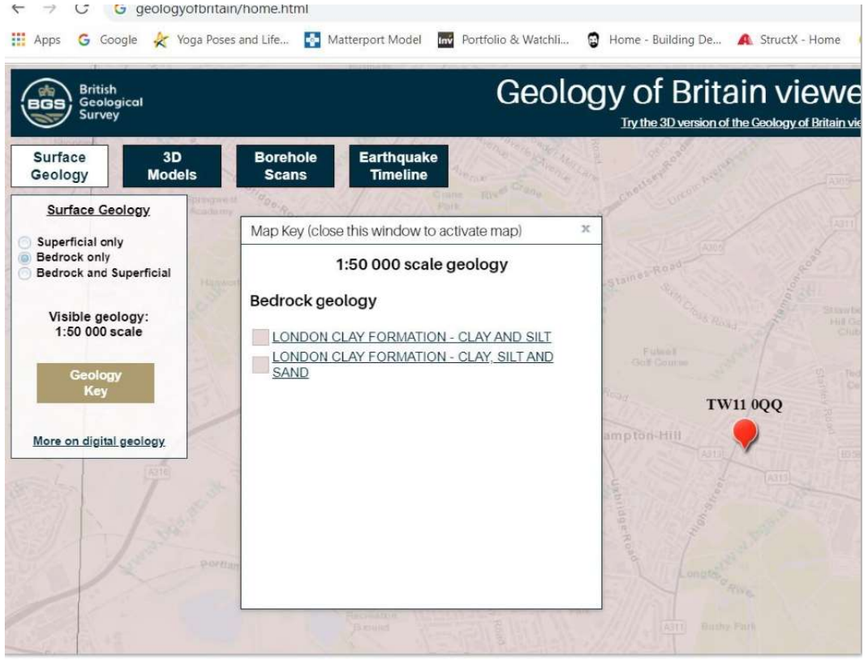
BRIDGES POUND CONSULTING ENGINEERS

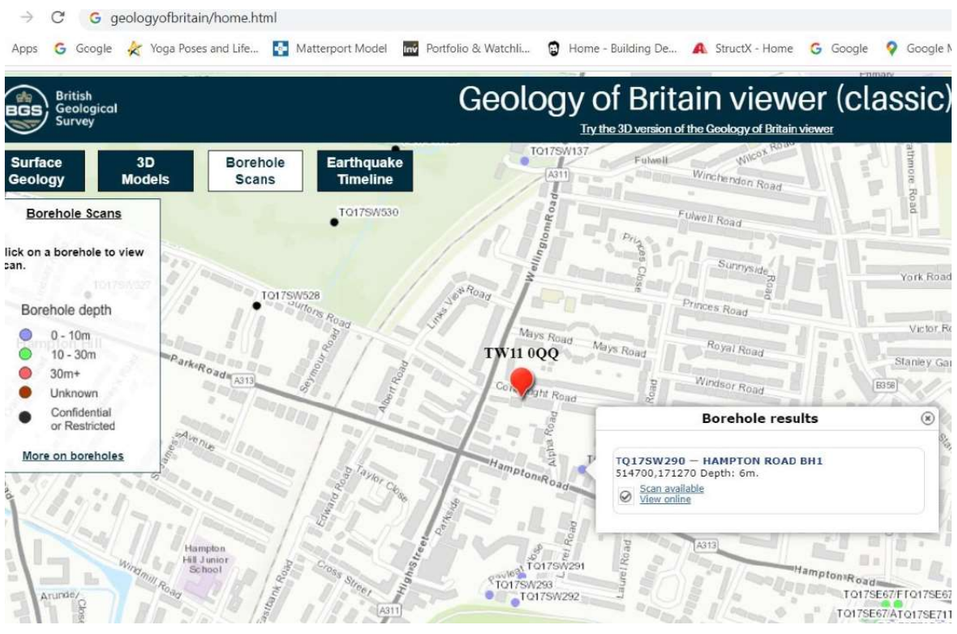


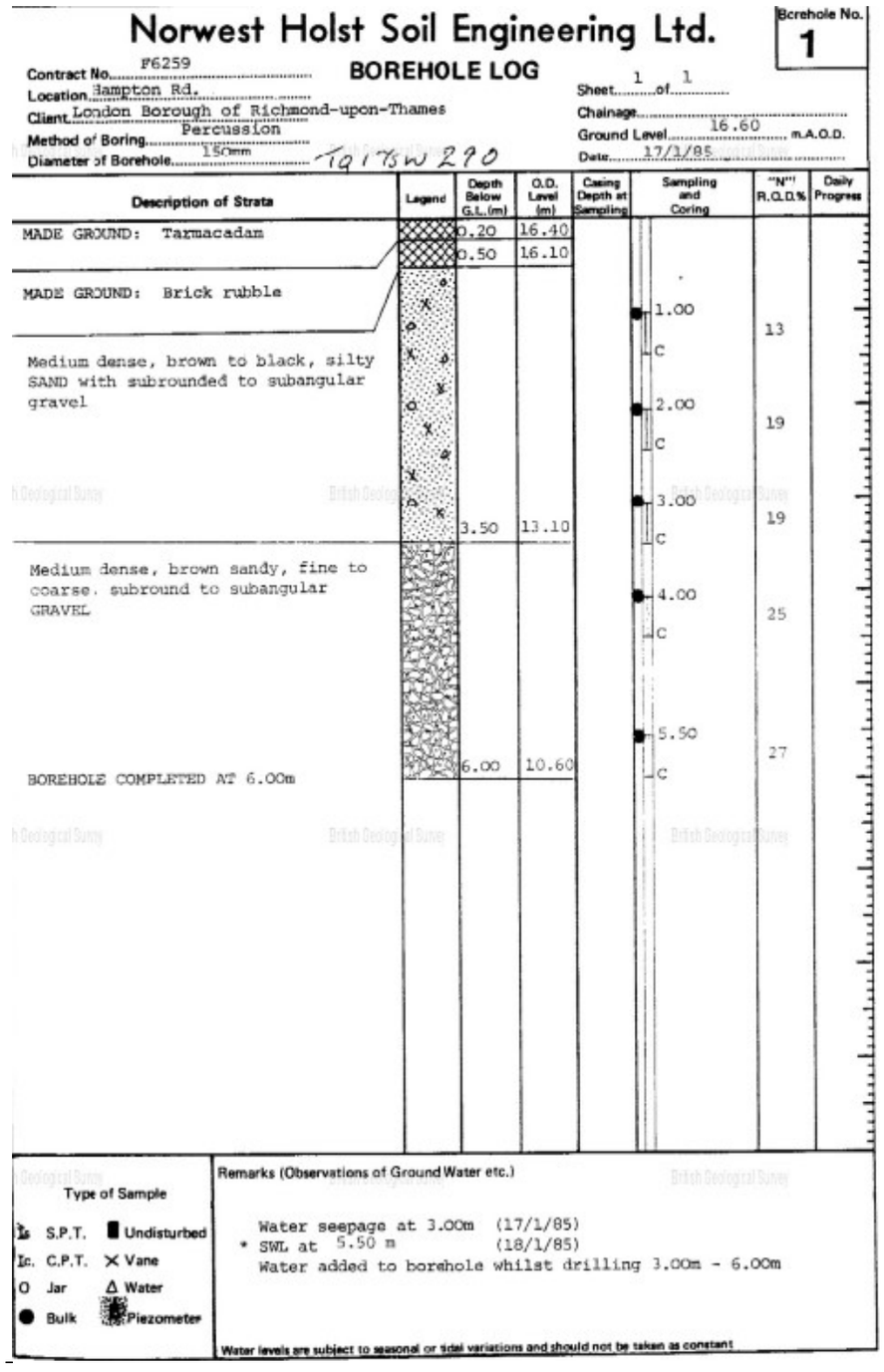




BRIDGES POUND CONSULTING ENGINEERS

FOLLOWING MAP SHOWS GEOLOGY



Norwest Holst Soil Engineering Ltd.

