SPACE BASEMENTS LTD
50b Chiswick High Road
London
W4 1S2

Basement Method Statement

Lidlington Place London

Property Details:
Lidlington Place London

Client Information:
Minh Quach

1.1. This method statement provides an approach that will allow the basement design to be correctly considered during construction. The statement also contains proposals for the temporary support to be provided during the works. The Contractor is responsible for the works on site and the final temporary works methodology and design on this site and any adjacent sites.
1.2. Contact Party Wall Surveyors to inform them of any changes to this method statement.
1.3. On this development, the approach is: construct the underpin segments that will support the permanent steel work. To insert the new steelwork cast the remainder of the retaining walls that will form the perimeter of the basement.
1.4. On this project, the cantilever pins are designed to be inherently stable without lateral support to the top of the wall. However, temporary props will be provided near the head and will provide support until the concrete has gained sufficient strength. The base benefits from propping. This is provided in the final condition by the ground slab. In the temporary condition, the edge of the slab is buttressed against the soil in the middle of the property. Also the skin friction between the concrete base and the soil provides further resistance. The central soil mass is to be removed in 1/3 portions and cross propping subsequently added as the central soil ass is removed
1.5. The bearing pressures have been limited to 100kN/m2. This is standard loading for the local ground conditions and acceptable to Building Control and their approvals
1.6. The structural water proofer must comment on the proposed design and ensure that he is satisfied that the proposals will provide adequate waterproofing.
1.7. Provide engineers with concrete mix, supplier, delivery and placement methods two weeks prior to the first pour. Site mixing of concrete should not be employed apart from in small sections (less than 1m3). The contractor must provide a method on how to achieve site mixing to the correct specification. The contractor must undertake toolbox talks with staff to ensure site quality is maintained.

2. Enabling Works

2.1. The site is to be hoarded with ply board sheets, at least 2.2m high, to prevent unauthorised public access.
2.2. Licences for skips and conveyors should be posted on the hoarding.
2.3. Provide protection to public where conveyor extends over footpath. Depending on the requirements of the local authority, construct a plywood bulkhead over the pavement. Hoarding to have a plywood roof covering over the footpath, night-lights and safety notices.
2.4. Dewater:
2.4.1.Place a bore hole to the front of the property down to a depth of 6m
2.4.2.Pump water away from site.
2.5. On commencement of construction, the contractor will determine the foundation type, width and depth. Any discrepancies will be reported to the structural engineer in order that the detailed design may be modified as necessary.

3. Basement Sequencing

3.1. Begin by placing cantilevered walls noted on plans. (Cantilevered walls to be placed in accordance with drawing 02
3.5. Excavate first rear corners of the basement (drawing 01 refers)
3.6. Excavate next in sequence. (drawing 02 refers)
3.7. Continue excavating section pins to form basement. (drawing 02 & 03 refers)
3.8. Place cantilevered retaining wall to the left side of front opening. After 48 hours place cantilevered retaining wall to the right side of front opening.
3.9. Needle and prop bay wall. Insert support
3.10. Excavate out first 1.2m around front opening, prop floor
3.11. Continue cantilevered wall formation around perimeter of basement following the numbering sequence on the drawings 02
3.11.1. Excavation for the next numbered sequential sections of underpinning shall not commence until at least 48 hours.
3.13.1. Excavate 1/3 of the middle section of basement floor. As excavation proceeds, place props at a maximum of 2.5m. Locate props at a third of the height of the wall Excavate a 1/3 of the middle section of basement floor. As excavation proceeds place
3.13.2. Continue excavating the next 1/3 and prop then repeat for the final 1/3.
3.13.3. Place below-slab drainage. Recommend that all drainage is encased in concrete below the slab and cast monolithically with the slab. Placing drainage on pea shingle below the slab allows greater penetration for water ingress.
3.13.5. Building Control Officer and Engineer are to be informed 48 hours before reinforcement is ready and invited for inspection.
3.13.6. Once inspected, pour concrete.
3.14. Provide structure to ground floor and water proofing to retaining walls as required. It is recommended to leave 3-4 weeks between completion of the basement and installing drained cavity. This period should be used to locate and fill any localised leakage of the basement

4. Underpinning and Cantilevered Walls

4.1. Prior to installation of new structural beams in the superstructure, the contractor may undertake the local exploration of specific areas in the superstructure. This will confirm the exact form and location of the temporary works that are required. The permanent structural work can then be undertaken whilst ensuring that the full integrity of the structure above is maintained.

4.3. Excavate first section of retaining wall (no more than 1000mm wide). Where excavation is greater than 1.0m deep, provide temporary propping to sides of excavation to prevent earth collapse
(Health and Safety). A 1000mm width wall has a lower risk of collapse to the heel face.
4.4. Excavation of pins involves working in confined spaces and the following measures should be applied:
o Operatives must wear a harness and there must be a winch above the excavation.
o An attendant must be present at all times, at ground level, while excavation is occupied.
o A rescue plan must be produced prior to the works as well as a task-specific risk and method statement.
o Working in the confined space should require a permit to work.
4.5. Backpropping of rear face: Rear face to be propped in the
temporary conditions with a minimum of 2 trench sheets. Trench sheets are to extend over entire height of excavation. Trench sheets can be placed in short sections as the excavation progresses.
4.5.1.If the ground is stable, trench sheets can be removed as the wall reinforcement is placed and the shuttering is constructed.
4.5.2.Where trench sheets are left in a slight over spill may occur past the neighbour's boundary wall line. Where this slight over spill is not allowed by the Party Wall Surveyors then cement particle board should be used as noted below.
4.5.3.Where soft spots are encountered, leave in trench sheets or alternatively back prop with precast lintels or sacrificial boards. If the soil support to the ends of the lintels is insufficient, then brace the ends of the PC lintels with 150x150 C24 timbers and
prop with Acrows diagonally back to the ground.
4.5.4. Where voids are present behind the lintels or trench sheeting, grout voids behind sacrificial propping. Grout to be 3:1 sand/cement packed into voids.
4.5.5.Prior to casting, place layer of DPM between trench sheeting (or PC lintels) and new concrete. The lintels are to be cut into the soil by 150mm either side of the pin. A site stock of a minimum of 10 lintels should be present to prevent delays due to ordering.
4.6. If cut face is not straight, or sacrificial boards noted previously have been used, place a 15mm cement particle board between sacrificial sheets or against the soil prior to casting. Cement particle board is to line up with the adjacent owner's face of wall. The method adopted, to prevent localized collapse of the soil, is to install these progressively, one at a time. Cement particle board must be used in any condition where overspill onto the adjacent owner's land is possible.
4.7. Underpins can be completed in segmental lifts (e.g. top section of wall followed by bottom section of wall).
4.7.1.Place reinforcement for retaining wall segmental lift
4.7.1.1. At lift sections, reinforcement needs to be driven in. This is to be completed by predrilling holes and inserting the reinforcement into the predrilled hole.
4.7.1.2. Underside of the wall to be cast with chamfer to allow concrete for lower lift to be cast and no packing to be required.
4.8. Excavate base. Mass concrete heels to be excavated. If soil over is unstable, prop top with PC lintel and sacrificial prop.
4.9. Visually inspect the footings and provide propping to local brickwork. If necessary install sacrificial Acrow, or pit props, and cast into the retaining wall.
4.10. Clear underside of existing footing.

