CampbellReith
consulting engineers

207 Goldhurst Terrace
London NW6 3ER

Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12066-47
Revision: F1

February 2016

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1.0 NON-TECHNICAL SUMMARY

1.1. CampbellReith was instructed by London Borough of Camden, (LBC) to carry out an audit on the Basement Impact Assessment submitted as part of the Planning Submission documentation for 207 Goldhurst Terrace, London NW6 3ER (planning reference 2015/4370/P). The basement is considered to fall within Category B as defined by the Terms of Reference.

1.2. The Audit reviewed the Basement Impact Assessment for potential impact on land stability and local ground and surface water conditions arising from basement development in accordance with LBC's policies and technical procedures.

1.3. CampbellReith was able to access LBC's Planning Portal and gain access to the latest revision of submitted documentation and reviewed it against an agreed audit check list.

1.4. The qualifications and experience of the authors of the BIA and Structural Strategy Report (SSR) are considered satisfactory.

1.5. The BIA has confirmed that the proposed basement will be founded within the London Clay. IT will be formed by constructing a reinforced concrete wall constructed in an underpinning sequence. The final construction sequence ansd the detailed design of the temporary and permanent works may be agreed as part of the party wall award.

1.6. It is likely that the ground water table will be encountered during basement foundation excavation. The area flooded in 1975 and 2002 and it is understood a Thames Water relief sewer has been constructed locally; this has been identified in the supporting documents.

1.7. A ground movement analysis has been presented and predicts damage to surrounding properties not worse that Burland Category 1. Monitoring of adjacent structures is noted however no trigger levels for action are noted. These should be agreed with the party wall surveyor.

1.8. It is accepted that the surrounding slopes to the development site are stable and that the development will not impact on the wider hydrogeology of the area as the London Clay is identified as unproductive strata.

1.9. Queries and requirements for clarification resulting from this audit are discussed in Section 4 and are summarised in Appendix 2. It is accepted that the updated BIA has identified the potential impacts to stability and the water environment from the basement construction and proposes sufficient mitigation.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 02 September 2015 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 207 Goldhurst Terrace, Camden Reference 2015/4370/P.

2.2. The Audit was carried out in accordance with the Terms of Reference set by LBC. It reviewed the Basement Impact Assessment for potential impact on land stability and local ground and surface water conditions arising from basement development.

2.3. A BIA is required for all planning applications with basements in Camden in general accordance with policies and technical procedures contained within

- Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.
- Camden Planning Guidance (CPG) 4: Basements and Lightwells.
- Camden Development Policy (DP) 27: Basements and Lightwells.
- Camden Development Policy (DP) 23: Water.

2.4. The BIA should demonstrate that schemes:

a) maintain the structural stability of the building and neighbouring properties;

b) avoid adversely affecting drainage and run off or causing other damage to the water environment; and,

c) avoid cumulative impacts upon structural stability or the water environment in the local area

and evaluate the impacts of the proposed basement considering the issues of hydrology, hydrogeology and land stability via the process described by the GSD and to make recommendations for the detailed design.

2.5. LBC's Audit Instruction described the planning proposal as *"Excavation of basement with lightwells to the front and rear of the building (Use Class C3)."*

2.6. CampbellReith accessed LBC's Planning Portal on 23 September 2015 and gained access to the following relevant documents for audit purposes:

- Construction Management Plan (pro forma) FT Architects
- Basement Impact Assessment June 2015 Vincent & Rymill
- Structural Calculations Vincent & Rymill
- Architect's Floor Plans Existing and Proposed FT Architects
- Structural Basement Plans and Sections Vincent & Rymill

2.7. A site specific Ground Investigation Report was received by email on 28 September 2015; this is also included in the review.

2.8. Following comments raised in the BIA audit Rev D1, the documents listed were received between November 2015 and February 2016, and have been reviewed in this updated report:

- Basement Impact Assessment Issue 3 – Vincent & Rymill
- Ground Movement Assessment – GEA
- Updated Structural Plans and Sections – Vincent & Rymill
- Updated Structural Calculations – Vincent and Rymill.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	YES	The qualifications authors of the BIA and associated documents are satisfactory.
Is data required by Cl.233 of the GSD presented?	NO	
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	YES	BIA.
Are suitable plan/maps included?	YES	Architects and Engineers.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	YES	Architects and Engineers drawings.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	NO	Screening appears appropriate however, full justification for answers not included.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	NO	Screening appears appropriate however, full justification for answers not provided.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	NO	Screening appears appropriate however, full justification for answers not provided.
Is a conceptual model presented?	YES	Ground Investigation Report.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	YES	

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	YES	
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	YES	
Is factual ground investigation data provided?	YES	Ground Investigation Report.
Is monitoring data presented?	NO	
Is the ground investigation informed by a desk study?	NO	No desk top study confirmed in Ground Investigation Report.
Has a site walkover been undertaken?	YES	Site walk over noted in Ground Investigation Report.
Is the presence/absence of adjacent or nearby basements confirmed?	NO	Basements at 203 and 211 noted in comments received.
Is a geotechnical interpretation presented?	YES	Section 6 of Ground Investigation Report.
Does the geotechnical interpretation include information on retaining wall design?	YES	Section 6 of Ground Investigation Report.
Are reports on other investigations required by screening and scoping presented?	YES	Arboricultural Report.
Are baseline conditions described, based on the GSD?	YES	
Do the base line conditions consider adjacent or nearby basements?	NO	No basements noted.
Is an Impact Assessment provided?	YES	Section 4 BIA.
Are estimates of ground movement and structural impact presented?	YES	Ground Movement Assessment Report.

Item	Yes/No/NA	Comment
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	YES	
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	YES	
Has the need for monitoring during construction been considered?	YES	BIA Scoping but not in construction sequence and no detailed proposal submitted.
Have the residual (after mitigation) impacts been clearly identified?	YES	
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	YES	Ground Movement Assessment.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	YES	
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	YES	
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	YES	Ground Movement Assessment.
Are non-technical summaries provided?	NO	Not considered necessary.

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried out by a firm of engineering consultants Vincent & Rymill. The author is noted as a chartered structural engineer and the BIA demonstrates the authors experience in similar basement schemes. The BIA report is not countersigned by a reviewer.

4.2. The geotechnical sections of the report have been carried out by Ground & Water Ltd but the individual's qualifications are not noted as CGeol as required by CPG4.

4.3. The BIA makes reference to Camden GSD maps and guidance documents used for the screening, we would expect the relevant figures to be included to justify the statements given within this section. The updated BIA only contains an extract from Fig 4 from the GSD which identified the sites.

4.4. It is accepted that there are no slope stability concerns regarding the proposed development. The site has previously flooded in 1975 and 2002, however it is understood a flood relief sewer has since been constructed and the area now can be considered as not prone to flooding.

4.5. The proposed basement consists of a single storey construction formed beneath the footprint of a three storey terraced house. The depth of excavation appears to be around 4.3m below the existing garden level. The proposed structural solution for the basement walls is to sequentially cast reinforced concrete walls in an underpinning sequence. This is recognised as a suitable form of construction.

4.6. The ground investigation has identified that the basement will be constructed in the London Clay, proven to a depth of 10.45m bgl.

4.7. A Thames Water storm relief tunnel is known to be in the local area; an in-house search could not determine if this passes beneath the site and it was recommended this should be further investigated to confirm its location. It is now confirmed the site is located 8m from the tunnel.

4.8. The BIA confirms any movement of the party walls will be monitored during construction, but no control threshold levels for action are indicated. Supplementary information submitted in January 2016 included a ground movement and building damage assessment prepared by GEA. Whilst we would question some of the assumptions made in the assessment, it is accepted that damage should not exceed Burland Category 1 provided that the affected buildings are in sound condition and there is good control of workmanship.

4.9. The ground movement assessment identified the potential for heave to occur beneath the basement slab. It is noted that it is proposed to utilise a compressible medium beneath the slab to accommodate this.

4.10. Basement retaining walls are noted in the BIA as propped in the temporary condition and a detail of the propping should be included for review. Revised calculations, submitted after the issue of the initial audit report, together with a further clarification issued by email, generally address our comments. The final design may be agreed as part of the party wall award.

4.11. The structural calculations for the retaining wall indicate a 400 deep base and the original drawings indicated a 350mm deep base. This is now updated to 400mm as per the calculations.

4.12. The Construction Method Statement and the Construction Sequence are brief documents and require further development, for construction, but are considered adequate for the BIA purposes.

5.0 CONCLUSIONS

5.1. The qualifications of the individual authors of the BIA and structural drawings and calculations are generally satisfactory.

5.2. The BIA has confirmed that the proposed basement will be founded within the London Clay which is classed as unproductive strata. It is therefore accepted that the development will not impact on the wider hydrogeology of the area

5.3. The Construction Method Statement, Construction Sequence and design calculations require to be developed further. However, they are considered satisfactory for the BIA and may be finalised and agreed as part of the party wall award.

5.4. The basement is to be constructed adopting traditional reinforced concrete walls formed in an underpinning sequence. This is considered an appropriate solution. It is proposed to place a compressible medium beneath the floor slab to accommodate heave.

5.5. An analysis of horizontal and vertical ground movements has confirmed that building damae to adjacent structures should not exceed Burland Category 1. This is accepted on the basis that the structures are in sound condition and there is good control of workmanship.

5.6. The BIA notes that monitoring of adjacent structures will be carried out although no proposals are provided for a movement monitoring strategy during excavation and construction. These may be agreed with the party wall surveyor.

5.7. It is accepted that the surrounding slopes to the development site are stable.

5.8. The site has previously flooded in 1975 and 2002, however it is understood a Thames Water relief sewer has been constructed to protect the area from further flooding. The sewer location has been confirmed.

5.9. It is accepted the BIA has identified the potential impacts on stability and the water environment arising from the basement proposals and proposes sufficient mitigation.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Neil	205 Goldhurst Terrace	01/09/15	Adjacent basements - ground stability Thames Water Sewer	Refer to section 4
Wood	219 Goldhurst Terrace	14/09/15	Damage to adjacent properties Thames Water Sewer	Refer to section 4
Kay	205 Goldhurst Terrace	10/09/2015	Adjacent basements - ground stability	Refer to section 4
205 Goldhurst Terrace Management Company		?	Thames Water Sewer Adjacent basements - ground stability Building damage	Refer to section 4

Appendix 2: Audit Query Tracker

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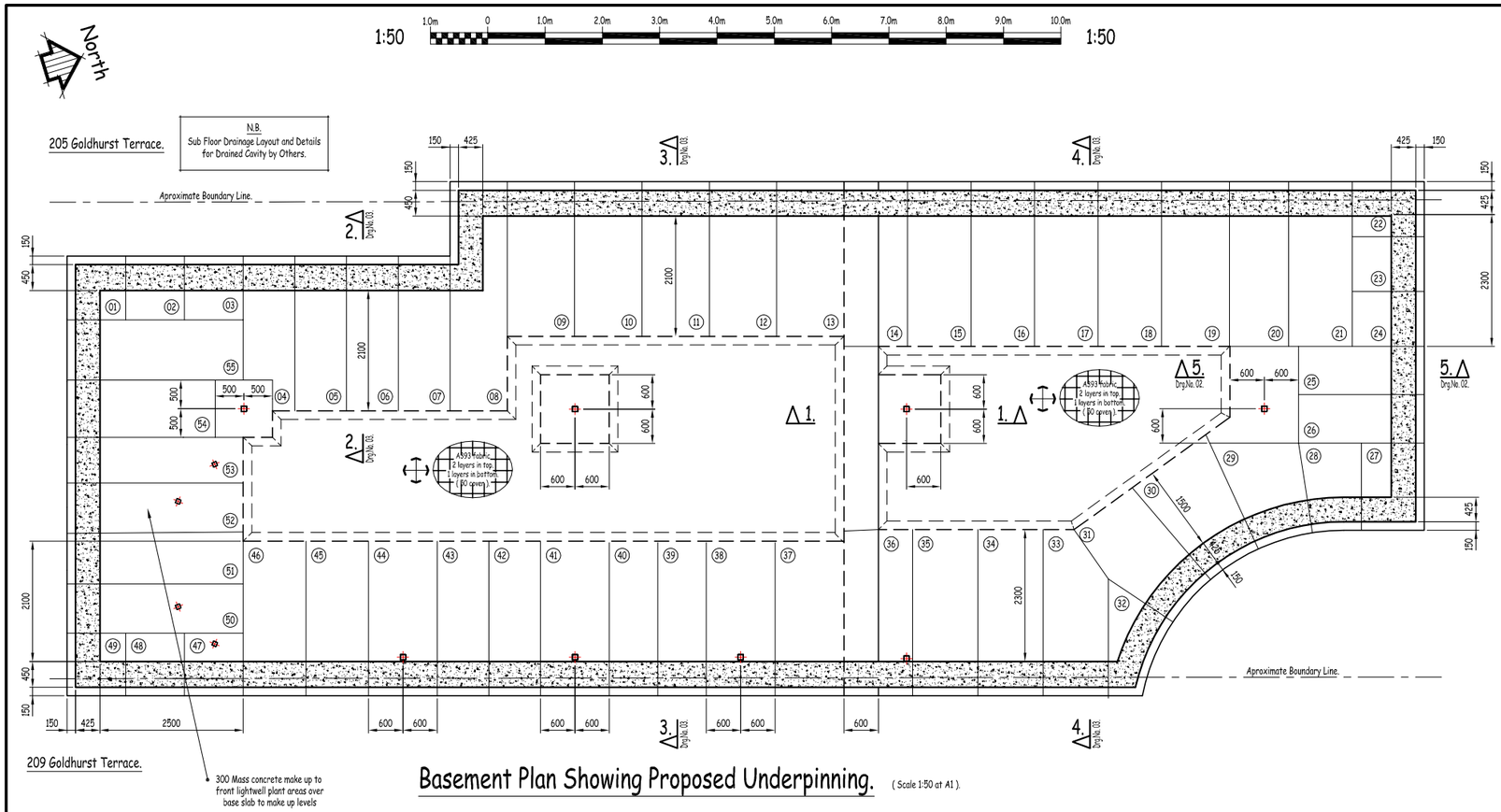
Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Qualifications	Clarify qualifications for ground investigation author in line with CPG4 requirements	Closed. Updated BIA	09.02.16
2	Qualifications	Demonstrate BIA author experience in ground engineering in line with CPG4 requirements	Closed. Updated BIA	09.02.16
3	Surface Water Flow	Confirm location of Thames Water relief sewer	Closed. ? email 24-09-15	09.02.16
4	Stability	Provide vertical and horizontal ground movement estimation	Closed. Ground Movement Assessment	24.02.16
5	Stability	Provide classification of potential damage to adjacent structures	Closed. Ground Movement Assessment	24.02.16
6	Scoping	Provide site specific extracts from GSD figures justifying stage 1 scoping	Closed. Updated BIA	09.02.16
7	Stability	Provide amended calculation for retaining wall	Closed. Updated calculations	09.02.16
8	Stability	Provide construction sequence plans and develop Construction Method Statement. Resolve discrepancies between BIA and CSM	Closed. Updated BIA	09.02.16

Appendix 3: Supplementary Supporting Documents



Basement Plan Showing Proposed Underpinning.

(Scale 1:50 at A1).

Underpinning Notes

U1. The underpin numbering for identification purposes only.

U2. The sequence of underpinning is to be agreed on site, with the District Surveyor and should follow the traditional 1, 4, 2, 5, 3 pattern.

U3. But at all times the minimum requirements for the laps, between the construction of adjacent pins must be adhered to.

U4. Underpinning to be a maximum length of 1200mm.

U5. Provide corner bars in under pinning stems, to ensure mesh reinforcement is held in place, during concreting.

U6. All reinforced concrete cast on the ground shall be placed on 50mm. of concrete blinding in a nominal 1:8 mix unless otherwise noted.

U7. Foundations have been designed to impose a net bearing pressure of 100kN/m². on London Clay and 150kN/m². on Sand and Gravel, at depths shown. The bearing strata shall be approved by the Local Authority's Building Inspector, before laying blinding, or casting foundations. Any additional excavation shall be replaced with a nominal 1:8 mix concrete. But in the event of extensive additional excavation being required, the Engineer must be informed immediately and fresh instructions obtained.