BOREHOLE LOG

Borehole No. 1

Contract No. F6259
Location Hampton Rd.
Client London Borough of Richmond-upon-Thames
Method of Boring Percussion
Diameter of Borehole 150mm TQ17SW290
Sheet 1 of 1
Chainage
Ground Level 16.60 m.A.O.D.
Date 17/1/85

| Description of Strata | Legend | Depth Below G.L. (m) | O.D. Level (m) | Casing Depth at Sampling | Sampling and Coring | "N" R.Q.D.% | Daily Progress |
|---|---|---|---|---|---|---|---|
| MADE GROUND: Tarmacadam | | 0.20 | 16.40 | | | | |
| | | 0.50 | 16.10 | | | | |
| MADE GROUND: Brick rubble | | | | | 1.00 C | 13 | |
| Medium dense, brown to black, silty SAND with subrounded to subangular gravel | | | | | 2.00 C | 19 | |
| | | 3.50 | 13.10 | | 3.00 C | 19 | |
| Medium dense, brown sandy, fine to coarse. subround to subangular GRAVEL | | | | | 4.00 C | 25 | |
| | | | | | 5.50 C | 27 | |
| BOREHOLE COMPLETED AT 6.00m | | 6.00 | 10.60 | | | | |

Type of Sample

S.P.T. Undisturbed
C.P.T. Vane
Jar Water
Bulk Piezometer

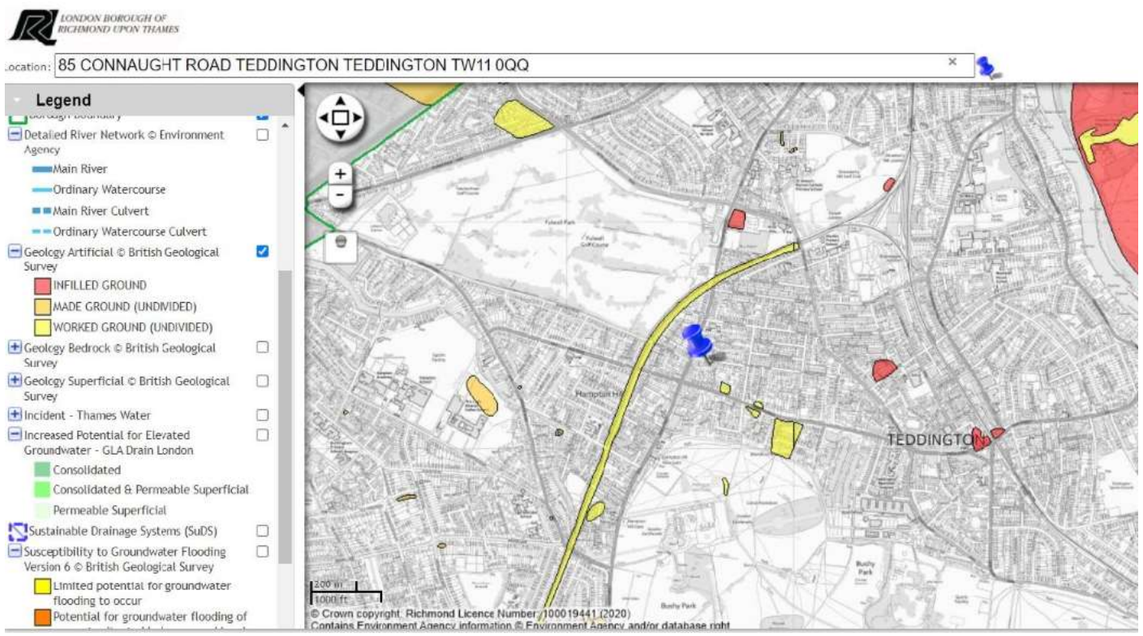
Remarks (Observations of Ground Water etc.)

Water seepage at 3.00m (17/1/85)
* SWL at 5.50 m (18/1/85)
Water added to borehole whilst drilling 3.00m - 6.00m

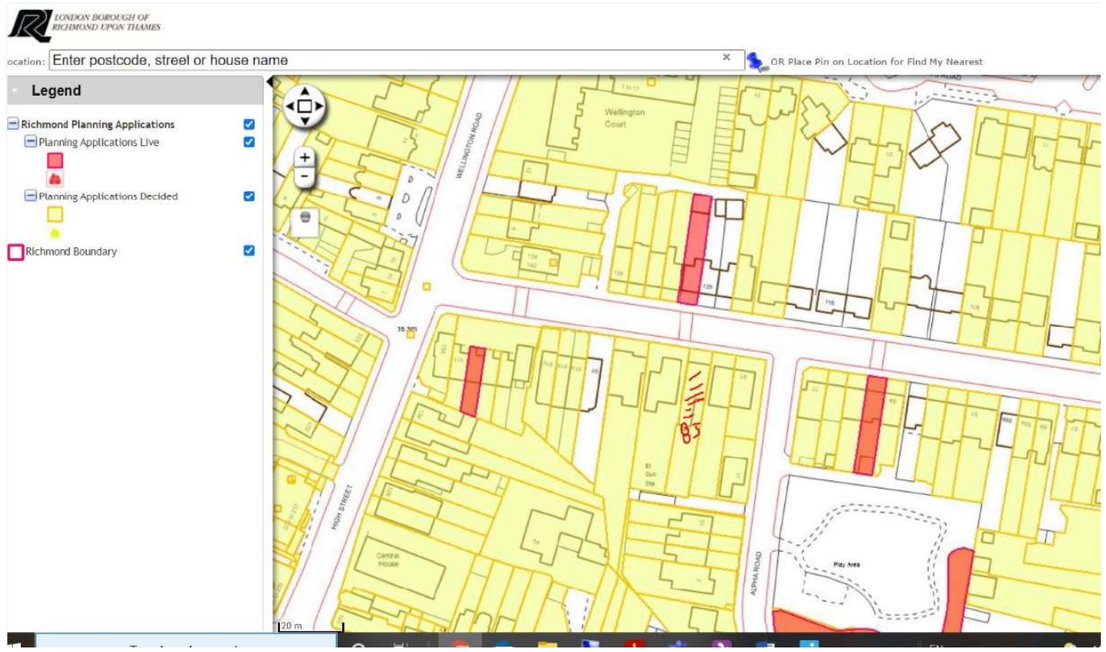
Water levels are subject to seasonal or tidal variations and should not be taken as constant

