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12 Park Village West

Construction Method Statement

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Ref: 140627/M Tulloch BEng MEng
Approved by: C Boydell BSc CEng MIStructE MICE
Date: 30 September 2019
Rev No: 2

1.0 INTRODUCTION & BRIEF

1.1 The purpose of this report is to consider the construction and condition of the existing buildings on the site of 12 Park Village West and consider how the proposed basement structure can be constructed safely without compromising the structural integrity of the existing buildings or those adjacent to the site.

1.2 The report is based on planning drawings produced by Watson, Bertram & Fell Ltd and a visual inspection of the building.

1.3 This report has been prepared to outline the proposed construction method with outline calculations and the related structural drawings and sections.

2.0 SITE INFORMATION

2.1 12 Park Village West, Camden is an early Victorian detached 'villa' style property, designed by office of John Nash and comprises a three storey house in an Italian style with a octagonal tower toward the road built in 1834-37. The house is Grade II Listed. The construction, typical for buildings of this era, has load bearing masonry walls and timber floors. The proposed development is structurally isolated from the main property.

2.2 The house lies within the generally gentle sloped setting toward Regents Canal. Although the areas to either side of no 12 are relatively flat, the site is divided into two levels: the front house and garage levelled with Park Village West road, and a lower ground level toward the garden facing Regents Canal area, with an approximately 3m difference in level.

2.3 The three surrounding properties: No. 11, 13-14 and 204 Albany Street are a reasonable distance from the proposed works; therefore the adjacent properties' foundations are outside the 45 degree line of influence taken from the bottom of the excavation.

2.4 The proposed basement development will be situation under the existing coach house. The construction consists of load bearing masonry walls, timber floor and a timber roof. A visual inspection of the site has indicated movement to the rear flank wall. A reinforced concrete box, with walls cast under the existing structure will allow the existing structure to be stabilised while creating useable living space.

2.5 A Basement Impact Assessment – Screening and Scoping Report has been completed for the site and concludes that there are no negative impacts anticipated in this basement proposal on the hydro-geological and hydrological conditions of the local environment that cannot be suitably addressed in the detailed design of this proposal.

3.0 PROPOSED WORKS

3.1 In outline the main proposed structural works consist of:

- Supporting the existing structure in the temporary state to allow for excavations;
- Reducing the existing ground level under the coach house by approximately 4.0m in order to provide a new basement structure;
- The construction of new reinforced concrete “box” to form the basement.

3.2 A reinforced concrete retaining wall, which will be designed to act as simply supported, will provide the retaining structure. The basement slab will be designed for potential overburden pressures, resisted by self weight and the frictional resistance of the concrete “box” in the ground. The ground floor will consist of a reinforced concrete slab, supported on the retaining walls and acting as a prop to the top of the retaining wall.

3.3 Outline sketch proposals for the basement construction are shown in drawings S100, S101, S200 in Appendix A.

3.4 Outline structural calculations are included in Appendix B.

4.0 DESIGN & OUTLINE CONSTRUCTION METHOD STATEMENT

4.1 SSK001, in Appendix C, shows the stages of construction on a typical cross-section through the site as detailed in the method statement below. S099 shows the proposed temporary works required to support the existing structure during construction.

4.2 The retaining wall will be constructed in an underpinning type sequence to ensure the stability of the existing building is not compromised. The underpinning works should be carried out by a competent contractor, experienced with these types of operations and, preferably accredited with the Association of Specialist Underpinning Contractors (ASUC).

4.3 Phase 1 – Locally break out existing slab and install Pynford beams under loading bearing walls. Install temporary piles to support Pynford beams. Demolition of the existing ground bearing slab once all temporary works are installed.

4.4 Phase 2 - The first stage of underpinning is to be carried out in traditional 1.0m wide sections to minimise the risk of damage to the existing walls. The depth of the underpinning sections will be over 1.5m so temporary shoring should be used to ensure the stability of the excavations are maintained during the formation of the pins particularly where increased depths of made ground are encountered.

4.5 Each section of underpinning is to be tied to the adjacent section using either pre-fixed or post-fixed dowels and surfaces prepared to provide a shear key between each section. Hydrophilic water stops are to be applied to each joint before pouring of new sections to ensure water tightness is achieved.

4.6 Horizontal propping is to be installed before the ground level is fully reduced to the level required to undertake the second stage of underpinning.

4.7 Phase 3 - The second stage of underpinning should be carried out in 1.0m bays similar to the first stage. Vertical bars from the first stage of underpinning should lap with reinforcement in the second stage pins in order to provide full continuity. As with the vertical joints hydrophilic are to be installed to the horizontal surface to prevent water ingress through the joints.

4.8 Horizontal propping is to be installed to the second stage pins in order to allow excavation to the base slab formation level.

4.9 Phase 4 – Construction of basement slab. Reinforcement from the lower underpinning sections is to be fully continuous with that present in the base slab which can be achieved using mechanical couplers.

4.10 Phase 5 – Construction of ground floor slab. Temporary propping can be removed once ground floor slab is fully cast and cured. Temporary piles to be broken down.

5.0 SUMMARY

The proposed development of 12 Park Village West is to construct a single storey basement under the existing coach house. The development allows for the stabilisation of the existing building, which is suffering from significant movement, while creating a useable living space.

The construction sequence indicated within this document allows for the basement to be constructed in a manner that is safe and economic considering the scale of the building.

The works to 12 Park Village West, although complicated, should not be unfamiliar to a competent and experienced groundwork contractor and are relatively modest.

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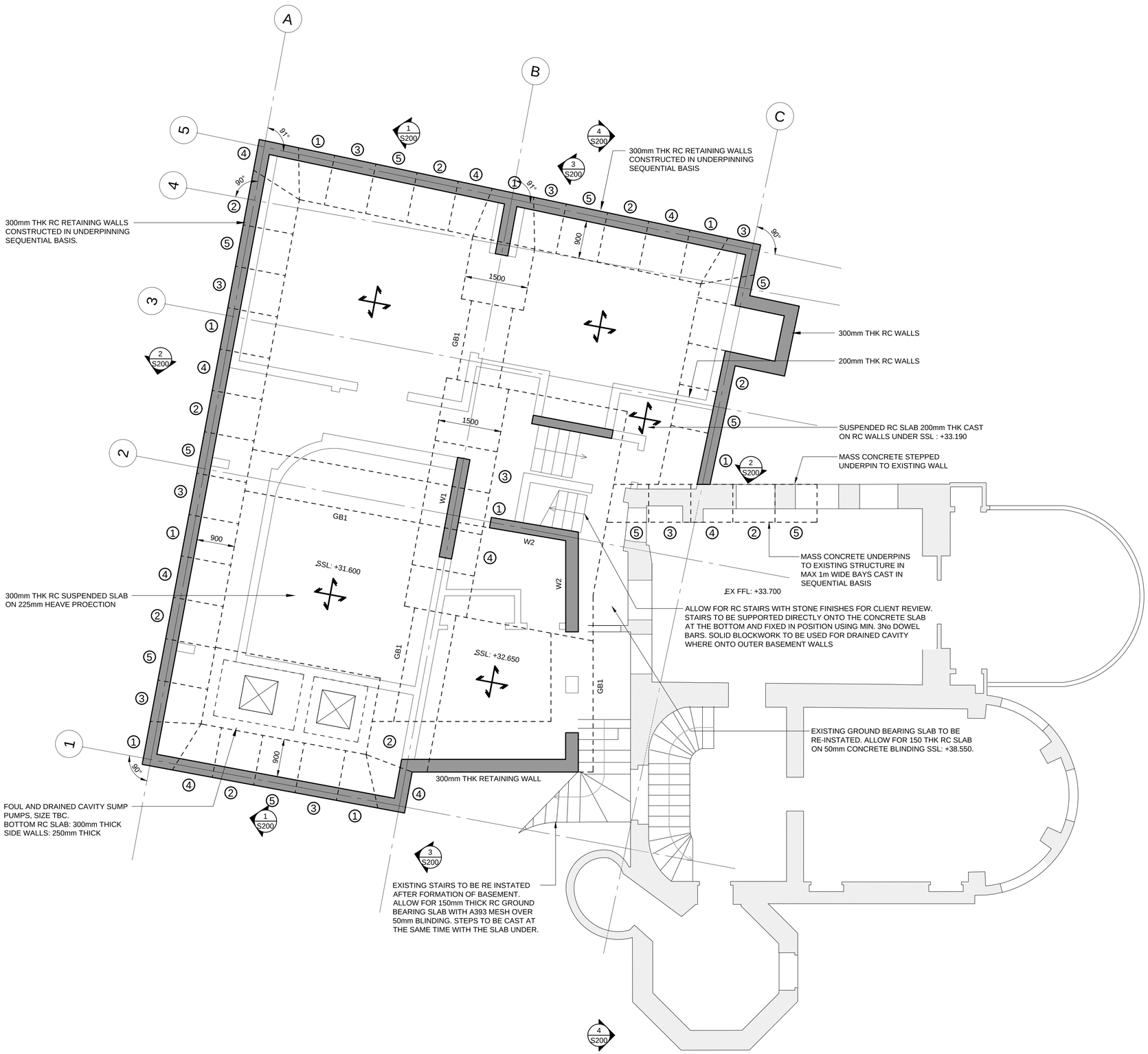
Appendix A – Structural Drawings and Sections



GENERAL NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS
2. DO NOT SCALE FROM THIS DRAWING IN EITHER PAPER OR DIGITAL FORM. USE WRITTEN DIMENSIONS ONLY.
3. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF ALL TEMPORARY WORKS AND SHALL SEQUENCE THE WORKS SUCH THAT THE BUILDING REMAINS STABLE AT ALL TIMES.
4. TREES NOT SHOWN FOR CLARITY. REFER TO TREES CONSTRAINTS PLAN BY LANDMARK TREES FOR TREES LOCATIONS AND SPECIES.