4.11. Local Authority inspection to be carried out for approval of excavation base.
4.12. Place reinforcement for retaining wall base and stem. Drive H16 Bars U-bars into soil along centre line of stem to act as shear ties to adjacent wall underpin.
4.13. Site supervisor to inspect and sign off works before proceeding to next stage.
4.13.1. For pins 1, 3 and 5, inform the engineer five days before the reinforcement is ready, to allow for inspection of the reinforcement prior to casting.
4.14. Cast base. On short stems it is possible to cast base and wall at the same time. It is essential that pokers/vibrators are used to compact concrete.
4.15. Concrete Testing:
4.15.1. For first 3 pins take 4 cubes and test at 7 days
then at 14 days and inform engineer of results. Test last cube at 28 days. If cube test results are low then action into concrete specification and placement method must be considered.
4.15.2. If results are good from first three pins, then from the 4th pin onwards take 2 cubes of concrete from every third pin and store for testing. Test one at 28 days. If result is low, test second cube. Provide results to client and design team on request or if values are below those required.
4.15.3. A record of dates for the concrete pouring of each pin must be kept on site.
4.15.4. The location of where cubes were taken and their reference number must be recorded.
4.16. Horizontal temporary prop to base of wall to be inserted. Alternatively cast base against soil.
4.17. Place shuttering and pour concrete for retaining wall. It is essential that pokers/vibrators are used, hitting shutters is **not** considered adequate.
4.19. After 24 hours, the temporary wall shutters can be removed..
4.21. Site supervisor to inspect and sign off for proceeding to the next stage. A record will be kept of the sequence of construction, which will be in strict accordance with recognised industry procedures.

Extending Party Boundary Wall down and reinforced concrete underpinning

4.22. Excavate. concrete base. If soil over unstable prop top with PC lintel and sacrificial prop.
4.25. Local authority inspection to be carried for approval of excavation base.
4.26. Cast reinforced concrete base
4.27. After 24hours put DPM over top of mass concrete base. It is essential that pokers/vibrators are used to compact concrete.
4.28. Place reinforcement for retaining wall. Drive H16 U-Bars into
soil along centre line of stem to act as shear ties to adjacent wall. Bottom bars of wall to be bent flush with shutter and fixed with mould release oil.
4.29. Site supervisor to inspect and sign off works for proceeding to next stage.
4.29.1. For pins 1, 3 and 5 inform the engineer 48 hours before the reinforcement is ready, to allow for inspection of the reinforcement prior to casting.
4.30. Place shuttering and pour concrete for retaining wall. Stop a minimum of 75mm from the underside of existing footing. It is essential that pokers/vibrators are used, hitting shutters is not considered adequate.

4.31. Concrete Testing:
4.31.1. For first 3 pins take 4 cubes and test at 7 days, 14 days and inform engineer of results. Test last cube at 28 days. If cube test results are low then action into concrete specification and placement method must be considered
4.31.2. If results are good from first three pins, then from the 4th pin onwards, take 2 cubes of concrete and store for testing from every third pin. Test one at 28 days, if result is low, test second cube. Provide results to client and design team on request or if values are below those required.
4.31.3. A record of pin poured dates must be kept on site.
4.31.4. The location of where cubes were taken and their reference number must be recorded.
4.32. racking temporary prop to base of wall to be inserted..
4.34. After 24 hours the temporary wall shutters are removed.
4.36. Site supervisor to inspect and sign off for proceeding to the next stage. A record will be kept of the sequence of construction, which will be in strict accordance with recognised industry procedures.
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Approval

7.1. Building Control Officer/Approved Inspector to inspect pin bases and reinforcement prior to casting concrete.
7.2. Contractor to keep list of dates of pins inspected and cast.
7.3. One month after the work is completed, the contractor is to contact Adjoining Party Wall Surveyor to attend site and complete final condition survey and to sign off works.

Build Design

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07771867679

Underpinning Specification

Lidlington Place London

Underpinning and Retaining Walls

1. The Contractor shall be responsible for ensuring that their operations do not in any way impair the safety or condition of the existing structure or the adjacent properties. They shall provide any temporary supports required for this purpose, and shall carefully inspect the condition of the structure both before and during the execution of the work and immediately inform the Engineer and Architect if they consider that any more stringent procedure than that specified is necessary.

2. Before starting the work the Contractor is to check for any services that could be damaged by the work and shall provide for the maintenance of drainage services during the works and for the reinstatement of any services interrupted or disturbed by the excavations.

3. Before completing the bulk excavation, the Contractor must install any temporary propping to the underpins and retaining walls in accordance with the temporary works design and sequence, and this temporary support shall remain in place until the drainage and permanent support structure has been installed.

4. Underpinning and retaining wall installation is to be carried out in short sections not exceeding 1000mm in length, in the numbered sequence shown on the drawings..

5. Where underpinning sections exceed 1.0m, the contractor should inform the engineer 7 days prior to the first excavation so the engineer can attend site to inspect the appropriateness of the underpin length. Where necessary, the engineer may specify a new maximum length.

6. The Engineer and Building Control Officer shall be given the opportunity of examining all excavations, prior to any underpinning or retaining walls being cast.

7. Unless noted otherwise on the drawings, reinforced concrete underpinning and retaining walls are to be constructed in designated concrete C35 using ordinary portland cement and 20mm max aggregate in accordance with BS8500 and BS EN 206-1. Cover to reinforced concrete in contact with the ground to be a minimum of 75mm unless noted otherwise.

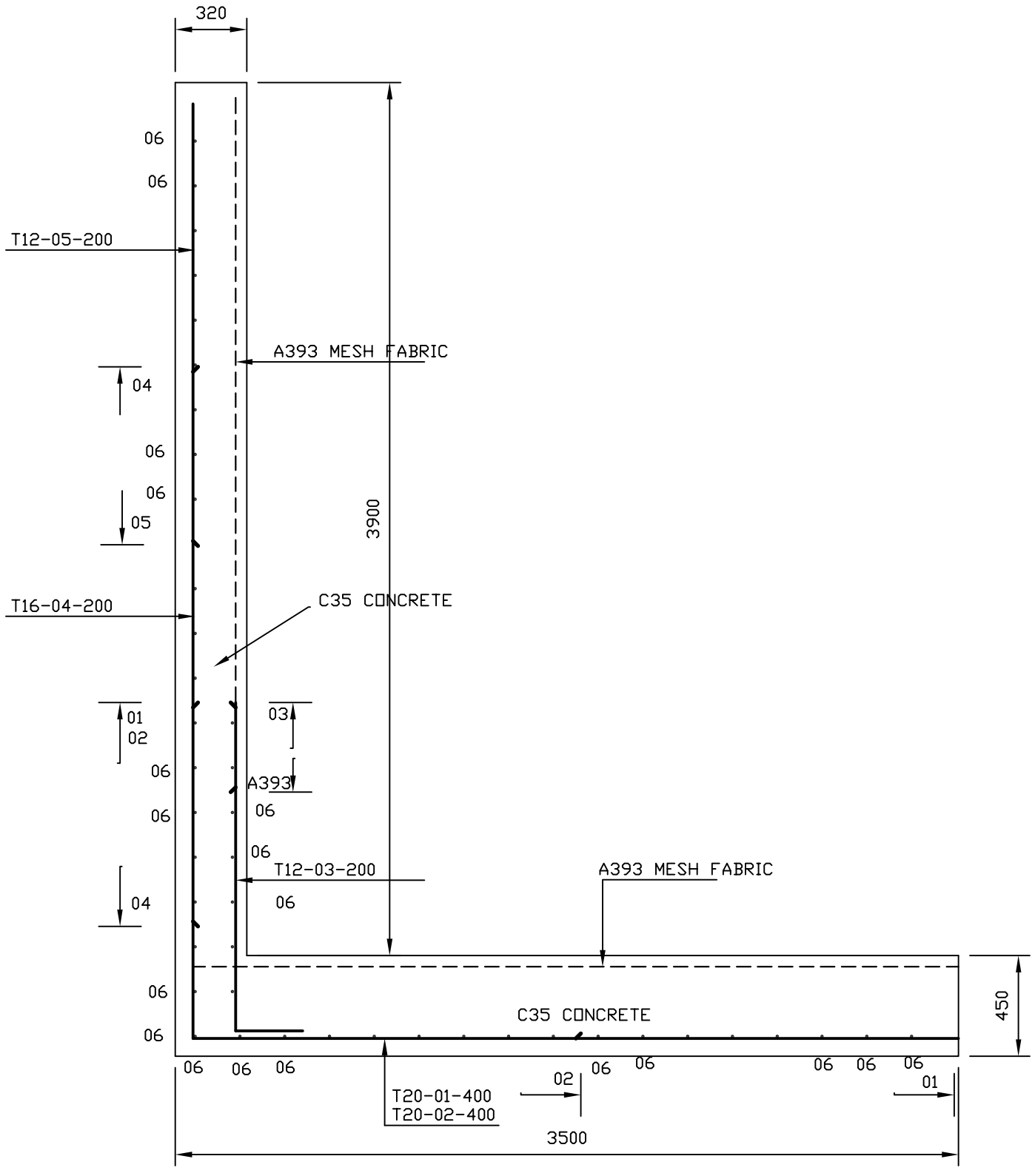
8. Underpinning and retaining walls are to be cast to the widths and depths shown on the drawings. As far as practicable excavation and concreting of any section of underpinning or retaining wall shall be carried out on the same day. Un-concreted sections shall be kept covered to prevent the ingress of water.