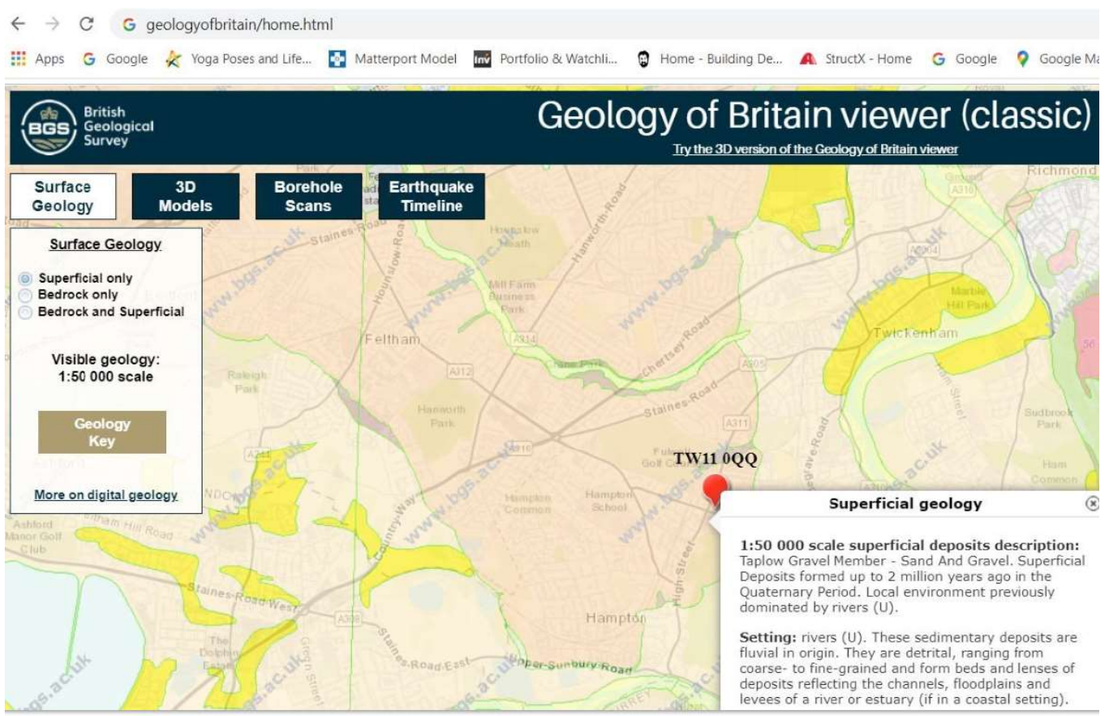
**L1914-CONNAUGHT ROAD**

BRIDGES POUND CONSULTING ENGINEERS




FOLLOWING document SHOWS EXISTING NEARBY LIVE PLANNING AND APPROVED PLANNING



# Planning search

You can view the details of all valid planning applications made to the London Borough of Richmond upon Thames.

## Find an application

TW11 0QQ Search

## Other options

Advanced search Major developments Weekly lists Planning map
Comment / Support / Object

## Results

Number of properties : **7**.

### 81 Connaught Road Teddington TW11 0QQ

09/0464/DD02

Details pursuant to appeal decision condition 3 re Materials (in part-glass brick only) (Property t...

**Granted Permission 08/11/2012**

---

09/0464/DD01

Details pursuant to appeal decision condition 3 re Materials (property to rear of 81 Connaught Road)

**Granted Permission 26/04/2011**

---

09/0464/FUL

New three bedroom chalet bunglow sited on land / rear of no. 81,Connaught Road, Teddington

**Refused Permission 22/07/2009. Appeal Appeal Allowed on 17/03/2010**

---

06/3873/HOT

Erection of gable end roof and rear dormer window, first floor rear extension and formation of new ...

**Granted Permission 23/01/2007**

---

06/1078/FUL

Erection of new dwelling to rear of garden

**Refused Permission 02/06/2006. Appeal Appeal Dismissed on 15/11/2006**

---

05/1975/FUL

Erection of new dwelling to rear of garden

**Refused Permission 01/09/2005. Appeal Appeal Dismissed on 09/02/2006**

---

05/0732/FUL

Erection of extension and conversion involving two storey side extension, single storey front porch...

**Refused Permission 09/05/2005**

---

66/1636

Conversion into and use of property as two self-contained flats each with parking space.

**Refused Permission 17/10/1966**

---

47/3215

The erection of a bungalow or dwelling house.

**Refused Permission 13/06/1952**

## 83 Connaught Road Teddington

03/3352/HOT

Erection Of Single Storey Rear Extension

**Granted Permission 08/12/2003**

97/1940

Roof Extension.

**Granted Permission 29/09/1997**

## 87 Connaught Road Teddington

01/0932

Single Storey Side Extension.

**Granted Permission 31/05/2001**

## 89 Connaught Road Teddington TW11 0QQ

11/2545/HOT

Erection of single storey side/rear extensions

**Granted Permission 20/09/2011**

97/0645

Single Storey Side Extension

**Granted Permission 13/05/1997**

95/0962/S192

Loft Extension

**Granted Permission 24/05/1995**

---

47/1512

The reinstatement of war damage.

**Granted Permission 17/04/1950**

---

## 91C Connaught Road Teddington Richmond Upon Thames TW11 0QQ

04/3864/HOT

Erection of a rear/side conservatory

**Granted Permission 12/01/2005**

---

03/2044/DD01

Details Pursuant To Condition Dv15u (windows), La11a & Pk02au

**Granted Permission 26/01/2004**

---

03/2044/FUL

Erection Of 4 Terraced Houses (amendment To Approved Application 02/2085/ful) Now Showing Hipped Ro...

**Granted Permission 28/08/2003**

---

03/1317/FUL

Erection Of 4 Terraced Houses (amendment To Approved Application No. 02/2085/ful) Now Showing 2 Sto...

**Refused Permission 12/06/2003. Appeal Appeal Withdrawn on 05/09/2003**

---

03/0175/FUL

Revised Application To Include 3 Number Conservatories To Terraced Houses Re Planning Permission 02...

**Granted Permission 06/03/2003**

---

02/2085

Demolition Of Existing House And Erection Of Terrace Of Four Houses.

**Granted Permission 12/12/2002**

---

02/2084

Demolition Of Existing House And Erection Of Terrace Of Four Houses.

**Refused Permission 19/09/2002. Appeal Appeal Withdrawn on 17/10/2002**

---

02/0400

Proposed Existing Property To Be Demolished And Four Residential Properties To Be Built.

**Refused Permission 10/07/2002**

---

01/3404

Demolish Existing Property, Proposed 2 Pairs Of Semi Detached Houses.

**Refused Permission 15/02/2002. Appeal Appeal Dismissed on 03/05/2002**

---

01/2418

Demolition Of Existing Property And Erection Of Four New Residential Properties.

**Refused Permission 05/11/2001. Appeal Appeal Dismissed on 03/05/2002**

---

76/0322

Change of use of ground floor from residential to office, storage and retail use.

**Refused Permission 09/07/1976**

---

## 91C Connaught Road Teddington TW11 0QQ

13/3648/HOT

Installation of a twin wall flue to connect to a Defra approved wood burning stove. The flue will b...

**Granted Permission 06/12/2013**

---

13/3223/PS192

Installation of flue to rear of property

**Withdrawn by the Applicant 11/10/2013**

---

## 99 Connaught Road Teddington TW11 0QQ

Not Validated

Replace existing windows to the two front top floor bedrooms with uPVC in a similar style in white...

**In Progress**

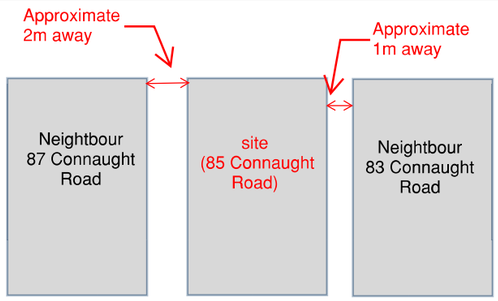
---

If you don't see the application you are looking for, please amend your criteria and try again.