REINFORCED CONCRETE NOTES

1. CONCRETE TO BE GRADE RC 32 / 40
2. REINFORCING TO BE GRADE 500 B HIGH YIELD TO BS 4445 / BS EN 10080.
3. CONCRETE BELOW GROUND TO CONFORM TO ACEC CLASS AC-2 AND DESIGN SULPHATE CLASS DS-3.
4. ALLOW FOR WATERPROOFING RENDER TO CONCRETE FORMING RETAINING WALLS AND BASEMENT SLABS TO SPECIALIST DETAILS.

STEELWORK NOTES

1. ALL STEEL TO BE GRADE S355 TO BS EN 10025.
2. THE FABRICATOR IS TO DESIGN AND DETAIL ALL CONNECTIONS NOT SHOWN ON CONISBEE DRAWINGS.

WALL CONSTRUCTION LEGEND	
SYMBOL	DESCRIPTION
	INDICATES NEW RC WALL
	INDICATES EXISTING STRUCTURE RETAINED
	INDICATES NEW BRICKWORK
	INDICATES NEW BLOCKWORK

WALL CONSTRUCTION LEGEND	
SYMBOL	DESCRIPTION
	INDICATES SPAN OF 300mm THICK RC SUSPENDED SLAB ON 225mm HEAVE PROTECTION
	INDICATES SPAN OF RC SUSPENDED SLAB. REFER TO PLANS FOR DEPTHS.
	INDICATES ASSUMED SPAN OF EXISTING FLOOR
	INDICATES SPAN OF TIMBER FLOOR JOISTS. REFER TO PLAN FOR SIZES AND SPACING.

GROUND BEAM SCHEDULE	
MARK	DESCRIPTION
GB1	1000x525 DP RC GROUND BEAM

WALL SCHEDULE	
MARK	DESCRIPTION
W1	300 THICK RC WALL
W2	200 THICK RC WALL

UNDERPINNING NOTES

1. UNDERPINS TO EXISTING STRUCTURE IN MAX. 1m WIDE BAYS CAST IN SEQUENTIAL BASIS. REFER TO PLAN FOR SUGGESTED LOCATION AND NUMBERING OF PINS.
2. PINS TO BE 525 mm DEEP UNLESS NOTED OTHERWISE.

NOT FOR CONSTRUCTION

Rev	Date	Description	Drawn	Check
P3	20.09.19	ISSUED FOR PLANNING	RG	GA
P2	27.05.16	ISSUED FOR INFORMATION	MT	CB
P1	14.08.15	ISSUED FOR INFORMATION	MT	CB

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Drawing Status
PLANNING

Project
12 PARK VILLAGE WEST
LONDON

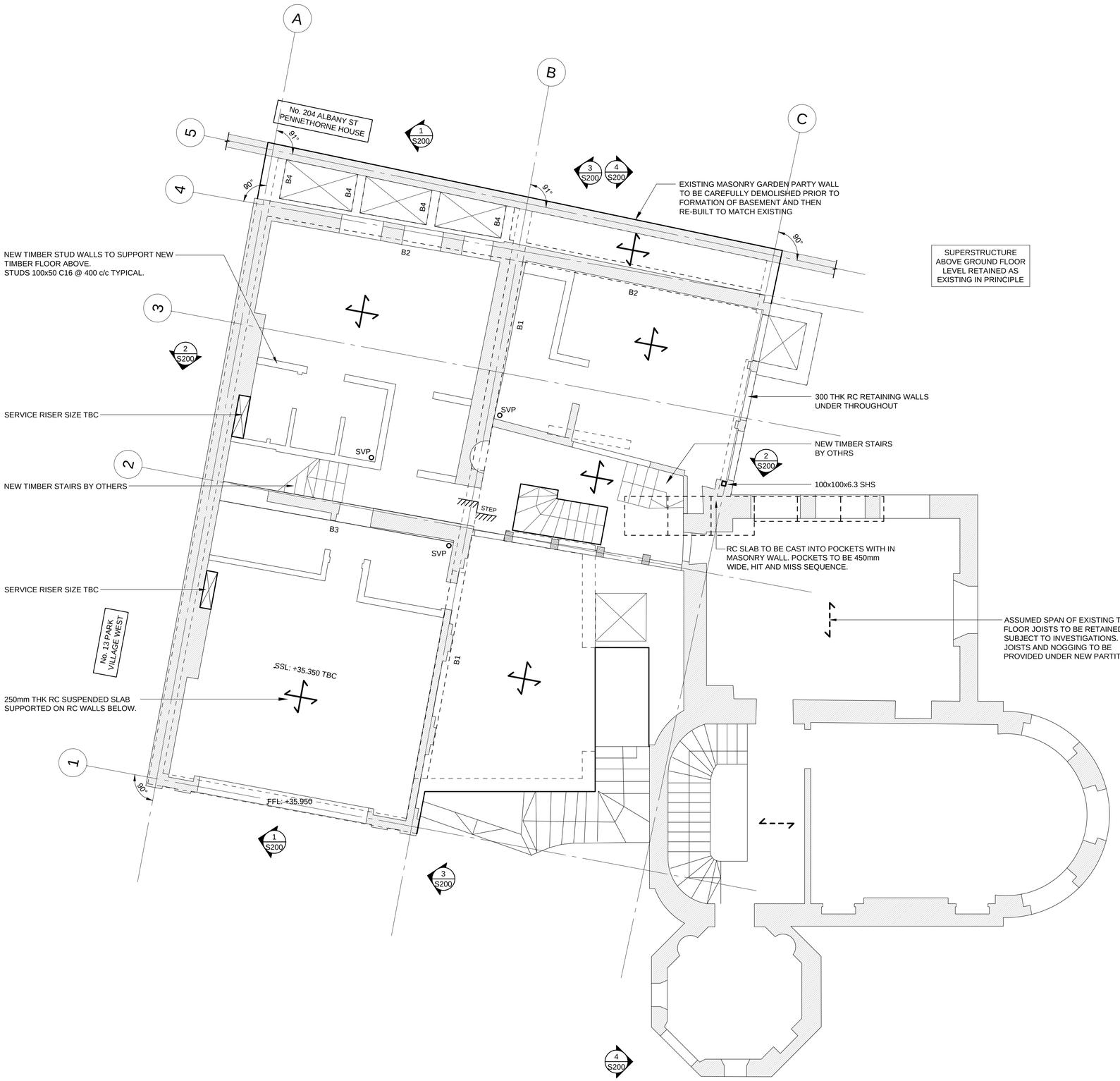
Title
BASEMENT PLAN

Date 2018
Scale 1:50 @A1
Drawn JD
Engineer GA

Project No
140627

Drawing No
S100

Revision
P3



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	INDICATES SPAN OF RC SUSPENDED SLAB. REFER TO PLANS FOR DEPTHS.
	INDICATES ASSUMED SPAN OF EXISTING FLOOR
	INDICATES SPAN OF TIMBER FLOOR JOISTS. REFER TO PLAN FOR SIZES AND SPACING.

BEAM SCHEDULE	
MARK	DESCRIPTION
B1	300x525 DEEP RC PYNFORD BEAM TO PROP WALL DURING CONSTRUCTION AND FORM PERMANENT SUPPORT
B2	450x525 DEEP RC PYNFORD BEAM TO PROP WALL DURING CONSTRUCTION AND FORM PERMANENT SUPPORT
B3	450x450 DEEP RC PYNFORD BEAM TO PROP WALL DURING CONSTRUCTION AND FORM PERMANENT SUPPORT
B4	200x250 DEEP RC BEAMS TO SUPPORT GLAZING/GRILL AND PROP RC RETAINING WALL

NOT FOR CONSTRUCTION

Rev	Date	Description	Drawn	Check
P1	20.09.19	ISSUED FOR PLANNING	RG	GA
P2	27.05.16	ISSUED FOR INFORMATION	MT	CB
P1	14.08.15	ISSUED FOR INFORMATION	MT	CB