10. Excavation to any section of underpinning shall not be commenced until at least 48 hours after completion of any adjacent section of the work.

12. The joint between adjacent sections of mass concrete underpinning is to be formed by creating a rough surface against which the first section is cast. Then, having thoroughly cleaned the exposed concrete face, the adjacent section may be cast. The joint between adjacent sections of reinforced concrete
underpins or retaining walls should be prepared as above, however reinforced concrete underpins are to be dowelled together in accordance with the reinforcement detail drawings.

13. The Contractor is to keep a record of the sequence and dimensions of the underpinning actually carried out, including details of excavation, casting concrete and pinning up for each section.

14. Holes and penetrations for services through underpins and retaining walls are to be set out and detailed by the Architect, including waterproofing details such as puddle flanges or hydrophilic strips, and installed prior to the pouring of concrete.



TYPICAL SECTION THRO' RETAINING WALL

REF. DETAILS

REVISIONS

CLIENT

–

PROJECT

LIDLINTON PLACE
LONDON
–

DESCRIPTION

PROPOSED
NEW PROPERTY
BASEMENT CONSTRUCTION

BUILD DESIGN

5, ELMFIELD ROAD
CHELTENHAM,
GLOS GL51 9JH
TEL/FAX No. 01242 693047
EMAIL. alan946@hotmail.com

DATE	SCALE	REV
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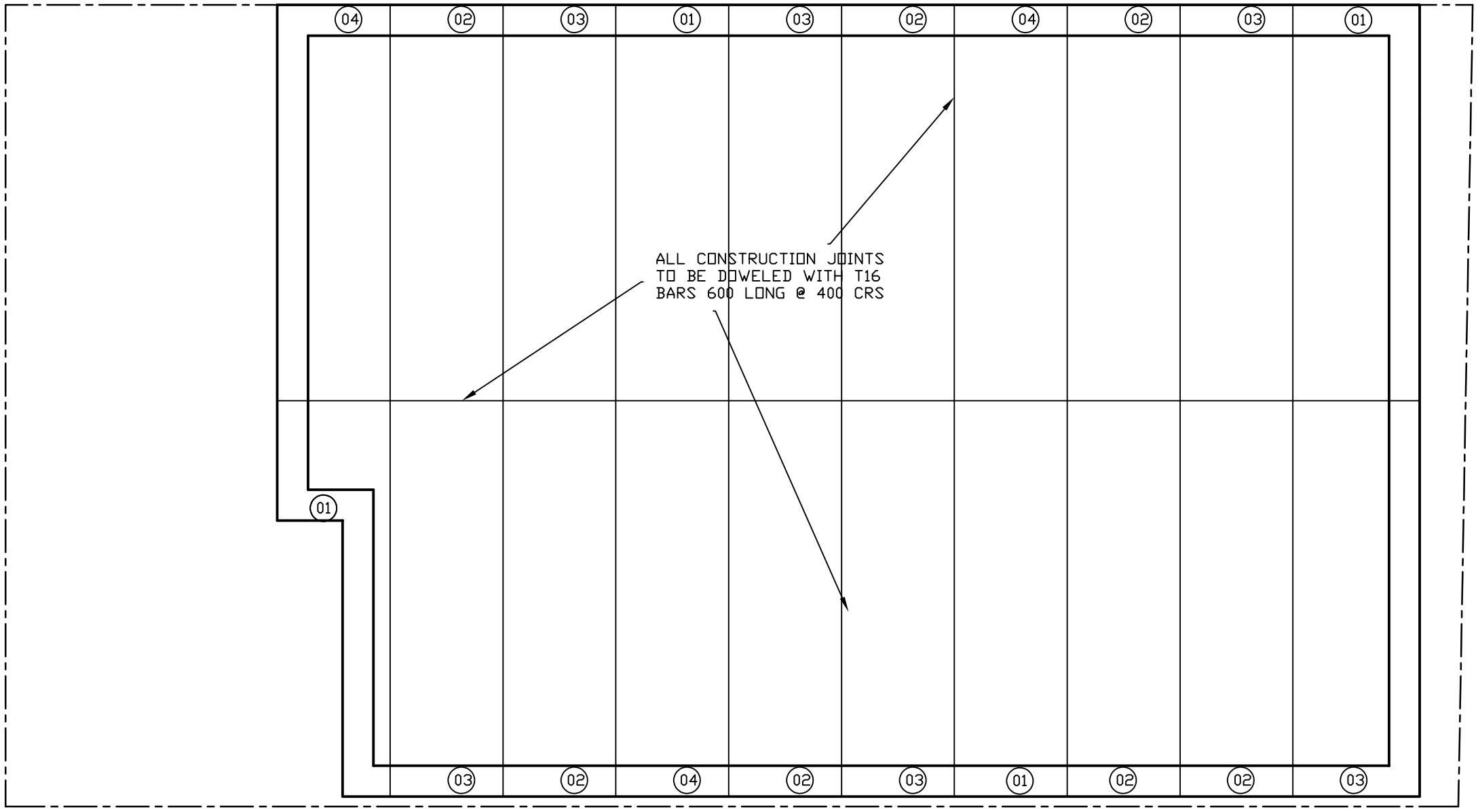

