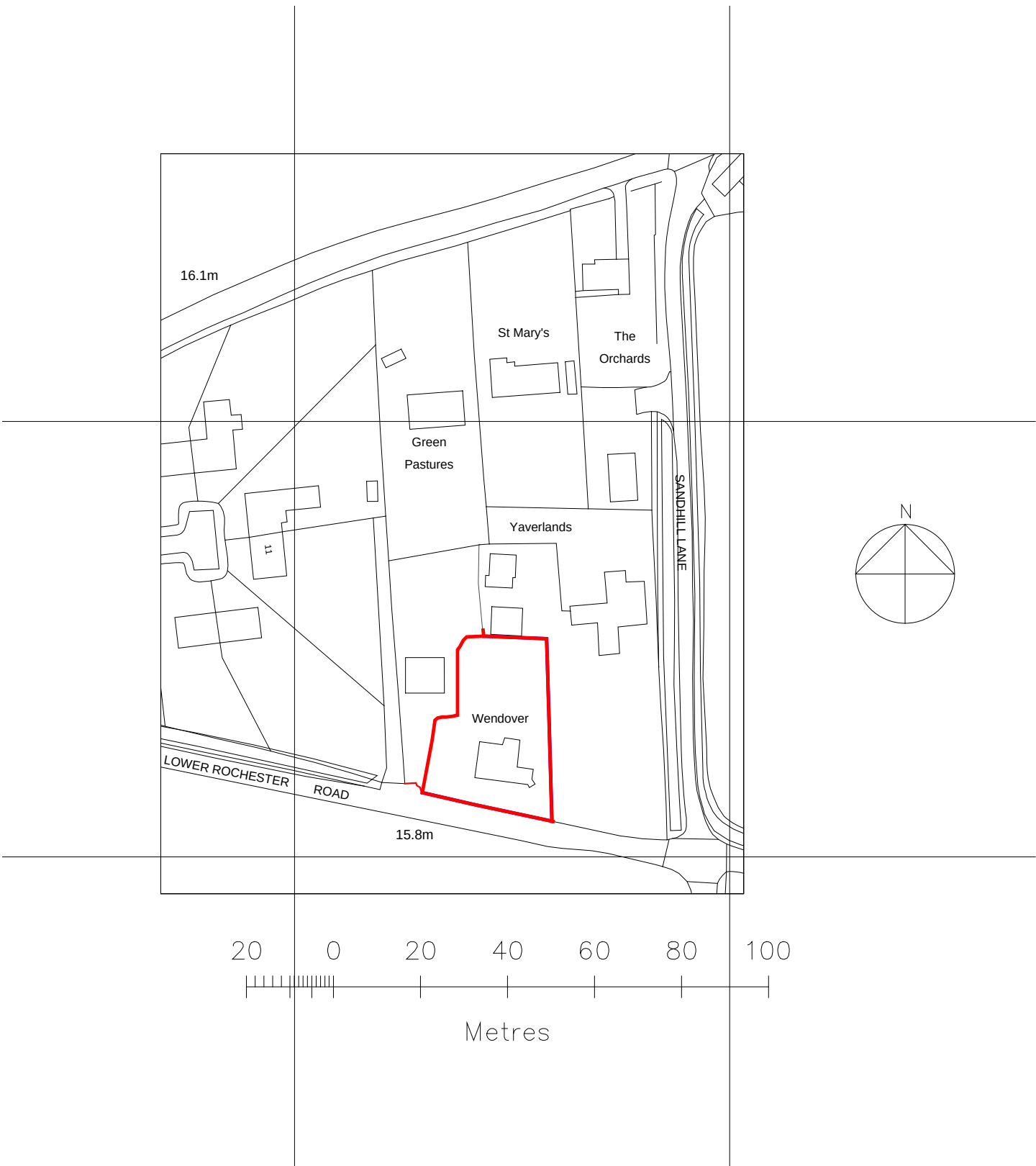




Location Plan 1:1250
Produced on 30 November 2025 from the Ordnance Survey National Geographic Database and incorporating surveyed revision available at this date. This map shows the area bounded by 549908 175207,550050 175207,550050 175349,549908 175349,549908 175207 Crown copyright and database rights 2025 OS 100054135. Supplied by copla ltd trading as UKPlanningMaps.com a licensed Ordnance Survey partner (OS 100054135). Data licence expires 30 November 2026. Unique plan reference: v2g//1347009/1805574