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Drawing Status
PLANNING

Project
12 PARK VILLAGE WEST
LONDON

Title
GROUND FLOOR PLAN

Date 2018
Scale 1:50 @A1
Drawn JD
Engineer GA

Project No
140627

Drawing No
S101

Revision
P3

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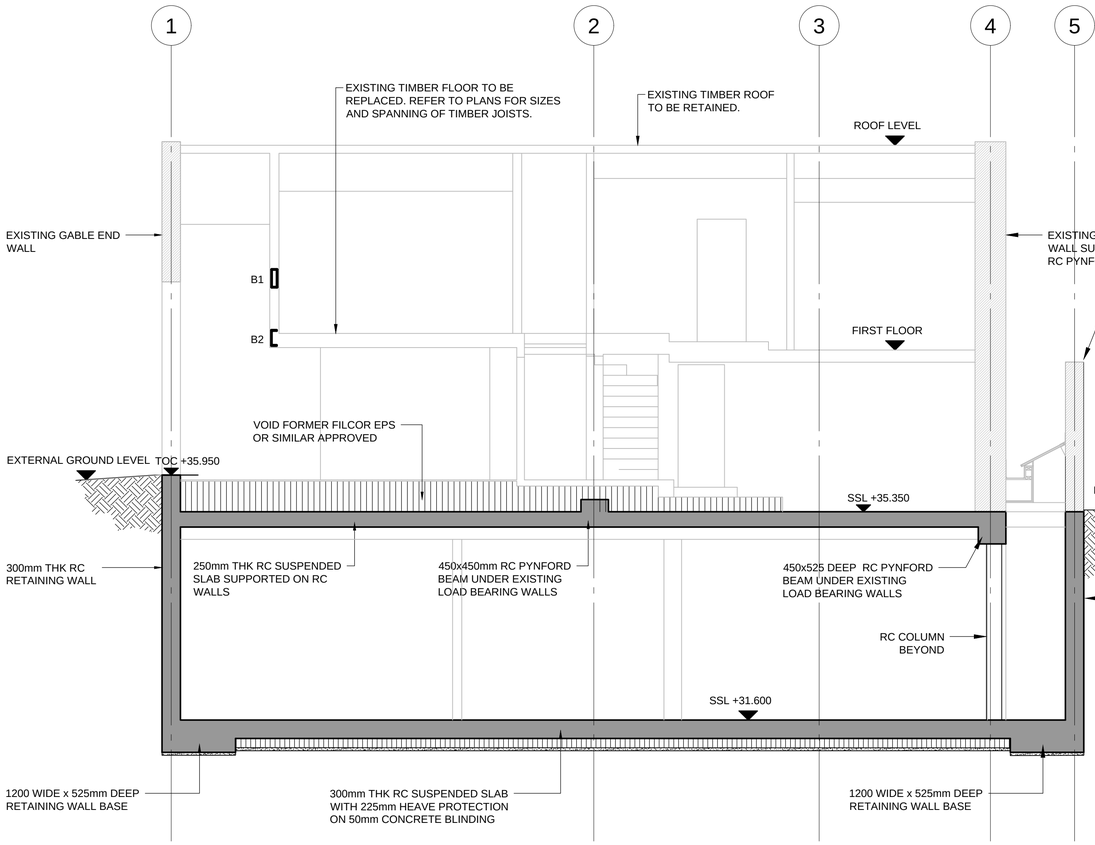
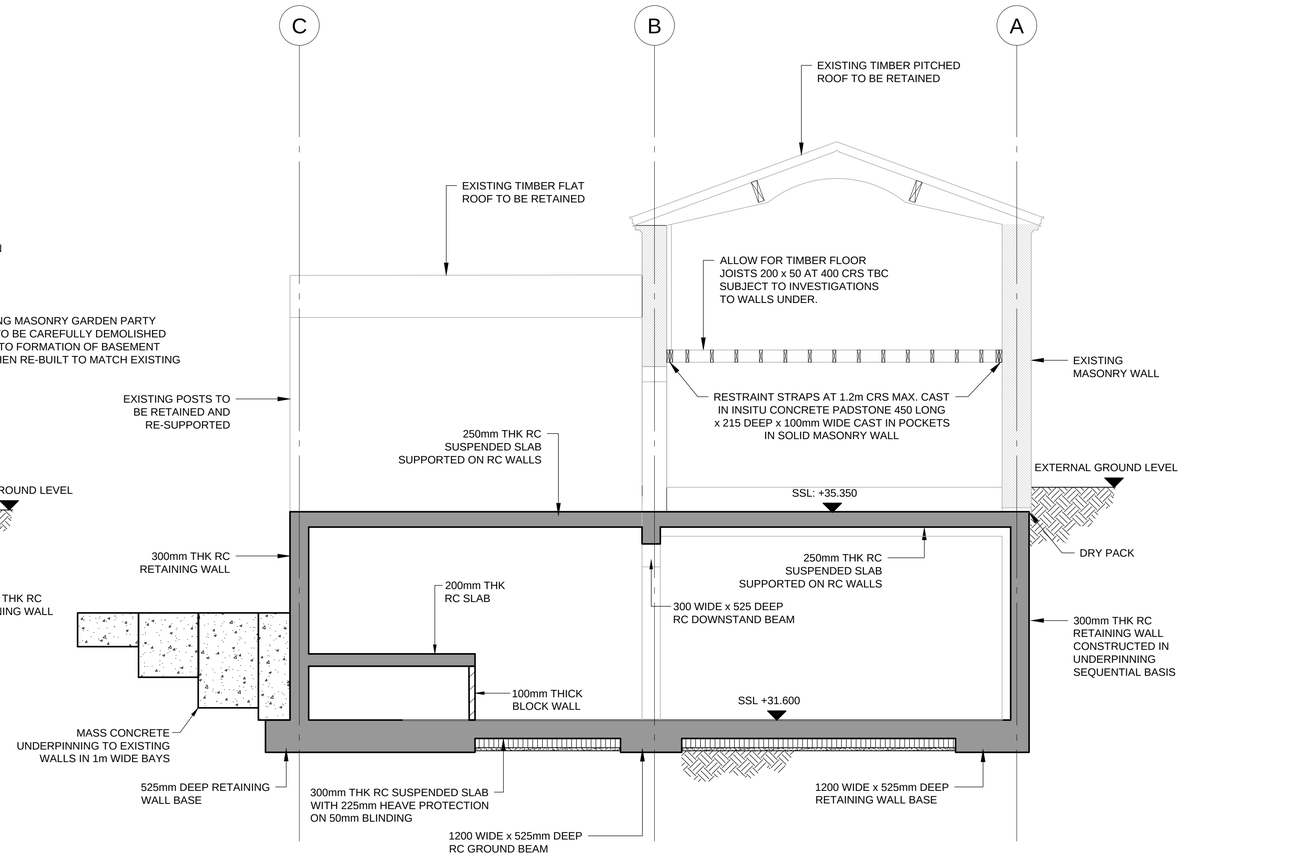


SECTION 1-1

SCALE 1:50



SECTION 2-2

SCALE 1:50

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Rev	Date	Description	Drawn	Check
P3	20.09.19	ISSUED FOR PLANNING	RG	GA
P2	27.05.16	ISSUED FOR INFORMATION	MT	CB
P1	14.08.15	ISSUED FOR INFORMATION	MT	CB

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Drawing Status
PLANNING

Project
12 PARK VILLAGE WEST
LONDON

Title
SECTIONS
SHEET 1 OF 2

Drawing No
S200

Date 2018
Scale 1:50 @A1
Drawn JD
Engineer GA
Project No **140627**
Revision **P3**

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Appendix B – Outline Structural Calculations

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project: 12 PARK VILLAGE WEST

job no.: 140627.

sheet no.:

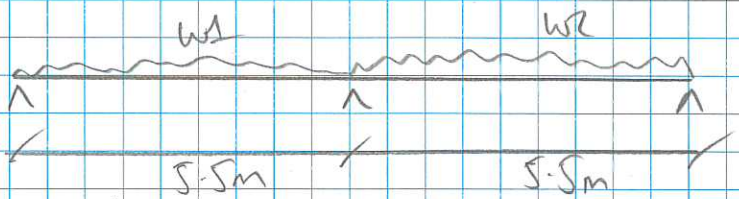
title: PYNFORD BEAM DESIGN

date:

engineer:

checked:

rev.	date



loading

W1:

dead

wall S/W = 6m × 0.33m × 20 kN/m³ = 39.6 kN/m

ground floor: 2.5m × 24 kN/m³ × 0.25m = 15 kN/m

first floor: 1m × 1 kN/m² = 1 kN/m

roof: 2m × 1 kN/m² = 2 kN/m

beam S/W = 0.45 × 0.45 × 24 kN/m³ = 4.86 kN/m

62.46 kN/m

live

floors: 2.5m × 2 kN/m² = 5 kN/m

1m × 2.0 kN/m² = 2 kN/m

roof: 2m × 0.75 kN/m² = 1.5 kN/m

8.5 kN/m

W1 = 101 kN/m.