SUGGESTED SEQUENCE OF UNDERPINS

REF.	DETAILS
REVISIONS	
CLIENT	Minh Quach

PROJECT

LIDLINTON PLACE
LONDON
–

DESCRIPTION

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DATE	SCALE	REV
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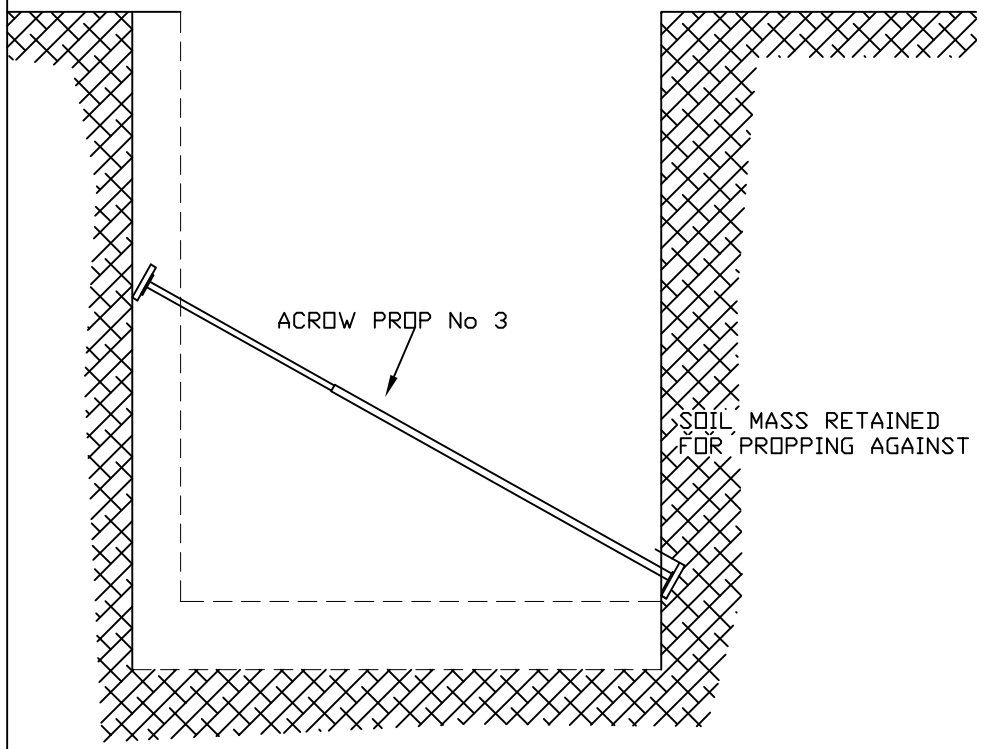
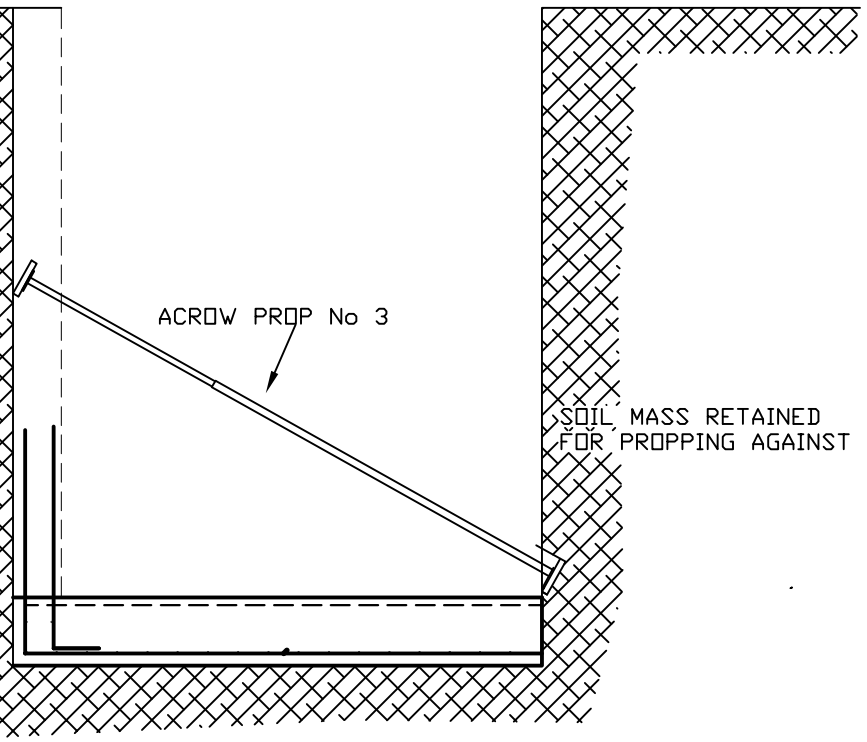


STAGE 1



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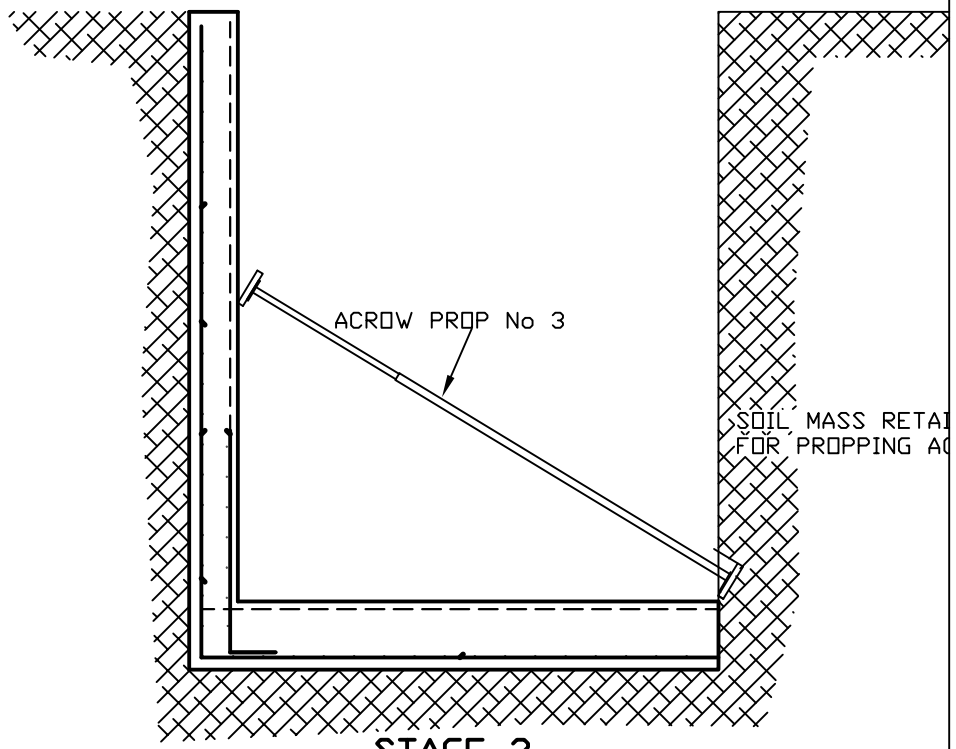
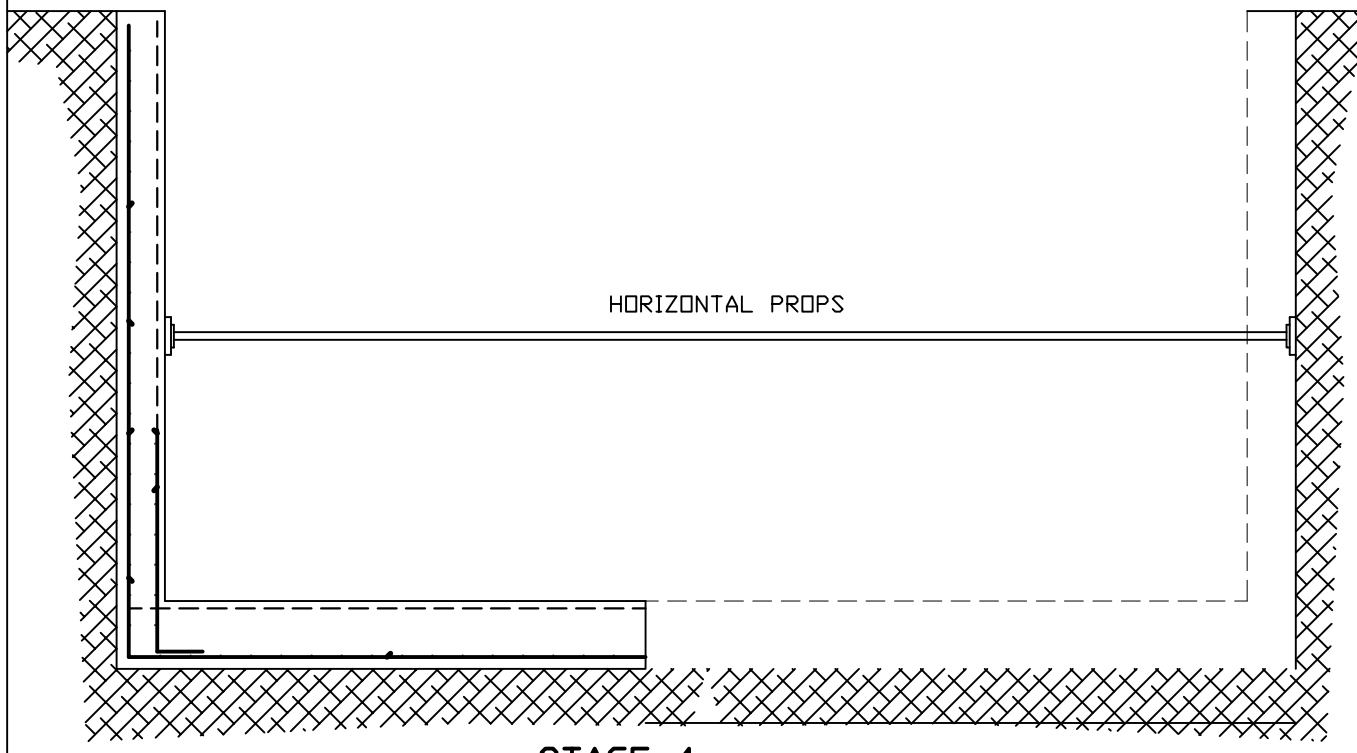


