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structural engineering and construction consultants

3959/CMS/001/DP

January 2019

CONSTRUCTION METHOD STATEMENT FOR THE PROPOSED BASEMENT EXTENSION

AT

8 AGAMEMNON ROAD LONDON NW6 1DY

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Registered in England and Wales

3959/CMS/001/DP

Synopsis

The property is a three-storey terrace house with an existing partial basement, which we assume was an old coal cellar, under the ground floor hallway. Originally a single family dwelling, it is apparent that the house was converted into eight separate studio flats at some point in the past. It is of traditional construction with timber floors and roof spanning between load-bearing masonry external walls and internal timber stud walls. The house consists of a main terraced section as well as an outrigger located on the rear right hand side.

It is proposed to reconfigure the house into four flats. This will involve carrying out various internal alterations of the upper floors, as well as constructing a rear extension to the outrigger. It is also proposed to lower the existing basement level, extend the basement under the new footprint of the house, as well as forming a terrace to the left of the outrigger in the basement.

It is assumed that the existing footings are shallow corbel brickwork, which is common for the age of the property. The depth will be verified prior to the full design being carried out.

Appraisal

This appraisal of the basement construction has been carried out for the purposes of making a planning application for the proposed works. Should the planning application be approved, a full appraisal of the existing structure would need to be carried out and a full design of the substructure alterations would then take place.

This appraisal contains a preliminary construction programme, a brief method statement, preliminary sketch proposals for the basement works, as well as preliminary calculations for the basement retaining walls.

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Temporary Works

The Contractor will be responsible for the design of the temporary works for the design of the temporary works for both the basement construction and superstructure works. The following method statement and suggested construction sequencing shown on the sketches should be finalised by the Contractor prior to works beginning. The temporary works would need to be designed to minimise ground movement and any effects on the adjoining properties. The Contractor's method statement and temporary works taking place.

During excavation, ground movement should be regularly monitored, as is standard practice. We would recommend a specialist company carry out the monitoring works.

Should works be carried out in line with the proposed method statement, we believe there would be minimal damage to any adjacent buildings, in line with *Category* 1 - Very Slight on the Burland Scale. However, we would certainly advise that an experienced builder is used with all relevant insurance to carry out the works. We would also suggest that Party Walls Awards are be in place with all relevant neighbours such that, in the unlikely event that additional damage is caused, it will be repaired.

We also believe that the structural stability of both the property being underpinned, as well as all adjacent properties, would be maintained if the method statement outlined below is followed.

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Basement Construction

The works would involve the underpinning of the existing external and party ground floor walls in order to minimise disruption to neighbouring properties. Internal walls are to be supported by steel beams spanning between the underpinning. Retaining walls would also be constructed to form the lowered front courtyard and rear left hand terrace. All of these retaining walls should be constructed using an underpinning sequence so as to minimise disruption to the adjoining properties.

The underpinning would consist of short sections of reinforced concrete retaining walls, excavated in sequence and tied together with dowel bars. They would be designed to carry both the vertical loads of the walls above, as well as lateral loads from the adjoining soil. They would be designed to be inherently stable during the construction stage, as well as in the final stage. It is assumed at this stage that neither of the adjoining properties has excavated a basement but this will be confirmed prior to the full design taking place. It is noted that the right hand property applied for planning permission for a similar basement but it is not presently known whether this has been constructed.

Following review of the British Geological Survey maps (1:50,000 scale), we have assumed the founding soil to be London Clay for the purposes of the design of the proposed basement. The founding soil appears to be relatively homogenous in the surrounding area and we therefore do not believe the soil will be unstable. We have also assumed the water table to be one metre above basement slab for the purposes of the structural appraisal. We would recommend a site investigation be carried out prior to construction so as to determine the exact make-up of the founding soils and water table level.

Enabling Works

The site is to be suitably hoarded to prevent unauthorised access.

Licenses for skips and conveyors are to be obtained and displayed in suitable locations.