ANY CHANGES FROM APPROVED DRAWINGS ARE THE RESPONSIBILITY OF CLIENT/CONTRACTOR – PLEASE READ CLAUSED BELOW BEFORE WORKS COMMENCE

Any dimensions taken from this drawing should be cross checked on site and approved prior to any construction works. The contractor shall be responsible for taking all necessary site measurements and levels and for all exploratory works to verify any existing structure before commencement of works. The contractor will be responsible for all the correct setting out and temporary supports of works on site to property and neighbouring properties

No liability taken of any kind is accepted by Architect for any error or omission Where new work is near/on boundary the party wall the property owner is to serve party wall notice to the adjoining property/land owner in accordance with the requirements of the 'Party Wall etc.' Act 1996

Contractor responsible for notifying of Building Control Surveyor each stage of works and ensure inspections have been made. All details to comply with current building regulations and Building Control Approval. Work not to commence until approval plans by Building Control Body. Any works that commence before Building Regulations drawings have been approved is responsibility of client.

After confirmation from local authority that prior approval is not required, proposed extension must comply with all permitted development criteria set out under the General Permitted Development Order 1995

Any development carried out without Permitted Development Certificate is at owner's own risk. It is strongly advised that a Permitted Development Certificate/Certificate of Lawfulness is sought prior to commencement of any works

- FD30** All habitable room doors to be replaced with FD30 doors with 38x25mm Door Stops and 3 No Stainless Steel Hinges. Middle Hinge to be installed at least 2/3 of way up door frame
- SD** Mains powered with battery back up interlinked smoke detector to be installed within at least 7.5m of all habitable rooms and at least 30cm from any light fitting or wall
- HD** Mains powered and interlinked operated heat detector with battery back up
- Ex** Extractor fan for shower room - 15l/s and Kitchen 30l/s to be taken through to run and expel externally

For Structural Steelwork refer to Structural Engineer's drawing. Beams indicated by red dashed lines (see right)

Steel work to be encased in 2 layers of FireLine Board with staggered joints or fire resisting intumescent paint in accordance with manufacturer's guidance to provide minimum 60min fire resistance

Steel work to only be ordered once contractor has confirmed dimensions on site and positioning with client. Any discrepancies noted to be discussed with Surveyor prior to ordering any steel work. No responsibility taken by Surveyor for steels ordered to match site conditions