U8. Concrete mix for foundations shall be a G35/40 mix with a minimum Ordinary Portland content of 320kg/m³. and a maximum water/cement ratio of 0.50 Concrete shall be left. for at least 48 hours before dry packing.

U9. Concrete cover to the reinforcement shall be as detailed on the drawings but never less than 35mm.

U10. The minimum depth of the underpinning, (measured from the underside of the existing footing, to the underside of the new), shall be 500mm. and shall be formed on a strata, capable of sustaining a permissable net ground pressure of 100kN/m². on London Clay and 150kN/m². on sand and gravel.

U11. The underside of the existing wall or foundation shall be trimmed and cleaned of all mud and debris, before dry packing. The dry pack shall be a 1:3 mix and well rammed in horizontal layers, not exceeding 75mm thick. Dry packing shall be left. 24 hours before works are commenced on adjacent underpins.

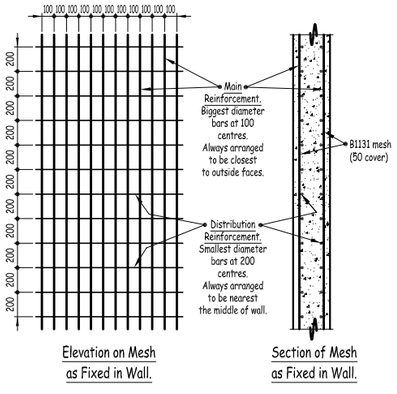
U12. The central area of excavation shall *not* be carried out until the perimeter underpinning has been completed.

U13. If necessary backfilling behind retaining walls shall be a 1:20 mix, using Ordinary Portland Cement.

Notes

1. This drawing remains the copyright of Vincent and Rymill and is not to be copied, altered or changed without permision.
2. All dimensions are in millimetres unless otherwise noted.
3. Do not scale off this drawing.
4. All temporary works shall be the responsibility of the main contractor. But should advice be given, by the Engineer. No responsibility will be accepted, unless the advice is confirmed in writing, by the Contractor, prior to the works being carried out.
5. The Contractor shall be responsible for the stability of the existing structure and earthworks on the site, as well as the adjoining sites. The Contractor must take all necessary precautions to safeguard this.
   Adequate shoring shall be installed during the works, to ensure the stability of the structure. Such shoring is to be adequately founded.
6. Any deviation from the details shown, must be notified to the Engineer, by the Contractor, in writing, before being carried out.
7. The Local Authority's Building Inspector and the Engineer are to be informed, by the Contractor, in writing, at least 48 hours prior to the works starting, on site. Their agreement must be, obtained, before work, can commence.
8. All new steelwork to be grade 275. To be cleaned at works to Sa 2.5 and primed with High Build zinc phosphate primer to 75 microns minimum dft. Primer to be touched up on site where damaged by transit or erection.
9. All beam to beam connections shall be double angle cleated using 90x90x12RSA's. All cleats to be drilled with 4no. 22Ø holes, for 4no. 20Ø grade 8.8 black bolts.
   All unless noted otherwise.
10. For fire protection to steelwork see Architects details.
11. All concrete padstones to be in 10mm. maximum aggregate size 1:3 mix (cement:aggregate/fines).
12. All new structural timber shall be grade C16, (or C24) to B.S. 4978, unless otherwise note. The timber, including cut ends, notches etc. will also, be treated, with an approved timber preservative.
13. Brickwork shall be constructed, using bricks, with a minimum crushing strength, of 27.5N/mm.
    Blockwork shall be constructed, using blocks, with a minimum crushing strength of 2.8N/mm.
    All unless noted otherwise.
    All masonry shall be laid in Class (iii) mortar.

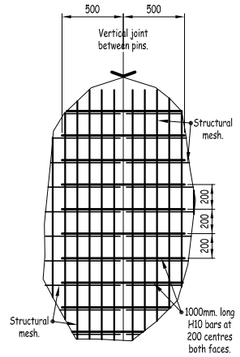
This Drawing is for Planning Application purposes only.



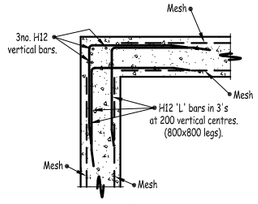
Elevation on Mesh as Fixed in Wall.

Section of Mesh as Fixed in Wall.

Important Note with Reference to the Fixing of Structural Mesh in Walls. i.e. Mesh Prefixed with the letter 'B' e.g. B1131 or B785 etc.



Part Elevation on Wall Showing Lacing Reinforcement Between Pins.



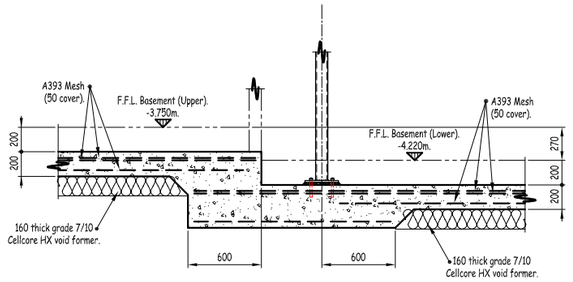
Plan Section on Typical Corner Showing Typical Reinforcement.

Reinforcement Note

Wall and Foundation reinforcement shall be continuous.
If loose bars are used to provide continuity
The area of loose bars shall not be less.
than the area of reinforcement specified.
Laps shall be not less than 45 times the lesser bar diameter.

Tension Lap Lengths for Reinforcement

10mm. Ø = 450mm.
12mm. Ø = 540mm.
16mm. Ø = 720mm.
20mm. Ø = 950mm.



Section 1-1

Rev	Details	Date
B	Minor dimension revisions.	28.01.16
A	Levels Updated	16.07.15

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Job

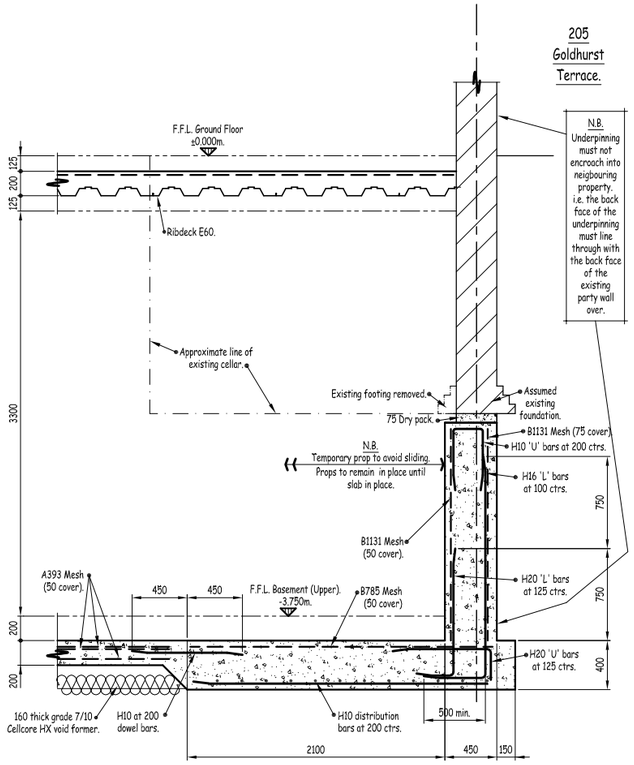
207 Goldhurst Terrace,
London NW6 3ER

Title

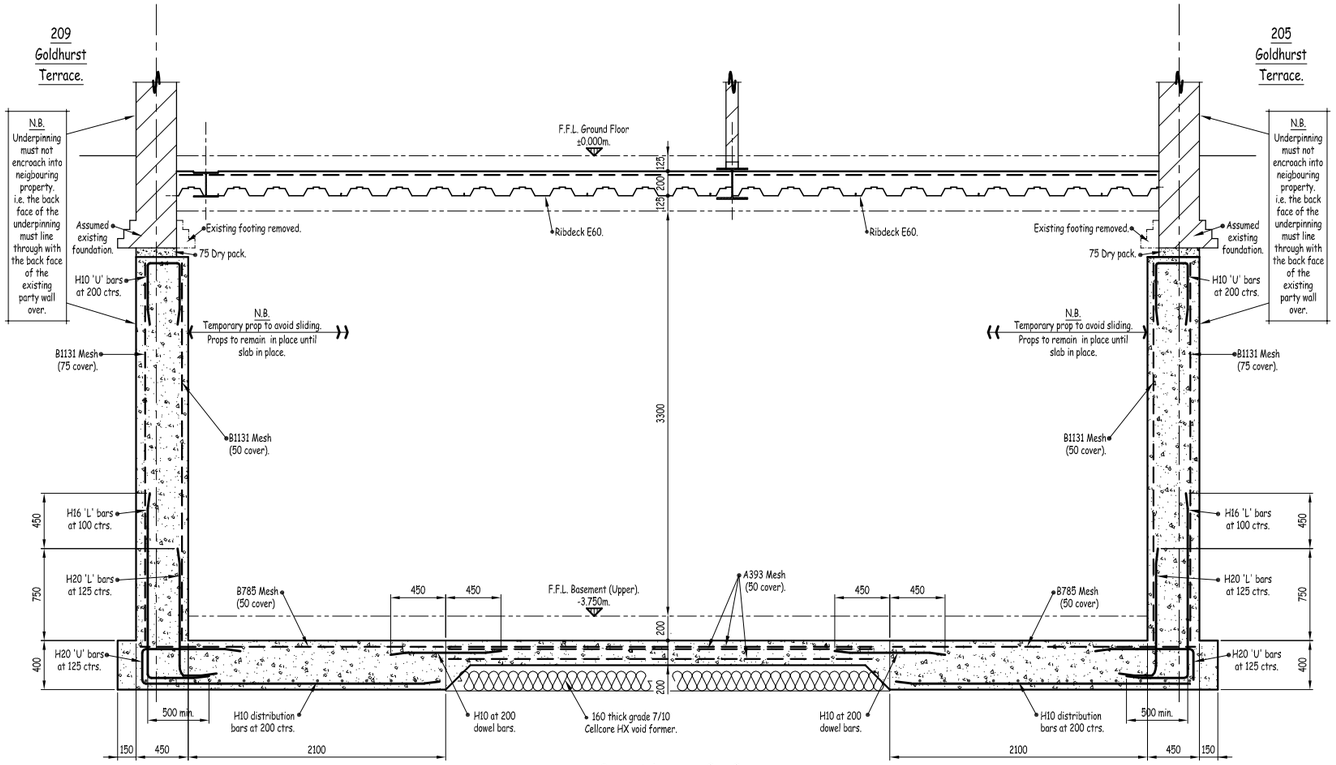
Proposed Basement
Structural Elements Sheet 1 of 3

Scale at A1	Date	Job No	Drg No	Rev
1:50 1:25	June 2015	15F02	01	B

1:25 1.0m 0 1.0m 2.0m 3.0m 4.0m 5.0m 1:25



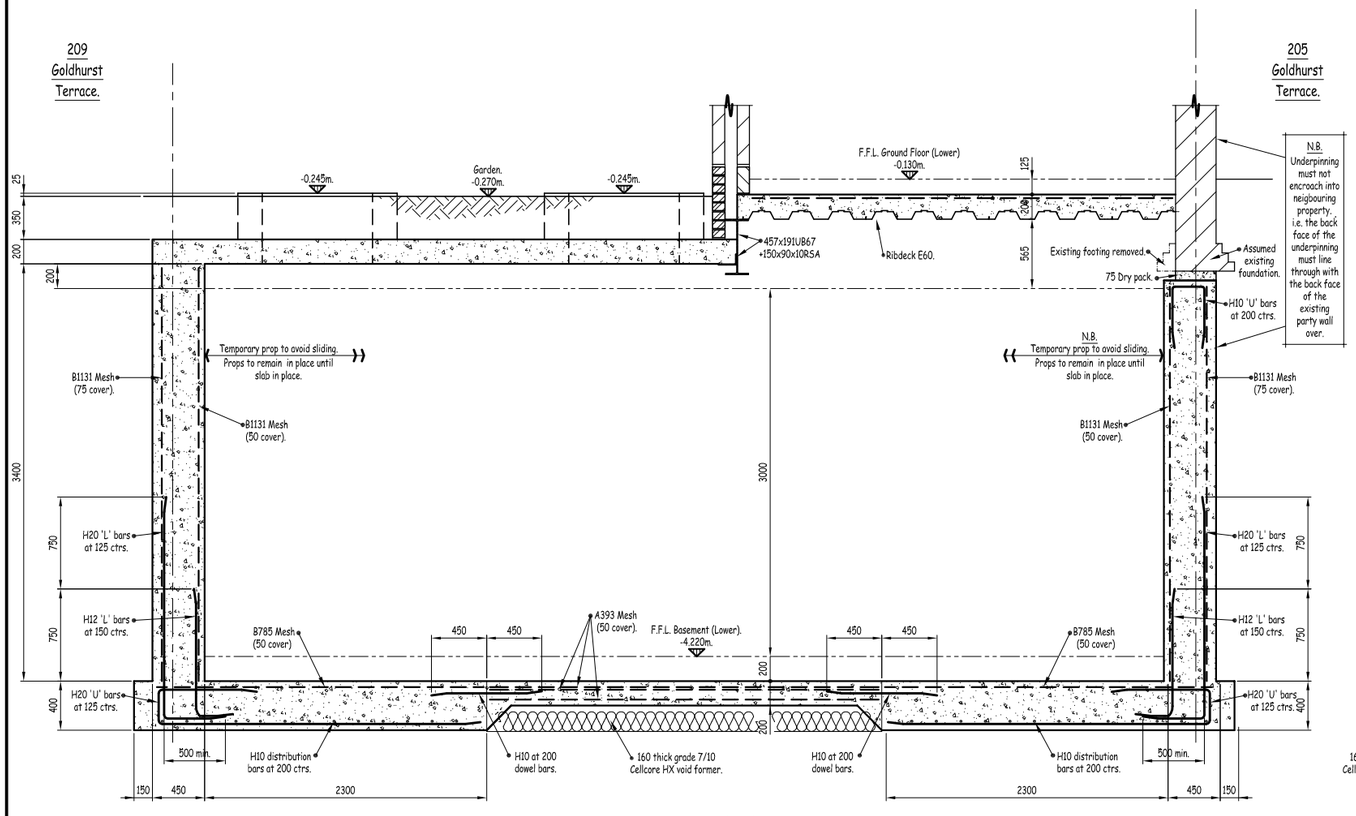
Section 2-2



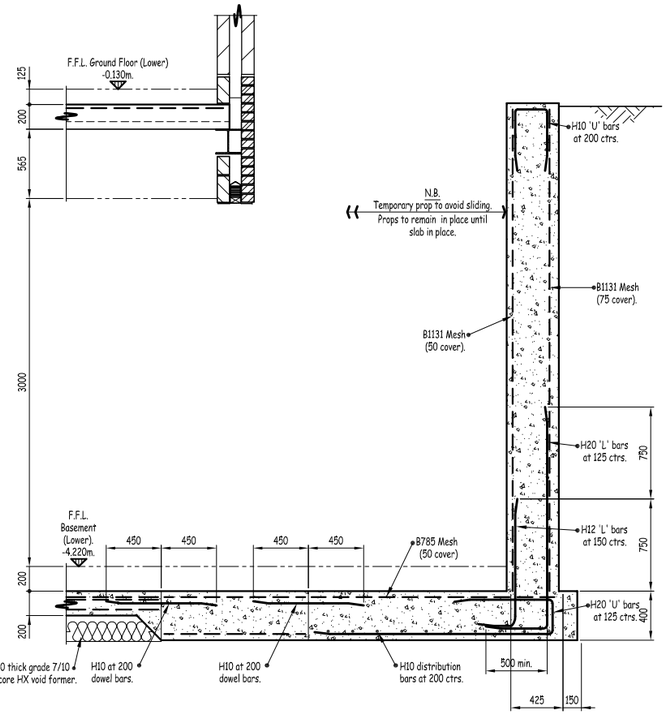
Section 3-3

Reinforcement Note

Wall and Foundation reinforcement shall be continuous.
If loose bars are used to provide continuity
The area of loose bars shall not be less.
than the area of reinforcement specified.
Laps shall be not less than 45 times the lesser bar diameter.



