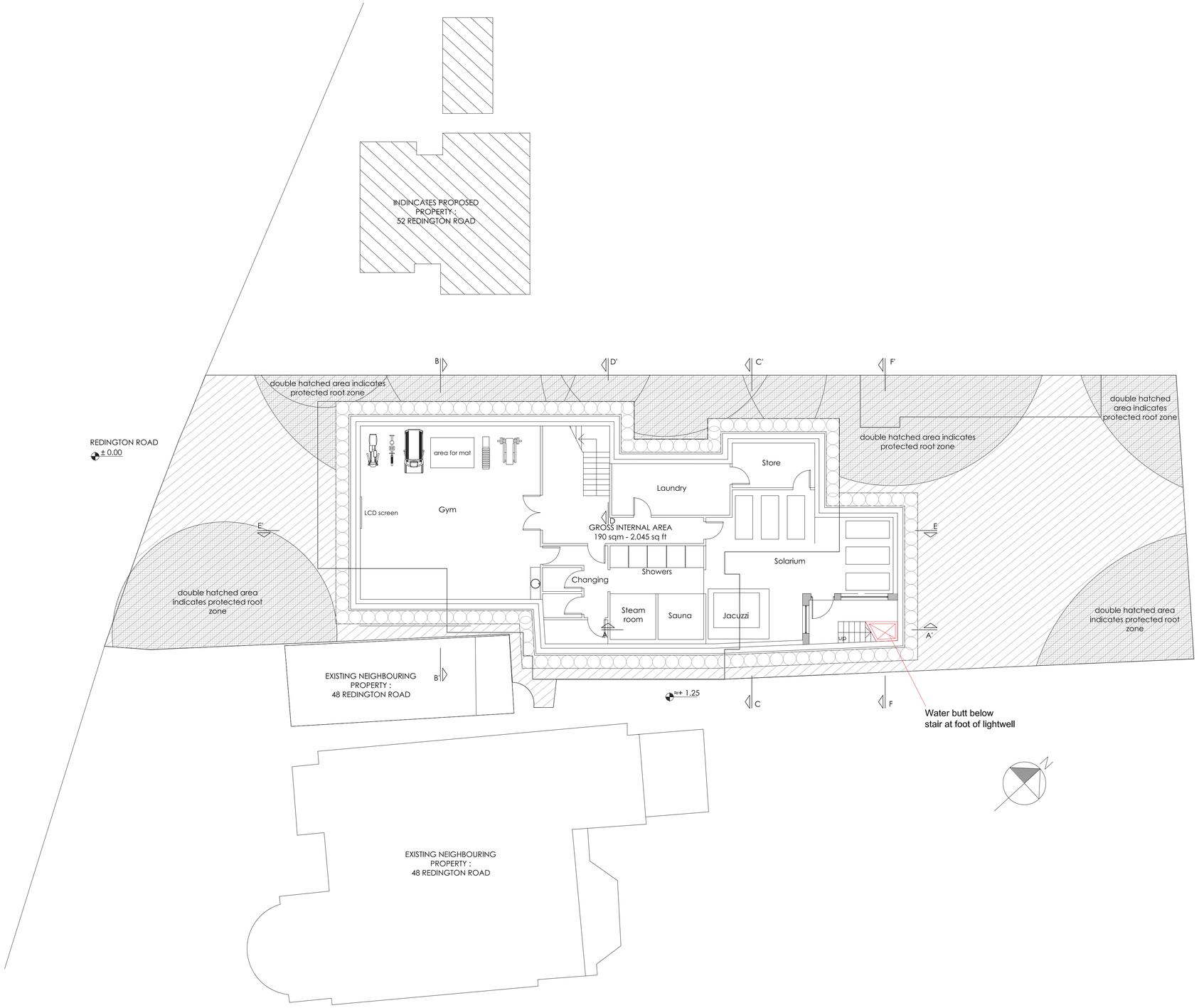
THE CONTRACTOR MUST VERIFY ALL DIMENSIONS ON SITE BEFORE MAKING SHOP DRAWINGS OR COMMENCING WORK OF ANY KIND.
NO DIMENSIONS TO BE SCALED FROM THIS DRAWING.

REV.	DATE	REVISION
A	11.02.2014	PREPARED FOR PLANNING SUBMISSION
B	14:03:18	Water butt indicated for Condition 8



PROPOSED BASEMENT LEVEL 2 PLAN

SCALE 1 : 100
SCALE 1 : 1

0m 1m 2m 4m 6m 8m 10m
0m 10mm 20mm 40mm 60mm 80mm 100mm

ISSUED FOR PLANNING
ISSUE DATE: 11.02.2014

Osel architects and development consultants

PROJECT:
50 REDINGTON ROAD
HAMPSTEAD
LONDON NW3 7RS

CLIENT:
MARCUS DONN
50 REDINGTON ROAD
LONDON NW3 7RS

DRAWING:
PROPOSED BASEMENT LEVEL 2 PLAN

DRAWING No.: E10-030/P0B
REV: B

SCALE: 1:100@A1 / 1:200@A3
DRAWN: JK DATE: FEB 2014
CHECKED: WTM DATE: FEB 2014

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E-mail: admin@oselarch.co.uk Web: www.oselarchitecture.co.uk

SCALE 1:20
SCALE 1:1

0m 0.5m 1m 1.5m 2m
0m 10mm 20mm 40mm 60mm 80mm 100mm

N

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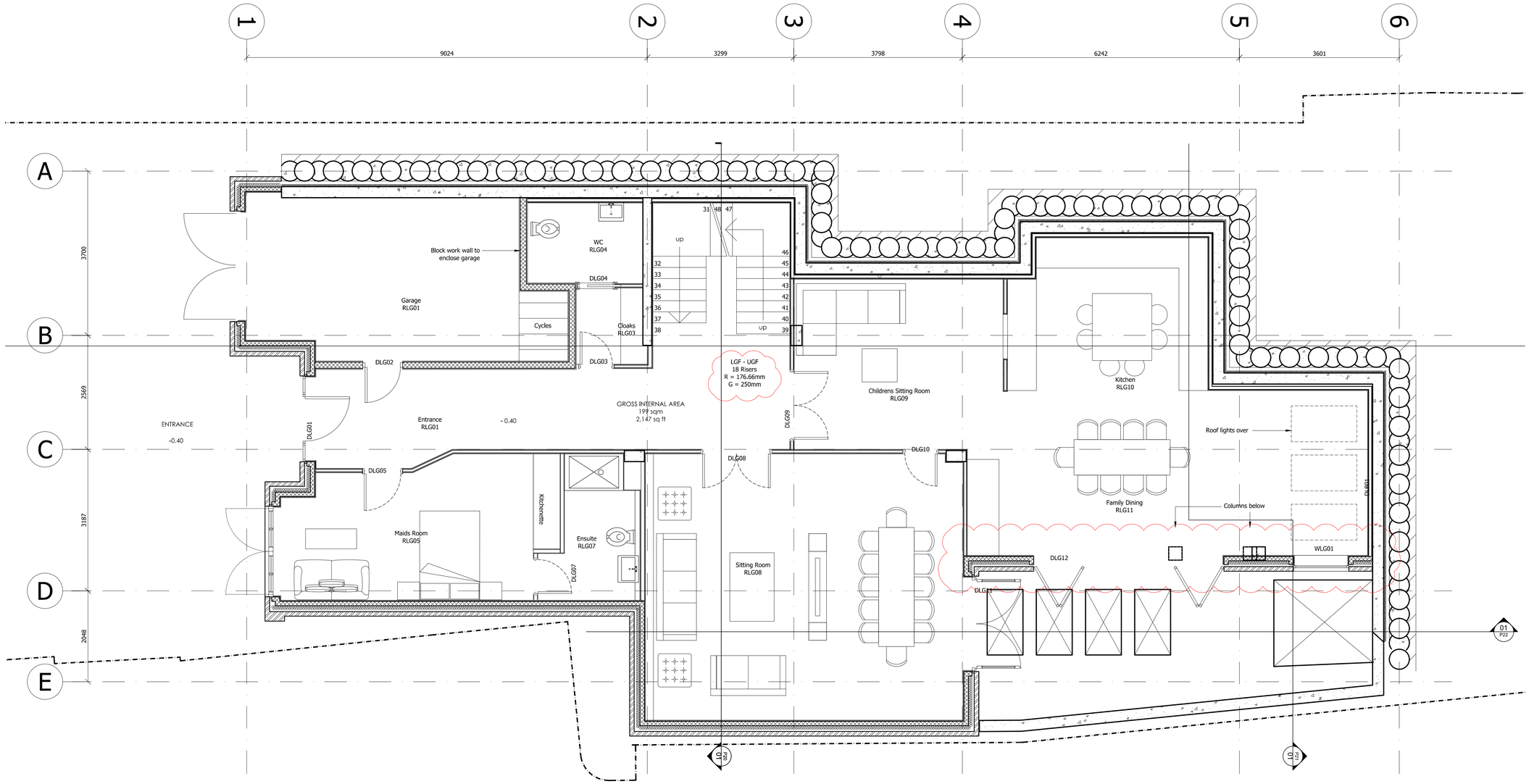
NO DIMENSIONS TO BE SCALED FROM THIS DRAWING.