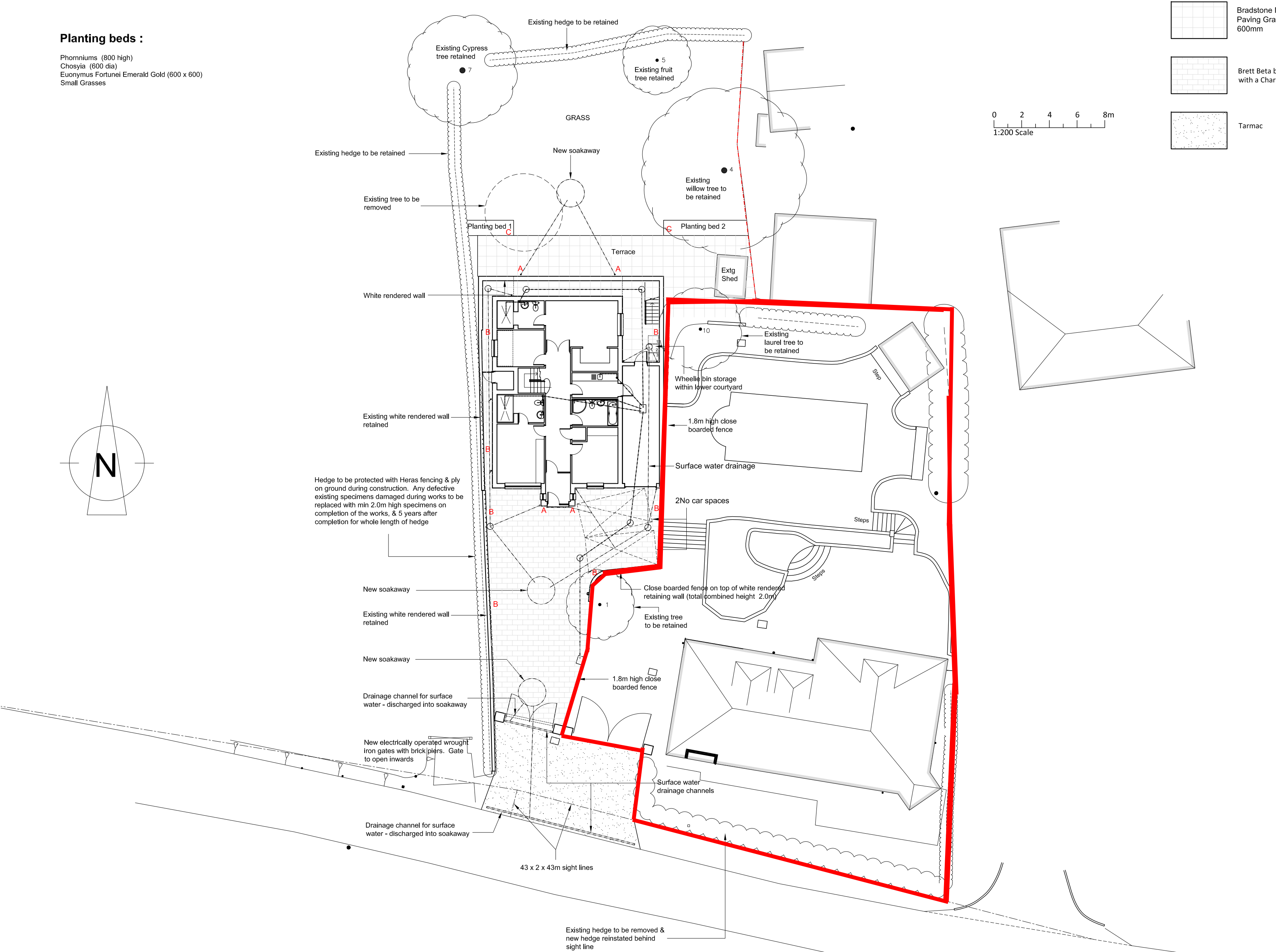
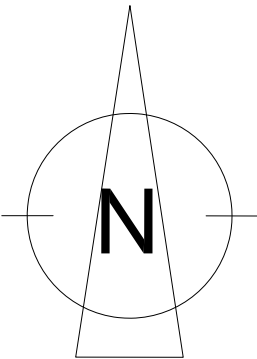
A-Z Building Services

A: Addlestone KT15
E: hthuseyinOBO9@msn.com
T: 07969925562

CLIENT	PROJECT	DRAWING	STAGE	CHECKED	APPROVED
Wendover Lower Rochester Road Higham Rochester Kent ME3 7HD		LOCATION PLAN	BUILDING REGS	SCALE 1:1250 @ A3	DATE
DRAWING No. 207LL-REGS-01					REV C

Planting beds :

Phorniums (800 high)
Chosyia (600 dia)
Euonymus Fortunei Emerald Gold (600 x 600)
Small Grasses



	Bradstone Natural Granite Paving Graphite Grey 600 x 600mm
	Brett Beta blocks in Silver Haze with a Charcoal boarder
	Tarmac

0 2 4 6 8m
1:200 Scale

ANY CHANGES FROM APPROVED DRAWINGS ARE THE RESPONSIBILITY OF CLIENT/CONTRACTOR – PLEASE READ CLAUSED BELOW BEFORE WORKS COMMENCE

Any dimensions taken from this drawing should be cross checked on site and approved prior to any construction works. The contractor shall be responsible for taking all necessary site dimensions and levels and for all exploratory works to verify any existing structure before commencement of works. The contractor will be responsible for all the correct setting out and temporary supports of works on site to property and neighbouring properties

No liability taken of any kind is accepted by Architect for any error or omission Where new work is near/on boundary line/party wall the property owner is to serve party wall notice to the adjoining property/land owner in accordance with the requirements of the 'Party Wall etc.' Act 1996

Contractor responsible for notifying of Building Control Surveyor of each stage of works and ensure inspections have been made. All details to comply with current building regulations and Building Control Approval. Work not to commence until approval of plans by Building Control Body. Any works that commence before Building Regulations drawings have been approved is responsibility of client.