Section 4-4



Section 5-5

Notes

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2. All dimensions are in millimetres unless otherwise noted.
3. Do not scale off this drawing.
4. For location of Sections see drawing number 15C01 /02.

This Drawing is for Planning Application purposes only.

Rev	Details	Date
B	Base depths amended.	28.01.16
A	Levels updated	16.07.15

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Job

207 Goldhurst Terrace,
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Title

Proposed Basement
Structural Elements Sheet 2 of 3

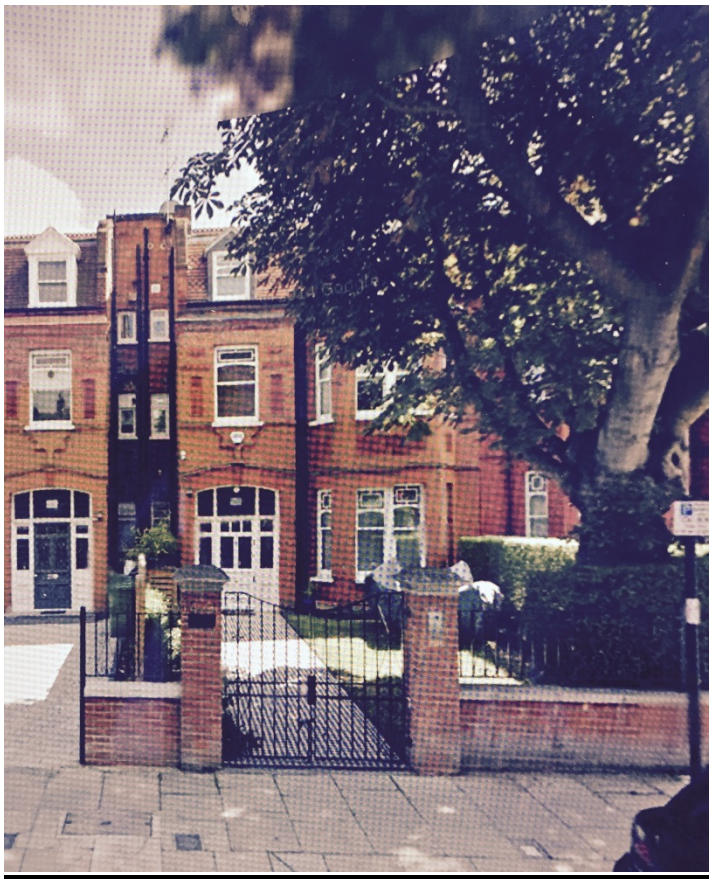
Scale at A1	Date	Job No	Drg No	Rev
1:25	June 2015	15F02	02	B

B

VINCENT & RYMILL

207 GOLDHURST TERRACE LONDON, NW6 3ER

PROPOSED BASEMENT UNDER FOOTPRINT OF BUILDING, INCLUDING LIGHTWELLS.



1. INTRODUCTION
2. STAGE 1 - SCREENING FOR BIA
3. STAGE 2 – SCOPING FOR BIA
4. STAGE 3 - SITE INVESTIGATION AND STUDY
5. STAGE 4 - IMPACT ASSESSMENT
6. STRUCTURAL DESIGN PHILOSOPHY
7. BRIEF METHOD STATEMENT FOR CONSTRUCTION.
8. CONSTRUCTION SEQUENCE.
9. GEOLOGICAL PLAN

INTRODUCTION.

Vincent & Rymill, Consulting Engineers, have been appointed by the building owner to prepare a B.I.A. for Planning purposes. The author of this report T. J. Vincent Bsc C.Eng M.I.Struct. E. first worked with The London Basement Company in 2004, designing and detailing such retro fitted basements all over London. Since that time T. J. Vincent has designed over 450 basements, both single and multi storey.

The property is a large three storey, terraced dwelling probably constructed around the 1920's.

The development proposal is to form a new basement storey below the footprint of the existing building and below part of the rear terraced garden, including light wells to the front and the rear.

Details of the proposals are shown by the relative FT Ltd Architects drawings.

The purpose of this report / statement is to provide details of the stage 1 and 2 BIA as requested by the 'Camden Planning Guidance Basements and Light wells', together with details of the method and sequence of construction.

The figures referred to in the Screening section are those contained within the Arup Report, ' Camden Geological hydrogeological and hydrologcal study, guidance for subterranean development.'

STAGE 1 - SCREENING FOR BIA- Reference Camden Planning Guidance Basements and Lightwells

Figure 1. Subterranean (ground water) flow screening chart.

Q1a Is the site located directly above an aquifer ?
NO. See figure 8, site above 'unproductive strata'

Q1b Will the proposed basement extend below the water table surface?
NO. Formation of new basement is at - 3. 75m below ground level, site investigation has shown no ground water down to 10.45m below ground level.

Q2. Is the site within 100m of a watercourse, well or potential spring line?
NO. With reference to figure 12 the site is not within 100m of any of these features.

Q3. Is the site within the catchment of the pond chains on Hampstead Heath.
NO. Refer to figure 14.

Q4. Will the proposed basement development result in a change in the proportion of hard surfaced paved areas.
NO. Basement is below footprint of existing building, new lightwells are formed replacing existing hard-scaped parts of the front and rear gardens.

Q5. As part of the site drainage will more surface water than at present be discharged into the ground.
NO. There is no increase in impermeable area.

Q6. Is the lowest point of the proposed excavation close to or lower than the mean level in any pond or spring line.
NO. There are no nearby ponds or spring lines.

Figure 2. Slope Stability Screening Flow Chart.

Q1. Does the existing site include slopes natural or manmade greater than 7^0
NO. Site does not include slopes greater than 7^0.

Q2. Will the proposed re-profiling of the landscaping at site change slopes at the boundary to more than 7^0
NO. There are no re-profiling works alongside the boundary that are not contained by r.c. walls, i.e. stairs.

Q3. Does the development neighbour land have slopes greater than 7^0.
NO. Neighbouring land does not contain slopes greater than 7^0.

Q4. Is the site within a wider hillside with general slopes greater than 7^0.
NO. Site is within a wider level area.

Q5 Is the London Clay the shallowest strata on the site.
YES. Carried forward to scoping

Q6. Will any trees be felled or are any of the works within root zones of protected trees?
YES. Carried forward to scoping

Q7. Is there a history of seasonal shrink swell subsidence in the area? And evidence that this affects the site.
NO. Site examination of buildings did not reveal evidence of subsidence due to shrink / swelling of soils.

Q8. Is the site within 100m of a watercourse or a potential spring line?
NO. Site is not within 100m of such features

Q9. Is the site within an area of previously worked ground?
NO. The site is presently a dwelling within its own land.

Q10. Is the site within an aquifer?
NO. See figure 8, site above 'unproductive strata'

Q11. Is the site within 50m of Hampstead Heath Ponds?
NO. Site is not within 50m of these ponds.

Q12 Is the site within 5m of a highway or pedestrian Way.
NO.

Q.13 Will the proposed basement significantly increase the differential depth of foundations to the relative properties.
YES. Carried forward to scoping

Q. 14. Is the site over any tunnels?
NO. No tunnels are known to exist under the site.

Figure 3. Surface Flow and Flooding Screening Flowchart.

Q1. Is the site within the catchment of the pond chains on Hampstead Heath.
NO. Site is not within the catchment area of the pond chains on Hampstead Heath.

Q2. As part of the proposed site drainage will surface water flows be materially changed from the existing route?
NO. The existing surface water routes will not be changed by the development.

Q. 3. Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas.
NO. The development does not increase the impermeable paved areas.

Q4. Will the basement result in changes to the profiles of the inflows of surface water being received by adjacent properties or downstream watercourses.
NO. The development does not increase the impermeable paved areas.

Q5. Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses.
NO. The presence of the basement structure will not alter the quality of the surface water.

Q6. Is the site in an area known to be at risk of flooding?
YES. Camden Planning Guidance on page 29 lists Goldhurst Terrace being flooded in 1975 and 2002. Carried forward to scoping

STAGE 2 - SCOPING FOR BIA- Reference Camden Planning Guidance Basements and Lightwells

Figure 2.
Q5 Is the London Clay the shallowest strata on the site.
YES. ***Potential impact; Settlement heave from growth of trees. Unloading caused by the basement excavations. High earth lateral pressures. Ground Investigation carried out, appropriate structural design to be undertaken for basement walls and bases resist lateral forces and to accommodate residual heave from overburden relief of clay. See calculations and drawings attached.***

Q6. Will any trees be felled or are any of the works within root zones of protected trees?
YES. ***See arbuculturist report attached to planning application pack***

Q.13 Will the proposed basement significantly increase the differential depth of foundations to the relative properties.
YES.
'The construction of the basement below no 207 will require underpinning of the party wall shared between with no 205 and no 209, these foundations will be some 2 to 2.5m below the existing foundations.
The borehole investigation has shown the site to be overlain with 0.60m depth of made ground then the firm to stiff silty clay of the London Clay, the investigation lists the London Clay as high shrinkage potential. It is probable that the existing foundations are formed into the Clay, i.e. at least 1.00m below ground level which is below the effective depth where seasonal variation can occur within the ground. It is unlikely therefore those seasonal variations within the soils will differentially affect the varying level of foundations.
Prior to works commencing the existing fabric of 207 and the adjoining buildings will be made to identify and record any existing cracks or movement. Monitoring points will be fixed at third points along the party wall, these levelled horizontally and vertically, these would be checked weekly to monitor movement of the party wall.
Differential movements between the underpinned foundations and those on the adjoining property will be minimised and controlled through careful structural design and controlled construction. The new and existing foundations will be founded upon similar material, i.e.

the London Clay. Structural design will be made adopting lower than normally acceptable bearing pressures at formation level these to control settlement movements, or pressures that imitate the existing bearing pressures below the existing foundations.
The method statement and construction sequence is added below for information.'

Figure 3. Surface Flow and Flooding Scoping Flowchart.
Q6. Is the site in an area known to be at risk of flooding?
YES. Camden Planning Guidance on page 29 lists Goldhurst Terrace as being flooded in *1975 and 2002.*

'This occurred 13 and 37 years ago due to surcharge of existing drains during a storm. Clause 6.5 of the 'Camden Flood Risk Management Strategy' note that improvements to the drainage system in this area have been made by Thames Water that are deemed to have solved the probability of local flooding.

There are no nearby rivers or other water features that would give rise to flooding. The E.A. Flood risk map shows the site to be in zone 1, i.e. no risk of flooding.

The basement will be protected from water / moisture by an internal cavity drainage layer, (DELTA SYTEM) , gravity drainage will not effectively be linked to the basement therefore the external drainage system will not be able to surcharge the new basement.

It should be noted that this is not a self-contained apartment.'

STAGE 3 - SITE INVESTIGATION AND STUDY- Reference Camden Planning Guidance Basements and Lightwells

The site is assessed as low risk.

A geological desk top study and a site specific borehole have been completed. Site conditions are known to be made ground over the London Clay. No ground water was found down to a depth of 10.35m below ground level.

STAGE 4 - IMPACT ASSESSMENT- Reference Camden Planning Guidance Basements and Lightwells

Attribute	Change from baseline	Comment
Geological / land stability	Nil	Ground is flat lying, made ground over firm London Clay.
Hydrogeological	Nil to not significant	The underlying London Clay is effectively impermeable. Any upper made ground will be permeable however any perched water that is in this layer has a path around the proposed development.

Hydrological (surface water)	Nil	There is negligible increase in impermeable area. The lightwell area replace existing areas of hard standing.
Structural to own property	Nil	The existing foundations will be reformed down onto the stiffer clays. No structural work is being undertaken to the existing main house.
Structural to neighbouring properties / highway	Nil / improve	'The construction of the basement below no 207 will require underpinning of the party wall shared with no's 205 and 209, these foundations will be some 2 to 2.5m below the existing foundations. The borehole investigation has shown the site to be overlain with 0.6m depth of made ground then the firm to stiff silty clay of the London Clay, the investigation lists the London Clay as high shrinkage potential. It is probable that the existing foundations are formed into the Clay, i.e. at least 1.00m below ground level which is below the effective depth where seasonal variation can occur within the ground. It is unlikely therefore those seasonal variations within the soils will differentially affect the varying level of foundations.

The impact of the development is considered low and a full BIA is not considered necessary

STRUCTURAL DESIGN PHILOSOPHY

External Walls

New concrete walls below the property are designed as propped cantilevers in reinforced concrete, the lower ground floor slab acting as the prop at base level. The walls will be designed using the soil parameters relative to the site. The walls will be designed for a water table at ground level.

The surcharge load allowed on the external walls of the property will be 10KN/m^2 . The party wall bounding will have a surcharge load of 10.00KN/m^2 for adjoining floor and partition wall construction and will also take into account any loads from adjoining foundations.

Basement Slab

The slab will be formed in reinforced concrete. It will be designed for uplift due to water pressure below, or as a clear span as appropriate. The basement slab will act as a prop to the base of the basement walls.

Design Criteria.

Basement walls and bases will be designed using the parameters for the retained soils and bearing soils as indicated by the Site Investigation.. The design is in accordance with BS 8002:1994.

The design will accomodate active and passive earth pressures. Pressure coeficients in the design will adopt ' at rest pressures'.

The wall and base in designed for the following

1.Vertical loads from walls above.
2.Party wall will be designed for a surcharge loading of 10kN/m^2.
3. Other external will be designed with a surcharge load of 10.00KN/m^2.
4. The design adopts a water head behind the wall to ground level.

The sub soils at new lower ground floor formation level will be London Clay, an SBP of 150KN/m^2 will be used in the design to limit differential foundation movements.

Concrete will generally be grade C35 and Class 1 to BRE Digest 363. Reinforcement will be grade 500N/mm^2.

Existing brickwork assumes 7N bricks in a lime mortar, CP.111 gives basic compressive stress for this makeup of 0.45N/mm^2, and therefore allowable bearing stress will be 0.45N/mm^2. Any bearings into existing external or party wall masonry will take account of this allowable stress.

Mortar will be class (ii) or (iii) as required.

Relevant Codes of Practice and British Standards

B.S. 8002	Code of Practise for Earth Retaining Structures
B.S. 8004	Code of Practice For Foundations
B.S. 6031	Code of Practice For Earthworks
B.S. 8110	Structural Use of Concrete
B.S. 5750	Structural Use of Steelwork in Buildings

BRIEF METHOD STATEMENT FOR CONSTRUCTION .

The exact sequence of works will be agreed with Main Contractor and Structural Engineer, a Contruction Method Statement for the works could be as follows.

a) The walls to the perimeter of the new/existing rooms will be underpinned in reinforced concrete. The underpins will take the vertical loads from the walls and horizontal loads from

the earth. During their construction the walls and bases will require laterally propping in the temporary condition; propping will be made against the central earth pudding.

b) Underpinning legs will be excavated in short sections not exceeding 1200mm in width.
c) The sequence of the underpinning will be in the 1, 3, 5, 2, 4 sequence and such that any given underpin will be completed, dry packed, and a minimum period of 48 hours lapsed before an adjacent excavation commenced to form another underpin.
d) In the event that the existing foundations to the wall are found to be unstable, sacrificial steel jacks will be installed underneath the foundation to prop the bottom few courses of bricks. These steel jacks will be left in place and will be incorporated into the concrete stem.
e) Whilst forming the wall and in the event that the vertical soil face is unstable, lateral propping will be provided as required to the excavation and to the sides of the working trench. The front and side faces of the excavation will be propped using a sacrificial inert board and acrow props as appropriate.
f) Concrete will be chuted from the point of delivery into a 'holding bath' within the working areas and placed by wheelbarrow and /or bucket, or mixed on site. The exact arrangement will be finalised when works commence on site.
g) Concrete will be placed within 30 minutes of batching on site, or delivery by lorry, concrete will be compacted with a mechanical hand held vitrator.
h) Excavation for an underpin section will be excavated in a day, and the concrete to the base poured by the end of the same day.
i) The concrete to the wall of the underpin will be poured the following day. This will be poured up to within 50 – 75mm of the underside of the existing wall foundations.
j) On the following day, the gap between the concrete and the underside of the existing foundation will be dry packed with a mixture of sharp sand and cement (ratio 3 : 1).
k) Once the dry pack has gained sufficient strength, any protrusions of the footings into the site will be carefully trimmed back using hand tools to avoid causing any damage to the foundation. The protrusions will be trimmed back to be flush in-line with the face of the wall above.
l) A minimum of 24 hours will be allowed before adjacent sections will be excavated to form a new underpin.
m) Once all pins are complete a temporary cross propping system will be introduced between the walls to allow bulk excavation will be carried out down to formation level.
n) The below – slab drainage for foul & ground water, sumps and pumps will then be installed. The pumps will discharge the foul / ground water into the sewer system to the front of the properties. The drainage layout will be designed in due course.
o) The basement slab will then be constructed, once cured this will provided the designed propping to the walls and the temporary cross propping can be removed.
p) A cavity drainage layer will be laid to the slabs and walls.