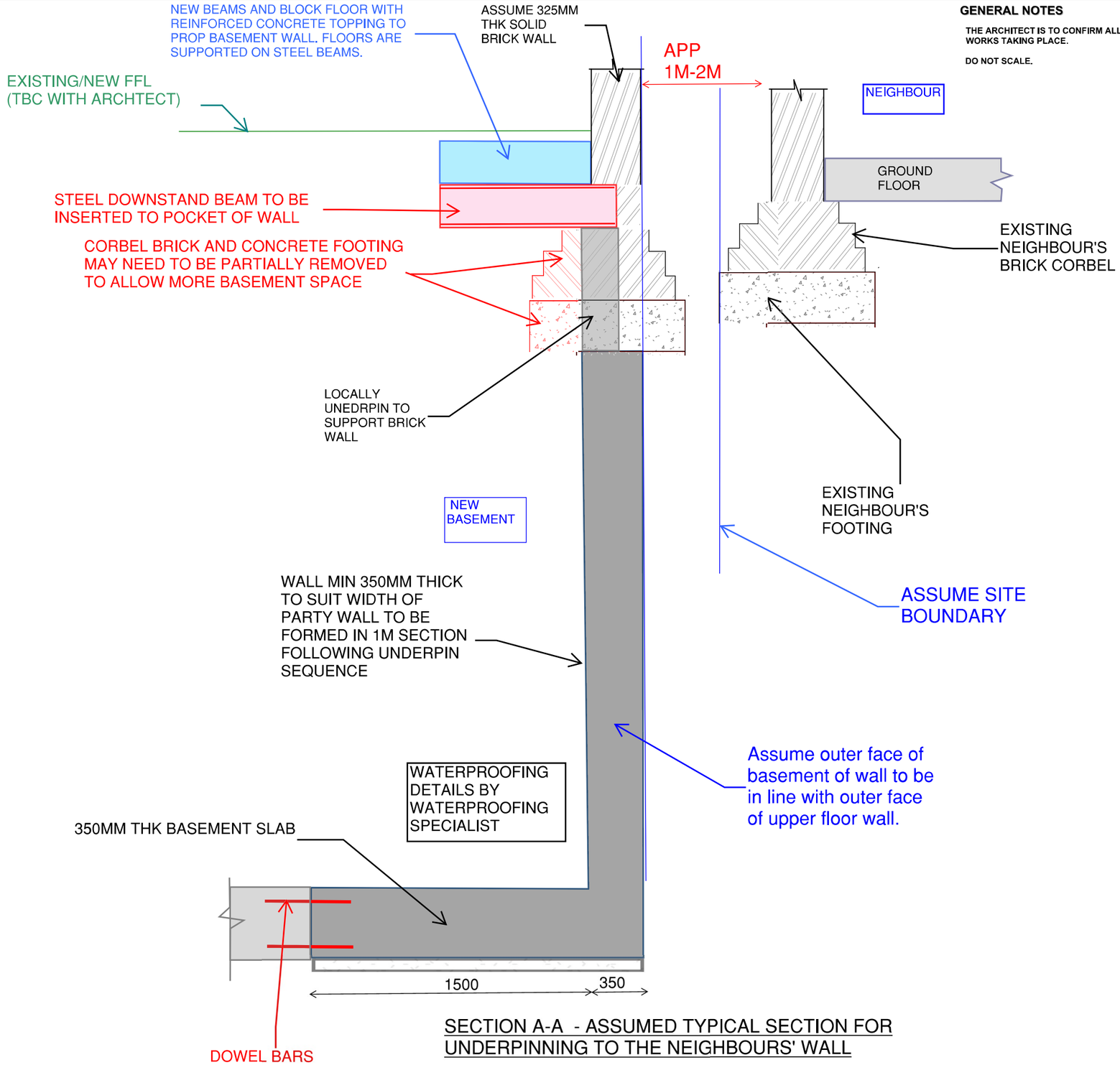
**Contact us**

**Address**: Civic Centre, 44 York Street, Twickenham, TW1 3BZ
**Opening hours**: Monday to Friday: 9am to 5pm

**View map**




Plan showing distance between neighbour




SECTION A-A - ASSUMED TYPICAL SECTION FOR UNDERPINNING TO THE NEIGHBOURS' WALL

**GENERAL NOTES**

THE ARCHITECT IS TO CONFIRM ALL SETTING-OUT PRIOR TO ANY WORKS TAKING PLACE.

DO NOT SCALE.

| Rev. | Description | By | Chkd. | Date |
|---|---|---|---|---|

701 The Chandlery
50 Westminster Bridge Road
London SE1 7QY
Tel: 020 7953 7561
Fax: 020 7953 7571

141 Albany Road
Earlsdon
Coventry CV5 6ND
Tel: 02477 719547
Fax: 01926 856366

Wira House
West Park
Leeds LS16 6EB
Tel: 0113 274 0721
Fax: 0113 274 9486

BRIDGES POUND
CONSULTING ENGINEERS



ISO 9001 REGISTERED FIRM

Client: **CRO LONDON LIMITED**

Project: **CONNAUGHT ROAD**

Title: ASSUMED BASEMENT SECTION

Drawing Status: PRELIMINARY

Date: DATE

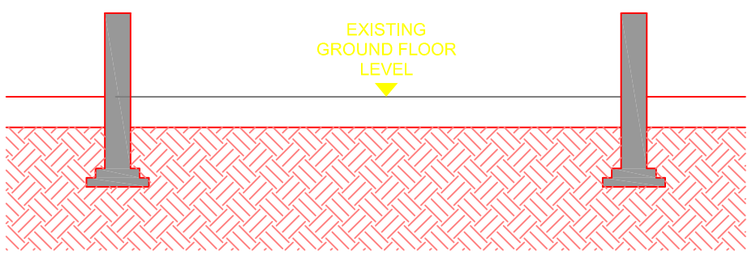
Scale: SCALE A3

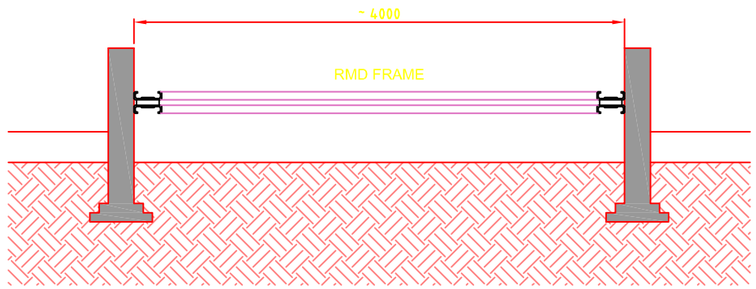
Drawn: DRAWN

Chkd: CHECKED

Drawing No. L1914-SK01

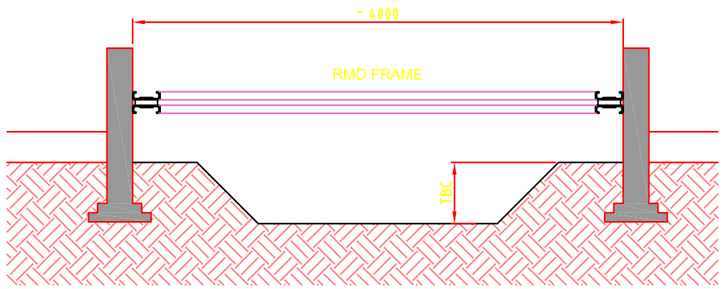
Rev. P1



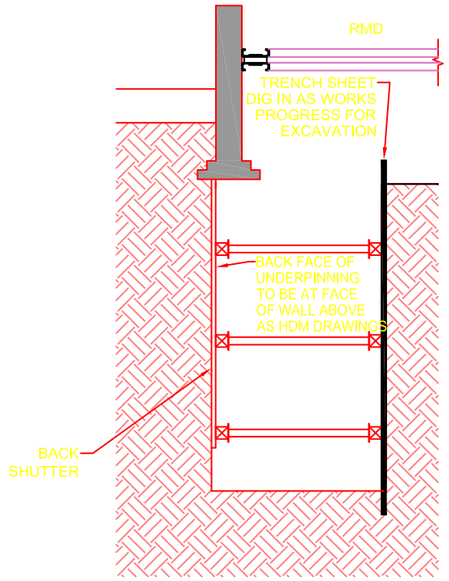

STAGE 1

- BREAK OUT EXISTING SLAB
- INSTALL RMD FRAME TO EXISTING WALLS




STAGE 2

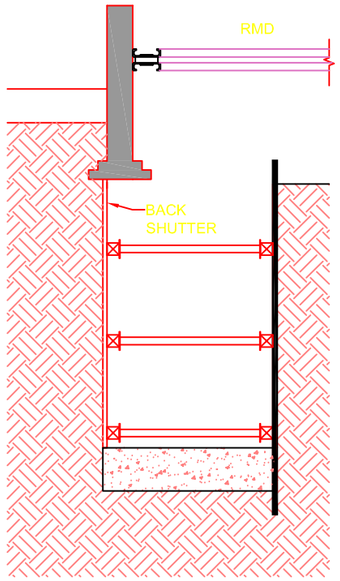
- REDUCE DIG




STAGE 3

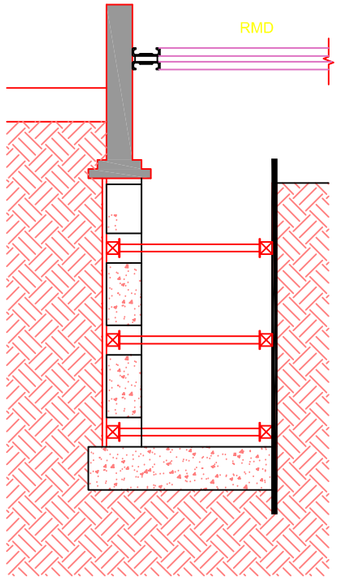
- EXCAVATE TO FORM UNDERPIN
- PROP OFF CENTRAL BERM