After confirmation from local authority that prior approval is not required, proposed extension must comply with all permitted development criteria set out under the General Permitted Development Order 1995

Any development carried out without Permitted Development Certificate is at owner's own risk. It is strongly advised that a Permitted Development Certificate/Certificate of Lawfulness is sought prior to commencement of any works

- FD30** All habitable room doors to be replaced with FD30 doors with 38x25mm Door Stops and 3 No Stainless Steel Hinges. Middle Hinge to be installed at least 2/3 of way up door frame
- SD** Mains powered with battery back up interlinked smoke detector to be installed within at least 7.5m of all habitable rooms and at least 30cm from any light fitting or wall
- HD** Mains powered and interlinked operated heat detector with battery back up
- Ex** Extractor fan for shower room - 15l/s and Kitchen 30l/s to be taken through to run and expel externally

For Structural Steelwork refer to Structural Engineer's Drawing. Beams indicated by red dashed lines (see right)

All Steel work to be encased in 2 layers of FireLine Board with staggered joints or fire resisting intumescent paint in accordance with manufacturer's guidance to provide minimum 60min fire resistance

All Steel work to only be ordered once contractor has confirmed dimensions on site and positioning with client. Any discrepancies noted to be discussed with Surveyor prior to ordering any steel work. No responsibility taken by Surveyor for steels ordered to match site conditions

A-Z Building Services

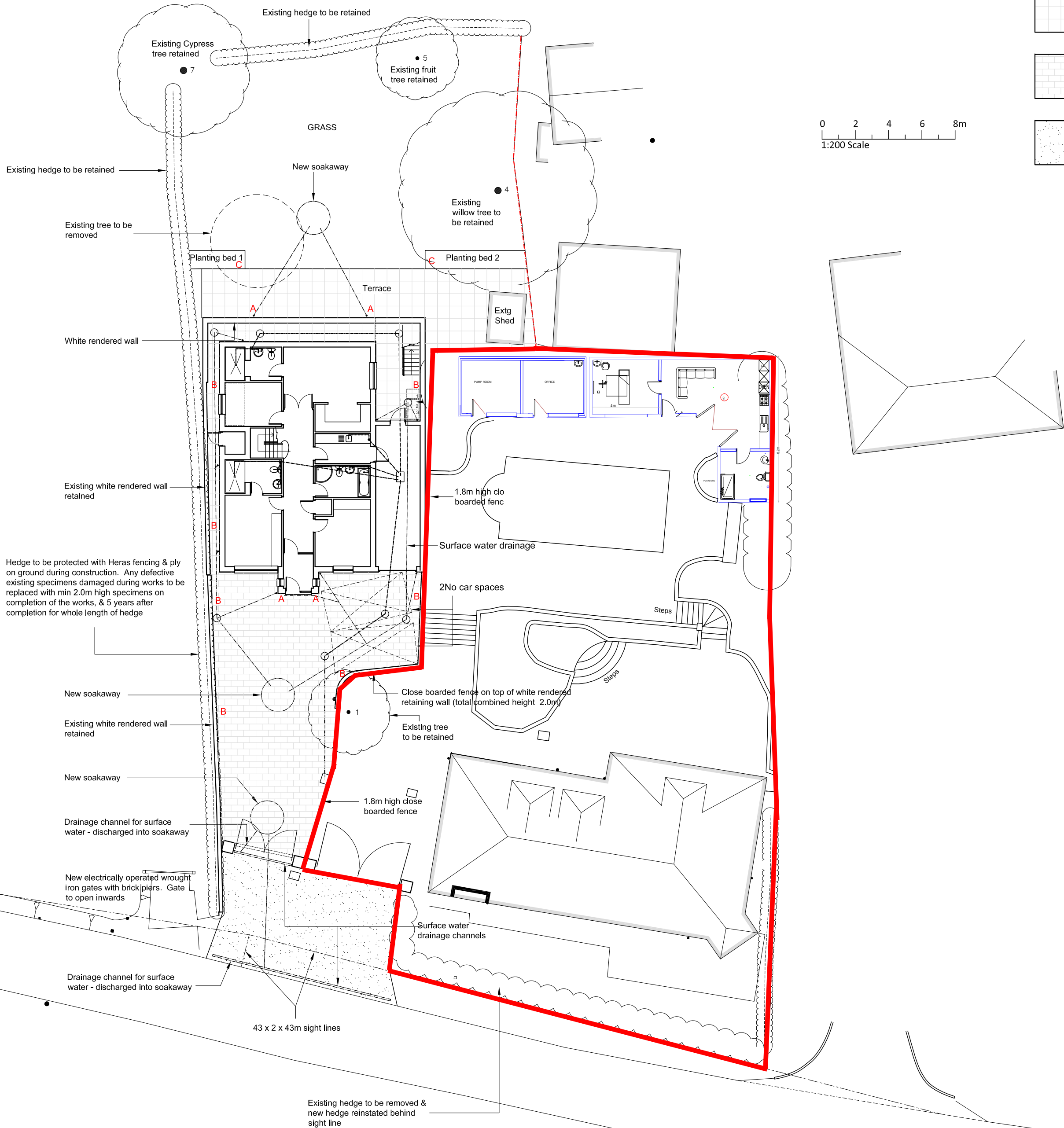
A: Addlestone KT15
E: hthuseyn0809@msn.com
T: 07969925562