REV.	DATE	REVISION
E	11.02.2014	PREPARED FOR PLANNING SUBMISSION
F	08.12.2017	STRUCTURAL INFORMATION UPDATED
G	22.12.2017	UPDATED AS CLOUDED AND SECTION LINES ADDED



Basement Wall

450mm piles
75mm shortcrete
INSULALATION _ 50mm styrozone n300R
Cetco Voltex waterproofing
250mm concrete
10mm waterproofing
10mm cavity
70mm stud zone
25mm wallboard build up

Retaining Wall

Alsecco Waterstop Sealant
Alsecco Basecoat render
Alsecco Insulation Board (200mm)
Alsecco Bitumen Adhesive 2C
Cetco Blacksheet
200mm retaining concrete wall
10mm waterproofing
25mm Gyplyner
25mm wallboard build up

External cavity wall 0.18w/m2k

102.5 brickwork
50mm cavity
80mm kingspan Kooltherm K108
100mm Porotherm Cellular Clay Block - PTH100 (332.5mm)

2mm eco parge (air tightness)
15mm dabs
12.5mm wallboard
3mm skim
(32.5mm)

Internal partitions - 42 dBA
100mm o/a

ref A206003
Gypframe 48 S50 C stud
2 x 12.5mm wallboard on either side

Drawing Notes

01 Internal walls to be non-load bearing MF partitions which will be part of a future fit-out works package.

Wall linings etc. also to be part of a future fit-out works package.

These layouts give indicative location and quantities for drainage services etc.

FOR COMMENT

Osel architects and development consultants

PROJECT:
50 REDINGTON ROAD
HAMPSTEAD
LONDON NW3 7RS

CLIENT:
MARCUS DOWN
50 REDINGTON ROAD
LONDON NW3 7RS

DRAWING:
PROPOSED LOWER GROUND FLOOR PLAN

DRAWING No.: E10-030/P01
REV: G

SCALE: 1:50 @ A1
DRAWN: JK DATE: FEB 2014
CHECKED: WTM DATE: FEB 2014

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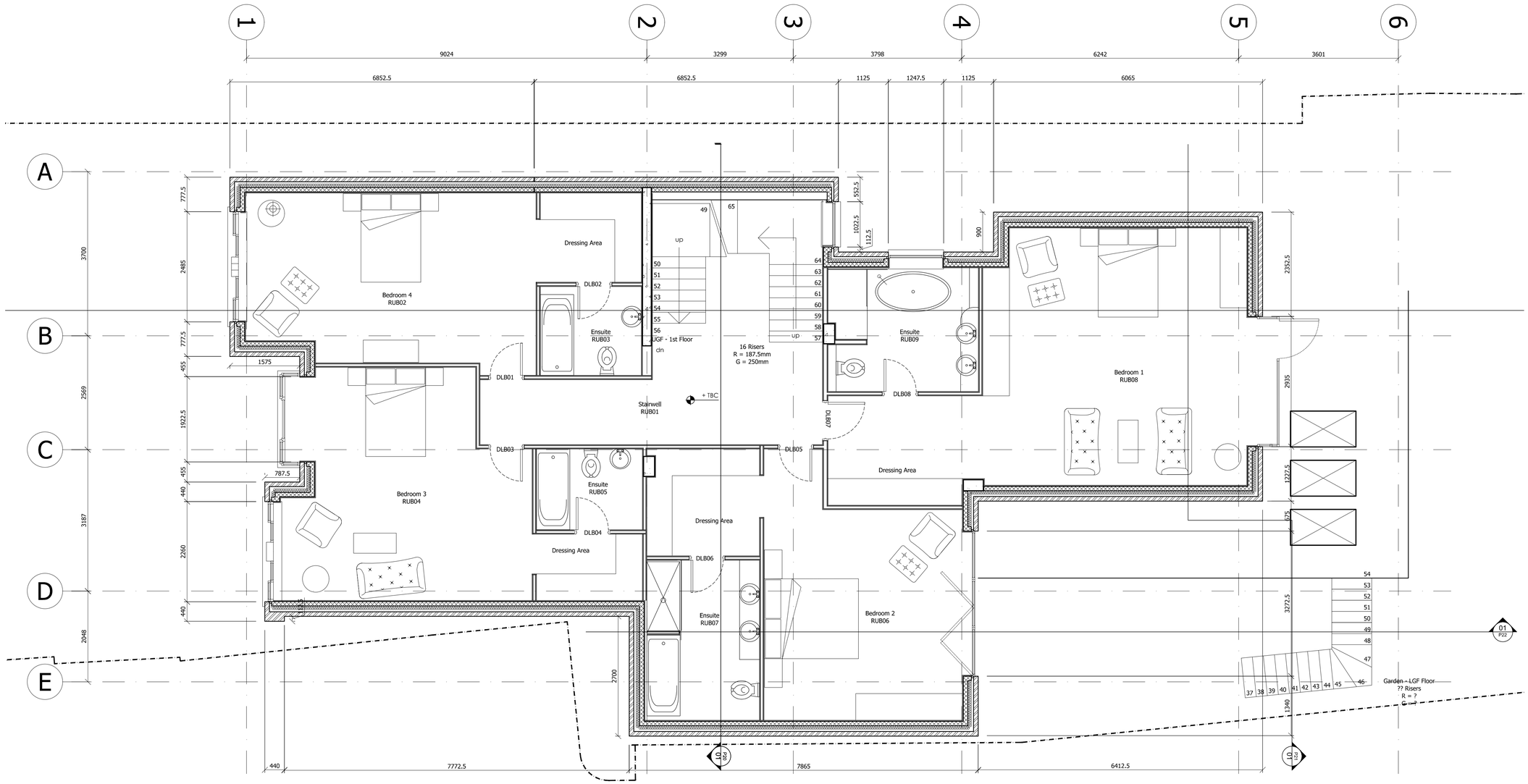
LOWER GROUND FLOOR PLAN

SCALE 1:20
SCALE 1:1

0m 0.5m 1m 1.5m 2m
0m 10mm 20mm 40mm 60mm 80mm 100mm

THE CONTRACTOR MUST VERIFY ALL DIMENSIONS ON SITE BEFORE MAKING SHOP DRAWINGS OR COMMENCING WORK OF ANY KIND.
NO DIMENSIONS TO BE SCALED FROM THIS DRAWING.

REV.	DATE	REVISION
D	11.02.2014	PREPARED FOR PLANNING SUBMISSION
E	02.06.2014	PREPARED FOR PLANNING SUBMISSION
F	08.12.2017	STRUCTURAL INFORMATION UPDATED
G	21.12.2017	UPDATED AS CLOUDED AND SECTION LINES ADDED



Basement Wall	Retaining Wall	External cavity wall 0.18w/m2k	Internal partitions - 42 dBA
			100mm o/a
450mm piles	Alsecco Waterstop Sealant	102.5 brickwork	
75mm shortcrete	Alsecco Basecoat render	50mm cavity	ref A206003
INSUALATION _ 50mm styrozone n300R	Alsecco Insulation Board (200mm)	80mm kingspan Kooltherm K108	Gypframe 48 S50 C stud
Cetco Voltex waterprrofing	Alsecco Bitumen Adhesive 2C	100mm Porotherm Cellular Clay Block - PTH100 (332.5mm)	2 x 12.5mm wallboard on either side
250mm concrete	Cetco Blacksheet		
10mm waterproofing	200mm retaining concrete wall	2mm eco parge (air tightness)	
10mm cavity	10mm waterproofing	15mm dabs	
70mm stud zone	25mm Gyplyner	12.5mm wallboard	
25mm wallboard build up	25mm wallboard build up	3mm skim (32.5mm)	

Drawing Notes

01 Internal walls to be non-load bearing MF partitions which will be part of a future fit-out works package.

Wall linings etc. also to be part of a future fit-out works package.

These layouts give indicative location and quantities for drainage services etc.

FOR COMMENT

Osel architects and development consultants

PROJECT:
50 REDINGTON ROAD
HAMPSTEAD
LONDON NW3 7RS

CLIENT:
MARCUS DOWN
50 REDINGTON ROAD
LONDON NW3 7RS

DRAWING:
PROPOSED UPPER GROUND FLOOR PLAN

DRAWING No.: E10-030/P02
REV: G

SCALE: 1:50 @ A1
DRAWN: JK DATE: JUN 2014
CHECKED: WTM DATE: JUN 2014

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E-mail: admin@oselarch.co.uk Web: www.oselarchitecture.co.uk