CONSTRUCTION SEQUENCE

1. Site set up will include a hoarding to the front garden; placement for skips will either be made within the front garden or on the public highway subject to Camden approval.
2. The site is only accessible from Goldhurst Terrace, and therefore all site deliveries and operations will take place from here. This entrance will be manned throughout operational hours by a banksman to ensure construction deliveries do not pose a risk to other users of Goldhurst Terrace.
3. Construct site hoarding, entrance gates to provide protection to passers-by from site operations. Site accommodation including welfare facilities will be confined to the main building throughout the site works.

4. Terminate / protect any incoming services temporarily divert any active drainage.
5. Install any tree protection measures as necessary.
6. Install enclosed skip to front on property and install conveyor to remove excavated soil to discharge soil into skip.
7. The light well to the front of the property will be constructed first to give access to the remainder of the works. The light well will be constructed by initially forming the upper part of the wall. Excavation will be made to form this part of the wall in the ground approximately 1.0 to 1.5 m deep. Once cured this wall will then be underpinned in the usual sequence to form the remainder of the wall and its base. Once formed the light well will be backfilled but leaving enough space to allow access subsequent works under the property.
8. Construction under the property will commence by taking out the ground floor and reducing ground levels to just above existing foundation formation.
9. Underpins will be carried out in the usual 1, 4, 2, 5, 3 underpinning sequence, the construction sequence for forming the pin is shown on the Vincent & Rymill drawings submitted for planning. Backfilling of the excavation will be made after each pin has been formed.
10. On completion of all underpinning and fixing of the structural steelwork supporting the lower ground floor, cross propping of the pin walls will be erected to allow release of the local pins that may be propped against the central dumpling so the basement slab can be constructed. The propping will be designed to suit the lateral loads behind the walls but generally takes the form of a series of horizontal slimshor props adequately laced and braced set approximately 1.5m from lower ground floor level.
11. Bulk excavation will be carried out down to basement slab formation level. Muck will continue to be removed from site via the conveyor belt.
12. The below – slab drainage for foul & ground water, sumps and pumps will then be installed. The pumps will discharge the foul / ground water into the sewer system to the front of the properties. The drainage layout will be designed in due course.
13. The basement slab (ground – bearing slab) will then be constructed.
14. After the new basement slabs have cured, the cross propping will be removed.
15. A drained – cavity layer will be laid to the slabs and walls.
16. The basement slab (ground – bearing slab) will then be constructed.
17. After the new basement slabs have cured, the cross propping will be removed.
18. A drained – cavity layer will be laid to the slabs and walls.

T. J. Vincent

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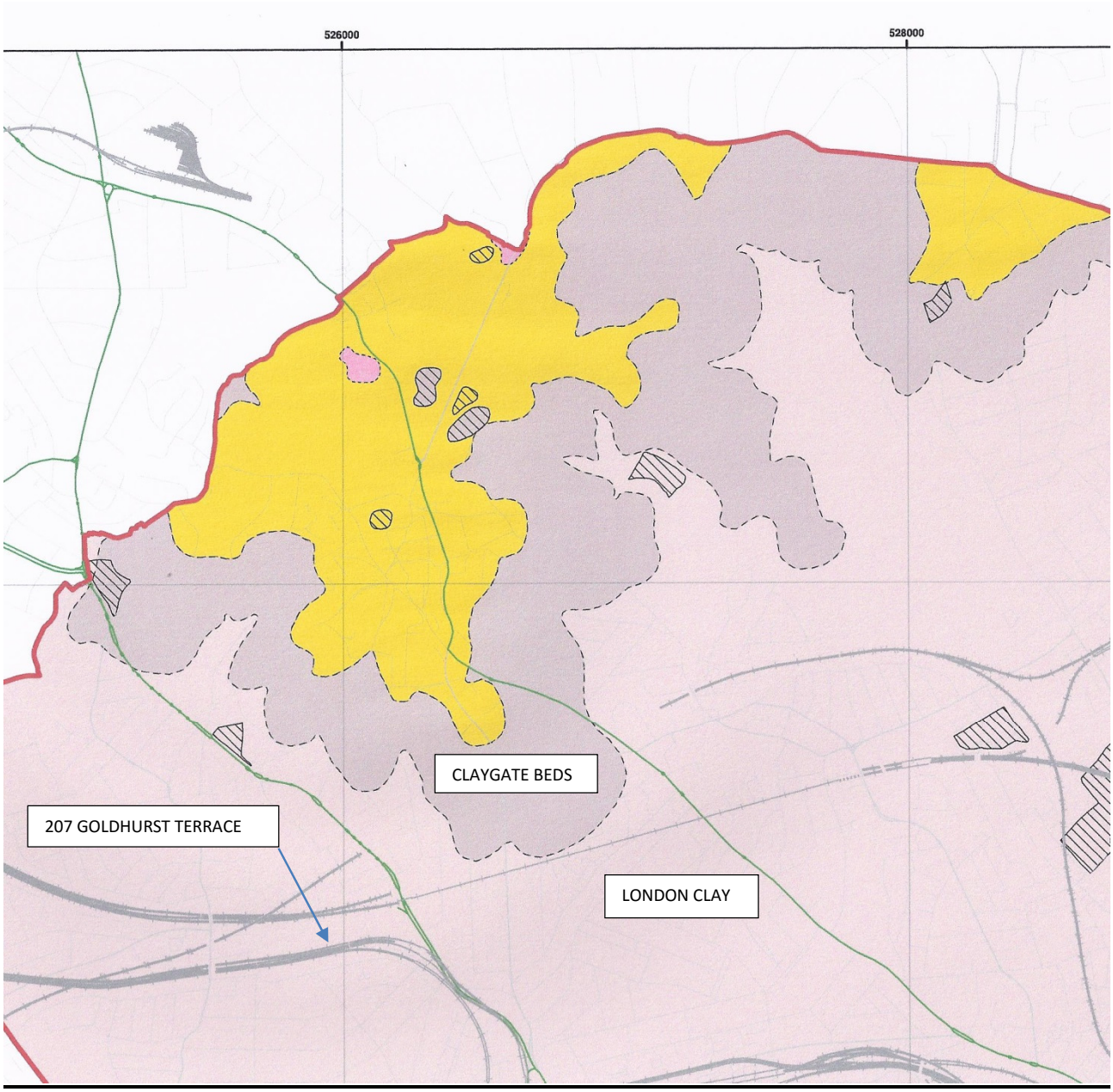
T. J. Vincent BSc C.Eng M.I.Struct E.
10 June 2015

CAMDEN GEOLOGY – Extract from FIGURE 4 Camden Geological, Hydrogeological and Hydrological Study



VINCENT & RYMILL LAKESIDE COUNTRY CLUB FRIMLEY GREEN SURREY GU16 6PT	Project 207 GOLDHURST TERRACE NW8				Job Ref. 15 F02	
	Section NEW BASEMENT - preliminary calculations				Sheet no./rev. 1 A	
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LOADINGS

PITCHED ROOF	**KN/m²**
Tiles	0.70
Felt & battens	0.05
Rafters	0.10
	0.85
30^0 on plan load D. L.	1.00 KN/m²
30^0 Imposed Load	0.75 KN/m²
	1.75 KN/m²

CEILING	**KN/m²**
Ceiling Joists	0.10
Plasterboard	0.15
D. L.	0.25 KN/m²
I. L. where applicable	0.25 KN/m²
	0.50 KN/m²

FLAT ROOF	**KN/m²**
Felt	0.25
Boards	0.25
Joists & firrings	0.15
Ceiling	0.15
D. L.	0.80 KN/m²
I .L.	0.75 KN/m²
	1.55 KN/m²

TIMBER FLOORS	**KN/m²**
Boards	0.20
Joists	0.10
Ceiling	0.30
D. L.	0.60 KN/m²
I. L.	1.50 KN/m²
	2.10 KN/m²

200 RIBDECK	**KN/m²**
Finish	1.80
CONCRETE	4.20
D. L.	6.00 KN/m²
I. L.	1.50 KN/m²
	7.50 KN/m²

STUDWORK 0.60KN/m²

MASONRY	**KN/m²**
102 Brick + plaster	2.20 KN/m²
215 BRICK + (1 x plaster)	4.60 KN/m²
215 BRICK + (2 x plaster)	4.80 KN/m²
330 BRICK (2 x plaster)	7.00 KN/m²

KEY PLAN

VINCENT & RYMILL LAKESIDE COUNTRY CLUB FRIMLEY GREEN SURREY GU16 6PT	Project 207 GOLDHURST TERRACE NW8				Job Ref. 15 F02	
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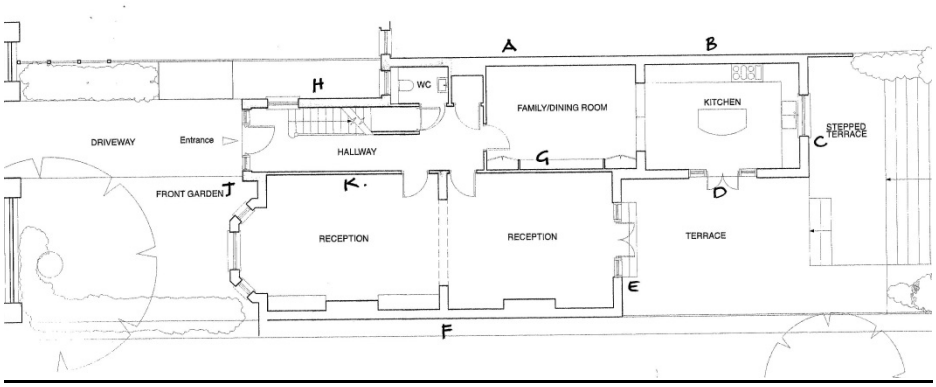

WALL LOADINGS

WALL A

WALL	10.5 X 4.80	=	50.40	
FLRS DL	2 X 0.6 X 1.75	=	2.10	
FLRS IL	2 X 1.5 X 1.75	=		5.25
ROOF DL	2 X 1	=	2.00	
ROOF IL	2 X 0.75	=	_____	1.50
			54.50KN/m	6.75KN/m

WALL B

WALL	3.5 X 3.3	=	11.55KN/m	
ROOF DL	1.75 X 0.8	=	1.40	
ROOF IL	1.75 X 0.75	=	____	1.30
			12.95KN/m	1.30KN/m

WALL C

WALL	3.5 X 3.3 X 80%	=	9.5KN/m	

WALL D

WALL	3.5 X 3.3 X 80%	=	9.25KN/m	
ROOF DL	1.75 X 0.8	=	1.40	
ROOF IL	1.75 X 0.75	=	____	1.30
			12.95KN/m	1.30KN/m

WALL E

WALL	7.5 X 4.6 X 70%	=	24.15	
ROOF	3 X 1	=	3.00	
ROOF	3 X 0.75	=	_____	2.25
			27.15KN/m	2.25KN/m

WALL F

WALL	10.5 X 4.80	=	50.40	
FLRS DL	2 X 0.6 X 2.25	=	2.70	
FLRS IL	2 X 1.5 X 2.25	=		6.75
ROOF DL	2 X 1	=	2.00	

ROOF IL	2 X 0.75	=	_____	1.50
			55.10KN/m	8.25KN/m
CHIMNEY BREASTS				
MASONRY	2.4 X 1.25 X 12.5	=	37.50KN/m	
WALL G				
WALL	2.6 X 6.5	=	16.90	
STUD	0.6 X 2.5	=	1.50	
FLRS DL	4 X 0.6 X 2	=	4.80	
FLRS IL	4 X 1.5 X 2	=	_____	12.00
			23.20KN/m	12.00KN/m

VINCENT & RYMILL LAKESIDE COUNTRY CLUB FRIMLEY GREEN SURREY GU16 6PT	Project 207 GOLDHURST TERRACE NW8				Job Ref. 15 F02	
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WALL K

WALL	2.6 X 6.5	=	16.90	
STUD	0.6 X 2.5	=	1.50	
FLRS DL	3 X 0.6 X 2	=	3.60	
FLRS IL	3 X 1.5 X 2	=	_____	9.00
			22.00KN/m	9.00KN/m

WALL H

WALL	10.5 X 4.80	=	50.40	
FLRS DL	2 X 0.6 X 1	=	1.20	
FLRS IL	2 X 1.5 X 1	=		3.00
ROOF DL	2 X 1	=	2.00	
ROOF IL	2 X 0.75	=	_____	1.50
			53.6KN/m	4.50KN/m

WALL J

WALL	7 X 4.6 X 70%	=	22.50KN/m	
ROOF DL	3 X 1	=	3.00	
ROOF IL	3 X 0.75	=	_____	2.25
			25.50KN/m	2.25KN/m

WALLS AND BASES

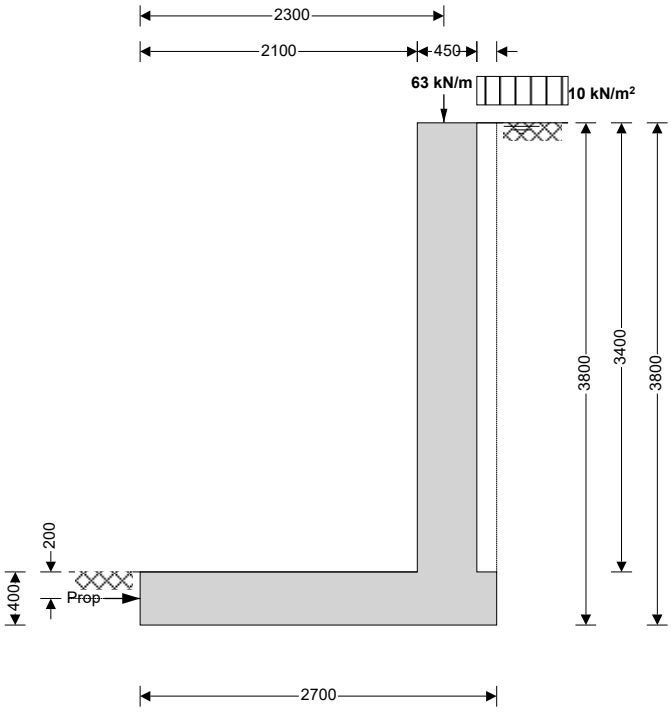
PARTY WALLS – WALLS A AND F

DL = 55.1KN/m, IL = 8.25KN/m

RETAINING WALL ANALYSIS & DESIGN (BS8002)

RETAINING WALL ANALYSIS (BS 8002:1994)