NOTE : BACK SHUTTER ASSUMED TO BE REQUIRED



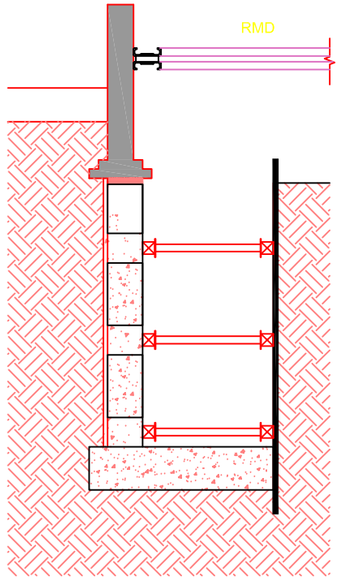

STAGE 4

- CONCRETE BASE OF UNDERPIN



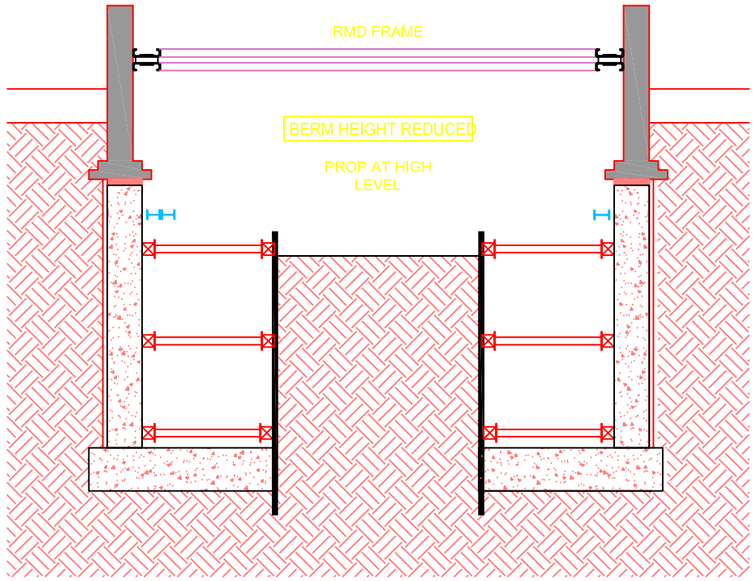

STAGE 5

- ERECT SHUTTER
- CONCRETE STEM OF UNDERPIN



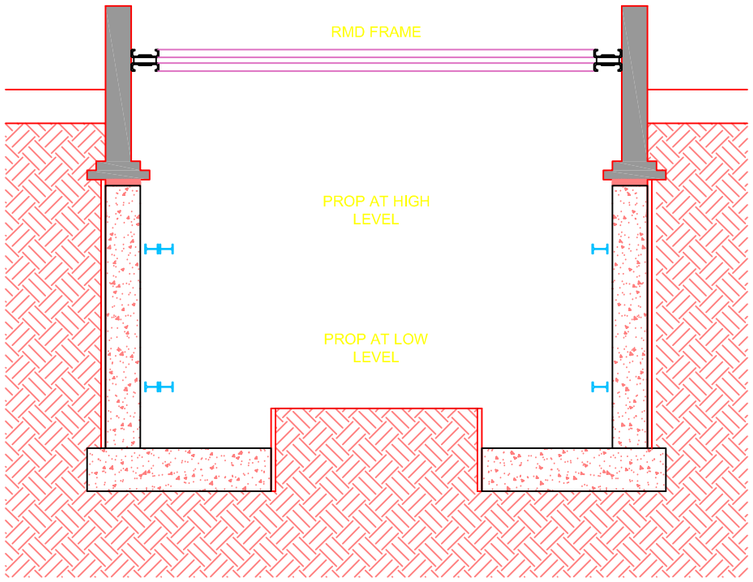

STAGE 6

- STRIKE FORMWORK
- RE-PROP WALL OFF BERM



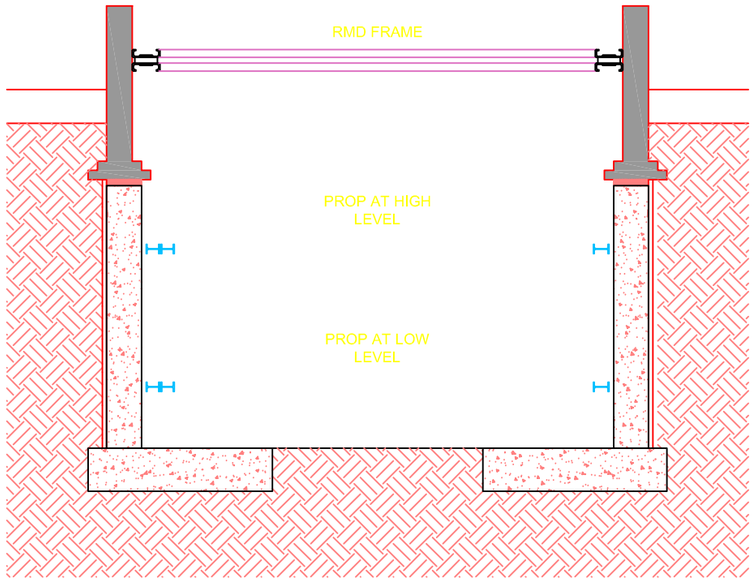

STAGE 7

- COMPLETE UNDERPINNING
- FORM UPSTANDS
- INSTALL PROPPING AT HIGH LEVEL TO RETAINING WALL



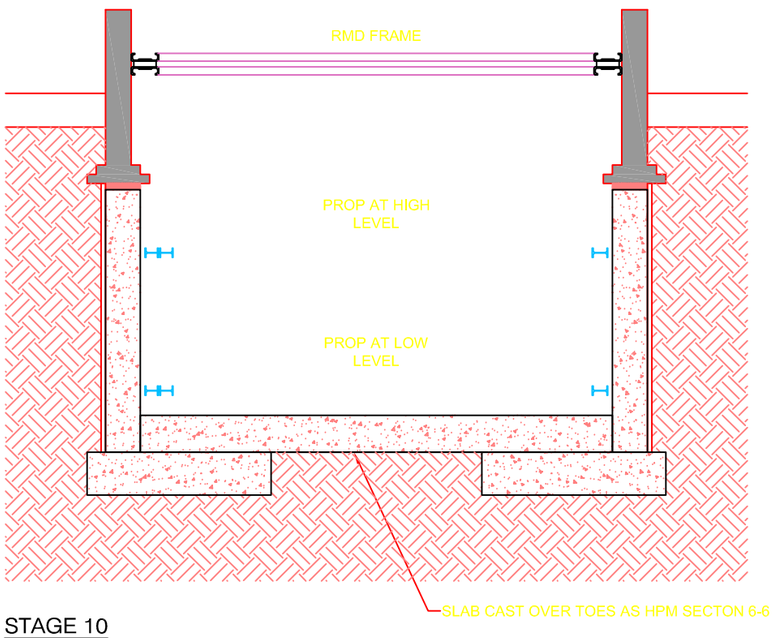

STAGE 8

- EXCAVATE CENTRAL BERM TO 350 mm ABOVE BASEMENT SSL
- INSTALL PROPPING AT LOW LEVEL TO RETAINING WALLs



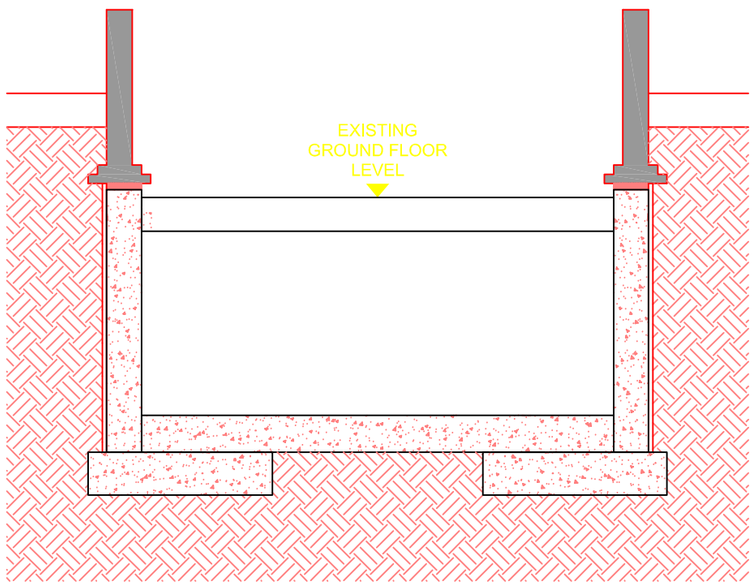

STAGE 9

- EXCAVATE REMAINING CENTRAL BERM
- INSTALL DRAINAGE ETC IN CENTRAL AREA




STAGE 10

- CAST REMAINING BASEMENT SLAB
- REMOVE LOW LEVEL PROPPING




STAGE 11

- CONSTRUCT NEW GROUND FLOOR
- REMOVE PROPPING

BRIDGES POUND CONSULTING ENGINEERS

# L1914-CONNAUGHT ROAD

# APPENDIX C: CALCULATIONS FOR BASEMENT WALL AND SLAB

**Made by: LY**

**Checked by : MT**

**Issued Date: 26/7/2021**

**Revision : A**

BRIDGES POUND CONSULTING ENGINEERS

a) Plans and sections

Notes below shows legend on the plan.

- Yellow shaded elements indicate load bearing wall
- Red arrow show shows span of floor
- Red dotted line shows steel beam

  (note: trimmer steel beams around stairs for simplicity of load take down)