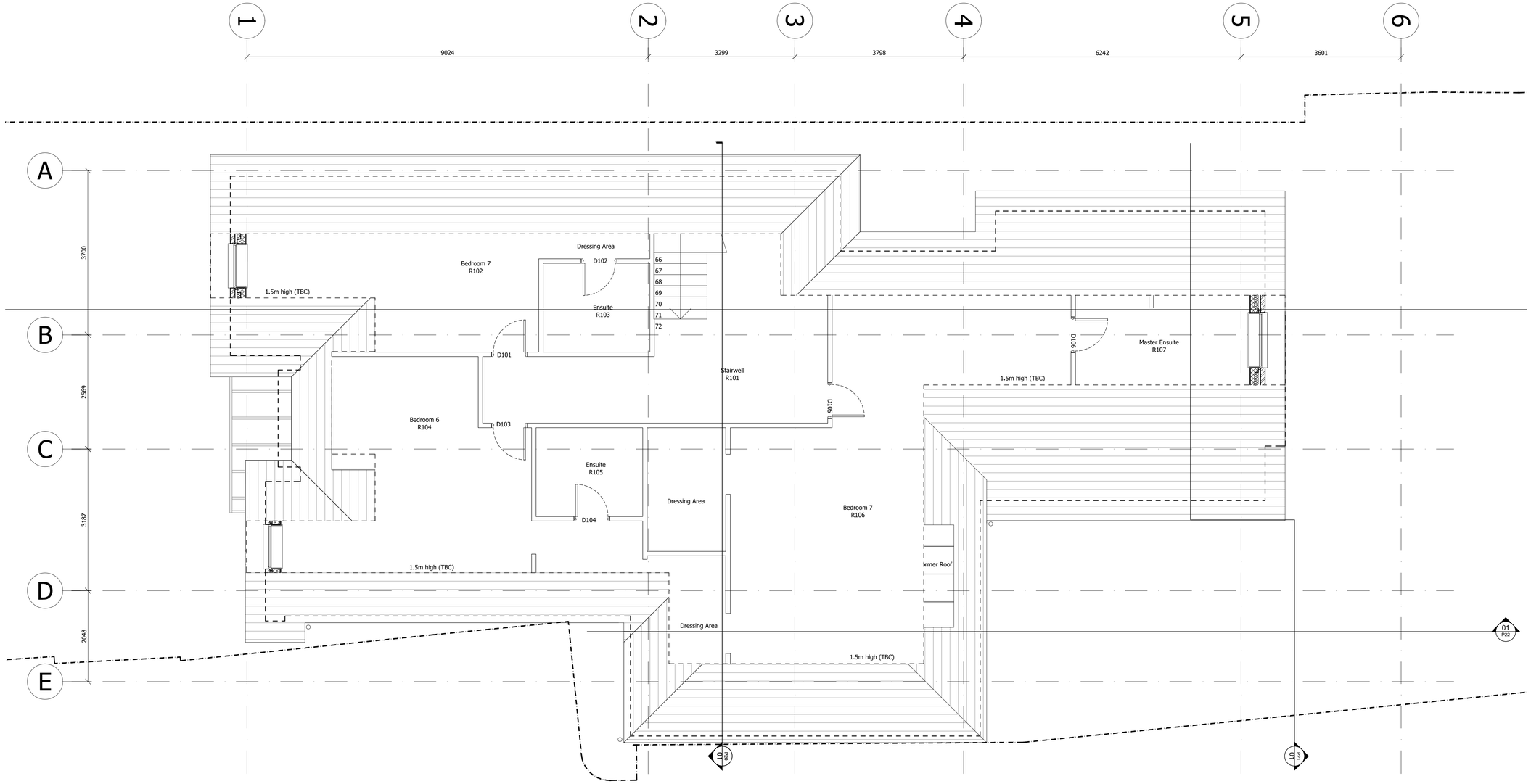
UPPER GROUND FLOOR PLAN

THE CONTRACTOR MUST VERIFY ALL DIMENSIONS ON SITE BEFORE MAKING SHOP DRAWINGS OR COMMENCING WORK OF ANY KIND.
NO DIMENSIONS TO BE SCALED FROM THIS DRAWING.

REV.	DATE	REVISION
F	22.12.2017	STRUCTURAL INFORMATION UPDATED

SCALE 1:20
SCALE 1:1

0m 0.5m 1m 1.5m 2m
0m 10mm 20mm 40mm 60mm 80mm 100mm



FIRST FLOOR PLAN

Basement Wall

450mm piles
75mm shortcrete
INSULATION _ 50mm styrozone n300R
Cetco Voltex waterprrofing
250mm concrete
10mm waterproofing
10mm cavity
70mm stud zone
25mm wallboard build up

Retaining Wall

Alsecco Waterstop Sealant
Alsecco Basecoat render
Alsecco Insulation Board (200mm)
Alsecco Bitumen Adhesive 2C
Cetco Blacksheet
200mm retaining concrete wall
10mm waterproofing
25mm Gyplyner
25mm wallboard build up

External cavity wall 0.18w/m2k

102.5 brickwork
50mm cavity
80mm kingspan Kooltherm K108
100mm Porotherm Cellular Clay Block - PTH100 (332.5mm)

2mm eco parge (air tightness)
15mm dabs
12.5mm wallboard
3mm skim
(32.5mm)

Internal partitions - 42 dBA
100mm o/a

ref A206003
Gyproframe 48 S50 C stud
2 x 12.5mm wallboard on either side

Drawing Notes

01 Internal walls to be non-load bearing MF partitions which will be part of a future fit-out works package.

Wall linings etc. also to be part of a future fit-out works package.

These layouts give indicative location and quantities for drainage services etc.

FOR COMMENT

Osel architects and development consultants

PROJECT:
50 REDINGTON ROAD
HAMPSTEAD
LONDON NW3 7RS

CLIENT:
MARCUS DOWN
50 REDINGTON ROAD
LONDON NW3 7RS

DRAWING:
PROPOSED FIRST FLOOR PLAN

DRAWING No.: E10-030/P03
REV: F

SCALE: 1:100 @ A1
DRAWN: JK DATE: FEB 2014
CHECKED: WTM DATE: FEB 2014

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NO DIMENSIONS TO BE SCALED FROM THIS DRAWING.

REV.	DATE	REVISION
D	11.02.2014	PREPARED FOR PLANNING SUBMISSION
E	02.06.2014	PREPARED FOR PLANNING SUBMISSION
F	22.12.2017	STRUCTURAL INFORMATION UPDATED
G	09.01.2018	LEVELS, TREE LINE AND BOUNDARY LINE UPDATED

SCALE 1:50
SCALE 1:1
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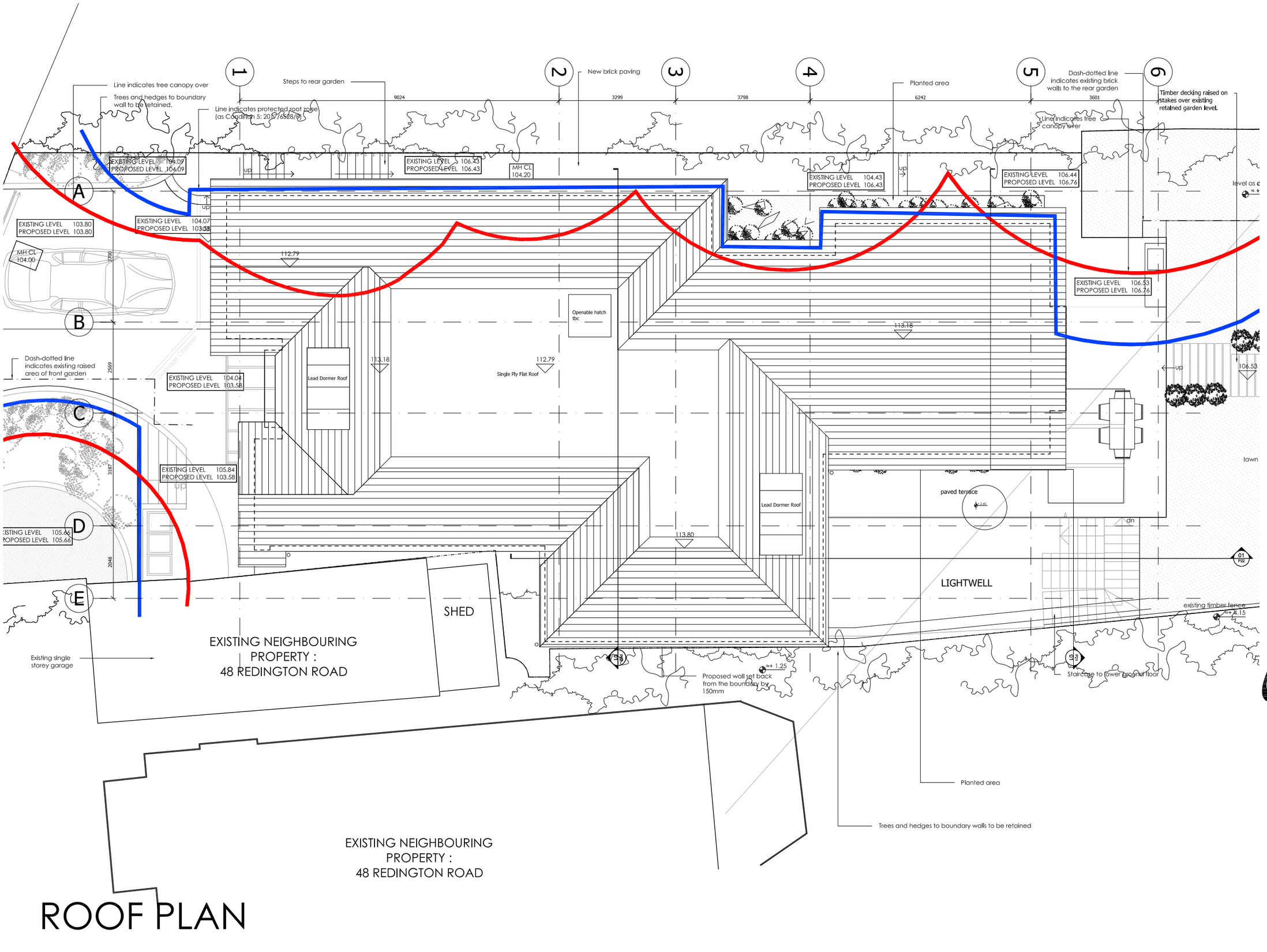
0m 10mm 20mm 40mm 60mm 80mm 100mm



ROOF PLAN

Drawing Notes

Details of tree protection measures are all set-out within Crown Consulting Arboricultural Method Statement of Tree Protection Plan ref: CCL09882/TPP rev.1 as approved under Condition 5 (application reference 2017/6528/P: dated 7 December 2017).