STAGE 3



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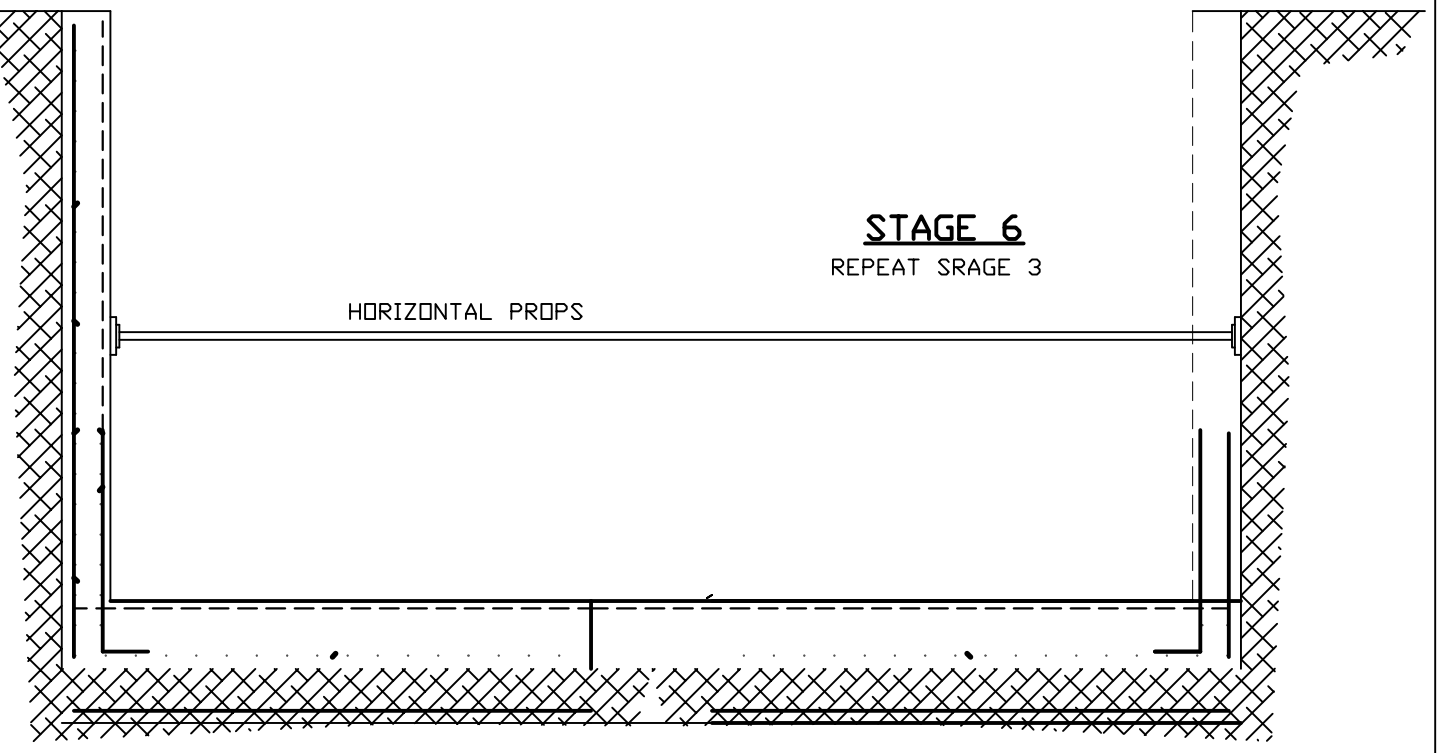

STAGE 5

PROPOSED
NEW PROPERTY
BASEMENT CONSTRUCTION

PROJECT

LIDLINTON PLACE
LONDON
-

BUILD DESIGN

5, ELMFIELD ROAD
CHELTENHAM,
GLOS GL51 9JH

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DATE	SCALE	REV
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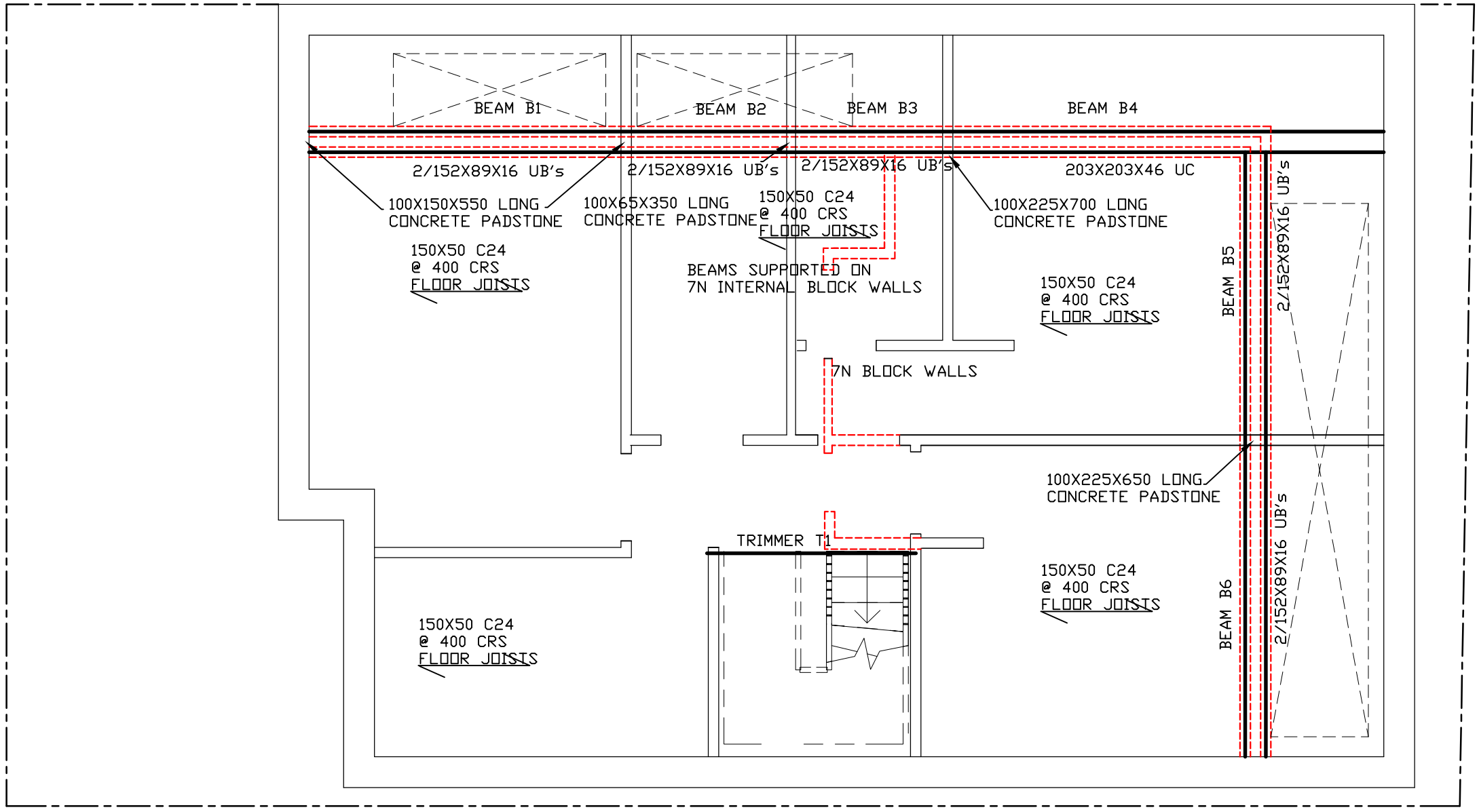