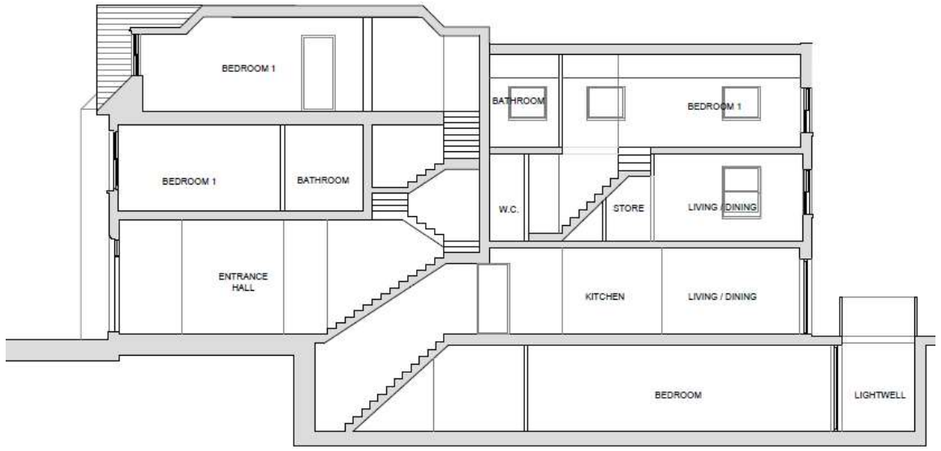



**Figure 1: Section (latest) showing 3-4 storeys flats**

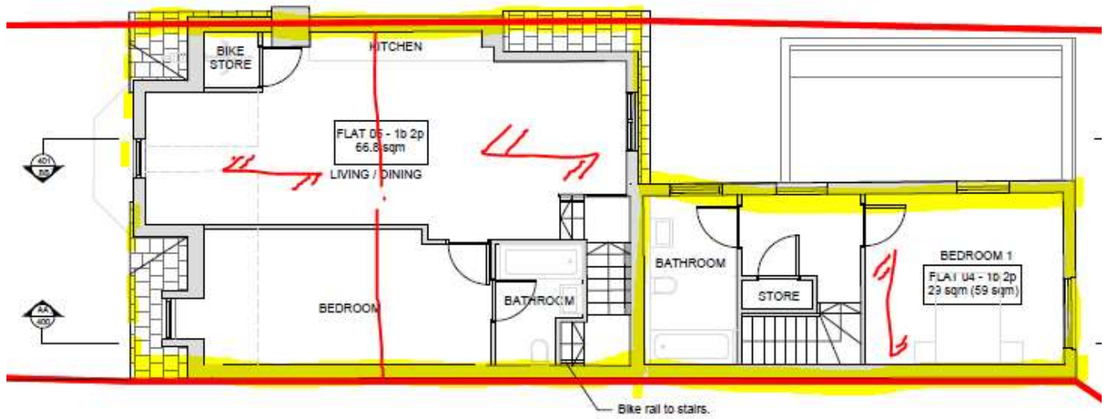



**Figure 2 : Assumed 2nd foor showing span of roof rafter over and steel beam.**

**Figure 3: Assumed 2nd floor showing span of 3rd floor over and steel beam over**

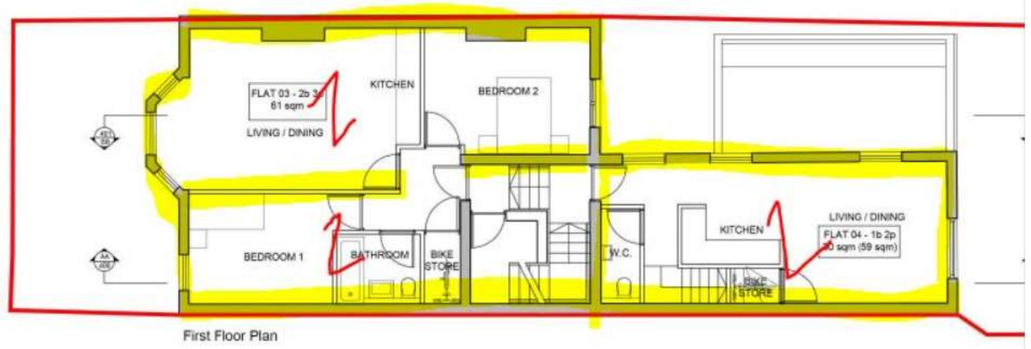



**Figure 4-Assumed 1st floor showing span of 2nd floor over and steel beam over**

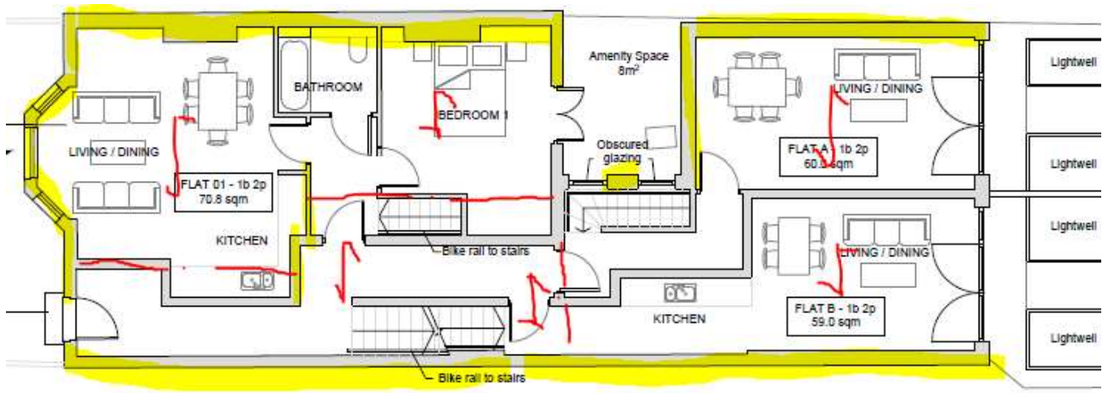



**Figure 5-Assumed ground floor showing span of 1st floor over and steel beam over**

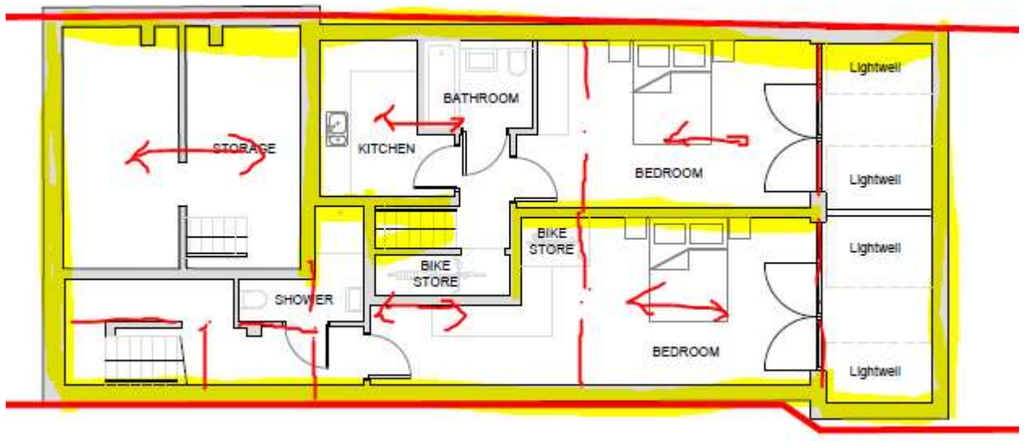



**Figure 6 -Assumed basement showing span of ground floor over and steel beam over**

b) Assumption for calculation

- Due to structural investigation had not been carried out the plans and section shown above are assumption only.
- Due to previous architect section shows 4 storeys above basement, assume 3rd floor similar as 2nd floor. Latest architect section shows 3 storeys above basement, hence 3rd floor is omitted. However, this calculation conservatively include 3rd floor conservatively.
- Assume timber floor joist for 1st , 2nd and 3rd floor
- Assume ground floor concrete floor or beams & block floor
- ssume 350mm thk basement raft slab and 300mm thk basement wall.
- Assume 2.5m max clear height for basement.
- Assume ground bearing capacity of 190kN/m2
- Assume no groundwater at basement formation level.
- Assume hydrostatic pressure of 1m below ground.
- Assume 325mm thk solid brick wall = 20kN/m3*0.325=6.5kN/m2
- Assume internal basement wall (marked red asterisk) to continue all the way up to support existing walls. If not steel beams and column will be required.
- Assume distance between external side wall =7m
- Assume roof load = 1.0kN/m2 DL, 0.75kN/m2LL
- Assume 1st, 2nd & 3rd floor = Dead load=1.0kN/m2 Live Load =1.5residentail +0.5partition=2.0kN/m2
- Assume ground floor = Dead load=3.5kN/m2 Live load=2.5kN/m2
- Assume basement slab = Dead load = 10.2kN/m2 Live load=2.5kN/m2

c) Design of basement wall and foundation generally

i. The basement wall is propped at ground floor during temporary and permanent stage.
ii. The basement slab is reinforced raft slab.
iii. For simplicity and preliminary assessment, basement wall and slab is designed by considering localised load from upper structure to basement wall and slab using Master Series retaining wall analysis.
iv. Assume external side wall as load bearing wall to support existing floor joist which span between side walls. Due to locations of internal load bearing walls had not been identified, the load take down which assume maximum load to external side basement walls and combined with lateral earth pressure loads are conservative. Max width of floor load onto the basement slab is 3.5m.