FOR COMMENT

Osel architects and development consultants

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PROJECT:
50 REDINGTON ROAD
HAMPSTEAD
LONDON NW3 7RS

CLIENT:
MARCUS DOWN
50 REDINGTON ROAD
LONDON NW3 7RS

DRAWING:
PROPOSED ROOF PLAN

DRAWING No.: E10-030/P04
REV: G

SCALE: 1:50 @ A1
DRAWN: JK DATE: JUN 2014
CHECKED: WTM DATE: JUN 2014

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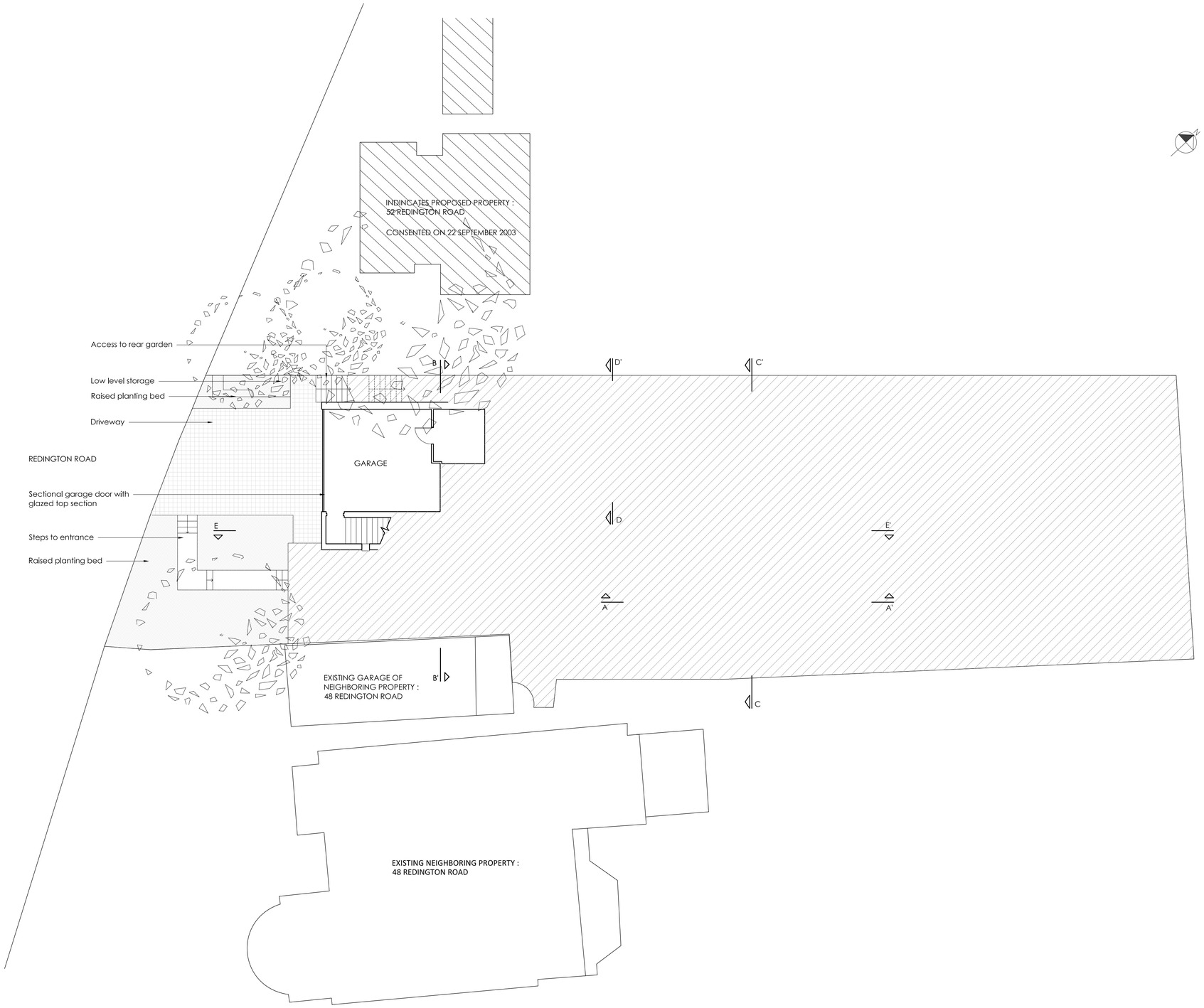
NO DIMENSIONS TO BE SCALED FROM THIS DRAWING.

REV.	DATE	REVISION
A	31.10.2011	SECTION LINES ADDED



SCALE 1 : 100
SCALE 1 : 1

0m 1m 2m 4m 6m 8m 10m
0m 10mm 20mm 40mm 60mm 80mm 100mm

Osel architects and development consultants

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E-mail: admin@oselarch.co.uk Web: www.oselarchitecture.co.uk

PROJECT:
50 REDINGTON ROAD
HAMPSTEAD
LONDON NW3 7RS

CLIENT:
MARCUS DONN
50 REDINGTON ROAD
LONDON NW3 7RS

DRAWING:
EXISTING LOWER GROUND FLOOR PLAN

DRAWING No.: E10-030/S01

REV: A

SCALE: 1:100@A1 / 1:200@A3

DRAWN: ZETA KACHRI DATE: AUG 2011

CHECKED: TERRY MONAN DATE: AUG 2011

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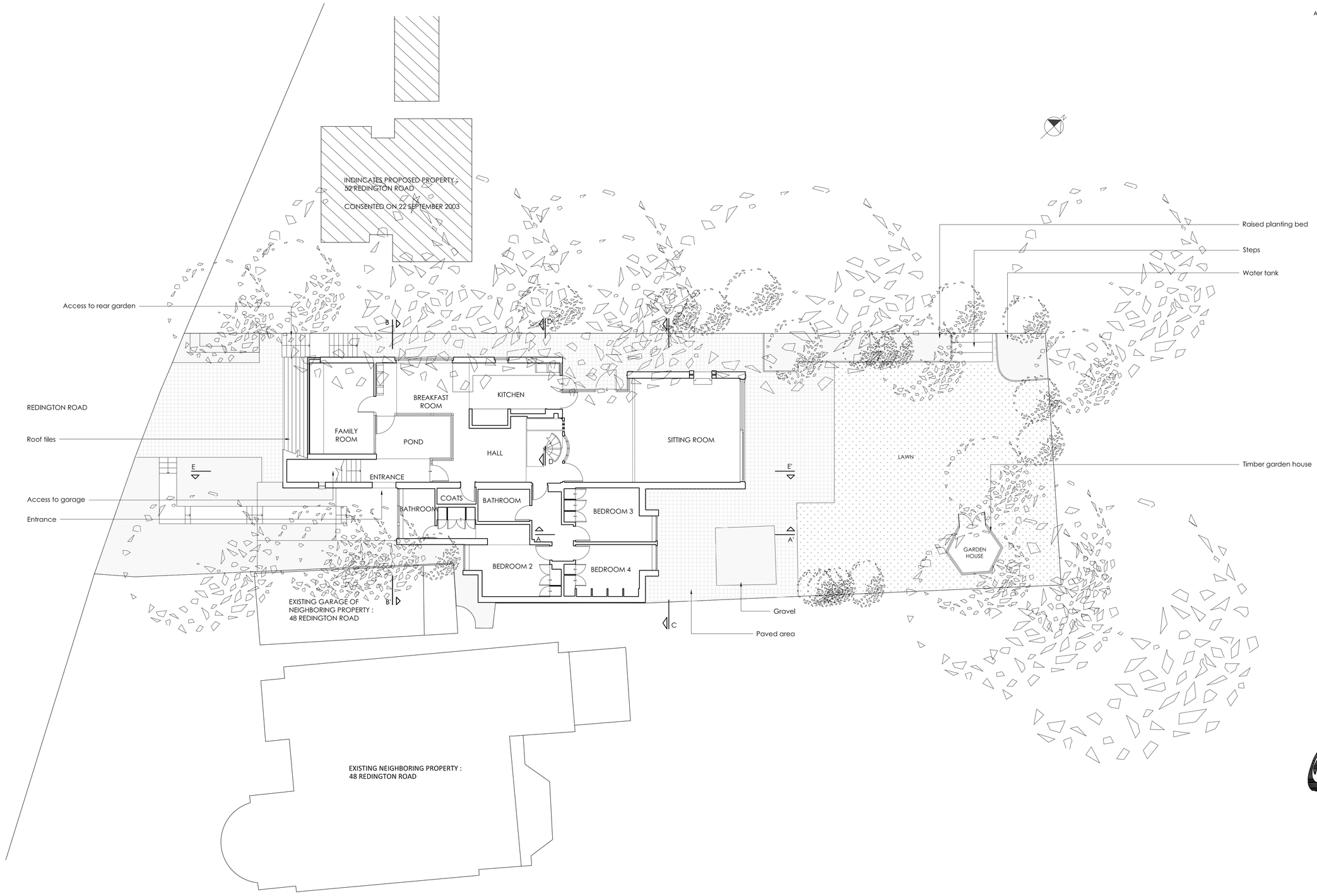
REV.	DATE	REVISION
A	31.10.2011	SECTION LINES ADDED