TEDDS calculation version 1.2.01.06



Wall details

Retaining wall type	**Cantilever**		
Height of wall stem	h_{stem} = **3400** mm	Wall stem thickness	t_{wall} = **450** mm
Length of toe	l_{toe} = **2100** mm	Length of heel	l_{heel} = **150** mm
Overall length of base	l_{base} = **2700** mm	Base thickness	t_{base} = **400** mm
Height of retaining wall	h_{wall} = **3800** mm		
Depth of downstand	d_{ds} = **0** mm	Thickness of downstand	t_{ds} = **400** mm
Position of downstand	l_{ds} = **1100** mm		
Depth of cover in front of wall	d_{cover} = **0** mm	Unplanned excavation depth	d_{exc} = **200** mm
Height of ground water	h_{water} = **3800** mm	Density of water	γ_{water} = 9.81 kN/m^3
Density of wall construction	γ_{wall} = **23.6** kN/m^3	Density of base construction	γ_{base} = **23.6** kN/m^3
Angle of soil surface	β = **0.0** deg	Effective height at back of wall	h_{eff} = **3800** mm
Mobilisation factor	M = **1.5**		
Moist density	γ_m = **18.0** kN/m^3	Saturated density	γ_s = **21.0** kN/m^3
Design shear strength	ϕ' = **24.2** deg	Angle of wall friction	δ = **0.0** deg
Design shear strength	ϕ'_b = **24.2** deg	Design base friction	δ_b = **18.6** deg
Moist density	γ_{mb} = **18.0** kN/m^3	Allowable bearing	$P_{bearing}$ = **150** kN/m^2

VINCENT & RYMILL LAKESIDE COUNTRY CLUB FRIMLEY GREEN SURREY GU16 6PT	Project 207 GOLDHURST TERRACE NW8				Job Ref. 15 F02	
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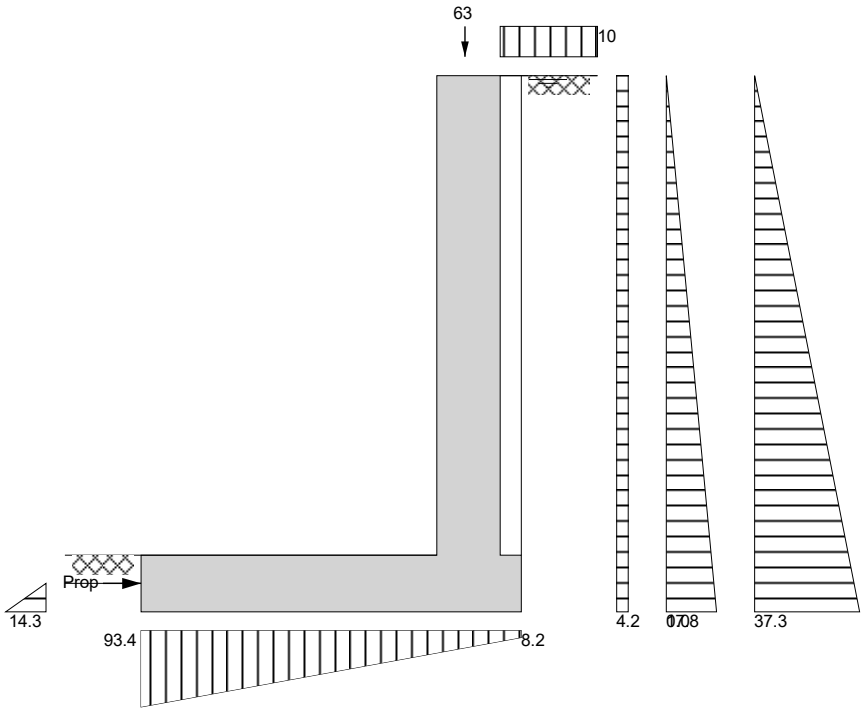
Using Coulomb theory

Active pressure	K_a = **0.419**	Passive pressure	K_p = **4.187**
At-rest pressure	K_0 = **0.590**		

Loading details

Surcharge load	Surcharge = **10.0** kN/m^2		
Vertical dead load	W_{dead} = **55.1** kN/m	Vertical live load	W_{live} = **8.3** kN/m
Horizontal dead load	F_{dead} = **0.0** kN/m	Horizontal live load	F_{live} = **0.0** kN/m
Position of vertical load	l_{load} = **2300** mm	Height of horizontal load	h_{load} = **0** mm



Loads shown in kN/m, pressures shown in kN/m^2

Calculate propping force

Propping force F_{prop} = **76.2** kN/m

Check bearing pressure

Total vertical reaction	R = **137.2** kN/m	Distance to reaction	x_{bar} = **972** mm
Eccentricity of reaction	e = **378** mm		

Reaction acts within middle third of base

Bearing pressure at toe	p_{toe} = **93.4** kN/m^2	Bearing pressure at heel	p_{heel} = **8.2** kN/m^2

PASS - Maximum bearing pressure is less than allowable bearing pressure

RETAINING WALL DESIGN (BS 8002:1994)

TEDDS calculation version 1.2.01.06

Ultimate limit state load factors

Dead load factor γ_{f_d} = **1.4** Live load factor γ_{f_l} = **1.6**

Earth pressure factor γ_{f_e} = **1.4**

Calculate propping force

Propping force F_{prop} = **76.2** kN/m

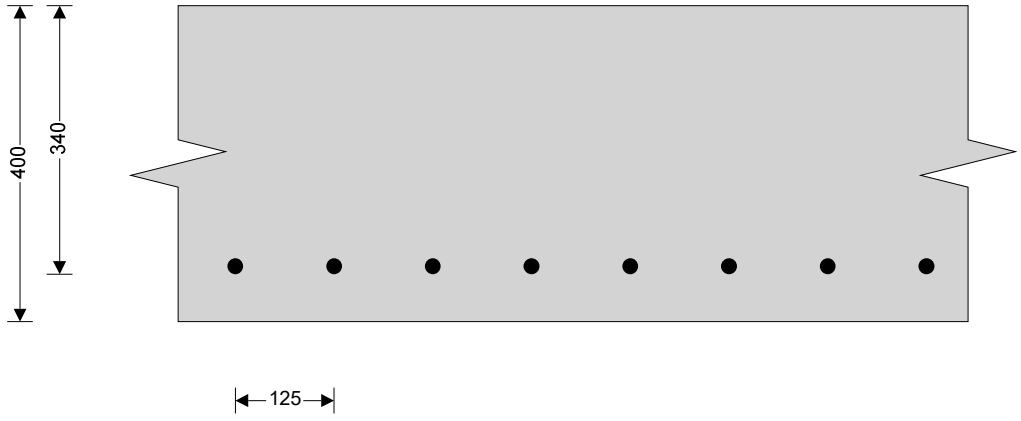
Design of reinforced concrete retaining wall toe (BS 8002:1994)

Material properties

Strength of concrete f_{cu} = **40** N/mm^2 Strength of reinforcement f_y = **500** N/mm^2

Base details

Minimum reinforcement k = **0.13** % Cover in toe c_{toe} = **50** mm



Design of retaining wall toe

Shear at heel V_{toe} = **166.0** kN/m Moment at heel M_{toe} = **285.2** kNm/m

Compression reinforcement is not required

Check toe in bending

Reinforcement provided **20 mm dia.bars @ 125 mm centres**

Area required $A_{s\_toe\_req}$ = **2082.3** mm^2/m Area provided $A_{s\_toe\_prov}$ = **2513** mm^2/m

PASS - Reinforcement provided at the retaining wall toe is adequate

Check shear resistance at toe

Design shear stress v_{toe} = **0.488** N/mm^2 Allowable shear stress v_{adm} = **5.000** N/mm^2

PASS - Design shear stress is less than maximum shear stress

Concrete shear stress v_{c_toe} = **0.696** N/mm^2

$v_{toe} < v_{c\_toe}$ - No shear reinforcement required

Design of reinforced concrete retaining wall heel (BS 8002:1994)

Material properties

Strength of concrete f_{cu} = **40** N/mm^2 Strength of reinforcement f_y = **500** N/mm^2

Base details

Minimum reinforcement k = **0.13** % Cover in heel c_{heel} = **50** mm

VINCENT & RYMILL LAKESIDE COUNTRY CLUB FRIMLEY GREEN SURREY GU16 6PT	Project 207 GOLDHURST TERRACE NW8				Job Ref. 15 F02	
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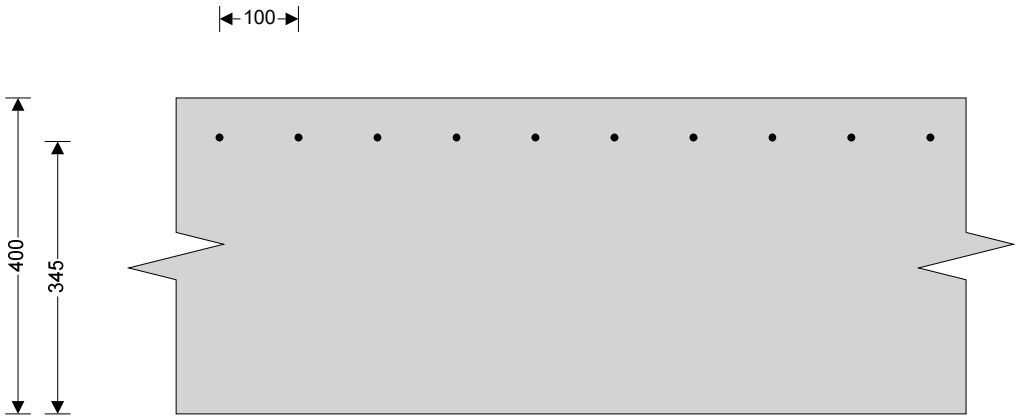


Design of retaining wall heel

Shear at heel V_{heel} = **19.4** kN/m Moment at heel M_{heel} = **6.1** kNm/m

Compression reinforcement is not required

Check heel in bending

Reinforcement provided **B785 mesh**

Area required $A_{s\_heel\_req}$ = **520.0** mm²/m Area provided $A_{s\_heel\_prov}$ = **785** mm²/m

PASS - Reinforcement provided at the retaining wall heel is adequate

Check shear resistance at heel

Design shear stress v_{heel} = **0.056** N/mm² Allowable shear stress v_{adm} = **5.000** N/mm²

PASS - Design shear stress is less than maximum shear stress

Concrete shear stress v_{c_heel} = **0.468** N/mm²

$v_{heel} < v_{c\_heel}$ - No shear reinforcement required

<u>Design of reinforced concrete retaining wall stem (BS 8002:1994)</u>

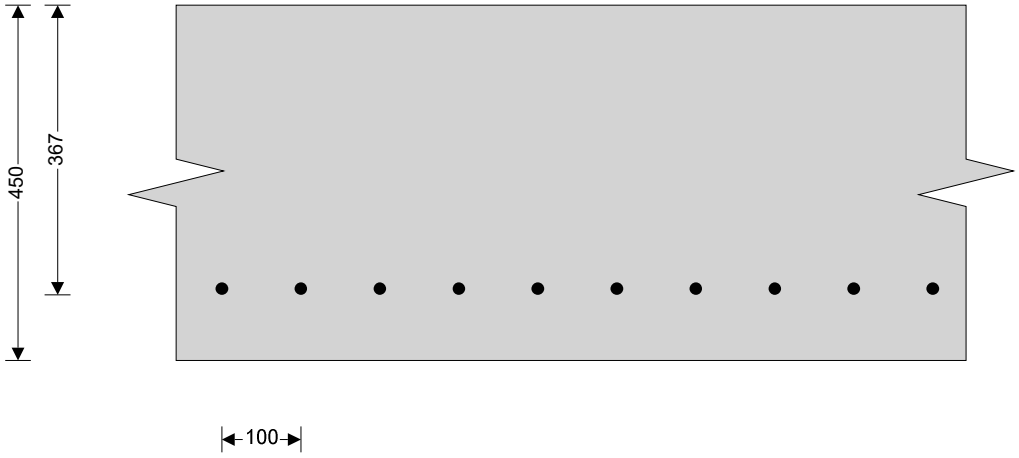
Material properties

Strength of concrete f_{cu} = **40** N/mm² Strength of reinforcement f_y = **500** N/mm²

Wall details

Minimum reinforcement k = **0.13** %

Cover in stem c_{stem} = **75** mm Cover in wall c_{wall} = **50** mm



Design of retaining wall stem

Shear at base of stem V_{stem} = **25.2** kN/m Moment at base of stem M_{stem} = **211.5** kNm/m

Compression reinforcement is not required

Check wall stem in bending

Reinforcement provided **16 mm dia.bars @ 100 mm centres**

Area required $A_{s\_stem\_req}$ = **1394.6** mm^2/m Area provided $A_{s\_stem\_prov}$ = **2011** mm^2/m

PASS - Reinforcement provided at the retaining wall stem is adequate

Check shear resistance at wall stem

Design shear stress v_{stem} = **0.069** N/mm^2 Allowable shear stress v_{adm} = **5.000** N/mm^2

PASS - Design shear stress is less than maximum shear stress

Concrete shear stress v_{c_stem} = **0.618** N/mm^2

$v_{stem} < v_{c\_stem}$ - No shear reinforcement required

Check retaining wall deflection

Max span/depth ratio $ratio_{max}$ = **9.65** Actual span/depth ratio $ratio_{act}$ = **9.26**

PASS - Span to depth ratio is acceptable

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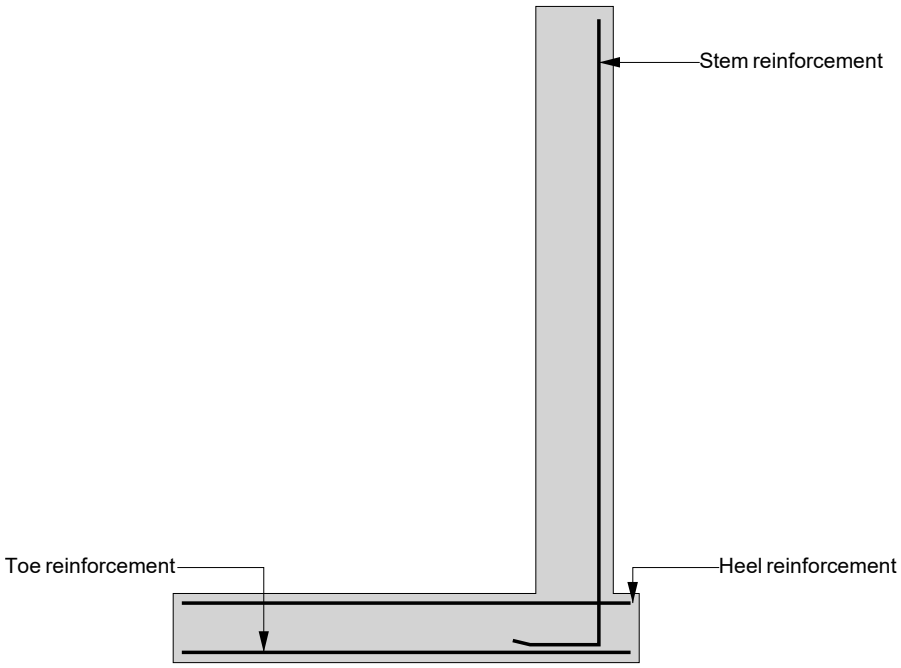
Indicative retaining wall reinforcement diagram



Toe bars - 20 mm dia.@ 125 mm centres - (2513 mm^2/m)

Heel mesh - B785 - (785 mm^2/m)

Stem bars - 16 mm dia.@ 100 mm centres - (2011 mm^2/m)

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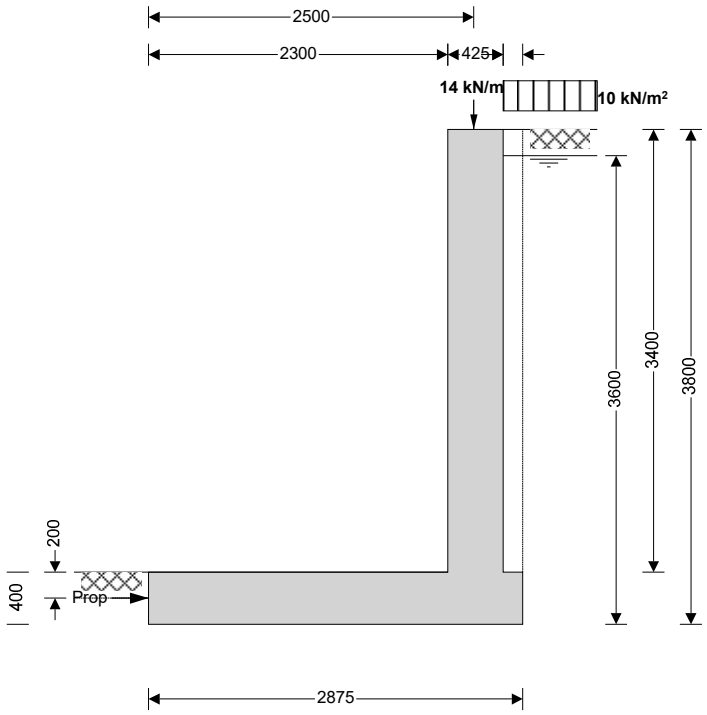
WALLS B