v. The layout as shown on item A (plans & sections) assumes there are some internal load bearing wall. If the internal load bearing wall exist and the max width of floor will also be 3.5m. By inspection from line load, applied bearing pressure under 1m wide reinforcement slab underside internal wall is approximate 125kN/m2 which less than allowable bearing pressure.
vi. Hence, the load take down, design of basement wall and basement slab are conservative.
vii. Due to basement slab formation is deeper than the neighbour's footing, the new basement wall and slab is designed for the surcharge from neighbour's footing.
viii. Due to the ground floor beams and block are assumed not spanning onto sides walls, reinforced concrete topping to beams and block floor are added to prop the wall and transfer lateral load to front/back wall for stability. However, for the purpose of preliminary stage, consider cantilever prop of wall
ix. Additional load from adjacent house are assumed and calculated as noted on item d on next page.

d) Load take down for basement wall underside external side wall

- Line load from roof = (1.0kN/m2 DL, 0.75kN/m2LL)*2.5 =3.5kN/m DL, 2.6kN/m LL
- Line load from 3rd floor = (1.0kN/m2 DL, 2.0kN/m2LL)*3.5 =3.5kN/m DL, 7kN/m LL
- Line load from 2nd floor = as 3rd floor = 3.5kN/m DL, 7kN/m LL
- Line load from 1st floor = as 3rd floor = 3.5kN/m DL, 7kN/m LL
- Line load from ground floor = (3.5kN/m2 DL, 2.5kN/m2LL)*3.5 =12.3kN/m DL, 8.8kN/m LL
- Line load from solid brick wall (ground to 3rd )= 6.5kN/m2*(2.8*3)=54.6kN/m
- Total line load onto basement wall = 80.9kN/m DL, 32.4kN/m LL, say 90kN/m DL, 35kN/m LL
- Additional load from neighbour's two storeys house are assumed as below.

  (This loads obtained from similar floor as this site but without 3rd floor.

  Hence line load=84.6kN/m

  DL = 80.9-3.5-6.5*2.8=59.2kN/m

  LL = 32.4-7=25.4kN/m

  Assume width of footing of 600mm wide, applied bearing pressure = 141kN/m2,

  Hence, assume bearing pressure underside two storeys house as 100kN/m2 and 50kN/m2

- Refer to Master Series for design. The wall thickness is shown as 350mm thk on drawings to suit width of existing 325mm thk solid brick wall.

e) Basement slab design

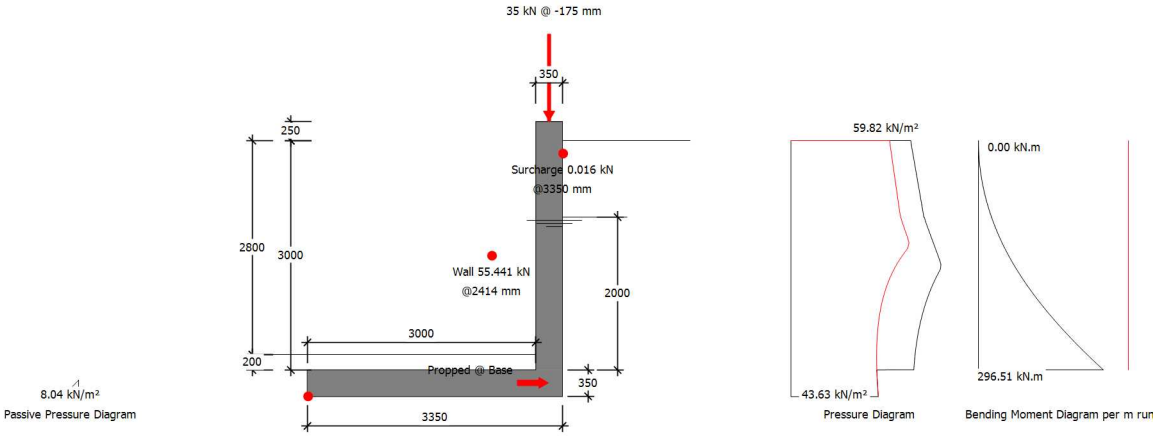
- 350mm thk basement slab selfweight=0.35*24=8.4kN/m2
- Additional line load from dead load (from item e)= 100kN/m/1m spread=100kN/m2
- Hydrostatic pressure for permanent condition=10kN/m3*2m=20kN/m2
- Due to combined load from superstructure and basement slab, by inspection 350mm thk slab is adequate for resisting hydrostatic pressure under permanent condition.
- Refer to Master Series retaining wall and basement slab design under vertical downward force.