SCALE 1 : 100
SCALE 1 : 1

0m 1m 2m 4m 6m 8m 10m
0m 10mm 20mm 40mm 60mm 80mm 100mm

Osel architects and development consultants

PROJECT:
50 REDINGTON ROAD
HAMPSTEAD
LONDON NW3 7RS

CLIENT:
MARCUS DONN
50 REDINGTON ROAD
LONDON NW3 7RS

DRAWING:
EXISTING UPPER GROUND FLOOR PLAN

DRAWING No.: E10-030/S02

REV: A

SCALE: 1:100@A1 / 1:200@A3

DRAWN: ZETA KACHRI DATE: AUG 2011

CHECKED: TERRY MONAN DATE: AUG 2011

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E-mail: admin@oselarch.co.uk Web: www.oselarchitecture.co.uk

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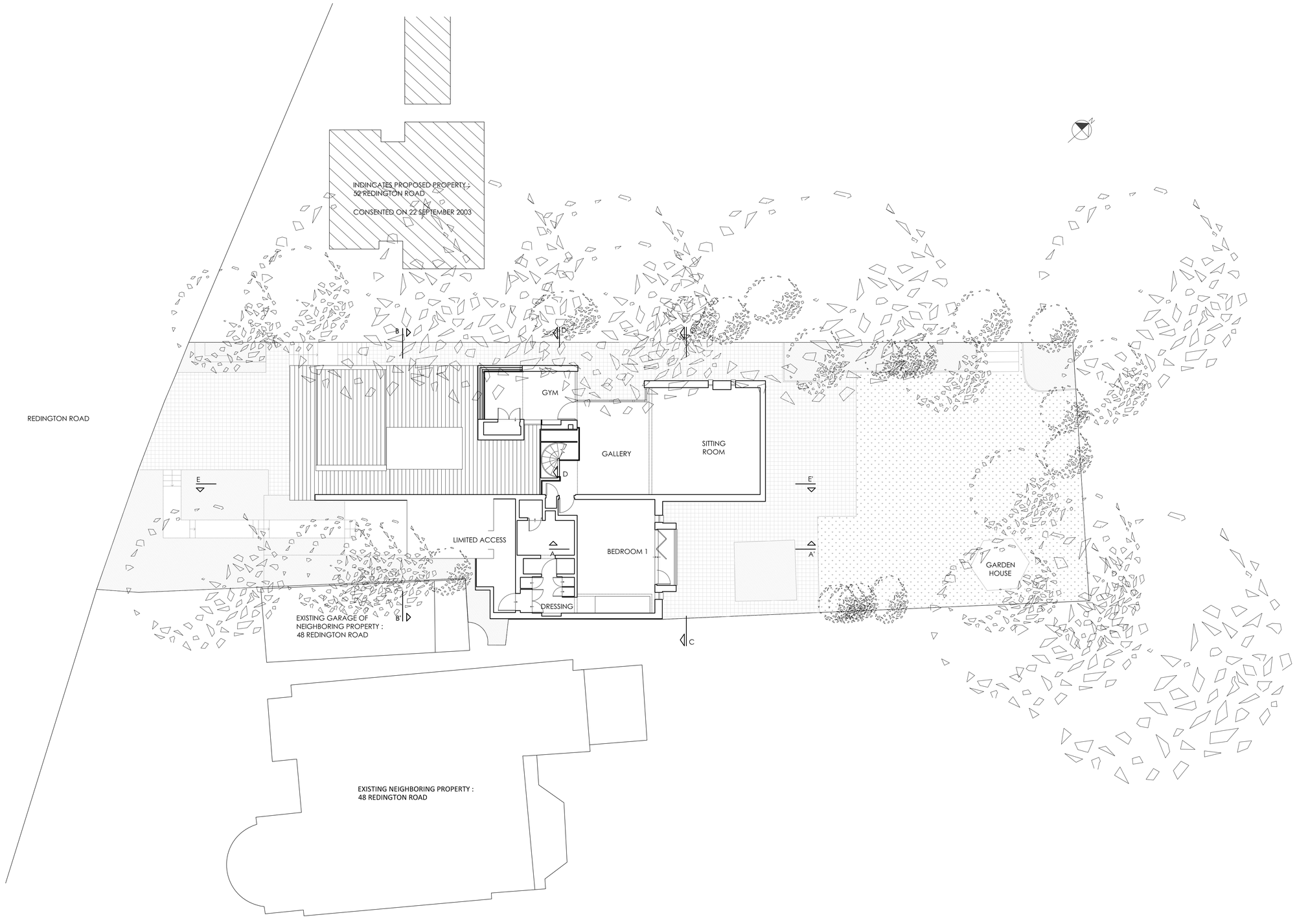
REV.	DATE	REVISION
A	31.10.2011	SECTION LINES ADDED



SCALE 1 : 100
SCALE 1 : 1

0m 1m 2m 4m 6m 8m 10m
0m 10mm 20mm 40mm 60mm 80mm 100mm

Osel architects and development consultants

26 Oldbury Place, London W1U 5PR Tel: 020 7224 2447 Fax: 020 7224 2997
E-mail: admin@oselarch.co.uk Web: www.oselarchitecture.co.uk

PROJECT:

50 REDINGTON ROAD
HAMPSTEAD
LONDON NW3 7RS

CLIENT:

MARCUS DONN
50 REDINGTON ROAD
LONDON NW3 7RS

DRAWING:

EXISTING FIRST FLOOR PLAN

DRAWING No.: E10-030/S03

REV: A

SCALE: 1:100@A1 / 1:200@A3

DRAWN: ZETA KACHRI DATE: AUG 2011

CHECKED: TERRY MONAN DATE: AUG 2011

GEA Geotechnical & Environmental Associates	Tyttenhanger House Coursers Road St Albans AL4 0PG	**Site** 50 Redington Road, Hampstead, London, NW3 7RS	**Borehole Number** **BH 1**

Boring Method	**Casing Diameter**	**Ground Level (mOD)**	**Client**	**Job Number**
Cable Percussion	150mm cased to 14.00m	104.40	Marcus Donn	J12045
	Location	**Dates** 08/03/2012- 09/03/2012	**Engineer** Michael Alexander Consulting Engineers	**Sheet** 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					104.30	(0.10)	Brick Paving		
						0.10			
0.30	D1		DRY		104.10	(0.20)	Reinforced concrete		
					104.00	0.30			
0.50	D2		DRY			(0.10)	Made Ground (brown clayey sand with occasional fragments of concrete)		
						0.40			
						(1.10)	Firm brown silty sandy CLAY with occasional layers of clayey sand and fine rootlets		
1.20-1.65	SPT N=13		DRY	1,2/2,3,4,4					
1.20-1.65	D3		DRY		102.90	1.50			
1.75	D4		DRY				Firm medium strength brown mottled orange-brown and grey silty sandy CLAY with a layer of sand between 3.75 m and 4.0 m		
2.00-2.45	U5		DRY	23 blows					
						(2.50)			
2.75	D6		DRY						
3.00-3.45	SPT N=16		DRY	3,3/4,4,4,4					
3.00-3.45	D7		DRY						
3.75	D8	3.50	DRY						
4.00-4.45	U9	3.50	DRY	30 blows	100.40	4.00	Stiff high strength and very high strength dark grey silty sandy CLAY with occasional partings of light grey fine sand and silt		
4.75	D10	3.50	DRY						
5.00-5.45	SPT N=17	3.50	DRY	2,3/4,3,5,5					
5.00-5.45	D11	3.50	DRY						
6.00	D12	5.00	DAMP						
6.50-6.95	SPT N=19	6.00	DAMP	3,4/5,5,4,5					
6.50-6.95	D13	6.00	DAMP						
7.50	D14	7.00	DRY						
8.00-8.45	U15	7.50	DRY	34 blows					
9.00	D16	8.00	DAMP	Moderate (1) at 9.00m, sealed at 13.50m.					▽1
9.50-9.95	SPT N=23	9.00	DAMP	3,5/5,6,6,6					
9.50-9.95	D17	9.00	DAMP						

Remarks
The OD levels shown should be checked and are approximate
Two hours spent breaking out concrete and hand digging a service pit and manhandling equipment to position
Standpipe installed to a depth of 8.0 m
Three hours demobilising equipment and tidying

Scale (approx)	**Logged By**
1:50	HD

Figure No.
J12045 .BH 1

Geotechnical & Environmental Associates	Tyttenhanger House Coursers Road St Albans AL4 0PG	**Site** 50 Redington Road, Hampstead, London, NW3 7RS	**Borehole Number** **BH 1**