W2:

dead

wall S/W = 3m × 0.33m × 20 kN/m³ = 19.8 kN/m

ground floor: 2m × 24 kN/m³ × 0.25m = 12 kN/m

roof: 2m × 1 kN/m² = 2 kN/m

beam S/W = 0.45 × 0.45 × 24 kN/m³ = 4.86 kN/m

38.66 kN/m

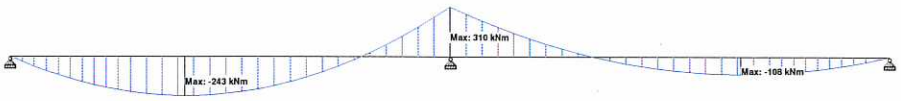
live

floor: 2m × 2 kN/m² = 4 kN/m

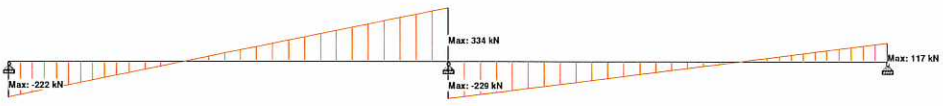
roof: 2m × 0.75 kN/m² = 1.5 kN/m

5.5 kN/m

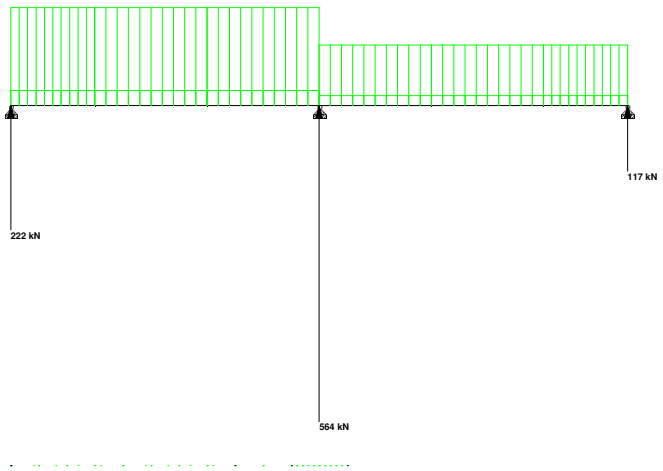
W2 = 62.9 kN/m



FACTORED BENDING MOMENT



FACTORED SHEAR FORCE



BEAM REACTIONS

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Page No.		Revision	
Engineer	MT	Date	
Checked		Date	

Job No.	140627	Job Title	12 Park Village West
Subject	Pynford Beam		

Reinforced Concrete Beam Design

Beam Reference — RC Beam

Forces				**Beam Dimensions**			
Maximum Moment	M =	310	kNm	Depth	450	mm	
Maximum Shear Force	V =	334	kN	Width	450	mm	
				Tens. reinft cover	35	mm	
Material Properties				Comp. reinft cover	35	mm	
Char. Strength tension reinft	f_y =	500	N/mm^2	Span	5.5	m	
Char. Strength links	f_{yv} =	500	N/mm^2				
Concrete strength	f_{cu} =	40	N/mm^2				

Compression and Tension Reinforcement

Effective Depth to tension reinft	d =	392.5	mm	
Effective depth to compression reinft	d' =	57.5	mm	
	k =	0.112		
Lever arm	z =	335.5	mm	
	x =	126.8	mm	
Reduced char strength		Not required	N/mm^2	For compression reinforcement only

Tension Reinforcement

Tension reinforcement required	A_s =	**1946**	mm^2						
Tension reinforcement provided	$A_{s\,prov}$ =	**2454**	mm^2	**Provide**	**5**	**H**	**25**	**s**	
				Tension reinforcement ok					

Compression reinforcement

Compression reinforcement required	A_s' =	**0**	mm^2						
Compression reinforcement provided	$A_{s'\,prov}$ =	**2454**	mm^2	**Provide**	**5**	**H**	**25**	**s**	
				Compression reinft ok					

Shear reinforcement

Design shear stress	v =	1.89	N/mm^2						
Concrete shear stress	v_c =	0.83	N/mm^2						
Shear reinforcement	A_{sv} =	252	mm^2	**Provide**	**2**	**H**	**10**	**links**	
Area of shear links	$A_{sv\,prov}$ =	314	mm^2		**at**	**250**	**centres**		
				Shear links ok					

Deflection

Basic span/effective depth ratio		**20**	
Design service stress	f_s =	264	N/mm^2
Modification factor (tension reinft)		0.88	
Modification Factor (compression reinft)		1.32	
Modified span/effective depth ratio		**23.2**	
Actual span/effective depth ratio		**14.0**	***Span/effective depth ratio ok***

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project: 12 PARK VILLAGE WEST

job no.: 140627.

sheet no.:

title: GROUND FLOOR SLAB.

date:

engineer:

checked:

rev.	date	

span 5.5m

loading

dead

S/W : 24kN/m³ × 1m × 0.25m = 6kN/m

finishes : 1kN/m² × 1m = 1kN/m.

live : 2.0kN/m² × 1m = 2kN/m

w = 13kN/m.

wall @ midspan

dead : 0.1m × 2m × 20kN/m³ × 1m = 4kN

floor : 2.8m × 1kN/m² × 1m = 2.8kN

live 2.8m × 2kN/m² × 1m = 5.6kN

P = 18.5kN.

Moment: $M = wL^2/8 + PL/4 = 49.16 + 25.44 = 74.6$kNm.

Shear: $V = wL/2 + P/2 = 35.75 + 9.25 = 45$kN

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project: 12 Park Village West, London

job no. 140627

sheet no.

title: Ground Floor Slab

date

engineer

checked

rev	date	

Material Properties

Concrete Self Weight =	24	kN/m^3
Concrete Grade, f_{cu} =	40	N/mm^2
Reinforcement Strength, f_y =	500	N/mm^2

Slab Properties

Span =	5.5	m
Overall Depth, h =	250	mm
Bar Diameter =	16	mm
Link diameter =	0	mm
Cover =	30	mm
Effective depth, d =	**212**	mm

Design Moment, M =	**75**	kNm
Ultimate Moment, M_u =	**280**	kNm

M < Mu therefore section adequate

Reinforcement

k =	0.0415	***< 0.156 No compression steel required***
z =	0.9500	d ≤ 0.95d
$A_{s\ reqd}$ =	852	mm^2/m
$A_{s\ min}$ =	325	
Therefore provide	**16**	s @ **200** mm spacing
$A_{s\ prov}$ =	**1005**	mm^2/m **> As reqd, reinforcement is adequate**
Steel content =	0.40%	> 0.13 and < 4 %
$A_{s'\ prov}$ =	393	mm^2/m

Deflection Check

basic l/d =	20	*(Simply supported)*
M / bd^2 =	1.660	
Design Service Stress, f_s =	264.93	N/mm^2
Modification factor (t) =	1.24	≤ 2
Modification factor (c) =	1.06	≤ 1.5
Allowable l / d =	26.25	
Actual l/d =	25.94	**OK**

Shear Check

V =	45	kN
Design Shear Stress, v =	0.212	N/mm^2 ***< 5N/mm2 therefore beam size adequate***
$100A_s / b_v d$ =	0.474	
Design Concrete Shear Stress,	0.576	N/mm^2

v < vc therefore shear links are not required

Project	12 PARK VILLAGE WEST			
Client				
Location	Basement Column			

The Concrete Centre™

SYMMETRICALLY REINFORCED RECTANGULAR COLUMN DESIGN, BENT ABOUT TWO AXES TO BS 8110:2005

Originated from **RCC53.xls** v3.2 on CD

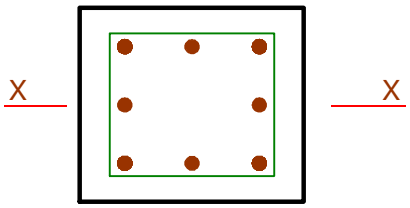
Made by	Date	Page
Checked	Revision	Job No

MATERIALS

fcu	40	N/mm²	γm, steel	1.15	Cover to link	30	mm
fy	500	N/mm²	γm, conc	1.5	h agg	20	mm
steel class	A						

SECTION

h	300	mm
b	300	mm
with	3	bars per 300 face
and	3	bars per 300 face



RESTRAINTS

	Lo (mm)	Top Condition	Btm Condition	Braced ?	ß	Le (mm)	Slenderness	Status
X-AXIS	3800	3	3	Y	1	3800	Lex/h = 12.67	Column is
Y-AXIS	3800	3	3	Y	1	3800	Ley/b = 12.67	SHORT

LOADCASES

	AXIAL N (kN)	TOP MOMENTS (kNm) M ix	TOP MOMENTS (kNm) M iy	BTM MOMENTS (kNm) M ix	BTM MOMENTS (kNm) M iy
B1	564	0.0	0.0	0.0	0.0
				0.0	0.0
				0.0	0.0
				0.0	0.0
				0.0	0.0
				0.0	0.0

BAR ARRANGEMENTS

Bar Ø	Asc %	Link Ø	BAR CENTRES (mm) 300 Face	300 Face	Nuz (kN)	Checks
H 40	11.17	10	90	90	0	Asc > 6 % (3.12.6.2)
H 32	7.15	8	96	96	0	Asc > 6 % (3.12.6.2)
H 25	4.36	8	100	100	3245	ok
H 20	2.79	6	104	104	2656	ok
H 16	1.79	6	106	106	2279	ok
H 12	1.01	6	108	108	1985	ok

DESIGN MOMENTS (kN

	K	X AXIS M add	X AXIS Mx	Y AXIS M add	Y AXIS My	COMBINED Axis	COMBINED M '	REBAR	max V *
B1	0.000	0.0	8.5	0.0	0.0	X	8.5	8 H12	48.4
0									#DIV/0!
0									#DIV/0!
0									#DIV/0!
0									#DIV/0!
0									#DIV/0!