Design Standards and Reference Documents

The relevant Eurocodes, Building Regulations and Codes of Practice should be used in the design.

Design Parameters

The internal steelwork and underpinning should be designed for an imposed floor load of 1.5 kN/m^2 , as well as calculated dead loads. The retaining wall adjacent to the highway in the front courtyard should be designed for an imposed load of 10 kN/m^2 to allow for HGV loading on the road.

We would propose an allowable bearing pressure of 100 kN/m^2 for London Clay, the assumed founding soil.

PRELIMINARY CONSTRUCTION PROGRAMME

Task	Duration
Enabling Works, including site setup, conveyor installation, hoarding	1 week
Temporary works, including propping	3 weeks
Excavation of basement, construction of retaining walls, including underpinning of party walls and external walls	16 weeks
Construction of basement slab, including drainage	3 weeks
Construction of new internal non-loading bearing walls	3 weeks
Strengthening to ground floor structure	2 weeks
Fit out	8 weeks
Total	36 weeks

PRELIMINARY METHOD STATEMENT

- 1 External and party walls to be underpinned at location of internal steelwork supports.
- 2 Temporarily prop internal load-bearing ground floor walls, and bay window.
- 3 Install internal steelwork to support load-bearing ground floor walls.
- 4 Remove ground-floor floor structure
- 5 Underpin remaining external and party walls in sequence see underpinning sequence below.
- 6 As underpinning is being carried out, form basement slab at appropriate stages.
- 7 Excavate front courtyard in underpinning sequence.
- 8 Construct basement bay window.
- 9 Excavate rear section of basement in underpinning sequence.
- 10 Construct rear extension on top of new basement structure
- 11 Construct new internal ground floor structure.

Underpinning Sequence

- 1. Underpinning to be carried out in standard 1, 3, 5, 2, 4 sequence. See sketches for suggested layout.
- Each leg is to be excavated in bays not exceeding 1.0m in length, concreted and pinned tight to existing footing before commencing next leg. Similarly numbered bays can be carried out consecutively.
- 3. The construction of each underpinning block shall be commenced immediately after the bottom of the excavation has been exposed. The bottom shall be sealed with concrete blinding immediately after inspection has shown it to be satisfactory.
- 4. The underside of the existing footing shall be thoroughly cleaned.
- 5. At least 24 hours after concrete pour, semi-dry pinning sand/cement pack to be rammed in hard.
- 6. At least 48 hours to elapse before excavation of next pin in sequence.
- 7. Sides of previously poured pins to be thoroughly cleaned and joined together with 20mm. diameter dowel bars, 1.0m long.
- 8. Concrete to be grade C40 minimum.





Date JAN '19

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All dimensions must be checked on site. Any dimensional discrepancies discovered must be reported to the Project Manager before proceeding. This drawing is to be read in conjunction with all relevant documents.

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Client

Nick Grant

Address

8 AGAMEMNON ROAD LONDON NW6 1DY

Drawing Title
CONSTRUCTION OF
UNDERPINNING FOR NEW
BASEMENT.

Date JAN '19

Drawing Number 3959 - sk 02

Scale	

Revision



DETAIL 5



METHOD STATEMENT

1) EXCAVATE ACCESS PIT AND UNDERMINE EXISTING FOUNDATION FOR FIRST UNDERPIN IN ACCORDANCE WITH THE SEQUENCE SHOWN ON THE DRAWING. INSTALL TEMPORARY PLANKING AND STRUTTING AS SOIL IS BEING EXCAVATED. BLIND EXCAVATION BASE WITH 75mm CONCRETE.

2) INSTALL PREFORMED REINFORCEMENT CAGE TO BASE AND WALL AND CAST BASE SLAB.

3) INSTALL WALL REINFORCEMENTAND FRONT SHUTTER, ADAPT PLANKING AND PROPS AND CAST CONCRETE UNDERPIN AND CURE FOR A MINIMUM OF 24 HOURS.