CLIENT Mr and Mrs SMITH Wendover Lower Rochester Road Higham Rochester Kent ME3 7HD	PROJECT OUTBUILDING	DRAWING Block Plan - SITE PLAN EXISTING	STAGE BUILDING CONTROL
--	------------------------	---	---------------------------

CHECKED	APPROVED
SCALE 1:200 @A3	DATE AUG 2026
DRAWING No. 7DCWD17-PA-01	REV A

Planting beds :

Phorniums (800 high)
Chosyia (600 dia)
Euonymus Fortunei Emerald Gold (600 x 600)
Small Grasses



	Bradstone Natural Granite Paving Graphite Grey 600 x 600mm
	Brett Beta blocks in Silver Haze with a Charcoal boarder
	Tarmac

ANY CHANGES FROM APPROVED DRAWINGS ARE THE RESPONSIBILITY OF CLIENT/CONTRACTOR – PLEASE READ CLAUSED BELOW BEFORE WORKS COMMENCE

Any dimensions taken from this drawing should be cross checked on site and approved prior to any construction works. The contractor shall be responsible for taking all necessary site dimensions and levels and for all exploratory works to verify any existing structure before commencement of works. The contractor will be responsible for all the correct setting out and temporary supports of works on site to property and neighbouring properties

No liability taken of any kind is accepted by Architect for any error or omission Where new work is near/on boundary line/party wall the property owner is to serve party wall notice to the adjoining property/land owner in accordance with the requirements of the 'Party Wall etc.' Act 1996

Contractor responsible for notifying of Building Control Surveyor of each stage of works and ensure inspections have been made. All details to comply with current building regulations and Building Control Approval. Work not to commence until approval of plans by Building Control Body. Any works that commence before Building Regulations drawings have been approved is responsibility of client.

After confirmation from local authority that prior approval is not required, proposed extension must comply with all permitted development criteria set out under the General Permitted Development Order 1995

Any development carried out without Permitted Development Certificate is at owner's own risk. It is strongly advised that a Permitted Development Certificate/Certificate of Lawfulness is sought prior to commencement of any works

- FD30** All habitable room doors to be replaced with FD30 doors with 38x25mm Door Stops and 3 No Stainless Steel Hinges. Middle Hinge to be installed at least 2/3 of way up door frame
- SD** Mains powered with battery back up interlinked smoke detector to be installed within at least 7.5m of all habitable rooms and at least 30cm from any light fitting or wall
- HD** Mains powered and interlinked operated heat detector with battery back up
- Ex** Extractor fan for shower room - 15l/s and Kitchen 30l/s to be taken through to run and expel externally