Boring Method	**Casing Diameter**	**Ground Level (mOD)**	**Client**	**Job Number**
Cable Percussion	150mm cased to 14.00m	104.40	Marcus Donn	J12045
	Location	**Dates** 08/03/2012- 09/03/2012	**Engineer** Michael Alexander Consulting Engineers	**Sheet** 2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
10.50	D18	9.00	9.00						
11.00-11.45	SPT N=24	10.00	10.00	1,4/5,6,6,7					
11.00-11.45	D19	10.00	10.00						
12.00	D20	12.00	10.00						
12.50-12.95	D21	12.20	11.00	08/03/2012:DRY					
				09/03/2012:10.50m					
12.50-12.95	SPT N=25	12.20	11.00	10,5/5,6,7,7					
13.50	D22	13.50	11.00						
14.00-14.45	U23	13.50	11.00	34 blows					
15.00	D24	14.00	14.00			(16.00)			
15.50-15.95	SPT N=27	14.00	14.50	2,4/5,6,8,8					
15.50-15.95	D25	14.00	14.50						
16.50	D26	14.00	14.50						
17.00-17.45	SPT N=26	14.00	15.00	5,5/6,6,7,7					
17.00-17.45	D27	14.00	15.00						
18.00	D28	14.00	15.00						
18.50-18.95	U29	14.00	15.50	45 blows					
19.25	D30	14.00	15.50						
19.55-20.00	SPT N=31	14.00	15.50	2,6/6,7,8,10					
19.55-20.00	D31	14.00	15.50						
				09/03/2012:15.50m	84.40	20.00			

Remarks

Scale (approx)	**Logged By**
1:50	HD

Figure No.
J12045 .BH 1

Geotechnical & Environmental Associates	Tyttenhanger House Coursers Road St Albans AL4 0PG	**Site** 50 Redington Road, Hampstead, London, NW3 7RS	**Number** **BH 2**

Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Opendrive Sampler		107.40	Marcus Donn	J12045
	Location	**Dates** 06/03/2012	**Engineer** Michael Alexander Consulting Engineers	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				107.38	(0.02)	Paving Slab		
				107.18	0.02			
0.25	D1			107.10	(0.20)	Concrete		
					0.22			
0.50	D2				(0.08)	Sand sub-base		
					0.30			
					(0.70)	Medium-dense light orange-brown mottled grey slightly clayey SAND with occasional rootlets		
1.00-1.45	SPT N=14		3,3/3,4,4,3	106.40				
					1.00	Light brown fine SAND		
1.20	D3			106.10	(0.30)			
					1.30	Light brown mottled orange-brown and grey clayey SAND with rootlets		
					(0.70)			
1.70	D4							
2.00-2.45	SPT N=16		2,2/3,4,4,5	105.40	2.00			
2.10	D5					'Stiff' brown mottled orange-brown and grey silty CLAY with occasional partings of orange-brown fine sand and silt, rare calcareous nodules. Rootlets encountered to a depth of 3.0 m - desiccated soil enocuntered to a depth of about 3.0 m		
2.60	D6							
					(1.60)			
3.00-3.45	SPT N=18		2,3/4,4,5,5					
3.00	D7							
3.50	D8			103.80	3.60			
						Stiff brown mottled orange-brown silty CLAY with occasional partings of orange-brown fine sand and silt, rare calcareous nodules		
4.00-4.45	SPT N=19		2,3/4,4,5,6					
4.00	D9							
4.50	D10				(1.80)			
5.00-5.45	SPT N=30		3,4/6,7,8,9					
5.00	D11							
				102.00	5.40			
5.50	D12					Stiff dark grey silty CLAY with occasional partings of orange-brown fine sand and silt		
6.00-6.45	SPT N=17		2,3/3,4,5,5		(1.30)			
6.00	D13							
6.50	D14							
				100.70	6.70			
6.80	D15					Medium dense brown mottled orange-brown and grey clayey SAND		
7.00-7.45	SPT N=28		4,6/5,6,7,10		(0.80)			
7.30	D16							
				99.90	7.50			
7.60	D17			99.70	(0.20)	Grey silty fine SAND with occasional partings of orange-brown fine sand and silt		
					7.70			
7.90	D18				(0.30)			
8.00-8.45	SPT N=30		3,5/8,7,7,8	99.40	8.00	Brown mottled orange-brown and grey clayey SAND		
						Complete at 8.00m		

Remarks
The OD levels shown should be checked and are approximate
Groundwater not encountered during drilling
Standpipe installed to a depth of 6.0 m

Scale (approx)	**Logged By**
1:50	HD

Figure No.
J12045.BH 2

Geotechnical & Environmental Associates	Tyttenhanger House Coursers Road St Albans AL4 0PG	**Site** 50 Redington Road, Hampstead, London, NW3 7RS	**Number** **BH 3**

Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Drive-in Window Sampler		107.40	Marcus Donn	J12045
	Location	**Dates** 08/03/2012	**Engineer** Michael Alexander Consulting Engineers	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.85)	Made Ground (greyish brown clayey sand with occasional fragments of brick, concrete and charcoal)		
0.50	D1			106.55	0.85			
1.00	D2				(0.75)	Light orange-brown clayey SAND. Rootlets encountered to a depth of 1.2 m		
				105.80	1.60			
						Terminated at 1.60m		

Remarks
The OD levels shown should be checked and are approximate
Groundwater not encountered
Borehole not completed as couplings snapped on hand-held window sampling equipment - borehole relocated 0.5 m to the east

Scale (approx)	**Logged By**
1:50	HD

Figure No.
J12045.BH 3

Geotechnical & Environmental Associates	Tyttenhanger House, Coursers Road, St Albans, AL4 0PG	**Site** 50 Redington Road, Hampstead, London, NW3 7RS	**Number** BH 3A

Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Drive-in Window Sampler		107.40	Marcus Donn	J12045
	Location	**Dates** 08/03/2012	**Engineer** Michael Alexander Consulting Engineers	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30	D1				(0.80)	Made Ground (greyish brown sandy clay with rootlets, occasional fragments of brick, concrete and charcoal)		
0.60	D2			106.60	0.80			
0.85	D3				(0.90)	Light orange-brown clayey SAND		
1.50	D4			105.70	1.70			
2.00	D5					'Stiff' light orange-brown silty CLAY with occasional partings of fine sand and silt. Rootlets encountered to a depth of 3.0 m - desiccated soil encountered to a depth of about 3.0 m		
2.50	D6				(2.00)			
3.00	D7							
3.50	D8			103.70	3.70			
3.90	D9			103.45	(0.25) 3.95	Light orange-brown clayey SAND		
4.20	D10			103.30	(0.15) 4.10	Stiff light orange-brown silty CLAY with occasional partings of fine sand and silt		
					(0.50)	Light orange-brown clayey SAND		
4.80	D11			102.80	4.60	Stiff light orange-brown silty CLAY with occasional partings of fine sand and silt		
5.50	D12				(1.30)			
6.00	D13			101.50	5.90			
				101.40	(0.10) 6.00	Light brown mottled orange-brown fine SAND		
						Complete at 6.00m		

Remarks
The OD levels shown should be checked and are approximate
Groundwater not encountered during drilling
Standpipe installed to a depth of 6.0 m

Scale (approx)	**Logged By**
1:50	HD

Figure No. J12045.BH 3A

GEA Geotechnical & Environmental Associates Tyttenhanger House Coursers Road St Albans AL4 0PG	**Site** 50 Redington Road, Hampstead, London, NW3 7RS	**Number** **BH 4**	
Excavation Method Drive-in Window Sampler	**Dimensions**	**Ground Level (mOD)** 107.20	**Client** Marcus Donn	**Job Number** J12045
	Location	**Dates** 08/03/2012	**Engineer** Michael Alexander Consulting Engineers	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30	D1				(0.60)	Made Ground (brown silty clay with occasional fragments of charcoal and brick)		
				106.60	0.60			
0.60	D2			106.55	(0.05)	Light orange-brown gravelly fine SAND		
0.75	D3				0.65			
1.00	D4				(0.60)	Brown mottled orange-brown clayey SAND with gravel. Rootlets encountered to a depth of 0.8 m		
				105.95	1.25			
1.40	D5				(0.55)	'Stiff' light orange-brown silty CLAY with occasional partings of fine sand and silt - desiccated soil		
1.65	D6			105.40	1.80			
						Terminated at 1.80m		

Remarks
The OD levels shown should be checked and are approximate
Groundwater not encountered
Borehole not completed as couplings snapped on hand-held window sampling equipment - borehole relocated 1.0 m to the west

Scale (approx)	**Logged By**
1:50	HD

Figure No.
J12045.BH 4

Geotechnical & Environmental Associates	Tyttenhanger House, Coursers Road, St Albans, AL4 0PG	**Site** 50 Redington Road, Hampstead, London, NW3 7RS	**Number** BH 4A

Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Drive-in Window Sampler		107.20	Marcus Donn	J12045
	Location	**Dates** 15/03/2012	**Engineer** Michael Alexander Consulting Engineers	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.50)	Made Ground (greyish brown sandy clay with fine rootlets and occasional fragments of brick and charcoal)		
0.40	D1			106.70	0.50			
0.65	D2				(0.30)	Light orange-brown mottled grey clayey SAND with rare gravel		
				106.40	0.80			
				106.35	(0.05)	Light orange-brown SAND and GRAVEL		
1.00	D3				0.85			
					(0.70)	Light orange-brown mottled grey slightly clayey fine SAND		
				105.65	1.55			
1.70	D4					'Stiff' brown silty CLAY with occasional partings of light orange-brown fine sand and silt. Rootlets encountered to a depth of about 2.0 m - desiccated soil encountered to a depth of about 2.0 m		
2.50	D5							
3.00	D6							
					(3.45)			
3.50	D7							
4.00	D8							
4.50	D9							
5.00	D10			102.20	5.00			
						Firm becoming stiff brown silty CLAY with occasional pockets of fine sand and silt with a layer of fine sand between 5.6 m and 5.8 m		
5.50	D11				(1.00)			
5.90	D12			101.20	6.00			
						Complete at 6.00m		