4) STRIP SHUTTERING AND INSTALL TEMPORARY PROPS. DRY PACK BETWEEN TOP OF NEW UNDERPIN AND EXISTING FOUNDATIONS WITH 3:1 SAND/CEMENT AND CONBEX100 ANTI SHRINK ADDITIVE.

5) EXCAVATE ACCESS PIT AND UNDERMINE EXISTING FOUNDATIONS FOR NEXT UNDERPIN IN ACCORDANCE WITH THE SEQUENCE SHOWN ON THE DRAWING. INSTALL TEMPORARY PLANKING AND STRUTTING AS NECESSARY.

6) REPEAT STEPS 2 TO 7 UNTIL ALL UNDERPINNING HAS BEEN COMPLETED.

7) BULK EXCAVATE CENTRAL BERM AND INSTALL TOP AND BOTTOM HORIZONTAL PROPS.

8) EXCAVATE CENTRAL BASE, BLIND EXCAVATION WITH 75mm CONCRETE AND INSTALL PREFORMED REINFORCEMENT CAGE. CAREFULLY CUT BACK CORBEL BRICKWORK FOUNDATION.

9) CAST CONCRETE TO FORM NEW BASEMENT FLOOR SLAB AND ALLOW TO CURE FOR 7 DAYS.



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Revisions

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8 AGAMEMNON ROAD LONDON NW6 1DY

Drawing Title CONSTRUCTION OF UNDERPINNING FOR NEW BASEMENT.

Date JAN '19 Scale

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PRELIMINARY SKETCH PROPOSALS







PRELIMINARY FOR PLANNING PURPOSES ONLY

Date

JAN '19

Drawing Number

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Scale

Revision

1:50 @ A2

PRELIMINARY CALCULATIONS



Project	8 Agamemnon Road			The Concrete Centre			
Client	0				Made by	Date	Page
Location	Wall A		The Co	ncrete Centre [™]	dp	Jan-19	2
	RETAINING WALL design to B	S 8110:2005			Checked	Revision	Job No
	Originated from 'RCC62.xls' v3.1	© 2006 TCC			0	0	3959
EXTERNAL	STABILITY					STABILITY CHECKS	: ОК
OVERTURNI	NG about TOE					F.O.S = 1.50	
	(using overall factor of s	afety instead	of partial	safety facto	r)	LOADING OPT	TION
Overturning	Lateral FORCE (kN)	Lever arn	n (m)	Moment	t (kNm)	(select critical loa	d combination)
Moments	PE = 45.00	LE =	1.00	45	.00	✓EARTH	_
	PS(GK) = 0.00	LS =	1.50	0.0	00	PS(GK)	Warning:
	PS(QK) = 2.25	LS =	1.50	3.	38	PS(QK)	
	PL(GK) = 0.00	LL = 3	3.13	0.0	00	PL(GK)	4
	PL(QK) = 0.00	LL = .	3.13	0.0	00	PL(QK)	4
	PW = 0.00	LVV = 0	0.00	0.0	00		J
	P = 47.25	(I D_UN) _ (0.00	0.0	00	-	
	- Fβ = 0.00	(LF-HIN) = V	0.00	ê Mo =	48.38	-	
				9 140 -	40.30		
Restoring	Vertical FORCE (kN)	Lever arn	n (m)	Moment	t (kNm)	7	
Moments	Wall = 19.44	2.35	5	45	.68	1	
	Base = 18.00	1.25	5	22.	.50		Warning:
	Nib = 0.00	0.00)	0.0	00		
	Earth = 0.00	2.50)	0.0	00	ALLOW BU	IOYANCY OF BASE
	Water = 0.00	2.50)	0.0	00		
	Surcharge = 0.00	2.50)	0.0	00		
	Line load = 60.00	2.35	5	141	.00	_	
	QV = 97.44			© Mr =	209.18		
	(· · · · · · · · · · · · · · · · · · ·	6	Factor	of Safety, N	Mr/Mo =	4.32 > 1.50	ОК
SLIDING (using overall factor of safety instead of partial safety factor) F.O.S = 1.50							
	Sum of LATERAL FC	DRCES, P =	47.25	kN			
PASSIVE	FORCE, Pp x Reduction f	actor(1) =	0.00	kN	Red'n fac	ctor for passive force =	= <u>1.00</u>
BAS	SE FRICTION (🎙 V TANØR	+ B Cb) =	-106.26	kN			
Sur	n of FORCES RESISTING S	_IDING, Pr =	-106.26	kN			
			F			2.25 1.50	01/
			Facto	or of Safety,	Pr/P =	2.25 > 1.50	UK
GROUND BE	ARING FAILUF Taking mon	ents about co	entre of ba	ase (anticloc	kwise "+"ו		
	Vertical FORCES (kN)	_ever arm (m)	Mor	nent (kNm)		BEARING PRESSURE (KN/	/m²)
	Wall = 19.44	-1.10	-21	.38		2.50	0.00
	Base = 18.00	0.00	0.	00			
	Nib = 0.00	1.25	0.	00			
	Earth = 0.00	-1.25	0.	00			
	Water = 0.00	-1.25	0.	00			
	Surcharge= 0.00	-1.25	0.	00		50 1	
	Line load = 60.00	-1.10	-66	5.00			
	Q V = 97.44	L	Ø M∨ =	-87.38			
	Moment due to LA	TERAL FORCE	S, Mo =	48.38	kNm	100	
	Resultant Mor	nent, M = M	/ + Mo =	-39.01	kNm		
There	Eccentricity fror efore, MAXIMUM Gross Be	n base centre aring Pressure	, M / V = e (GRP) =	-0.40 76	m kN/m²	< 100	ОК