RETAINING WALL ANALYSIS & DESIGN (BS8002)

RETAINING WALL ANALYSIS (BS 8002:1994)

TEDDS calculation version 1.2.01.06



Wall details

Retaining wall type	**Cantilever**		
Height of wall stem	h_{stem} = **3400** mm	Wall stem thickness	t_{wall} = **425** mm
Length of toe	l_{toe} = **2300** mm	Length of heel	l_{heel} = **150** mm
Overall length of base	l_{base} = **2875** mm	Base thickness	t_{base} = **400** mm
Height of retaining wall	h_{wall} = **3800** mm		
Depth of downstand	d_{ds} = **0** mm	Thickness of downstand	t_{ds} = **400** mm
Position of downstand	l_{ds} = **1900** mm		
Depth of cover in front of wall	d_{cover} = **0** mm	Unplanned excavation depth	d_{exc} = **200** mm
Height of ground water	h_{water} = **3600** mm	Density of water	γ_{water} = 9.81 kN/m^3
Density of wall construction	γ_{wall} = **23.6** kN/m^3	Density of base construction	γ_{base} = **23.6** kN/m^3
Angle of soil surface	β = **0.0** deg	Effective height at back of wall	h_{eff} = **3800** mm
Mobilisation factor	M = **1.5**		
Moist density	γ_m = **18.0** kN/m^3	Saturated density	γ_s = **21.0** kN/m^3
Design shear strength	ϕ' = **24.2** deg	Angle of wall friction	δ = **0.0** deg
Design shear strength	ϕ'_b = **24.2** deg	Design base friction	δ_b = **18.6** deg
Moist density	γ_{mb} = **18.0** kN/m^3	Allowable bearing	$P_{bearing}$ = **150** kN/m^2

Using Coulomb theory

Active pressure	K_a =**0.419**	Passive pressure	K_p = **4.187**
At-rest pressure	K_0 = **0.590**		

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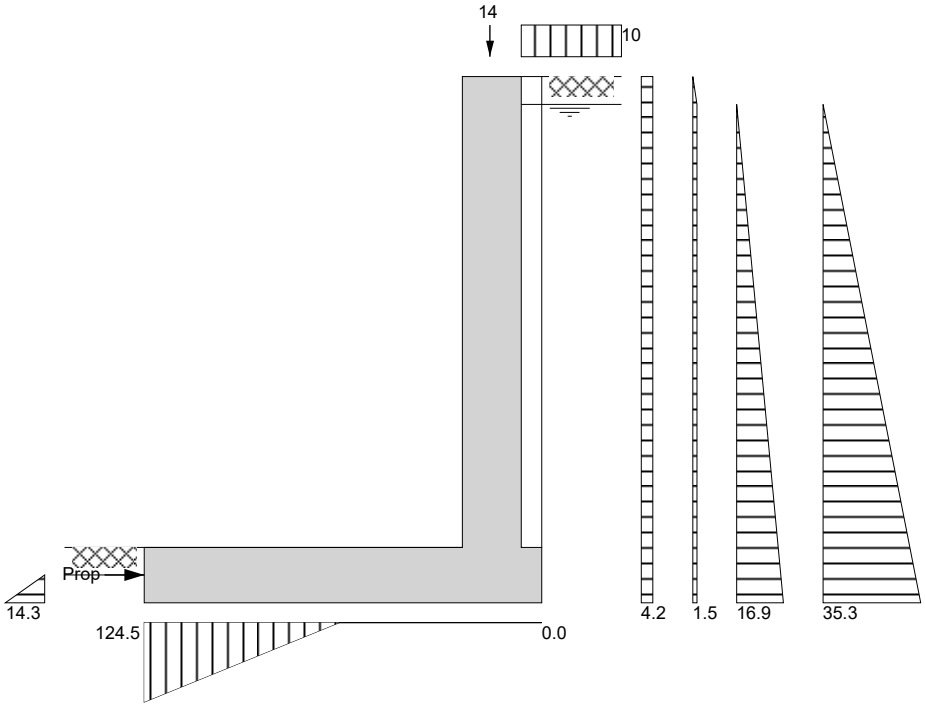
Loading details

Surcharge load	Surcharge = **10.0** kN/m^2		
Vertical dead load	W_{dead} = **13.0** kN/m	Vertical live load	W_{live} = **1.3** kN/m
Horizontal dead load	F_{dead} = **0.0** kN/m	Horizontal live load	F_{live} = **0.0** kN/m
Position of vertical load	l_{load} = **2500** mm	Height of horizontal load	h_{load} = **0** mm



Loads shown in kN/m, pressures shown in kN/m^2

Calculate propping force

Propping force F_{prop} = **85.4** kN/m

Check bearing pressure

Total vertical reaction	R = **87.7** kN/m	Distance to reaction	x_{bar} = **469** mm
Eccentricity of reaction	e = **968** mm		

Reaction acts outside middle third of base

Bearing pressure at toe	p_{toe} = **124.5** kN/m^2	Bearing pressure at heel	p_{heel} = **0.0** kN/m^2

PASS - Maximum bearing pressure is less than allowable bearing pressure

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RETAINING WALL DESIGN (BS 8002:1994)

TEDDS calculation version 1.2.01.06

Ultimate limit state load factors

Dead load factor γ_{f_d} = **1.4** Live load factor γ_{f_l} = **1.6**

Earth pressure factor γ_{f_e} = **1.4**

Calculate propping force

Propping force F_{prop} = **85.4** kN/m

Design of reinforced concrete retaining wall toe (BS 8002:1994)

Material properties

Strength of concrete f_{cu} = **40** N/mm^2 Strength of reinforcement f_y = **500** N/mm^2

Base details

Minimum reinforcement k = **0.13** % Cover in toe c_{toe} = **50** mm

Design of retaining wall toe

Shear at heel V_{toe} = **92.9** kN/m Moment at heel M_{toe} = **261.6** kNm/m

Compression reinforcement is not required

Check toe in bending

Reinforcement provided **20 mm dia.bars @ 125 mm centres**

Area required $A_{s\_toe\_req}$ = **1896.8** mm^2/m Area provided $A_{s\_toe\_prov}$ = **2513** mm^2/m

PASS - Reinforcement provided at the retaining wall toe is adequate

Check shear resistance at toe

Design shear stress v_{toe} = **0.273** N/mm^2 Allowable shear stress v_{adm} = **5.000** N/mm^2

PASS - Design shear stress is less than maximum shear stress

Concrete shear stress v_{c_toe} = **0.696** N/mm^2

$v_{toe} < v_{c\_toe}$ - No shear reinforcement required

Design of reinforced concrete retaining wall heel (BS 8002:1994)

Material properties

Strength of concrete f_{cu} = **40** N/mm^2 Strength of reinforcement f_y = **500** N/mm^2

Base details

Minimum reinforcement k = **0.13** % Cover in heel c_{heel} = **50** mm

Design of retaining wall heel

Shear at heel V_{heel} = **19.3** kN/m Moment at heel M_{heel} = **5.8** kNm/m

Compression reinforcement is not required

Check heel in bending

Reinforcement provided **B785 mesh**

Area required $A_{s\_heel\_req}$ = **520.0** mm^2/m Area provided $A_{s\_heel\_prov}$ = **785** mm^2/m

PASS - Reinforcement provided at the retaining wall heel is adequate

Check shear resistance at heel

Design shear stress v_{heel} = **0.056** N/mm^2 Allowable shear stress v_{adm} = **5.000** N/mm^2

PASS - Design shear stress is less than maximum shear stress

Concrete shear stress v_{c_heel} = **0.468** N/mm^2

$v_{heel} < v_{c\_heel}$ - No shear reinforcement required

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Design of reinforced concrete retaining wall stem (BS 8002:1994)

Material properties

Strength of concrete f_{cu} = **40** N/mm^2 Strength of reinforcement f_y = **500** N/mm^2

Wall details

Minimum reinforcement k = **0.13** %

Cover in stem c_{stem} = **75** mm Cover in wall c_{wall} = **50** mm

Design of retaining wall stem

Shear at base of stem V_{stem} = **5.8** kN/m Moment at base of stem M_{stem} = **202.7** kNm/m

Compression reinforcement is not required

Check wall stem in bending

Reinforcement provided **16 mm dia.bars @ 100 mm centres**

Area required $A_{s\_stem\_req}$ = **1435.6** mm^2/m Area provided $A_{s\_stem\_prov}$ = **2011** mm^2/m

PASS - Reinforcement provided at the retaining wall stem is adequate

Check shear resistance at wall stem

Design shear stress v_{stem} = **0.017** N/mm^2 Allowable shear stress v_{adm} = **5.000** N/mm^2

PASS - Design shear stress is less than maximum shear stress

Concrete shear stress v_{c_stem} = **0.644** N/mm^2

$v_{stem} < v_{c\_stem}$ - No shear reinforcement required

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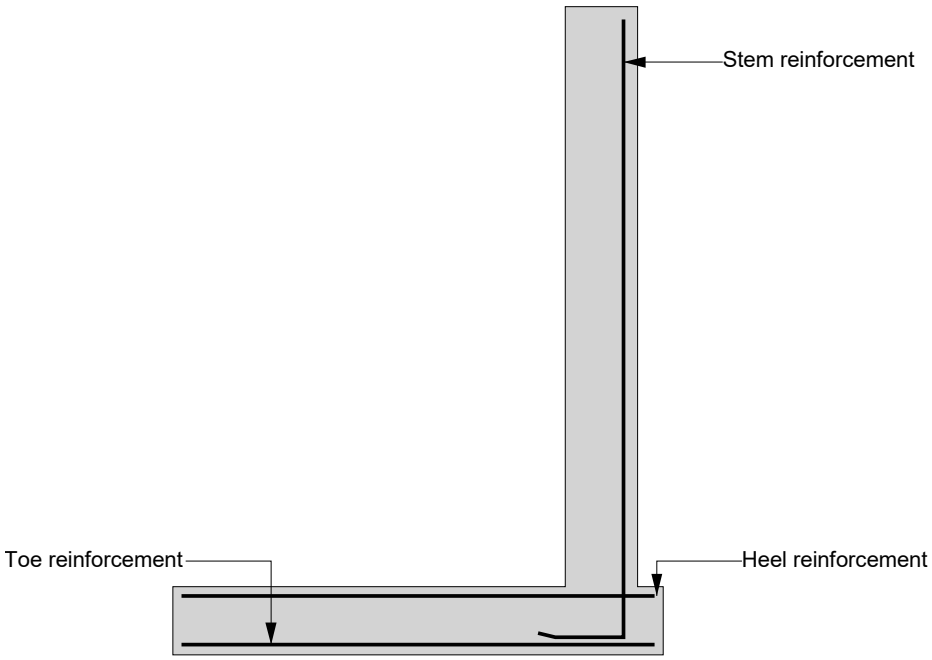
Indicative retaining wall reinforcement diagram



Toe bars - 20 mm dia.@ 125 mm centres - (2513 mm^2/m)

Heel mesh - B785 - (785 mm^2/m)

Stem bars - 16 mm dia.@ 100 mm centres - (2011 mm^2/m)

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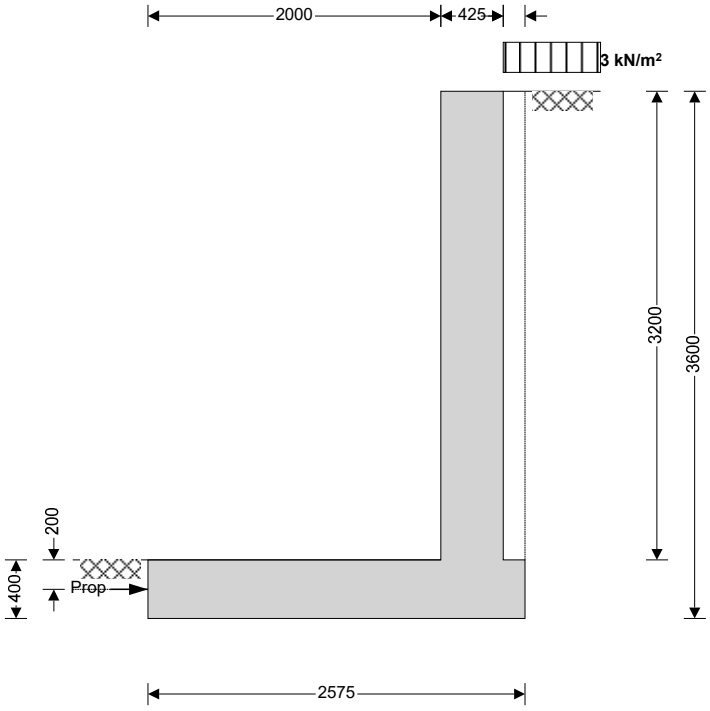
TYPICAL LIGHT WELL WALL

RETAINING WALL ANALYSIS & DESIGN (BS8002)

RETAINING WALL ANALYSIS (BS 8002:1994)

TEDDS calculation version 1.2.01.06



Wall details

Retaining wall type	**Cantilever**		
Height of wall stem	h_{stem} = **3200** mm	Wall stem thickness	t_{wall} = **425** mm
Length of toe	l_{toe} = **2000** mm	Length of heel	l_{heel} = **150** mm
Overall length of base	l_{base} = **2575** mm	Base thickness	t_{base} = **400** mm
Height of retaining wall	h_{wall} = **3600** mm		
Depth of downstand	d_{ds} = **0** mm	Thickness of downstand	t_{ds} = **400** mm
Position of downstand	l_{ds} = **1900** mm		
Depth of cover in front of wall	d_{cover} = **0** mm	Unplanned excavation depth	d_{exc} = **200** mm
Height of ground water	h_{water} = **0** mm	Density of water	γ_{water} = 9.81 kN/m^3
Density of wall construction	γ_{wall} = **23.6** kN/m^3	Density of base construction	γ_{base} = **23.6** kN/m^3
Angle of soil surface	β = **0.0** deg	Effective height at back of wall	h_{eff} = **3600** mm
Mobilisation factor	M = **1.5**		
Moist density	γ_m = **18.0** kN/m^3	Saturated density	γ_s = **21.0** kN/m^3
Design shear strength	ϕ' = **24.2** deg	Angle of wall friction	δ = **0.0** deg
Design shear strength	ϕ'_b = **24.2** deg	Design base friction	δ_b = **18.6** deg
Moist density	γ_{mb} = **18.0** kN/m^3	Allowable bearing	$P_{bearing}$ = **150** kN/m^2

Using Coulomb theory

Active pressure	K_a =**0.419**	Passive pressure	K_p = **4.187**
At-rest pressure	K_0 = **0.590**		