BASEMENT PLAN

REF. DETAILS

REVISIONS

CLIENT
Minh Quach

PROJECT
LIDLINTON PLACE
LONDON
-

DESCRIPTION
PROPOSED
NEW PROPERTY
BASEMENT CONSTRUCTION

BUILD DESIGN

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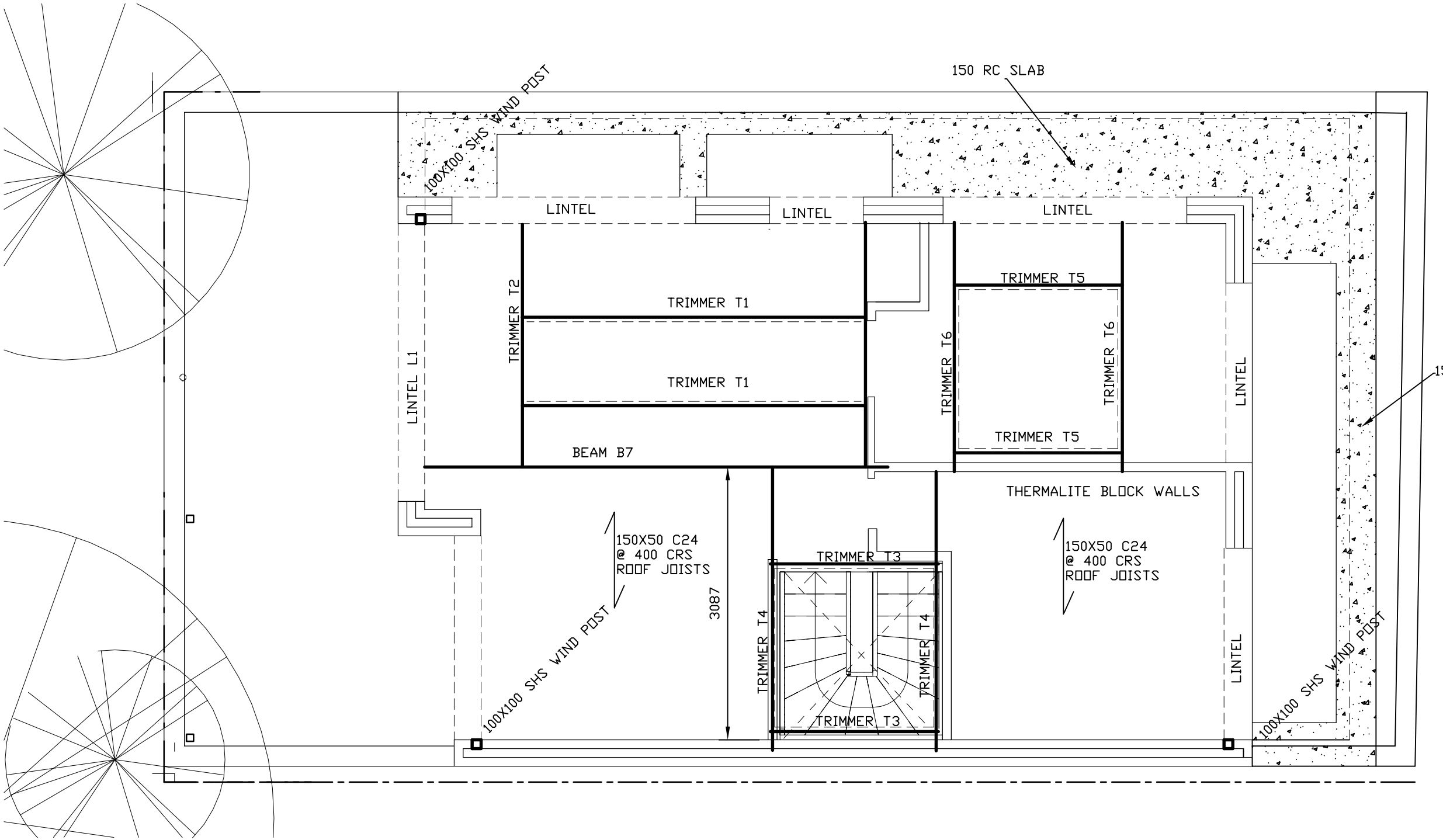