Project 8 Agamemnon Road					The Concrete Centre							
Client O	6				Made by	ade by Date		Page				
Location Wall A			The Co	oncrete Centre"	dp	Jan-19		3				
RETAINING WA	LL design to B	S 8110:2005			Checked	Revision		Job No				
Originated from 'RG	CC62.xls' v3.1	© 2006 T	CC		0	()	3959				
STRUCTURAL DESIGNS (ultimate)						DESIGN CHECKS : OK						
WALL (per metre length)												
	Force	Lever arm	Moment	Υf	V ult	M ult						
	(kN)	(m)	(kNm)		(kN)	(kNm)						
EARTH	36.45	0.90	32.81	1.4	51.03	45.93						
SURCHARGE(GK)	0.00	1.35	0.00	1.4	0.00	0.00						
SURCHARGE(QK)	2.03	1.35	2.73	1.6	3.24	4.37						
LINE LOAD(GK)	0.00	2.83	0.00	1.4	0.00	0.00						
LINE LOAD(QK)	0.00	2.83	0.00	1.6	0.00	0.00						
WATER	0.45	0.00	0.00	1.4	0.63	0.00						
Totai	38.93		35.54		54.90	50.30		DC0110				
	BS8110 reference											
МОМЕ	ENT (KNm)		MAIN REINFO	RCEMENT :								
	30 40 50	60	Min. As =	390	mm ²			Table 3.25				
0.00			φ :	= 16	mm							
			centres =	200	mm	< 584	OK	3.12.11.2.7(b)				
0.54			Asprov =	1005	mm ²	> 390	ОК					
		_	MOMENT of	RESISTANCE	:							
			d =	222	mm							
			z =	209.77	mm			3.4.4.4				
1.62			As' =	0	mm ²							
			Mres =	91.69	kNm	> 50.30	OK					
v 2.16			SHEAR RESIS	STANCE:								
		1	00 As/bd =	0.45%								
2.70			VC =	0.66	N/mm ²			Table 3.8				
			Vres =	146.00	kN	> 54.90	OK	3.5.5.2				
Ultimate Bending Momer	nt Diagram											
CHECK CRACK WIDTH TO	BS8110/BS	\$8007 :	X =	66.38	mm							
(Temperature and shrinkag	ge effects n	ot included)	Acr =	118.82	mm							
			εm =	0.000455				BS8007				
			W =	0.11	mm	< 0.30	OK	App. B.2				
REINFORCEMENT SUMMARY for WALL												
	Туре	φ	Centres	As	Min. As							
		mm	mm	2	mm ²	4						
VER FICAL EXT. FACE	H H	$\frac{10}{10}$	200	393	390		OK					
VERTICAL INT. FACE	H H	16	200	1005	390		OK					
IKANSVERSE	H	<u> </u>	<u>200</u>	393	390		UK					