SEE CHARTS ON NEXT SHEET

Project	12 PARK VILLAGE WEST		0
Client	0	Made by: 0	Date: 00-Jan-00 / Page:
Location	Basement Column	Checked	Revision / Job No

SYMMETRICALLY REINFORCED RECTANGULAR COLUMN DESIGN, BENT ABOUT TWO AXES TO BS 8110:2005

Originated from RCC53.xls v3.2 on CD

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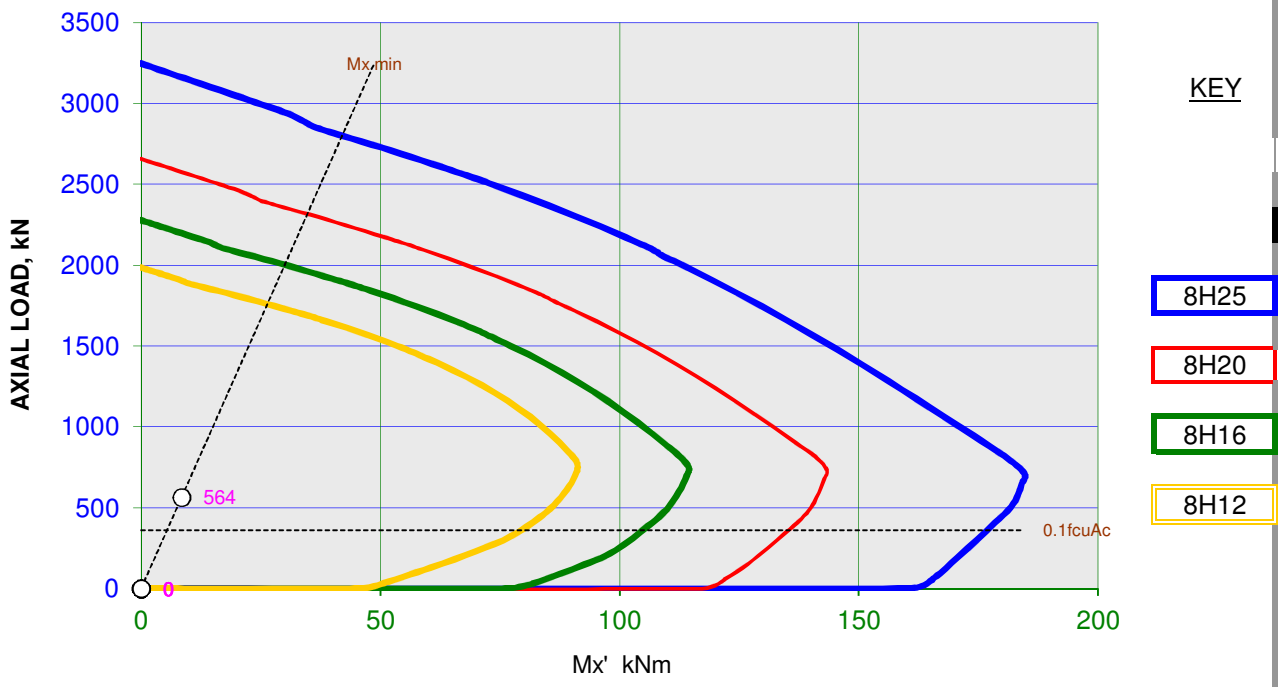
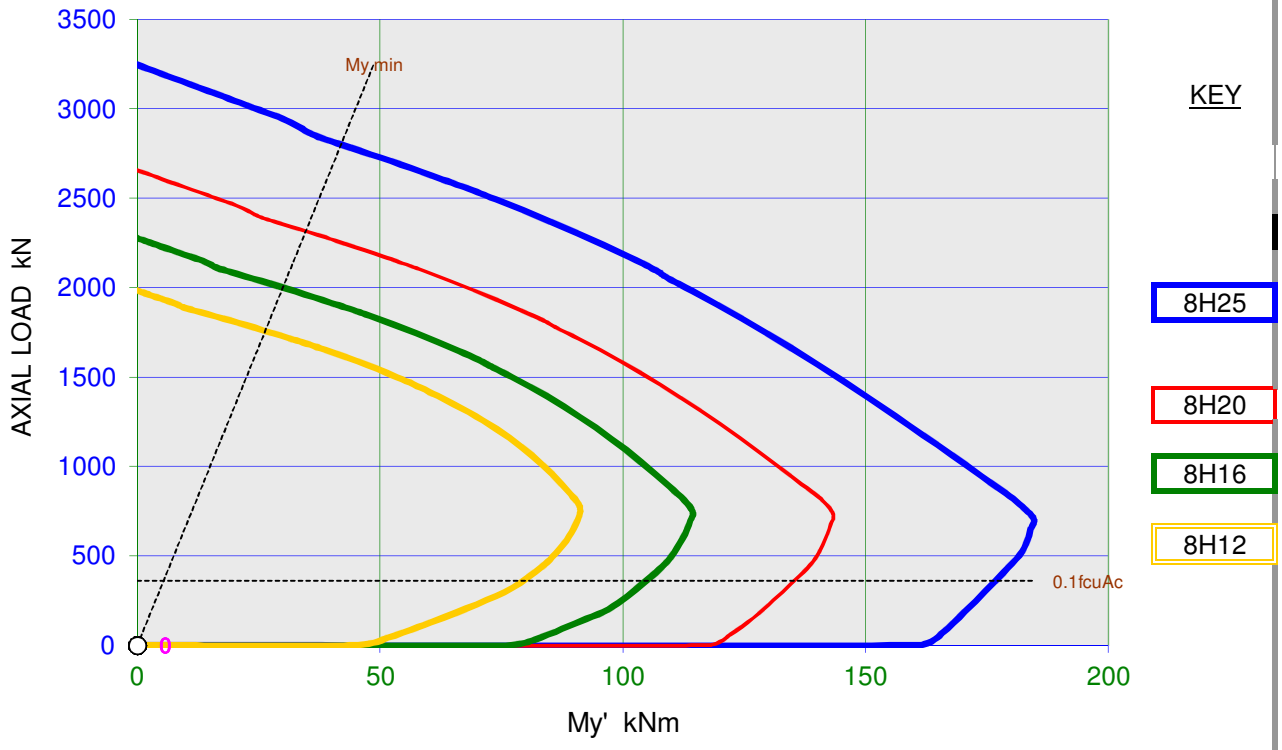
N:M interaction chart: Mx' critical

300 x 300 column (h x b), grade C40, 30 mm cover



N:M interaction chart: My' critical

300 x 300 column (h x b), moment about yy axis), Grade C40, 30 Cover



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project: 12 PARK VILLAGE WEST

job no.: 140627

sheet no.:

title: RETAINING WALL

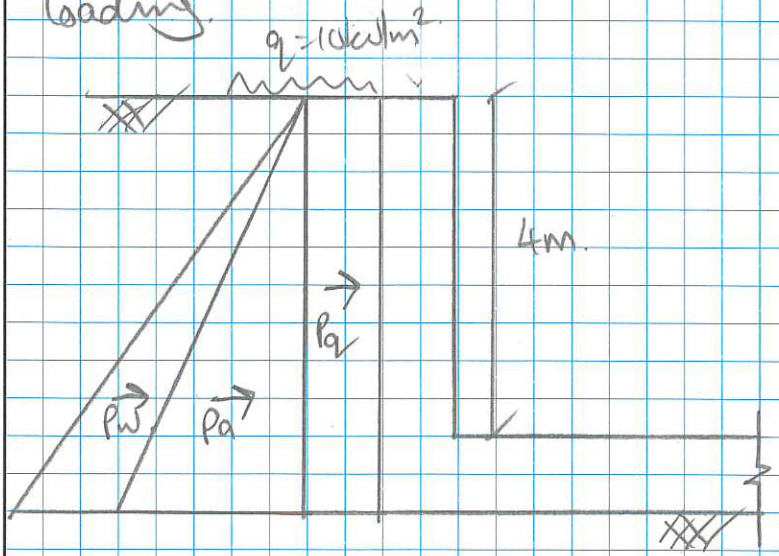
date:

engineer:

checked:

rev.	date

Loading.



$\gamma = 19.5\ kN/m^3$

$\phi = 23°$

$K_{aa} = 0.44$

$K_p = 2.28$

Soil.	Depth (m)	pressure (kN/m^2)
Clay.	0	$10 \times 0.44 = 4.4$
	4	$4.4 + (4 \times 19.5 \times 0.44) + (4 \times 10 \times 0.44) = 56.32$

2 conditions.

Propped Top & bottom (wall to be propped during construction)

$M_{max} = 86.7\ kNm$
$V_{max} = 109\ kN$

Propped Cantilever.