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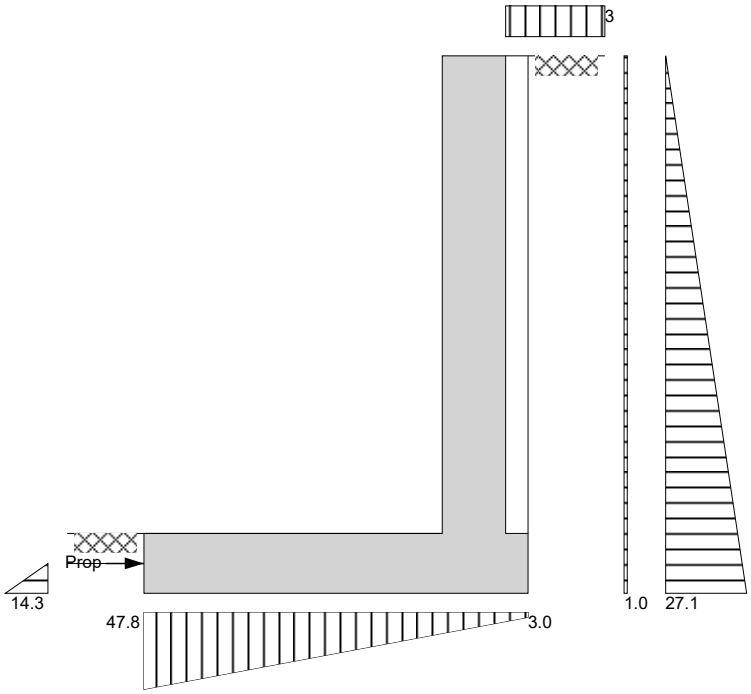
Loading details

Surcharge load	Surcharge = **2.5** kN/m^2		
Vertical dead load	W_{dead} = **0.0** kN/m	Vertical live load	W_{live} = **0.0** kN/m
Horizontal dead load	F_{dead} = **0.0** kN/m	Horizontal live load	F_{live} = **0.0** kN/m
Position of vertical load	l_{load} = **0** mm	Height of horizontal load	h_{load} = **0** mm



Loads shown in kN/m, pressures shown in kN/m^2

Calculate propping force

Propping force F_{prop} = **29.3** kN/m

Check bearing pressure

Total vertical reaction	R = **65.4** kN/m	Distance to reaction	x_{bar} = **909** mm
Eccentricity of reaction	e = **378** mm		

Reaction acts within middle third of base

Bearing pressure at toe	p_{toe} = **47.8** kN/m^2	Bearing pressure at heel	p_{heel} = **3.0** kN/m^2

PASS - Maximum bearing pressure is less than allowable bearing pressure

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RETAINING WALL DESIGN (BS 8002:1994)

TEDDS calculation version 1.2.01.06

Ultimate limit state load factors

Dead load factor γ_{f_d} = **1.4** Live load factor γ_{f_l} = **1.6**

Earth pressure factor γ_{f_e} = **1.4**

Calculate propping force

Propping force F_{prop} = **29.3** kN/m

Design of reinforced concrete retaining wall toe (BS 8002:1994)

Material properties

Strength of concrete f_{cu} = **40** N/mm^2 Strength of reinforcement f_y = **500** N/mm^2

Base details

Minimum reinforcement k = **0.13** % Cover in toe c_{toe} = **50** mm

Design of retaining wall toe

Shear at heel V_{toe} = **65.2** kN/m Moment at heel M_{toe} = **126.4** kNm/m

Compression reinforcement is not required

Check toe in bending

Reinforcement provided **20 mm dia.bars @ 125 mm centres**

Area required $A_{s\_toe\_req}$ = **899.6** mm^2/m Area provided $A_{s\_toe\_prov}$ = **2513** mm^2/m

PASS - Reinforcement provided at the retaining wall toe is adequate

Check shear resistance at toe

Design shear stress v_{toe} = **0.192** N/mm^2 Allowable shear stress v_{adm} = **5.000** N/mm^2

PASS - Design shear stress is less than maximum shear stress

Concrete shear stress v_{c_toe} = **0.696** N/mm^2

$v_{toe} < v_{c\_toe}$ - No shear reinforcement required

Design of reinforced concrete retaining wall heel (BS 8002:1994)

Material properties

Strength of concrete f_{cu} = **40** N/mm^2 Strength of reinforcement f_y = **500** N/mm^2

Base details

Minimum reinforcement k = **0.13** % Cover in heel c_{heel} = **50** mm

Design of retaining wall heel

Shear at heel V_{heel} = **14.7** kN/m Moment at heel M_{heel} = **4.5** kNm/m

Compression reinforcement is not required

Check heel in bending

Reinforcement provided **12 mm dia.bars @ 150 mm centres**

Area required $A_{s\_heel\_req}$ = **520.0** mm^2/m Area provided $A_{s\_heel\_prov}$ = **754** mm^2/m

PASS - Reinforcement provided at the retaining wall heel is adequate

Check shear resistance at heel

Design shear stress v_{heel} = **0.043** N/mm^2 Allowable shear stress v_{adm} = **5.000** N/mm^2

PASS - Design shear stress is less than maximum shear stress

Concrete shear stress v_{c_heel} = **0.463** N/mm^2

$v_{heel} < v_{c\_heel}$ - No shear reinforcement required

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Design of reinforced concrete retaining wall stem (BS 8002:1994)

Material properties

Strength of concrete f_{cu} = **40** N/mm^2 Strength of reinforcement f_y = **500** N/mm^2

Wall details

Minimum reinforcement k = **0.13** %

Cover in stem c_{stem} = **75** mm Cover in wall c_{wall} = **50** mm

Design of retaining wall stem

Shear at base of stem V_{stem} = **11.5** kN/m Moment at base of stem M_{stem} = **110.0** kNm/m

Compression reinforcement is not required

Check wall stem in bending

Reinforcement provided **20 mm dia.bars @ 125 mm centres**

Area required $A_{s\_stem\_req}$ = **783.1** mm^2/m Area provided $A_{s\_stem\_prov}$ = **2513** mm^2/m

PASS - Reinforcement provided at the retaining wall stem is adequate

Check shear resistance at wall stem

Design shear stress v_{stem} = **0.034** N/mm^2 Allowable shear stress v_{adm} = **5.000** N/mm^2

PASS - Design shear stress is less than maximum shear stress

Concrete shear stress v_{c_stem} = **0.696** N/mm^2

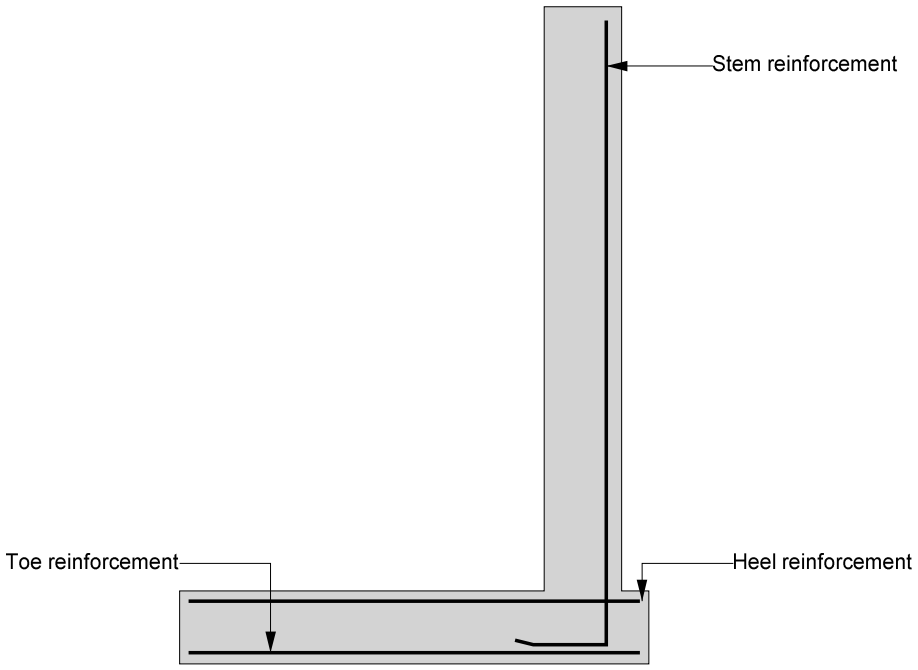
$v_{stem} < v_{c\_stem}$ - No shear reinforcement required

Check retaining wall deflection

Max span/depth ratio $ratio_{max}$ = **14.00** Actual span/depth ratio $ratio_{act}$ = **9.41**

PASS - Span to depth ratio is acceptable

Indicative retaining wall reinforcement diagram



Toe bars - 20 mm dia.@ 125 mm centres - (2513 mm^2/m)
Heel bars - 12 mm dia.@ 150 mm centres - (754 mm^2/m)
Stem bars - 20 mm dia.@ 125 mm centres - (2513 mm^2/m)

BASE SLAB

CHECK UPLIFT FROM WATER PRESSURE
NETT PRESSURE AT ULS = 1.4((10 X 3.75) –(6.8)) = 43KN/m^2

B.M. MAX = 43 X 2.5^2 /8 = 33.5KN.m

RC SLAB DESIGN (BS8110)

RC SLAB DESIGN (BS8110:PART1:1997)

TEDDS calculation version 1.0.04

CONCRETE SLAB DESIGN (CL 3.5.3 & 4)

SIMPLE ONE WAY SPANNING SLAB DEFINITION

Overall depth of slab h = **200** mm

Cover to tension reinforcement resisting sagging c_b = **35** mm

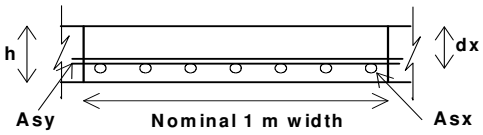
Trial bar diameter D_{tryx} = **10** mm

Depth to tension steel (resisting sagging)

$d_x = h - c_b - D_{tryx}/2$ = **160** mm

Characteristic strength of reinforcement f_y = **500** N/mm^2

Characteristic strength of concrete f_{cu} = **35** N/mm^2



One-way spanning slab
(simple)

ONE WAY SPANNING SLAB (CL 3.5.4)

MAXIMUM DESIGN MOMENTS IN SPAN

Design sagging moment (per m width of slab) m_{sx} = **33.0** kNm/m

CONCRETE SLAB DESIGN – SAGGING – OUTER LAYER OF STEEL (CL 3.5.4)

Design sagging moment (per m width of slab) m_{sx} = **33.0** kNm/m

Moment Redistribution Factor β_{bx} = **1.0**

Area of reinforcement required

$K_x = abs(m_{sx}) / (d_x^2 \times f_{cu})$ = **0.037**

$K'_x = min (0.156 , (0.402 \times (\beta_{bx} - 0.4)) - (0.18 \times (\beta_{bx} - 0.4)^2))$ = **0.156**

Outer compression steel not required to resist sagging

One-way Spanning Slab requiring tension steel only (sagging) - mesh

$z_x = min ((0.95 \times d_x), (d_x \times (0.5 + \sqrt{(0.25 - K_x/0.9)})))$ = **152** mm

Neutral axis depth $x_x = (d_x - z_x) / 0.45$ = **18** mm

Area of tension steel required

$A_{sx\_req} = abs(m_{sx}) / (1/\gamma_{ms} \times f_y \times z_x)$ = **499** mm^2/m

Tension steel

Use B785 Mesh

$A_{sx\_prov} = A_{sl}$ = **785** mm^2/m $A_{sy\_prov} = A_{st}$ = **252** mm^2/m

$D_x = d_{sl}$ = **10** mm $D_y = d_{st}$ = **8** mm

Area of tension steel provided sufficient to resist sagging

Check min and max areas of steel resisting sagging

Total area of concrete $A_c = h$ = **200000** mm^2/m

Minimum % reinforcement k = **0.13** %

$A_{st\_min} = k \times A_c$ = **260** mm^2/m

$A_{st\_max} = 4\ \% \times A_c$ = **8000** mm^2/m

Steel defined:

Outer steel resisting sagging A_{sx_prov} = **785** mm^2/m

Area of outer steel provided (sagging) OK

Inner steel resisting sagging A_{sy_prov} = **252** mm^2/m

Less than min area of inner steel (sagging) FAIL

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CONCRETE SLAB DEFLECTION CHECK (CL 3.5.7)

Slab span length l_x = **2.500** m

Design ultimate moment in shorter span per m width m_{sx} = **33** kNm/m

Depth to outer tension steel d_x = **160** mm

Tension steel

Area of outer tension reinforcement provided A_{sx_prov} = **785** mm^2/m

Area of tension reinforcement required A_{sx_req} = **499** mm^2/m

Moment Redistribution Factor β_{bx} = **1.00**

Modification Factors

Basic span / effective depth ratio (Table 3.9) $ratio_{span\_depth}$ = **20**

The modification factor for spans in excess of 10m (ref. cl 3.4.6.4) has not been included.

$f_s = 2 \times f_y \times A_{sx\_req} / (3 \times A_{sx\_prov} \times \beta_{bx})$ = **212.0** N/mm^2

$factor_{tens} = \min (2 , 0.55 + (477\ N/mm^2 - f_s) / (120 \times (0.9\ N/mm^2 + m_{sx} / d_x^2)))$ = **1.559**

Calculate Maximum Span

This is a simplified approach and further attention should be given where special circumstances exist. Refer to clauses 3.4.6.4 and 3.4.6.7.

Maximum span $l_{max} = ratio_{span\_depth} \times factor_{tens} \times d_x$ = **4.99** m

Check the actual beam span

Actual span/depth ratio l_x / d_x = **15.63**

Span depth limit $ratio_{span\_depth} \times factor_{tens}$ = **31.17**

Span/Depth ratio check satisfied

CHECK OF NOMINAL COVER (SAGGING) – (BS8110:PT 1, TABLE 3.4)

Slab thickness h = **200** mm

Effective depth to bottom outer tension reinforcement d_x = **160.0** mm

Diameter of tension reinforcement D_x = **10** mm

Diameter of links L_{diax} = **0** mm

Cover to outer tension reinforcement

$c_{tenx} = h - d_x - D_x / 2$ = **35.0** mm

Nominal cover to links steel

$c_{nomx} = c_{tenx} - L_{diax}$ = **35.0** mm

Permissable minimum nominal cover to all reinforcement (Table 3.4)

c_{min} = **35** mm

Cover over steel resisting sagging OK

2 LAYERS A393 TOP 1 LAYER BOTTOM

FT ARCHITECTS

Marian Twenefoo <marian@ftarchitects.co.uk>

IRef:1013254220 RE: 207 Goldhurst Terrace

1 message

DEVELOPER.SERVICES@thameswater.co.uk 24 September 2015 at 08:53
<DEVELOPER.SERVICES@thameswater.co.uk>
To: marian@ftarchitects.co.uk
Cc: louise@ftarchitects.co.uk

Dear Marian,

Thank you for your email.

As you are 8m from our existing asset, we do not envisage any problems here. When you submit your build over application, please submit a method statement with regards to excavation. You will need to account for a maximum peak particle velocity rating of 10mm/s.

Best regards

Shaun Picart

Thames Water - Development Engineer

0800 009 3921

Original Text

From: marian@ftarchitects.co.uk
To: developer.services@thameswater.co.uk
CC: louise@ftarchitects.co.uk
Sent: 17.09.15 10:32:51
Subject: 207 Goldhurst Terrace

Dear Sir/Madam,

I am writing further from a phone conversation with a Thames Water development representative, regarding the storm overflow drain 11m beneath the street level of Goldhurst Terrace measuring 2.59m in diameter.

Please see attached, the plans for a proposed basement excavation at the site 207 Goldhurst Terrace, NW3 3ER.

I was advised to forward the proposed plans to enquire whether the storm relief drain will be affected by the works.
The proposed work will be 8m away from the drain upon completion.