**Bridges Pound Limited**
**701 The Chandlery**
**50 Westminster Bridge Road**
**London, SE1 7QY**
**Tel: 0207 953 7561**

25712

**Job Ref** : **L1914**
**Sheet** : **RET WALL & BASE /**
**Made by** : **LY**
**Date** : **15 July 2021 / Ver. 2020.14**
**Checked** : **MT**
**Approved** :

# MasterKey : Retaining Wall Design to BS 8002 : 1994 and BS 8110 : 1997
# Basic RC Retaining Wall 1 (side)
# Reinforced Concrete Retaining Wall with Reinforced Base




## Summary of Design Data

| | |
|---|---|
| Notes | All dimensions are in mm and all forces are per metre run |
| Material Densities (kN/m³) | Dry Soil 18.00, Saturated Soil 20.80, Submerged Soil 10.80, Concrete 24.00 |
| Special Assumptions (virtual back) | No surcharge over heel |
| Concrete grade | fcu 40 N/mm², Permissible tensile stress 0.250 N/mm² |
| Concrete covers (mm) | Wall inner cover 50 mm, Wall outer cover 50 mm, Base cover 50 mm |
| Reinforcement design | fy 500 N/mm² designed to BS 8110: 1997 |
| Surcharge and Water Table | Surcharge 12.50 kN/m², Water table level 2000 mm |
| Unplanned excavation depth | Front of wall 335 mm |

† The Engineer must satisfy him/herself to the reinforcement detailing requirements of the relevant codes of practice

## Additional Loads

| | |
|---|---|
| Wall Propped at Base Level | Therefore no sliding check is required |
| Vertical Line Loads | 90 kN/m @ X -175 mm and Y 0 mm - Load type Dead<br>35 kN/m @ X -175 mm and Y 0 mm - Load type Live |
| Distributed Surcharge Loads | 100 kN/m² starting @ 0 mm and ending @ 1000 mm - Load type Dead<br>50 kN/m² starting @ 0 mm and ending @ 1000 mm - Load type Live |
| † Dimensions | Ties, line loads and partial loads are measured from the inner top edge of the wall |

## Soil Properties

| | |
|---|---|
| Soil bearing pressure | Allowable pressure @ front 190.00 kN/m², @ back 190.00 kN/m² |
| Back Soil Friction and Cohesion | $\phi_h$ = Atn(Tan(32)/1.2) = 27.51° |
| Base Friction and Cohesion | $\delta$ = Atn(0.75xTan(Atn(Tan(20)/1.2))) = 12.82° |
| Front Soil Friction and Cohesion | $\phi$ = Atn(Tan(30)/1.2) = 25.69° |

## Loading Cases

$G_{Wall}$- Wall & Base Self Weight, $Fv_{Heel}$- Vertical Loads over Heel, $P_a$- Active Earth Pressure, $P_{surcharge}$- Earth pressure from surcharge, $P_p$- Passive Earth Pressure

| | |
|---|---|
| Case 1: Geotechnical Design | 1.00 $G_{Wall}$+1.00 $Fv_{Heel}$+1.00 $P_a$+1.00 $P_{surcharge}$+1.00 $P_p$ |
| Case 2: Structural Ultimate Design | 1.40 $G_{Wall}$+1.60 $Fv_{Heel}$+1.00 $P_a$+1.00 $P_{surcharge}$+1.00 $P_p$ |

# Geotechnical Design

## Wall Stability - Virtual Back Pressure

| | | | |
|---|---|---|---|
| Case 1 Overturning/Stabilising | 288.571/530.636 | 0.544 | OK |

## Wall Sliding - Virtual Back Pressure

| | | | |
|---|---|---|---|
| $Fx/(Rx_{Friction}+Rx_{Passive})$ | 0.000/(41.043+0.870) | 0.000 | OK |
| Prop Reaction Case 2 (Service) | 164.8 kN @ Base | | |

## Soil Pressure

| | | | |
|---|---|---|---|
| Virtual Back (No uplift) | Max(86.007/190, 21.716/190) kN/m² | 0.453 | OK |

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| | | | |
|---|---|---|---|
| Wall Back | 133.903/190 kN/m², Length under pressure 2.695 m | 0.705 | OK |

# Structural Design

## Prop Reaction

| | | | |
|---|---|---|---|
| Maximum Prop Reaction (Ultimate) | 213.7 kN @ Base | | |

## Wall Design (Inner Steel)

| | | | |
|---|---|---|---|
| Critical Section | Critical @ 0 mm from base, Case 2 | | |
| Steel Provided (Cover) | Main B25@150 (50 mm) Dist. B12@200 (75 mm) | 3272 mm² | OK |
| Compression Steel Provided (Cover) | Main B16@150 (50 mm) Dist. B12@200 (66 mm) | 1340 mm² | |
| Leverarm z=fn(d,b,As,fy,Fcu) | 288 mm, 1000 mm, 3272 mm², 500 N/mm², 40.0 N/mm² | 254 mm | |
| Mr=fn(above,As',d',x,x/d) | 1340 mm², 58 mm, 76 mm, 0.26 | 356.0 kN.m | |
| Moment Capacity Check (M/Mr) | M 296.5 kN.m, Mr 356.0 kN.m | 0.833 | OK |
| Wall Axial Design (N/Ncap) | N 220.2 kN, Ncap 5600.0 kN | 0.039 | OK |
| Wall Slenderness λ | Leff/tk =2.00x3000.0/350.0 | 17.1 | OK |
| Kmin = (Nuz-N)/(Nuz-Nbal) | Min(1.0, 6222.2 - 220.2)/(6222.2 - 1413.5) | 1.0 | |
| $M_{add}$= N.Kmin.h.λ²/2000 | 220.2x1.0x350.0x17.1²/2000 | 11.3kN.m | |
| (M+Madd)/$Mr_{Axial}$ | M+Madd 307.8 kN, $Mr_{Axail}$372.7 kN.m | 0.826 | OK |
| Shear Capacity Check | F 198.6 kN, vc 0.838 N/mm², Fvr 241.0 kN | 0.82 | OK |

## Base Top Steel Design

| | | | |
|---|---|---|---|
| Steel Provided (Cover) | Main B20@150 (50 mm) Dist. B12@125 (70 mm) | 2094 mm² | OK |
| Compression Steel Provided (Cover) | Main B25@150 (50 mm) Dist. B12@125 (75 mm) | 3272 mm² | |
| Leverarm z=fn(d,b,As,fy,Fcu) | 290 mm, 1000 mm, 2094 mm², 500 N/mm², 40 N/mm² | 264 mm | |
| Mr=fn(above,As',d',x,x/d) | 3272 mm², 63 mm, 58 mm, 0.20 | 240.9 kN.m | |
| Moment Capacity Check (M/Mr) | M 0.0 kN.m, Mr 240.9 kN.m | 0.000 | OK |
| Shear Capacity Check | F 0.0 kN, vc 0.719 N/mm², Fvr 208.4 kN | 0.00 | OK |

## Base Bottom Steel Design

| | | | |
|---|---|---|---|
| Steel Provided (Cover) | Main B25@150 (50 mm) Dist. B12@125 (75 mm) | 3272 mm² | OK |
| Compression Steel Provided (Cover) | Main B20@150 (50 mm) Dist. B12@125 (70 mm) | 2094 mm² | |
| Leverarm z=fn(d,b,As,fy,Fcu) | 288 mm, 1000 mm, 3272 mm², 500 N/mm², 40 N/mm² | 255 mm | |
| Mr=fn(above,As',d',x,x/d) | 2094 mm², 60 mm, 73 mm, 0.25 | 355.7 kN.m | |
| Moment Capacity Check (M/Mr) | M 332.9 kN.m, Mr 355.7 kN.m | 0.936 | OK |
| Shear Capacity Check | F 203.6 kN, vc 0.838 N/mm², Fvr 241.0 kN | 0.84 | OK |