$M_{max} = 89.9\ kNm$
$V_{max} = 132\ kN$

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project: 12 Park Village West, London
job no.: 140627
sheet no.:
title: Retaining wall propped top and bottom
date:
engineer:
checked:

rev	date	

Material Properties

Concrete Self Weight =	24	kN/m^3
Concrete Grade, f_{cu} =	40	N/mm^2
Reinforcement Strength, f_y =	500	N/mm^2

Slab Properties

Span =	4	m
Overall Depth, h =	300	mm
Bar Diameter =	16	mm
Link diameter =	0	mm
Cover =	30	mm
Effective depth, d =	**262**	mm

Design Moment, M =	**87**	kNm
Ultimate Moment, M_u =	**428**	kNm

M < Mu therefore section adequate

Reinforcement

k =	0.0316	***< 0.156 No compression steel required***
z =	0.9500	d ≤ 0.95d
$A_{s\ reqd}$ =	801	mm^2/m
$A_{s\ min}$ =	390	
Therefore provide	**16**	s @ **200** mm spacing
$A_{s\ prov}$ =	**1005**	mm^2/m **> As reqd, reinforcement is adequate**
Steel content =	0.34%	> 0.13 and < 4 %
$A_{s'\ prov}$ =	1005	mm^2/m

Deflection Check

basic l/d =	20	*(Simply supported)*
M / bd^2 =	1.263	
Design Service Stress, f_s =	249.07	N/mm^2
Modification factor (t) =	1.43	≤ 2
Modification factor (c) =	1.11	≤ 1.5
Allowable l / d =	31.80	
Actual l/d =	15.27	**OK**

Shear Check

V =	109	kN
Design Shear Stress, v =	0.416	N/mm^2 ***< 5N/mm2 therefore beam size adequate***
$100A_s$ / b_vd =	0.384	
Design Concrete Shear Stress,	0.537	N/mm^2

v < vc therefore shear links are not required

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project
12 Park Village West
London

job no. **140627**
sheet no.

title
Retaining Wall
Propped Cantilever

date
engineer
checked

rev	date	

Material Properties

Concrete Self Weight =	24	kN/m^3
Concrete Grade, f_{cu} =	40	N/mm^2
Reinforcement Strength, f_y =	500	N/mm^2

Slab Properties

Span =	4	m
Overall Depth, h =	300	mm
Bar Diameter =	16	mm
Link diameter =	0	mm
Cover =	35	mm
Effective depth, d =	**257**	mm

Design Moment, M =	**90**	kNm
Ultimate Moment, M_u =	**412**	kNm

M < Mu therefore section adequate

Reinforcement

k =	0.0340	***< 0.156 No compression steel required***
z =	0.9500	d ≤ 0.95d
$A_{s\ reqd}$ =	847	mm^2/m
$A_{s\ min}$ =	390	
Therefore provide	**16**	s @ **100** mm spacing
$A_{s\ prov}$ =	**2010**	mm^2/m **> As reqd, reinforcement is adequate**
Steel content =	0.67%	> 0.13 and < 4 %
$A_{s'\ prov}$ =	1005	mm^2/m

Deflection Check

basic l/d =	20	*(Simply supported)*
M / bd^2 =	1.361	
Design Service Stress, f_s =	131.69	N/mm^2
Modification factor (t) =	1.82	≤ 2
Modification factor (c) =	1.12	≤ 1.5
Allowable l / d =	40.66	
Actual l/d =	15.56	**OK**

Shear Check

V =	132	kN
Design Shear Stress, v =	0.514	N/mm^2 ***< 5N/mm2 therefore beam size adequate***
$100A_s / b_v d$ =	0.782	
Design Concrete Shear Stress,	0.681	N/mm^2

v < vc therefore shear links are not required

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project: 12 PARK VILLAGE WEST

job no.: 140627.

sheet no.:

title: BASEMENT SLAB

date:

engineer:

checked:

rev.	date	

Basement Slab.

loading.

dead: 0.3m x 24kN/m³ = 7.2kN/m².
finishes. = 1.0kN/m².

live. 2.0kN/m².

uplift:
heave: 225mm Celtcrete ref 9/13 = 13kN/m².
water. 3m x 10kN/m² = 30kN/m².

W downward = 14.68 kN/m².
W upward = 35.8 kN/m².

Project	12 Park Village Wesr		
Client			
Location	Basement Slab	F to G: 1 to 2	
	2-WAY SPANNING INSITU CONCRETE SLABS to BS 8110:2005 (Table 3.14)		
	Originated from RCC94.xls v3.1	© 2006 TCC	

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Made by	Date	Page
Checked	Revision	Job No

DIMENSIONS

short span, lx	m	4.10
long span, ly	m	4.70
h	mm	300
Top cover	mm	30
Btm cover	mm	40

LOADING *characteristic*

Self weight	kN/m²	7.20	
Extra dead	kN/m²	1.00	
Total Dead, gk	kN/m²	8.20	γf= 1.40
Imposed, qk	kN/m²	2.00	γf= 1.60
Design load, n	kN/m²	14.68	

MATERIALS

fcu	N/mm²	35	γc = 1.50
fy	N/mm²	500	γs = 1.15
steel class		A	
Density	kN/m³	24	

(Normal weight concrete)

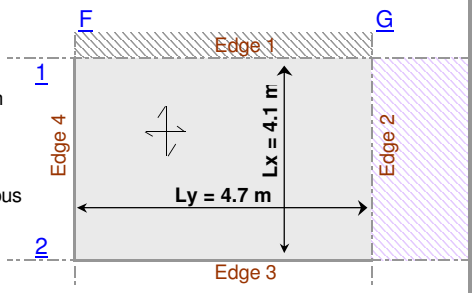
EDGE CONDITIONS

Edge 1	C	C = Continuous
Edge 2	C	D = Discontinuous
Edge 3	D	
Edge 4	d	

See Figure 3.8 and clauses 3.5.3.5-6

STATUS VALID DESIGN

Plan



MAIN STEEL		SHORT SPAN x	LONG SPAN y	EDGE 1 Continuous	EDGE 2 Continuous	EDGE 3 Free	EDGE 4 Free	BS8110 Reference
ßs		0.044	0.034	0.059	0.045	0.000	0.000	Table 3.14
M	kNm/m	10.9	8.4	14.6	11.2	0.0	0.0	
d	mm	254.0	242.0	264.0	252.0	264.0	252.0	
k'		0.156	0.156	0.156	0.156	0.156	0.156	
k		0.005	0.004	0.006	0.005	0.000	0.000	
Z	mm	241.3	229.9	250.8	239.4	250.8	239.4	3.4.4.4
As req	mm²/m	104	84	134	107	0	0	
As min	mm²/m	390	390	390	390	390	390	Table 3.25
As deflection	mm²/m	104	84	~	~	~	~	
Ø	mm	12	12	12	12	12	12	
Layer		B 1	B 2	T 1	T 2	T 1	T 2	
@	mm	275	275	275	275	275	275	
As prov	mm²/m	411	411	411	411	411	411	
=	%	0.162	0.170	0.156	0.163	0.156	0.163	%
S max	mm	762	738	762	762	762	762	Clause
Subclause		(a)	(a)	(a)	(a)	(a)	(a)	3.12.11.2.7
DEFLECTION								
fs		85	68	108	87	0	0	Eqn 8
Mod factor		2.000						Eqn 7
Perm L/d		52.00		Actual L/d	16.14	*Asx enhanced 0.0% for deflection control*		Table 3.10

TORSION STEEL

Ø mm: 10

		BOTH EDGES DISCONTINUOUS		ONE EDGE DISCONTINUOUS		
		X	Y	X	Y	
As req	mm²/m	390		390		3.5.3.5
As prov T	mm²/m	411	411	411	411	
Additional As T req	mm²	0	0	0	0	
As prov B	mm²/m	411	411	411	411	

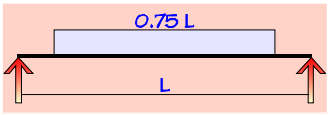
Bottom steel not curtailed in edge strips at free edges

SUPPORT REACTIONS (kN/m char uno) *(See Figure 3.10)*

Sum ßvx = 0.758 Table 3.15

Sum ßvy = 0.660

		EDGE 1 1, F-G	EDGE 2 G, 2-1	EDGE 3 2, F-G	EDGE 4 F, 2-1	equations
ßv		0.455	0.396	0.303	0.264	19 & 20
Dead	kN/m	15.28	13.31	10.19	8.88	
Imposed	kN/m	3.73	3.25	2.48	2.16	
Vs	kN/m	27.4	23.8	18.2	15.9	



OUTPUT/SUMMARY

	SHORT SPAN	LONG SPAN	EDGE 1 1, F-G	EDGE 2 G, 2-1	EDGE 3 2, F-G	EDGE 4 F, 2-1
PROVIDE MAIN STEEL	H12 @ 275 B1	H12 @ 275 B2	H12 @ 275 T1	H12 @ 275 T2	H12 @ 275 T1	H12 @ 275 T2

ADDITIONAL TORSION STEEL	CORNER 1 F1	CORNER 2 G1	CORNER 3 G2	CORNER 4 F2
X direction				
Y direction				

placed in edge strips

CHECKS	BAR Ø < COVER	SINGLY REINFORCED	MIN SPACING	MAX SPACING	DEFLECTION	GLOBAL STATUS
Lx > Ly						
OK	OK	OK	OK	OK	OK	VALID DESIGN

Project	12 Park Village Wesr		
Client			
Location	Basement Slab Heave	F to G: 1 to 2	
	2-WAY SPANNING INSITU CONCRETE SLABS to BS 8110:2005 (Table 3.14)		
	Originated from RCC94.xls v3.1 © 2006 TCC		

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Made by	Date	Page
Checked	Revision	Job No

DIMENSIONS

short span, lx	m	4.10
long span, ly	m	4.70
h	mm	300
Top cover	mm	30
Btm cover	mm	40

LOADING *characteristic*

Self weight	kN/m²	7.20	
Extra dead	kN/m²	0.00	
Total Dead, gk	kN/m²	7.20	γf= 1.40
Imposed, qk	kN/m²	35.80	γf= 1.60
Design load, n	kN/m²	67.36	