GROUND FLOOR PLAN

REF.	DETAILS
REVISIONS	

CLIENT
Minh Quach

PROJECT
LIDLINTON PLACE
LONDON
–

DESCRIPTION
PROPOSED
NEW PROPERTY
BASEMENT CONSTRUCTION

BUILD DESIGN
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ASB	-	A3	05

BUILD DESIGN

5 Elmfield Road
Cheltenham
Glos GL51 9JH
01242 693047

DATE	SCALE	REV
19/01/20		

DRAWN	CHECKED	PROJECT No.	SHEET No
ASB		-	01

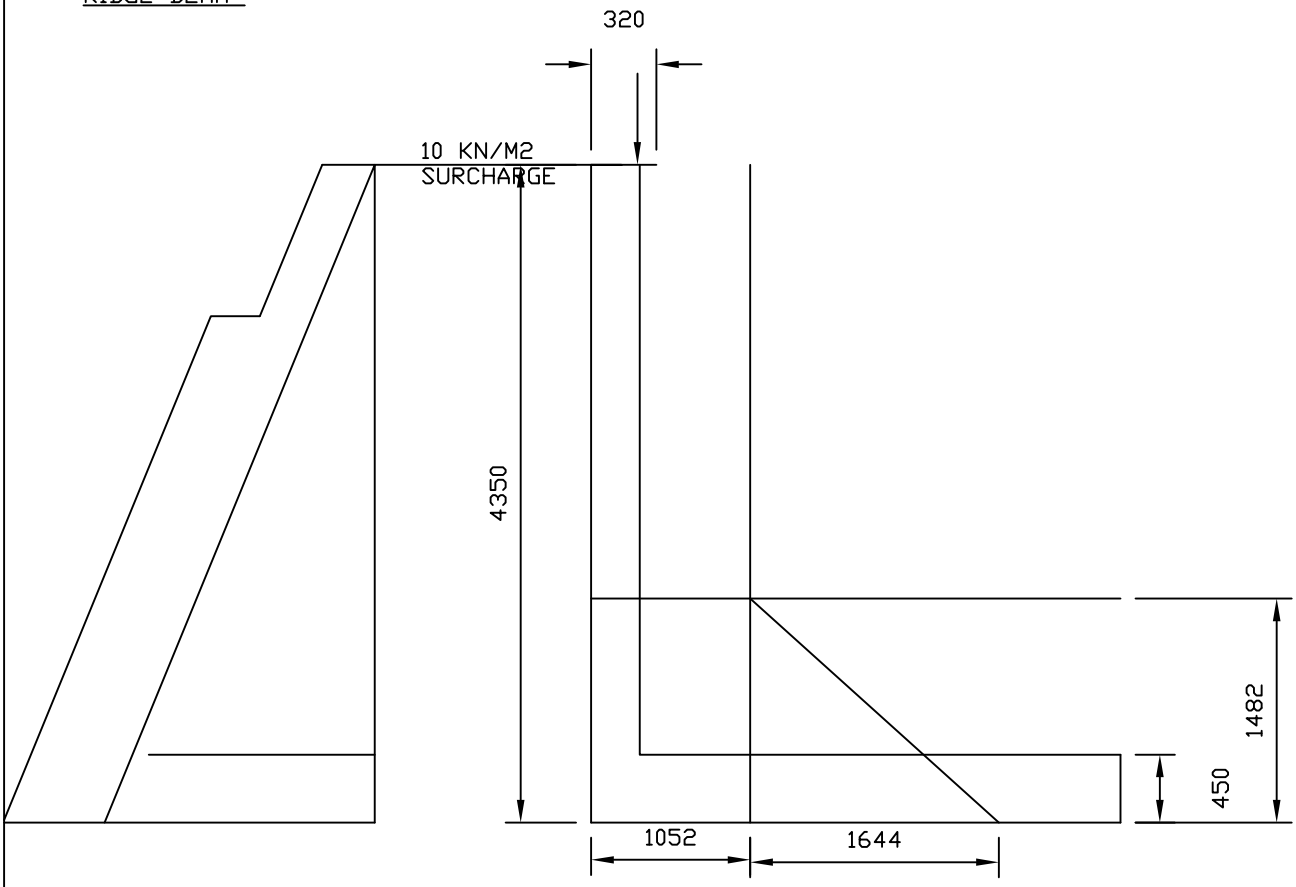
CLIENT
Minh Quach

CONTRACT
LIDLINGTON PLACE
LONDON
-

DESCRIPTION
BASEMENT EXTENSION

STRUCTURAL CALCULATIONS

RIDGE BEAM



DESIGN OF WALL STEM

C OF G OF HORIZONTAL LOADS

10 KN/M2 SURCHARGE = 0.35 X 18 X 0.556 X 3.9 = 13.66 KN @ 1.95

RETAINED EARTH = 0.35 X 18 X 1.0 X 1.0/2 = 3.15 KN AT 3.567

GROUND WATER = 9.8 X 2.9/2 = 14.21 KN AT 0.967

ULT BENDING MOMENT = (13.66 X 1.95 + 3.15 X 3.567 + 14.21 X 0.967) X 1.5= 77.42 KNM

b = 1000, d = 320 - 85 = 235mm. FK = 460 N/mm2. fcu = 35 N/mm2

k = 77.42 X 1000000/1000 X 235 x 235 X 35 = 0.04005

$z = 0.5 + \sqrt{0.25 - 0.0445/0.9} = 0.95$

Ast = 77.42 X 1000000/460 X 0.95 X 0.95 X 235 = 794mm2

PROVIDE T16 @ 200 CRS (1005mm2)

DISTRIBUTION = 0.14 X 235 X 1000/100 = 329mm2

PROVIDE T10 BARS @ 200crs (393mm2)

FOUNDATIOS

ESTIMATE VERTCAL LOAD

FROM EXISTING PARTY WALL = 20 X 0.25 X 13 = 65 KN
FLOORS 3.1 X 2.0 X 3 = 18.6 KN/M
FROM ROOF = 1.927 X 3.0 = 5.781 KN/M
PARTITIONS = 1.0 X 3.0 X 3 = 9.0 KN/M
TOTAL = 98.381 KN

BUILD DESIGN

5 Elmfield Road
Cheltenham
Glos GL51 9JH
01242 693047

DATE	SCALE	REV
19/01/20		

DRAWN	CHECKED	PROJECT No.	SHEET No
ASB		-	02

CLIENT
Minh Quach

CONTRACT
LIDLINGTON PLACE
LONDON

DESCRIPTION
BASEMENT EXTENSION

STRUCTURAL CALCULATIONS

SLIDING

RETAINING WALL ABUTS SLAB AND RESISTED AGAINST OPOSITE RETAINING WALL

NO CHECK REQUIRED

HORIZONTAL LOADS

SURCHARGE = 0.35 X 18 X 0.556 X 4.35 = 15.237 KN X 2.175 = 33.14 KNM/M
RETAINED EARTH = 0.35 X 18 X 4.35 X 4.35/2 = 59.6 KN/M X 1.4 = 77.79 KNM/M

TOTAL = 74.84 KN/M TOTAL = 110.93 KNM/M

C OF G = 110.93/74.84 = 1.482

VERTICAL LOADS WALL LOAD = 98.381 KN/M X 0.175 = 17.217 KNM/M

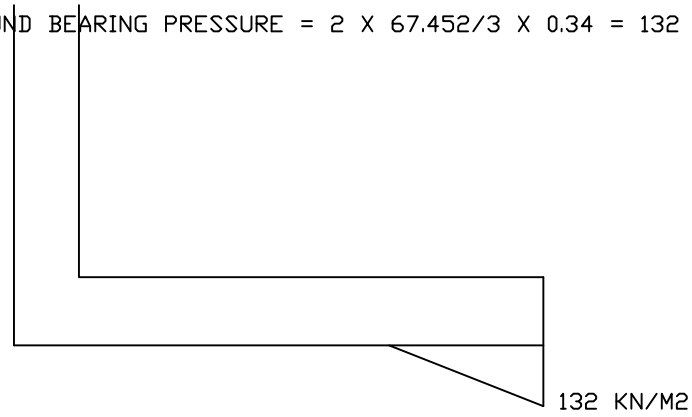
WALL STEM = 24 X 0.32 X 3.9 = 29.952 KN/M X 0.16 = 4.792 KNM/M
BASE = 24 X 0.45 X 3.5 = 37.5 KN X 1.75 = 66.15 KNM/M
TOTAL = 67.452 KN/M TOTAL = 70.942 KNM/M

C OF G = 70.942/67.452 = 1.052

x = 1.482 x 74.84/67.482 = 1.64

e = 1.052 + 1.64 - 1.75 = 0.942 > D/6

MAX GROUND BEARING PRESSURE = 2 X 67.452/3 X 0.34 = 132 KN/M2 - 6 X 4.35 = 106 KN/M2



450 THICK BASE

BENDING MOMENT = 67.452 X2.84 = 191.56 KNM

ULT BENDING MOMENT = 191.56 X 1.5 = 287.3 KNM

b = 1000; d = 450 - 100 = 350; fk = 460 N/mm2; Fcu = 35 N/mm2

k = 287.3 X 10000000/1000 X 350 X 350 X 35 = 0.067

z = 0.5 + 0.25 - 0.067/0.9 = 0.919

Ast = 287.3 X 1000000/460 X 0.95 X 350 X 0.918 = 2046mm2

PROVIDE T25 @ 200crs(2545mm2)

BUILD DESIGN

5 Elmfield Road
Cheltenham
Glos GL51 9JH
01242 693047

DATE	SCALE	REV
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ASB		-	03

CLIENT
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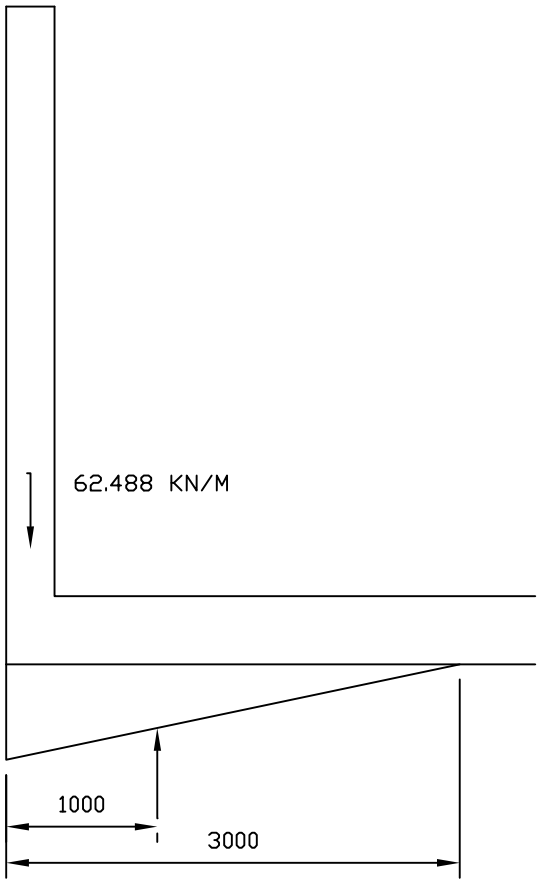
CONTRACT
LIDLINGTON PLACE
LONDON