Project	8 Agamemnon Road	The Concrete Centre									
Client	0		6		Date		Page				
Location	Location Wall A		The Concrete Centre [™]		<u>Jan-1</u> 9		4				
	RETAINING WALL design to BS 811	0:2005		Checked	Revision		Job No				
	Originated from 'RCC62.xls' v3.1	© 2006 TCC		0	0		3959				
BASE - unloaded side (per metre length)BS8 $\gamma_f = 1.41$ (default = ult mt / non-factored mt 1.41V ult = 77.87kNM ult = 64.67kNmkNm('+' TENSION AT BOTTOM FACE)											
	BOTTOM REINFORCEMENT	Min As =	390	mm ²			Table 3 25				
	BOTTOM REINTORCEMENT .	φ =	= 16	mm							
		centres =	200	mm	< 678	ОК	3.12.11.2.7(b)				
		Asprov =	1005	mm ²	> 390	ОК					
	MOMENT of RESISTANCE :	d =	222	mm							
		Z =	209.77	mm			3.4.4.4				
		As' =	0	mm ²	04.07	01/					
		Mres =	91.69	kNm	> 64.67	OK					
		100 Ac/bd	0 4 5 0 4								
	SHEAR RESISTANCE:	100 As/bd =	0.45%	2			Table 2.0				
		VC = Vres -	146.00	N/mm⁻ kN	77 87	OK					
		vic5 –	1 10.00		> 11.01	OR	5.5.5.2				
	CHECK CRACK WIDTH TO BS811	10/BS8007 : (Te	mperature	and shrinka	age effects not	t included	1) (t				
	X = 66.38 mm	εm =	0.000836		5		BS8007				
	Acr = 118.82 mm	W =	0.21	mm	< 0.30	ОК	App. B.2				
BASE - lo	aded side (per metre lengt	h)									
	V ult = 76.89 kN										
	M UIT = -14.37 KNM	(TENSION -	TOP FACE)								
		Min As =	390	mm ²			Table 3 25				
	TOT REIN ORCEMENT :	φ =	10	mm							
		centres =	200	mm	< 685	ОК	3.12.11.2.7(b)				
		Asprov =	393	mm ²	> 390	OK					
		•									
	MOMENT RESISTANCE :	d =	225	mm							
		Z =	213.75	mm			3.4.4.4				
		As' =	0	mm ²							
		Mres =	36.50	kNm	> -14.37	OK					
			0 4 70/								
	SHEAR RESISTANCE:	100 As/bd =	0.17%	2							
		VC =	0.48	N/mm ²	70.00		Table 3.8				
		vres =	107.55	KIN	> 76.89	UK	3.5.5.2				
		0/ BS8007 · (Te	mnerature	and shrink:	age effects not	t includer	n				
	X = 44.66 mm	۳۵ (۳۵ ٤m =	-0.00317		age effects fior		BS8007				
	Acr = 120.00 mm	W =	-0.82	mm	< 0.30	ОК	App. B.2				
REINFORCEMENT SUMMARY for BASE											
	·			T	-						
	Туре	φ Centers	As	Min. As							
		mm mm	mm ²		4						
		10 200	393	390		OK OK					
ROL		16 200	1005	390		UK					
			1005	230		UK					