MATERIALS

fcu	N/mm²	35	γc = 1.50
fy	N/mm²	500	γs = 1.15
steel class		A	
Density	kN/m³	24	

(Normal weight concrete)

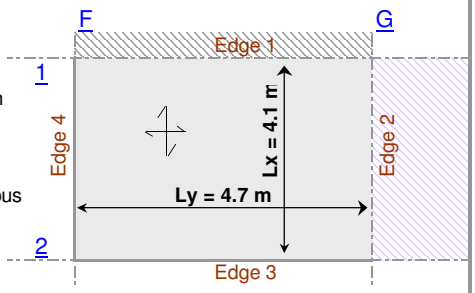
EDGE CONDITIONS

Edge 1	C	C = Continuous
Edge 2	C	D = Discontinuous
Edge 3	D	
Edge 4	d	

See Figure 3.8 and clauses 3.5.3.5-6

STATUS **VALID DESIGN**

Plan



MAIN STEEL		SHORT SPAN x	LONG SPAN y	EDGE 1 Continuous	EDGE 2 Continuous	EDGE 3 Free	EDGE 4 Free	BS8110 Reference
ßs		0.044	0.034	0.059	0.045	0.000	0.000	Table 3.14
M	kNm/m	50.2	38.5	67.0	51.3	0.0	0.0	
d	mm	254.0	242.0	264.0	252.0	264.0	252.0	
k'		0.156	0.156	0.156	0.156	0.156	0.156	
k		0.022	0.019	0.027	0.023	0.000	0.000	
Z	mm	241.3	229.9	250.8	239.4	250.8	239.4	3.4.4.4
As req	mm²/m	479	385	614	493	0	0	
As min	mm²/m	390	390	390	390	390	390	Table 3.25
As deflection	mm²/m	479	385	~	~	~	~	
Ø	mm	12	12	12	12	12	12	
Layer		B 1	B 2	T 1	T 2	T 1	T 2	
@	mm	225	275	175	225	275	275	
As prov	mm²/m	503	411	646	503	411	411	
=	%	0.198	0.170	0.245	0.199	0.156	0.163	%
S max	mm	762	738	762	762	762	762	Clause
Subclause		(a)	(a)	(a)	(a)	(a)	(a)	3.12.11.2.7
DEFLECTION								
fs		317	312	317	327	0	0	Eqn 8
Mod factor		1.342						Eqn 7
Perm L/d		34.89		Actual L/d	16.14	*Asx enhanced 0.0% for deflection control*		Table 3.10

TORSION STEEL

Ø mm: 10

		BOTH EDGES DISCONTINUOUS		ONE EDGE DISCONTINUOUS		
		X	Y	X	Y	
As req	mm²/m	390		390		3.5.3.5
As prov T	mm²/m	411	411	411	411	
Additional As T req	mm²	0	0	0	0	
As prov B	mm²/m	503	411	503	411	

Bottom steel not curtailed in edge strips at free edges

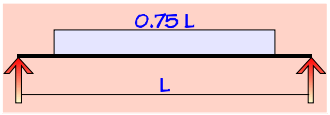
SUPPORT REACTIONS (kN/m char uno) *(See Figure 3.10)*

Sum ßvx = 0.758

Sum ßvy = 0.660

Table 3.15

		EDGE 1 1, F-G	EDGE 2 G, 2-1	EDGE 3 2, F-G	EDGE 4 F, 2-1	equations
ßv		0.455	0.396	0.303	0.264	19 & 20
Dead	kN/m	13.42	11.69	8.95	7.79	
Imposed	kN/m	66.72	58.12	44.48	38.75	
Vs	kN/m	125.5	109.4	83.7	72.9	



OUTPUT/SUMMARY

	SHORT SPAN	LONG SPAN	EDGE 1 1, F-G	EDGE 2 G, 2-1	EDGE 3 2, F-G	EDGE 4 F, 2-1
PROVIDE MAIN STEEL	H12 @ 225 B1	H12 @ 275 B2	H12 @ 175 T1	H12 @ 225 T2	H12 @ 275 T1	H12 @ 275 T2

ADDITIONAL TORSION STEEL	CORNER 1 F1	CORNER 2 G1	CORNER 3 G2	CORNER 4 F2
X direction				
Y direction				

placed in edge strips

CHECKS	BAR Ø < COVER	SINGLY REINFORCED	MIN SPACING	MAX SPACING	DEFLECTION	GLOBAL STATUS
Lx > Ly						
OK	OK	OK	OK	OK	OK	VALID DESIGN

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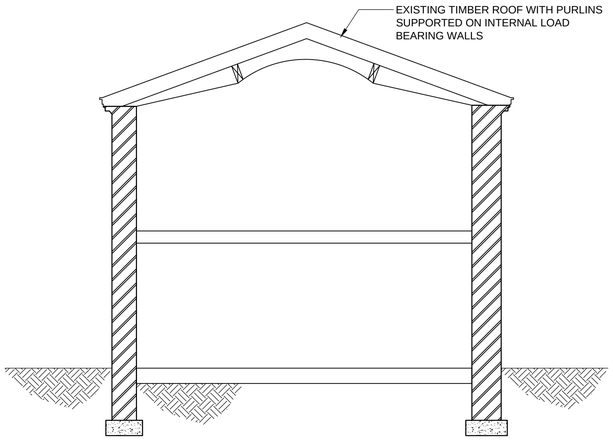
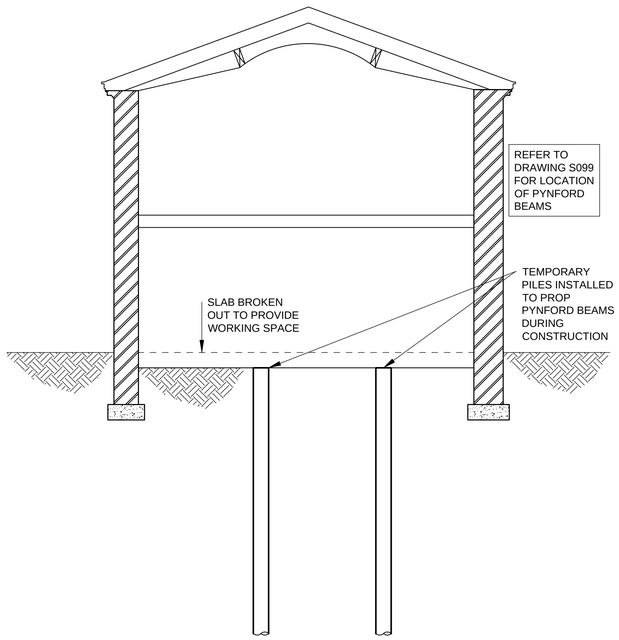
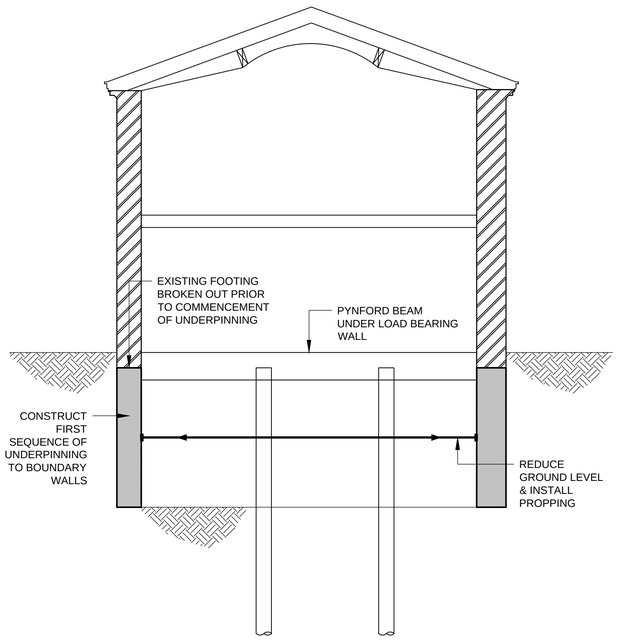
Appendix C – Construction Method Statement



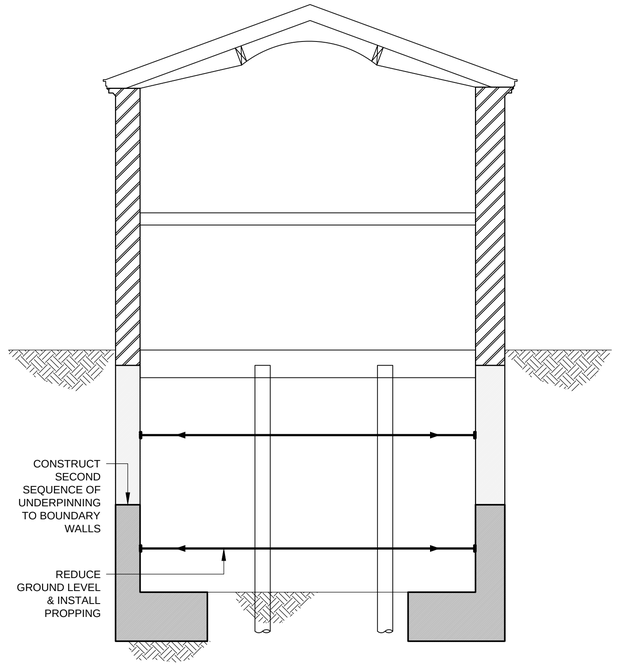
CROSS SECTION THROUGH EXISTING STRUCTURE