Remarks
The OD levels shown should be checked and are approximate
Groundwater not encountered

Scale (approx)	**Logged By**
1:50	HD

Figure No. J12045 .BH 4A

Geotechnical & Environmental Associates	Tyttenhanger House Coursers Road St Albans AL4 0PG	**Site** 50 Redington Road, Hampstead, London, NW3 7RS	**Borehole Number** **BH5**

Boring Method	**Casing Diameter**	**Ground Level (mOD)**	**Client**	**Job Number**
Cable Percussion	150mm cased to 11.00m	107.40	Marcus Donn	J12045
	Location	**Dates** 03/03/2014- 05/03/2014	**Engineer** Michael Alexander Consulting Engineers	**Sheet** 1/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.35)	Made Ground (dark brown slightly clayey silty sand with occasional flint gravel, rare partings of orange-brown sand, fine rootlets and abundant fragments of brick and ash)		
0.30	D1				107.05	0.35			
0.50	B2						Medium dense orange-brown clayey silty SAND with fine rootlets		
1.20-1.65	CPT N=11			1,1/2,2,3,4		(1.90)			
1.20-1.65	B3								
1.75	D4								
2.00-2.45	CPT N=14			1,2/3,3,4,4					
2.00-2.45	B5				105.15	2.25	Firm locally soft medium strength orange-brown silty sandy CLAY with alternate bands of orange-brown clayey sand		
2.75	D6								
3.00-3.45	U7								
3.75	D8								
4.00-4.45	CPT N=16			2,2/3,4,4,5					
4.00-4.45	D9								
4.75	D10								
5.00-5.45	D11			03/03/2014:DRY					
				04/03/2014:DRY					
5.00-5.45	CPT N=18			2,3/4,4,5,5					
6.00	D12								
						(8.25)			
6.50-6.95	SPT N=18			2,3/4,4,5,5					
6.50-6.95	D13								
7.50	D14								
8.00-8.45	D15			Water strike(1) at 8.00m.					▽1
8.00-8.45	SPT N=13	8.00		1,2/2,3,4,4					
9.00	D16								
9.50-9.95	SPT N=16			1,2/3,4,4,5					
9.50-9.95	D17								

Remarks
Manhandled equipment and rig to borehole position (8 hours)
Hand-dug service pit to a depth of 1.20 m (60 minutes)
Dismantled rig and equipment (8 hours)
Standpipe installed to a depth of 11.0 m

Scale (approx)	**Logged By**
1:50	HD

Figure No.
J12045.BH5

GEA Geotechnical & Environmental Associates	Tyttenhanger House Coursers Road St Albans AL4 0PG	**Site** 50 Redington Road, Hampstead, London, NW3 7RS	**Borehole Number** **BH5**

Boring Method	**Casing Diameter**	**Ground Level (mOD)**	**Client**	**Job Number**
Cable Percussion	150mm cased to 11.00m	107.40	Marcus Donn	J12045
	Location	**Dates** 03/03/2014- 05/03/2014	**Engineer** Michael Alexander Consulting Engineers	**Sheet** 2/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(8.25)			
10.50	D18				96.90	10.50	Stiff high strength dark grey silty very sandy CLAY with occasional partings of light grey fine sand and silt		
11.00-11.45	U19								
12.00	D20								
12.50-12.95 12.50-12.95	SPT N=25 D21	11.00		2,4/5,5,7,8					
13.50	D22								
14.00-14.45	U23			Water strike(2) at 14.00m.					▽2
15.00	D24								
15.50-15.95 15.50-15.95	SPT N=25 D25	11.00		2,4/5,6,7,7					
16.50	D26								
17.00-17.45 17.00-17.45	SPT N=20 D27	11.00		4,4/5,,7,8					
						(14.50)			
18.00	D28								
18.50-18.95 18.50-18.95	SPT N=26 D29	11.00		3,5/6,7,6,7					
19.50	D30								
20.00-20.45	SPT N=28	11.00		5,6/6,7,7,8					

Remarks	**Scale (approx)**	**Logged By**
	1:50	HD
	Figure No.	
	J12045.BH5	

Geotechnical & Environmental Associates	Tyttenhanger House Coursers Road St Albans AL4 0PG	**Site** 50 Redington Road, Hampstead, London, NW3 7RS	**Borehole Number** **BH5**

Boring Method	**Casing Diameter**	**Ground Level (mOD)**	**Client**	**Job Number**
Cable Percussion	150mm cased to 11.00m	107.40	Marcus Donn	J12045
	Location	**Dates** 03/03/2014- 05/03/2014	**Engineer** Michael Alexander Consulting Engineers	**Sheet** 3/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
20.00-20.45	D31			Water strike(3) at 20.00m.					▽3
21.00	D32								
21.50-21.95	CPT N=30	11.00		2,4/5,8,8,9					
21.50-21.95	D33								
22.50	D34					(14.50)			
23.00-23.45	CPT N=32	11.00		2,5/7,8,8,9					
23.00-23.45	D35								
24.00	D36								
24.55-25.00	CPT N=35	11.00		5,5/8,8,9,10					
24.55-25.00	D37								
				04/03/2014:15.00m	82.40	25.00	Complete at 25.00m		

Remarks	**Scale (approx)**	**Logged By**
	1:50	HD
	Figure No.	
	J12045.BH5	

DRAINAGE STRATEGY REPORT

FOR

50 REDINGTON ROAD
LONDON
NW3 7RS

CLIENT: MR MARCUS DONN
PROJECT NO: P3940

ISSUE 1.1 – Updated to reflect CCTV Results
19 JANUARY 2018

Michael Alexander Consulting Engineers, Foundation House, 4 Percy Road, London, N12 8BU
E–mail mail@maengineers.com
Tel 020 8445 9115

1.00 INTRODUCTION

1.01 It is proposed to demolish the existing house at 50 Redington Road NW3 7RS and construct a replacement house. The proposed works are covered by Planning Application 2014/4531/P

1.02 Michael Alexander Consulting Engineers have been instructed by the Client, Mr Marcus Donn to prepare a Drainage Strategy for the project. This amended version of the report reflects the findings of the CCTV report. Revised clauses are highlighted in the margin.

1.03 This report has been prepared by Isaac Hudson MA(Cantab.) MEng CEng MIStructE
Calculations in respect of allowable discharge rates and attenuation volumes have been prepared by Rupert Evans MSc CEnv C.WEM MCIWEM PIEMA

2.00 DRAINAGE STRATEGY REQUIREMENTS

2.01 Planning permission reference 2014/4531/P (Planning Condition 8) sets out the following requirements of the Sustainable Urban Drainage System: -
"*(the) system shall be based on a 1:100 year event with 30% provision for Climate Change and demonstrating greenfield levels of runoff*"

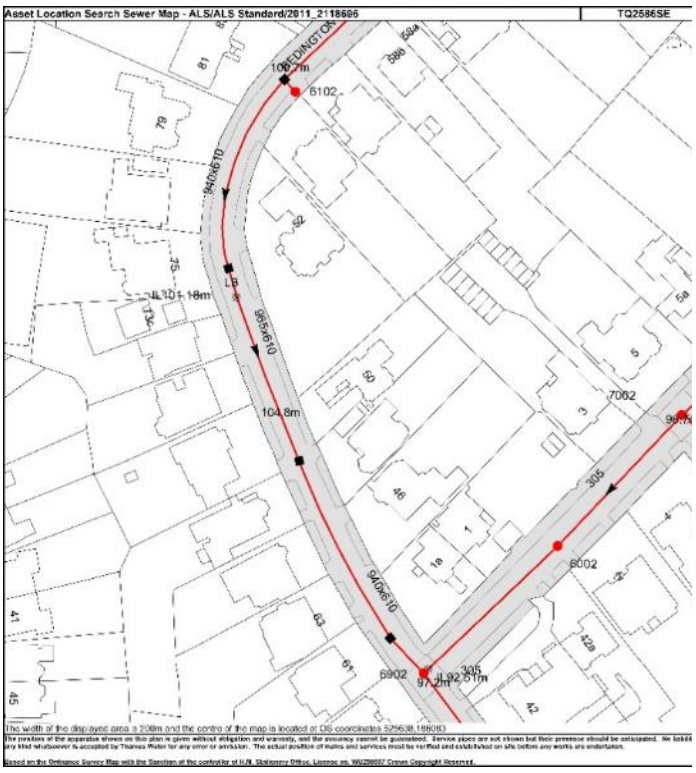
2.02 Furthermore, the scheme is required to be compliant with Code for Sustainable Homes level 4. Mandatory requirements are: -

- The peak runoff rate and annual runoff volume is not greater for development than for predevelopment.
- The system must also be designed to prevent flooding of property in the instance of local drainage failure.

3.00 DESK STUDY & INVESTIGATIONS

3.01 The Thames Water Asset Location Search Sewer Map was obtained.

It shows a combined sewer within Redington Road, at a depth of circa 4.8-5.2m below ground level.



3.02 A CCTV survey has been commissioned. The report by Chelmer Global Ltd, reference CDL/9623 is included in Appendix D.