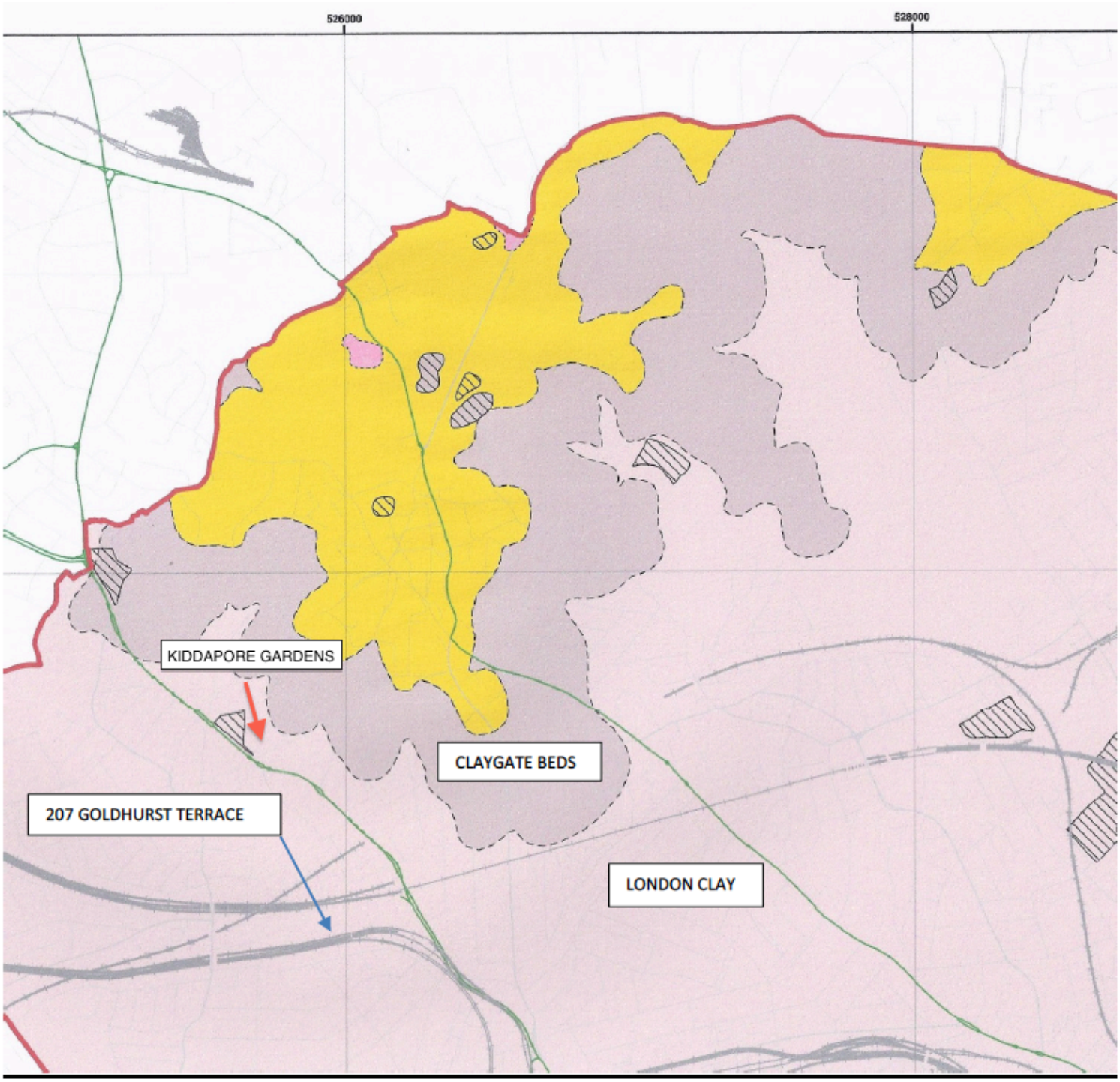
Kind regards

Marian Twenefoo

FT Architects Ltd

T 020 7953 0388

www.ftarchitects.co.uk


526000
528000
KIDDAPORE GARDENS
CLAYGATE BEDS
207 GOLDHURST TERRACE
LONDON CLAY

RE: FW: 207 Goldhurst Terrace
Liz Brown to: Stephen Ash 10/02/2016 11:22

Hi Steve

Can you let me know when you think you could have a look at this?

Thanks, Liz

----- Forwarded by Liz Brown/CRH on 10/02/2016 11:24 -----

From: "Gracie, Ian" <Ian.Gracie@camden.gov.uk>
To: "StephenAsh@campbellreith.com" <StephenAsh@campbellreith.com>
Cc: "camdenaudit@campbellreith.com" <camdenaudit@campbellreith.com>, "Sexton, Gavin" <gavin.sexton@camden.gov.uk>, "LizBrown@campbellreith.com" <LizBrown@campbellreith.com>
Date: 09/02/2016 09:40
Subject: RE: FW: 207 Goldhurst Terrace

Hi Stephen,

Please see attached the response regarding your email below.

Thanks,
Ian

From: StephenAsh@campbellreith.com [mailto:StephenAsh@campbellreith.com]
Sent: 26 January 2016 14:43
To: Gracie, Ian
Cc: camdenaudit@campbellreith.com; Sexton, Gavin; LizBrown@campbellreith.com
Subject: RE: FW: 207 Goldhurst Terrace

Ian

As far as I can ascertain the only new document submitted is the ground movement analysis.

The calculations and the BIA are not updated from the September review, CampbellReith audit report raised 8 specific queries which we would like to see addressed, I have copied the query schedule with additional clarification for ease of reference.

We would like to only update the audit report once all points are addressed, can you please confirm with the client if they intend to provide additional information.

Query No	Subject	Query	CR comment 26 January	stat
1	Qualifications	Clarify qualifications for ground investigation author in line with CPG4 requirements	With hindsight The reviewer of the soil investigation report is C Geol qualified so we can agree this item is closed.	clos
2	Qualifications	Demonstrate BIA author experience in ground engineering in line with CPG4 requirements	Not addressed in new documents, please provide short summary confirming authors experience in similar basement projects.	
3	Surface Water Flow	Confirm location of Thames Water relief sewer	Not addressed in new documents, please confirm location of Thames Water sewer in relation to the new basement	

4	Stability	Provide vertical and horizontal ground movement estimation	GMA provided and accepted as being reasonable	clos
5	Stability	Provide classification of potential damage to adjacent structures	Building damage assessment included within GMA does not include heave movements resulting from excavation	
6	Scoping	Provide site specific extracts from GSD figures justifying stage 1 scoping	Not addressed in new documents - he screening process described in CPG4 appears to have been followed, however the figures mentioned are not contained in the BIA to support the findings. For example the BIA contains only Figure 4 (geological map) which appears to reference a site at Kidderpore Gardens?	
7	Stability	Provide amended calculation for retaining wall	Previous calculations are presented still discrepancies with drawing: l Depth of concrete base to wall 350/400 ? l Concrete cover to stem reinft 50/75 ? l passive pressure/soil properties not as per ground investigation report recommendations	
8	Stability	Provide construction sequence plans and develop Construction Method Statement. Resolve discrepancies between BIA and CSM	Structural Design Philosophy and Construction Sequence contained within BIA - will consider this as acceptable	clos

Regards
Stephen Ash
Associate

CampbellReith
consulting engineers
Friars Bridge Court,
41-45 Blackfriars Road,
London
SE1 8NZ

Tel +44 (0)20 7340 1700
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From: "Gracie, Ian" <Ian.Gracie@camden.gov.uk>
To: "LizBrown@campbellreith.com" <LizBrown@campbellreith.com>
Cc: "camdenaudit@campbellreith.com" <camdenaudit@campbellreith.com>, "Sexton, Gavin" <gavin.sexton@camden.gov.uk>
Date: 13/01/2016 09:56
Subject: RE: FW: 207 Goldhurst Terrace

Hi Liz,

I have now received the GMA for this app. I attach that and the other initial BIA information for your review.

Thanks,
Ian

From: LizBrown@campbellreith.com [mailto:LizBrown@campbellreith.com]
Sent: 03 December 2015 15:28
To: Gracie, Ian
Subject: RE: FW: 207 Goldhurst Terrace

Thanks Ian

We have about 30 BIA audits on the go at any one time, so sometimes I'm not sure if I might have missed something!

We'll make a start on the audit when the GMA is ready.

Best wishes,
Elizabeth Brown
Partner

CampbellReith
consulting engineers

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Tel +44 (0)20 7340 1700

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From: "Gracie, Ian" <Ian.Gracie@camden.gov.uk>
To: "LizBrown@campbellreith.com" <LizBrown@campbellreith.com>
Cc: "camdenaudit@campbellreith.com" <camdenaudit@campbellreith.com>, "Sexton, Gavin" <gavin.sexton@camden.gov.uk>
Date: 03/12/2015 14:38
Subject: RE: FW: 207 Goldhurst Terrace

Hi Liz,

Yes you are right. Still awaiting the report.

Will keep you updated.

Regards,
Ian

From: LizBrown@campbellreith.com [mailto:LizBrown@campbellreith.com]
Sent: 03 December 2015 14:13
To: Gracie, Ian
Cc: camdenaudit@campbellreith.com; Sexton, Gavin
Subject: RE: FW: 207 Goldhurst Terrace

Ian

I believe we are still waiting for the GMA - can you confirm? Please accept my apologies if I am wrong about that.

Regards,
Liz Brown
Partner

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From: "Gracie, Ian" <Ian.Gracie@camden.gov.uk>
To: "LizBrown@campbellreith.com" <LizBrown@campbellreith.com>
Cc: "camdenaudit@campbellreith.com" <camdenaudit@campbellreith.com>, "Sexton, Gavin" <gavin.sexton@camden.gov.uk>
Date: 30/11/2015 11:48
Subject: RE: FW: 207 Goldhurst Terrace

Hi Liz,

The applicant is happy to proceed on that basis. Could you give me an idea of timescales?

Thanks,
Ian

From: LizBrown@campbellreith.com [mailto:LizBrown@campbellreith.com]
Sent: 20 November 2015 15:18
To: Gracie, Ian
Cc: camdenaudit@campbellreith.com; Sexton, Gavin
Subject: Re: FW: 207 Goldhurst Terrace

Ian

Thanks for this. Whilst the review of the GMA and other new information is covered by our existing fee, there will be an additional fee for reviewing the revised BIA document and updating our report. The fee is £540.

If you can confirm that is acceptable, we shall advise a date once we get the GMA.

Regards,
Elizabeth Brown
Partner

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From: "Gracie, Ian" <Ian.Gracie@camden.gov.uk>
To: "LizBrown@campbellreith.com" <LizBrown@campbellreith.com>
Cc: "camdenaudit@campbellreith.com" <camdenaudit@campbellreith.com>
Date: 18/11/2015 09:13
Subject: FW: 207 Goldhurst Terrace

Hi Liz,

The agent has responded to your queries on this case. Please see the BIA Audit responses attached. They want to know if their responses are OK or if more information is required. They have let me know that they are preparing a ground movement survey which will be sent through in the next couple of weeks. I have attached your original comments for reference.

Regards,
Ian

From: Marian Twenefoo [mailto:marian@ftarchitects.co.uk]
Sent: 09 November 2015 16:36
To: Gracie, Ian
Cc: Louise Turley; Matteo Sotti
Subject: 207 Goldhurst Terrace

Hi Ian,

Please find attached, the responses/questions regarding the 207

Goldhurst Terrace BIA Audit.

I have also attached an amended BIA document from the structural engineer for review.

We are currently in the process of appointing a geotechnical engineer to produce a ground movement assessment.

Kind regards

Marian Twenefoo

FT Architects Ltd

T 020 7953 0388

www.ftarchitects.co.uk

----- Message from "LizBrown@campbellreith.com" <LizBrown@campbellreith.com> on Mon, 5 Oct 2015 16:47:43 +0000 -----

"Gracie, Ian"
To: <Ian.Gracie@camden.gov.uk>
Subject: Audit report for 207 Goldhurst Terrace

This message has been archived.
Ian

Apologies that this wasn't with you on Friday, however, please find attached our draft audit report for 207 Goldhurst Terrace. If you refer to Section 4 and Appendix 2 you will see that we are asking for further information on the author's qualifications, the impact on the sewer network, the screening process and the potential damage that might be caused to neighbouring properties. There are also some discrepancies in the construction methodologies as described in the BIA and the CSM.

If you have any queries, please let me know.

Regards
Elizabeth Brown
Partner

----- Message from Marian Twenefoo <marian@ftarchitects.co.uk> on Thu, 4 Feb 2016 11:31:51 +0000 -----

To: "Gracie, Ian" <Ian.Gracie@camden.gov.uk>

cc: Louise Turley <louise@ftarchitects.co.uk>

Subject: Re: FW: FW: 207 Goldhurst Terrace

Hi Ian,

We have reviewed the comments made by Campbell Reith and have addressed them below:

Query 2 - The author of the BIA has added a summary of his experience to the introduction of the BIA

Query 3 - The previous response states that the storm relief tunnel is 8 metres below the basement excavation. I have attached the email from thames water for clarity.

Query 5 - The Ground movement assessment does include heave movements resulting from excavation in section 5.2

Query 6 - The Figure 4 geological map makes reference to Goldhurst Terrace not Kiddapore Gardens, the figure supports the findings.

Query 7 - The drawings have been amended, please see attached. The concrete covers in the drawings correspond with those in the calculations.

Kind regards

Marian Twenefoo

FT Architects Ltd

T 020 7953 0388

www.ftarchitects.co.uk

On 26 January 2016 at 15:01, Gracie, Ian <Ian.Gracie@camden.gov.uk> wrote:

> Dear Marian and Louise,
>
> Please see below the comments from Campbell Reith regarding your latest submission of information.

It appears as though a number of items were not addressed from their original request for further information.

Please could you respond to the below.

Regards,

Ian

From: StephenAsh@campbellreith.com [mailto:StephenAsh@campbellreith.com]
Sent: 26 January 2016 14:43
To: Gracie, Ian
Cc: camdenaudit@campbellreith.com; Sexton, Gavin; LizBrown@campbellreith.com
Subject: RE: FW: 207 Goldhurst Terrace

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Associate

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Cc: "camdenaudit@campbellreith.com" <camdenaudit@campbellreith.com>, "Sexton, Gavin" <gavin.sexton@camden.gov.uk>
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Ian

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Kind regards

Marian Twenefoo

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T 020 7953 0388

www.ftarchitects.co.uk

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To: "Gracie, Ian" <Ian.Gracie@camden.gov.uk>

Subject: Audit report for 207 Goldhurst Terrace

This message has been archived.
Ian

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If you have any queries, please let me know.

Regards
Elizabeth Brown
Partner

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London
SE1 8NZ

Tel +44 (0)20 7340 1700
www.campbellreith.com <http://www.campbellreith.com/>

Attachments:

ATT00001.jpg	(25 KB)
SAjw12066-47-051015-207 Goldhurst Terrace-D1.pdf	(1.1 MB)

[attachment "@" deleted by Liz Brown/CRH]


FT Architects Ltd Mail - IRef1013254220 RE 207 Goldhurst Terrace.pdf

15F02 - 01B-2.pdf

15F02 - 02B-2.pdf

207 GOLDHURST TERRACE BIA 10 JAN 2015 ISSUE 3.pdf

207 GOLDHURST TERRACE CALCS REV A.pdf

Goldhurst Terrace Geological Map.pdf

FW: FW: FW: 207 Goldhurst Terrace

Gracie, Ian to: StephenAsh@campbellreith.com 24/02/2016 15:33
Cc: "camdenaudit@campbellreith.com", "Sexton, Gavin", "LizBrown@campbellreith.com"

Stephen,

Please see response from applicant below.

Thanks,
Ian

From: Marian Twenefoo [mailto:marian@ftarchitects.co.uk]
Sent: 24 February 2016 15:05
To: Gracie, Ian; Louise Turley
Subject: Re: FW: FW: 207 Goldhurst Terrace

Hi Ian,

Thank you for your email, we have forwarded the query from Campbell Reith to our structural Engineer. Please see the response below.

I have queried the value of Kp quoted in the SI as it appears too low. However the value is irrelevant. The value quoted within the calculations is calculated and quoted by the software as matter of course. The value is not used in any calculation as the wall is propped laterally by the basement slab, as noted in the design philosophy and itemised in the calcs. Passive resistance from the soil is therefore not required.

Kind regards

Marian Twenefoo

FT Architects Ltd

T 020 7953 0388

www.ftarchitects.co.uk

On 24 February 2016 at 13:06, Gracie, Ian <Ian.Gracie@camden.gov.uk> wrote:
Dear Marian and Louise,

Please see below an email I have just received re: 207 Goldhurst Terrace. One item outstanding I understand.

Regards,
Ian

From: Stephen Ash
Sent: 24 February 2016 12:35
To: Gracie, Ian
Cc:

London

Friars Bridge Court
41- 45 Blackfriars Road
London, SE1 8NZ

T: +44 (0)20 7340 1700
E: london@campbellreith.com

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E: bristol@campbellreith.com

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