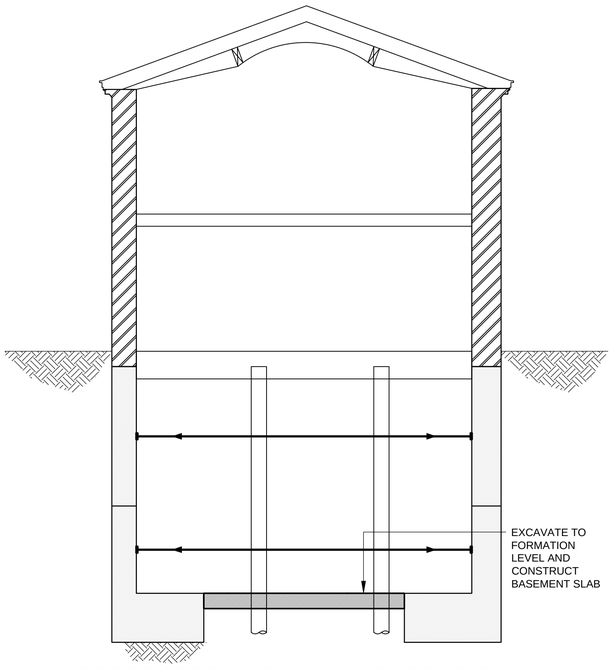
CROSS SECTION THROUGH BASEMENT PHASE 1 - GROUND FLOOR SLAB LOCALLY BROKEN OUT, TEMPORARY PILES INSTALLED & PYNFORD BEAMS CAST



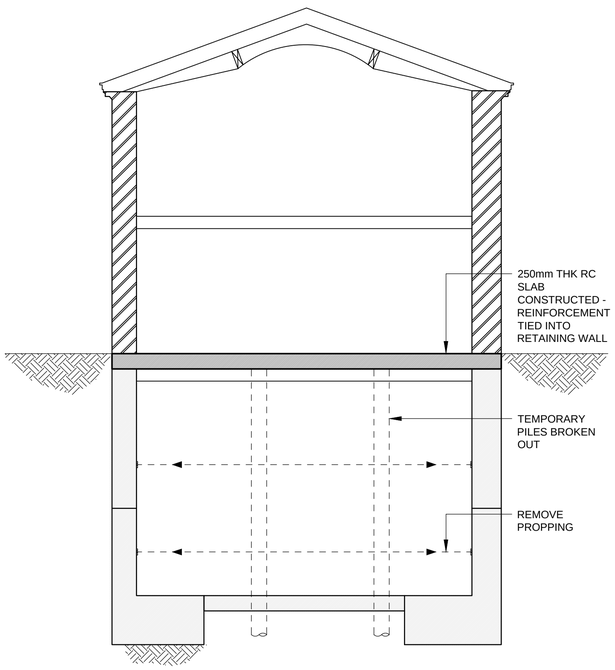
CROSS SECTION THROUGH BASEMENT PHASE 2 - STAGE 1 RETAINING WALL, REDUCED DIG & PROP



CROSS SECTION THROUGH BASEMENT PHASE 3 - STAGE 2 RETAINING WALL, REDUCED DIG AND PROP



CROSS SECTION THROUGH BASEMENT PHASE 4 - CONSTRUCTION OF BASEMENT SLAB



CROSS SECTION THROUGH BASEMENT PHASE 5 - GROUND FLOOR SLAB CONSTRUCTED

NOTE:
SOIL LEVELS OUTSIDE THE COACH HOUSE ONLY TO REDUCE ONCE UNDERPINNING OF THE COACH HOUSE IS COMPLETE

THE PRINCIPLE OF THIS SEQUENCE APPLIES THROUGHOUT PROPOSED BASEMENT

NOT FOR CONSTRUCTION

Rev	Date	Description	Drawn	Check
P3	20.09.19	ISSUED FOR PLANNING	RG	GA
P2	27.05.16	ISSUED FOR INFORMATION	MT	CB
P1	14.08.15	ISSUED FOR INFORMATION	MT	CB

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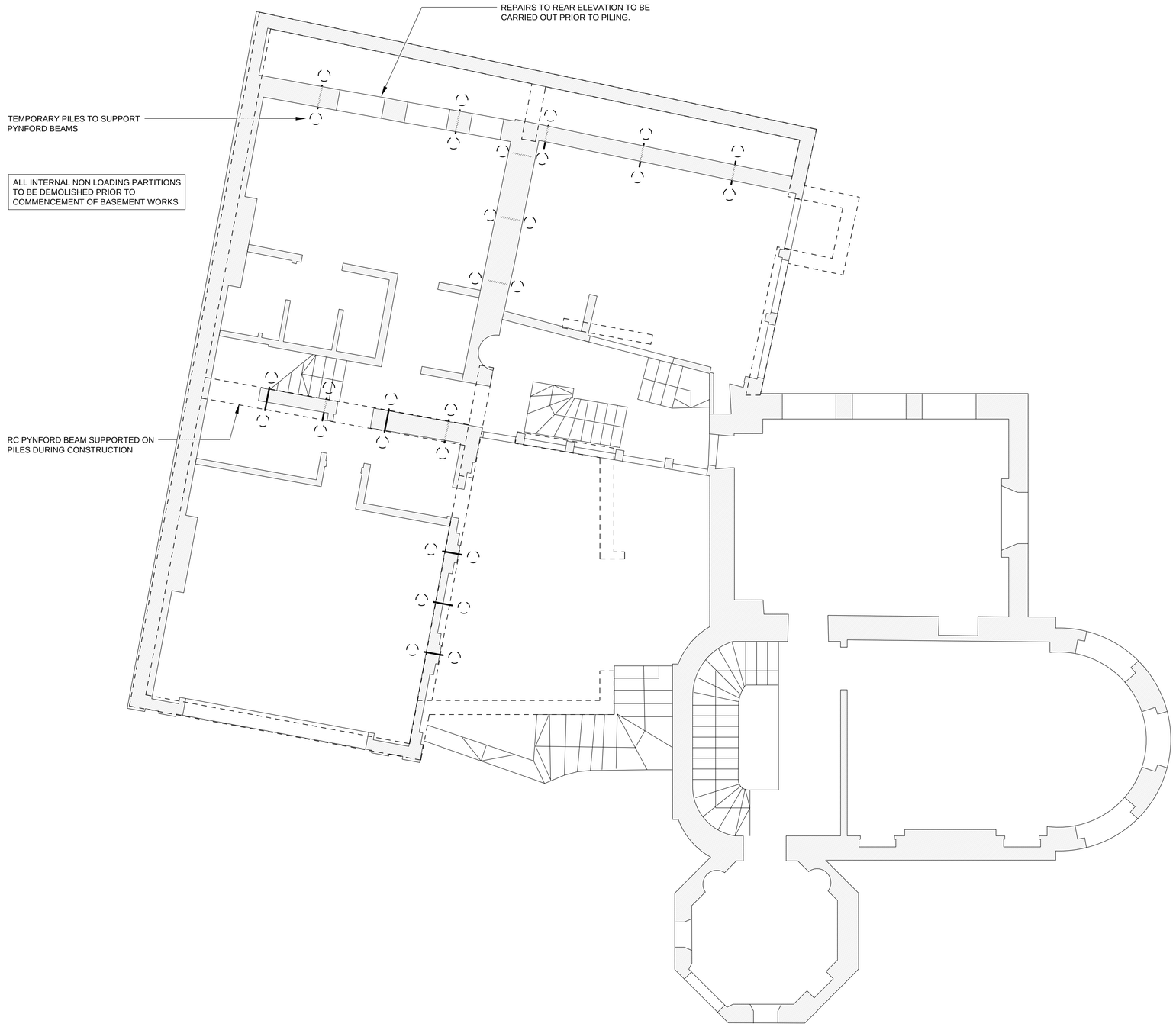
Drawing Status
PLANNING

Project
12 PARK VILLAGE WEST
LONDON

Title
SUGGESTED CONSTRUCTION SEQUENCE - BASEMENT

Date AUG 15
Scale 1:50@A1
Drawn MT
Engineer MT
Project No **140627**
Drawing No **SSK001**
Revision **P3**



NOTES

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS, DRAINAGE AND SPECIALIST DRAWINGS AND SPECIFICATIONS.
2. THE CONTRACTOR IS TO ASCERTAIN THE LOCATION OF EXISTING SERVICES PRIOR TO COMMENCING WORKS.
3. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF ALL TEMPORARY WORKS AND SHALL SEQUENCE THE WORKS SUCH THAT THE BUILDING REMAINS STABLE AT ALL TIMES.

NOT FOR CONSTRUCTION

Rev	Date	Description	Drawn	Check
P2	20.09.19	ISSUED FOR PLANNING	RG	GA
P1	14.08.15	ISSUED FOR INFORMATION	MT	CB

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Drawing Status
PLANNING

Project
12 PARK VILLAGE WEST
LONDON

Title
PROPOSED TEMPORARY WORKS
GROUND FLOOR PLAN

Date AUG 15
Scale 1:50@A1
Drawn MT
Engineer MT

Project No
140627

Drawing No
S099

Revision
P2