DESCRIPTION
BASEMENT EXTENSION

STRUCTURAL CALCULATIONS

MAX VERTICAL LOAD ON WALL

WALL STEM = 24 X 3.9 X 0.32 X 1.4 = 41.93 KN/M
CAVITY WALL = 3.7 X 2.1 X 1.4 = 10.878 KN/M
FROM FLOOR = 3.1 X 1.6 = 4.96 KN/M
FROM ROOF = 2.95 X 1.6 = 4.72 KN/M
TOTAL = 62.488 KN/M



LEVER ARM = 1000mm

ULT BENDING = 62.488 X 1.0 = 62.488 KNM

AST = 62.488 X 1000000/460 X 0.95 X 0.95 X 390 = 386mm2

PROVIDE A393 MESH FABRIC

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5 Elmfield Road
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01242 693047

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ASB		-	04

CLIENT
Minh Quach

CONTRACT
LIDLINGTON PLACE
LONDON

DESCRIPTION
BASEMENT EXTENSION

STRUCTURAL CALCULATIONS

BEAM B1, B2 & B3

EFFECTIVE SPAN = 3250mm

LOADING - OUTER

SELF WEIGHT SAY = 0.42 KN/M
OUTER LEAF = 2.0 X 2.7 X 1.4 X 0.8 = 6.048 KN/M
150 RC TERRACE = 9.96 X 0. = 5.58 KN/M
TOTAL = 12.046 KN/M

LOADING - INNER

SELF WEIGHT SAY = 0.42 KN/M
INNER LEAF = 1.7 X 2.7 X 1.4 X 0.8 = 5.14 KN/M
ROOF = 2.95 X 1.4 = 4.13 KN/M
TOTAL = 9.69 KN/M

REACTIONS
RL = RR = 12.046 X 1.625 = 19.575 KN

RL = RR = 9.69 X 1.625 = 15.75 KN

BENDING MOMENT = 39.15 X 3.25/8 = 15.90 KNM

I REQUIRED = 39.15 X 3.25 X 3.25 X 2.232/1.45 = 636cm4

DESIGN SPAN = 2500mm

152X152X23 UC Mb = 43 KNM > 19.03 KNM OK

PROVIDE 152X152X23 UC

BEARINGS

BEARING STRESS = 30.45 X 1000/100 X 350 = 0.87 N/mm2

PROVIDE 100X150X350 LONG CONCRETE PADSTONE

BUILD DESIGN

5 Elmfield Road
Cheltenham
Glos GL51 9JH
01242 693047

DATE	SCALE	REV
19/01/20		

DRAWN	CHECKED	PROJECT No.	SHEET No
ASB		-	05

CLIENT
Minh Quach

CONTRACT
LIDLINGTON PLACE
LONDON

DESCRIPTION
BASEMENT EXTENSION

STRUCTURAL CALCULATIONS

BEAM B5 & B6

EFFECTIVE SPAN = 2900mm

LOADING - OUTER

SELF WEIGHT SAY = 0.42 KN/M
OUTER LEAF = 2.0 X 2.7 X 1.4 X 0.8 = 6.048 KN/M
150 RC TERRACE = 9.96 X 0. = 5.58 KN/M
TOTAL = 12.046 KN/M

LOADING - INNER

SELF WEIGHT SAY = 0.42 KN/M
INNER LEAF = 1.7 X 2.7 X 1.4 X 0.8 = 5.14 KN/M
FLOOR = 3.1 X 1.45 = 4.495 KN/M
TOTAL = 10.005 KN/M

REACTIONS

RL = RR = 12.046 X 1.45 = 17.467 KN

RL = RR = 10.005 X 1.45 = 14.58 KN

BENDING MOMENT = 34.933 X 2.9/8 = 12.663 KNM

I REQUIRED = 34.933 X 2.9 X 2.9 X 2.232/1.45 = 452cm4

DESIGN SPAN = 1.2 X 2.9 = 3480mm

152X89X16 UB Mb = 15 KNM > 12.663 KNM OK

PROVIDE 2/152X89X16 UB's

BEARINGS

BEARING STRESS = (17.467 + 14.58) X 2 X 1000/100 X 650 = 0.986 N/mm2

PROVIDE 100X225X650 LONG CONCRETE PADSTONE

BEAM B7

EFFECTIVE SPAN = 5200mm

LOADING - OUTER

SELF WEIGHT SAY = 0.42 KN/M
ROOF = 2.95 X 1.6 = 4.72 KN/M
TOTAL = 5.14 KN/M

REACTIONS

RL = RR = 5.14 X 2.6 = 26.0 KN

BENDING MOMENT = 52 X 5.2/8 = 33.8 KNM

I REQUIRED = 52 X 5.2 X 5.2 X 2.232/1.45 = 2164cm4

DESIGN SPAN = 1.2 X 5.2 = 6240mm

152X152X37 UC Mb = 50.8 KNM > 33.8 KNM OK

PROVIDE 152X152X37 UC

BEARINGS

BEARING STRESS = 26 X 1000/100 X 250 = 1.04 N/mm2

PROVIDE 100X65X250 LONG CONCRETE PADSTONE

BUILD DESIGN

5 Elmfield Road
Cheltenham
Glos GL51 9JH
01242 693047

DATE	SCALE	REV
19/01/20		

DRAWN	CHECKED	PROJECT No.	SHEET No
ASB		-	06

CLIENT
Minh Quach

CONTRACT
LIDLINGTON PLACE
LONDON

DESCRIPTION
BASEMENT EXTENSION

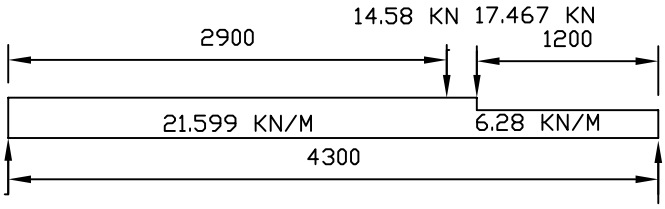
STRUCTURAL CALCULATIONS

BEAM B4

EFFECTIVE SPAN = 3250mm

LOADING - OUTER

SELF WEIGHT SAY = 0.70 KN/M
CAVITY WALL = 3.7 X 2.7 X 1.4 X 0.8 = 11.189 KN/M
150 RC TERRACE = 9.96 X 0. = 5.58 KN/M
ROOF = 2.95 X 1.4 = 4.13 KN/M
TOTAL = 21.599 KN/M



REACTIONS
RL = (15.319 X 3.1 X 2.75 + 14.58 X 1.4 + 17.467 X 1.2)/4.3 + 6.28 X 2.15 = 53.494 KN
RR = (15.319 X 3.1 X 1.55 + 14.58 X 2.9 + 17.467 X 3.1)/4.3 + 6.28 X 2.15 = 53.046 KN

BENDING MOMENT = 53.494 X 2.477 - 21.599 X 2.477 X 2.477/2 = 66.244 KNM

I REQUIRED = 123.245 X 4.3 X 4.3 X 2.232/1.45 = 3508cm4

DESIGN SPAN = 1.2 X 4.3 = 5160mm

203X203X46 UC Mb = 97.4 KNM > 66.244 KNM OK

PROVIDE 203X203X46 UC

BEARINGS

BEARING STRESS = (22.15 x 0.775 + 53.494 X 1000/100 X 700 = 1.01 N/mm2

PROVIDE 100X225x700 LONG CONCRETE PADSTONE