For Structural Steelwork refer to Structural Engineer's Drawing. Beams indicated by red dashed lines (see right)

All Steel work to be encased in 2 layers of FireLine Board with staggered joints or fire resisting intumescent paint in accordance with manufacturer's guidance to provide minimum 60min fire resistance

All Steel work to only be ordered once contractor has confirmed dimensions on site and positioning with client. Any discrepancies noted to be discussed with Surveyor prior to ordering any steel work. No responsibility taken by Surveyor for steels ordered to match site conditions

A-Z Building Services

A: Addlestone KT15
E: hthuseyn0809@msn.com
T: 07969925562

CLIENT
Mr and Mrs SMITH
Wendover Lower Rochester Road
Higham Rochester Kent ME3 7HD

PROJECT
OUTBUILDING

DRAWING
Block Plan - SITE PLAN
PROPOSED

STAGE
BUILDING CONTROL

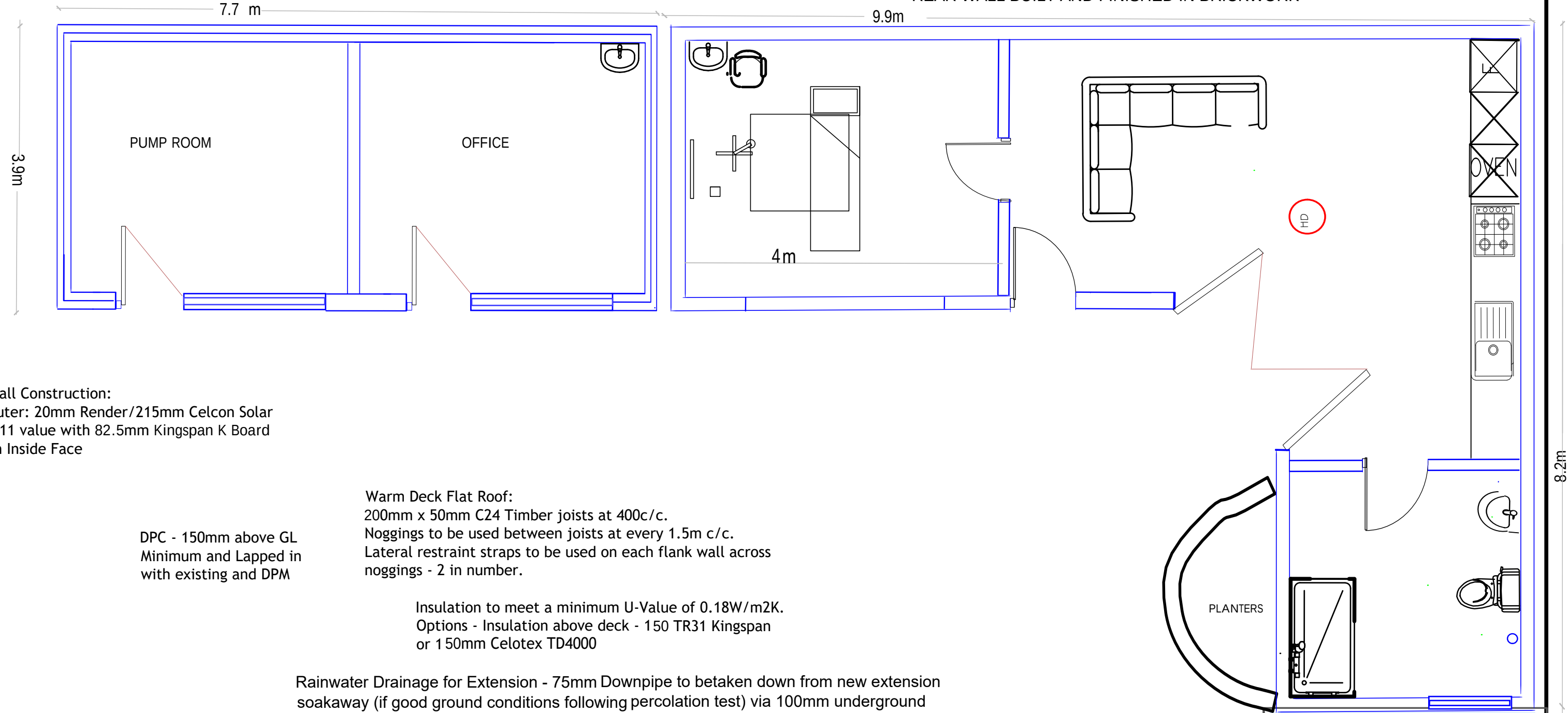
DRAWING No. 7DCWD17-PA-02

REV
A

GROUND BEARING SLAB:
150mm hardcore, 50mm sharp sand, lapping DPM, 100mm Rigid insulation, followed by 200mm Slab with B283 Mesh Top and Bottom. Shorter Mesh to span horizontally. T25 Bars to be every 3m Vertically and Linked with R8 Bars at 250 c.c

Drainage laid in $\frac{1}{40}$ slope connecting to existing Drainage Run
Manholes to be provided every 10m run. If slope is not sufficient other methods to be investigated including saniflow system