The aim of the CCTV survey was both to establish the existing layout but also to enable assessment of the condition of the drainage network where it is to be retained in the new scheme.

4.00 IMPERMEABLE AREA CALCULATIONS

4.01 In its current condition the site is predominantly covered by the house and its surrounding hard landscaping, with a lawn to the rear and small soft landscaped areas either side of the drive to the front garden

4.02 For the proposed replacement house, the increased footprint is offset by the reduction in hard landscaped areas. The areas of building and hard landscaping have been calculated and are summarised on the drawings included in Appendix A.

5.00 RAINWATER STORAGE CALCULATIONS

5.01 A specialist consultant, Evans River & Coastal, has been appointed to: -

- calculate the allowable discharge rates based on the criteria set out in the Planning Condition and described in clause 2.01 of this report
- generate a required attenuation volume to enable the discharge criteria to be met.

The calculations and findings are given in Appendix B

5.02 The results of the analysis are that between 43m^3 and 49m^3 of attenuation is required. For the purposes of the drainage strategy the worst case of 49m^3 has been adopted.

6.00 CONSTRAINTS ON DRAINAGE SOLUTION

6.01 The Drainage Strategy has been developed to meet the requirements described above. A number of alternative options have been considered but the adopted solution has been informed by the constraints described below.

6.02 The soil conditions have been determined by geotechnical investigations (boreholes and trial pits). The soils were found to be the strata known as the 'Claygate Member' which is a clay based soil with partings and bands of sand. Whilst there are parts of the soil which are locally permeable the areas are not well interlinked so overall the soil how as a low permeability. As such the use of soakaways, permeable paving or other approaches based on infiltration are not appropriate for this site.

6.03 The site is constrained by the boundaries so there is limited space for new drainage runs or shallow extensive attenuation features outside the footprint of the building. Furthermore there are areas where groundworks need to be minimised due to the presence of tree roots.

6.04 The level of the public sewer limits the depth of any attenuation to enable a gravity connection.

7.00 DRAINAGE STRATEGY

7.01 The Drainage Strategy is described on the drawings included in Appendix C

7.02 The Foul drainage from the 1st floor, Upper Ground and Lower Ground floors will generally run externally or are distributed at high level within Basement Level 1. These will then fall under gravity to an external Foul manhole within the front drive.

Foul drainage for Basement Levels 1 and 2 will be collected in a sump beneath Basement Level 2. These will then be pumped up to the external Foul manhole within the front drive.

7.03 The waterproofing to the basement levels will include 'Cavity Drainage' to the floor of Basement Level 2 and the walls of both basement levels. Any collected water from this system will be collected in a separate Cavity Drainage sump within the basement and pumped to the Foul manhole within the front drive.

7.04 Surface water will be collected from external hard landscaped areas and the new building's roof, using existing drainage runs where it is possible to retain them. The Surface Water drainage system will be attenuated to limit discharge to the required levels.

7.05 Attenuation will be provided using a cellular modular storage system such as Hydro International 'Stormell'. This has been adopted due to the limited site area available for attenuation and the ability to stack the cells.

Each cell has a capacity of 1.5m^3 and hence the required number of cells = 49/1.5 = 32.7 cells. Due to the inherent storage in the drains etc, this is rounded down to 32 cells.

7.06 The existing drainage connection will be reused for the foul drainage.

In respect of the surface water drainage, it is not possible to reuse the existing connection as the invert level of the last manhole is above the level of the base of the cellular attenuation. Therefore a new connection to the combined sewer in Redington Road will be made for the surface water.

7.07 The existing surface water drainage system does not have attenuation, and the collected impermeable areas for existing and proposed conditions are similar. Hence the Code for Sustainable Homes requirement for not increasing the volume of run-off is easily met by the proposals.

7.08 There is a low risk of flooding to the property in the case of Drainage System failure.

If there is ponding to external areas, water will be prevented from entering the building by the landscaping levels design and appropriate threshold details. There will be upstands to all lightwells. For the foul drainage the sump will be fitted with a backup pump and there will be an alarm/SMS alert in case of failure.

7.09 The existing defects of the retained sections of the drainage system, as highlighted in Chelmer report CDL/9623 will be addressed prior to handover of the completed project. A CCTV survey of the full system will also be carried out prior to practical completion to ensure no damage to the drainage has occurred during construction

7.10 The maintenance regime for the drainage systems will be documented in accordance with best practice. Maintenance of the system will be carried out by specialist contractors at the appropriate frequency.

In respect of the drainage attenuation, the detailed design and installation will minimise the maintenance requirements. A catchpit chamber immediately upstream of the cellular storage will help to reduce the risk of siltation, as will the laying of pipes to achieve self-cleansing velocities. The maintenance regime will involve checking the catchpit chamber and the hydrobrake after 3 months, and then further checks at 6 monthly intervals.

APPENDIX A

Impermeable Area Drawing

APPENDIX B

Calculation of Storage Requirements

Email from Rupert Evans of Evans River & Coastal, dated 7th December 2017: -

Greenfield Runoff

The contributing impermeable area across the proposed site has been calculated as 416.6 sq m. Runoff from the contributing area is assumed to be 100% (i.e. 100% PIMP and no infiltration into the ground) and permeable parts of the site such as garden areas will be profiled so that they do not enter the drainage system. Therefore, in accordance with Section 24.2 of CIRIA 753 permeable areas will not contribute to the drainage system and have therefore not been included in the Greenfield runoff rate calculations.

In order to quantify the equivalent Greenfield runoff rate for the contributing area, the methodology outlined within the document entitled *The Revitalised Flood Hydrograph Model ReFH2 Technical Guidance* has been adopted. The document states that Table 24.1 of CIRIA 753 prefers FEH Methods over the IoH 124 Method, as they are more accurate when calculating peak flows within small catchments and plot scale Greenfield runoff calculations.

The ReFH2.2 software has been integrated within the Microdrainage software Version 2017.1.2 with rescaling abilities for sites below 50 ha. The method also uses the more up-to-date FEH13 Point rainfall data (which replaces the FEH99 data) which have been imported into the Microdrainage software Version 2017.1.2 from the FEH Web Service as well as the catchment descriptors.

In the Microdrainage software the AREA was modified to represent the contributing area area and a winter storm profile was used. Figure 1 shows that the equivalent 1 in 1 year runoff rate is 0 l/s (i.e. too low to be recorded by the software) and the 1 in 2 year runoff rate (i.e. similar to QBAR) is 0.1 l/s. When considering 2 l/s/ha, the runoff rate is 0.08 l/s.

Evans Rivers & Costal Ltd		Page 1
19 St Andrews Avenue Thorpe St Andrew Norwich NR7 0RG	Greenfield runoff rate	
Date 07/12/2017 20:03 File	Designed by rupertercl Checked by	
Micro Drainage	Source Control 2017.1.2	

ReFH2 Rural Runoff Peak Flows

Input

Return Period (Years)	2
FEH Rainfall Version	2013
Site Location	GB 525638 186082
Data Type	Point
Season	Winter
Country	England/Wales/Northern Ireland
Area (ha)	0.042
SAAR (mm)	664
BFIHOST	0.683
FARL	0.000
SPRHOST	0.000
URBEXT (2000)	0.0000

Results

Return Period (Years)	Rural (l/s)	Urban (l/s)
User	0.1	0.1
Q1	0.0	0.0
Q2	0.1	0.1
Q5	0.1	0.1
Q10	0.1	0.1
Q30	0.2	0.2
Q50	0.2	0.2
Q75	0.2	0.2
Q100	0.2	0.2
Q200	0.3	0.3
Q1000	0.4	0.4

Figure 1: Greenfield runoff rate equivalent (Source: Microdrainage Version 2017.1.2)

Allowable Discharge Rate

The DEFRA/EA document entitled *Rainfall runoff management for developments* dated 2013, and BS8582:2013 advise that the post-development site should aim to try and replicate the undeveloped state and that for Greenfield sites, the peak runoff rate from the developed site for the 1 in 1 year event and 1 in 100 year event should be constrained to the equivalent peak Greenfield runoff rate to minimise the impact on the receiving watercourse.

The guidance states that when considering volume control, the volume discharged from the site for the 1 in 100 year, 6 hour event is constrained to the equivalent volume associated with the Greenfield condition.

The aforementioned guidance and Section 24.10 of CIRIA 753 states that where the additional volume from the development cannot be used or disposed of on-site (e.g. through infiltration or rainwater harvesting) such as in this case, to avoid an increased runoff volume from developed areas into the sewer system, this volume should be discharged at a very low rate.

Therefore, the guidance recommends that:

a) The additional volume resulting from the development (i.e. long term storage volume) should be discharged at a rate of 2 l/s/ha (or less); or

b) *ALL* the runoff for the 1 in 100 year event from the site should be discharged at a rate of 2 l/s/ha or QBAR (whichever is greater).

In order to provide effective attenuation from the site it is proposed that the runoff from the proposed site will be discharged in accordance with criterion b) above. Therefore, the allowable discharge from the site equates to 0.1 l/s.

Attenuation

The Microdrainage – *Quick Storage Estimate* function has been used in order to determine the volume of storage required based on the discharge rate of 0.1 l/s and contributing area of 416.6 sq m. The model was run for the climate change (30%) 1 in 100 year event as required by Planning Condition 8. The result can be seen on Figure 2.