REAR WALL BUILT AND FINISHED IN BRICKWORK



Wall Construction:
Outer: 20mm Render/215mm Celcon Solar
0.11 value with 82.5mm Kingspan K Board
on Inside Face

DPC - 150mm above GL
Minimum and Lapped in
with existing and DPM

Warm Deck Flat Roof:
200mm x 50mm C24 Timber joists at 400c/c.
Noggings to be used between joists at every 1.5m c/c.
Lateral restraint straps to be used on each flank wall across
noggings - 2 in number.

Insulation to meet a minimum U-Value of 0.18W/m2K.
Options - Insulation above deck - 150 TR31 Kingspan
or 150mm Celotex TD4000

Rainwater Drainage for Extension - 75mm Downpipe to be taken down from new extension
soakaway (if good ground conditions following percolation test) via 100mm underground
drainage pipe subject to inspector approval. Soakaway to be minimum 5m away from any
building. Alternatively contractor to investigate any existing rainwater sewer during excavation
stage and advise surveyor if found for instruction. Contractor to leave indication of soakaway
location

New UPVC door and window to meet U-Value of at
least 1.8Wm2k. Glazing to door to be toughened
glass. As per manufacturer's specification.

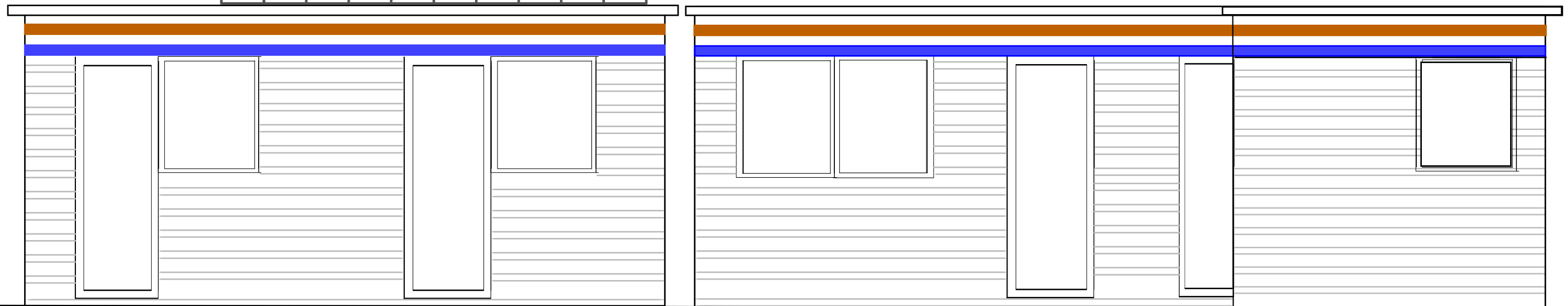
Scale 1:50



CLIENT	PROJECT	DRAWING	STAGE	CHECKED	APPROVED
Mr and Mrs SMITH	Wendover Lower Rochester Road Higham Rochester Kent ME3 7HD	OUTBUILDING PLAN	BUILDING CONTROL	SCALE 1:50 @A3	DATE
DRAWING No. k_P-13				REV A	

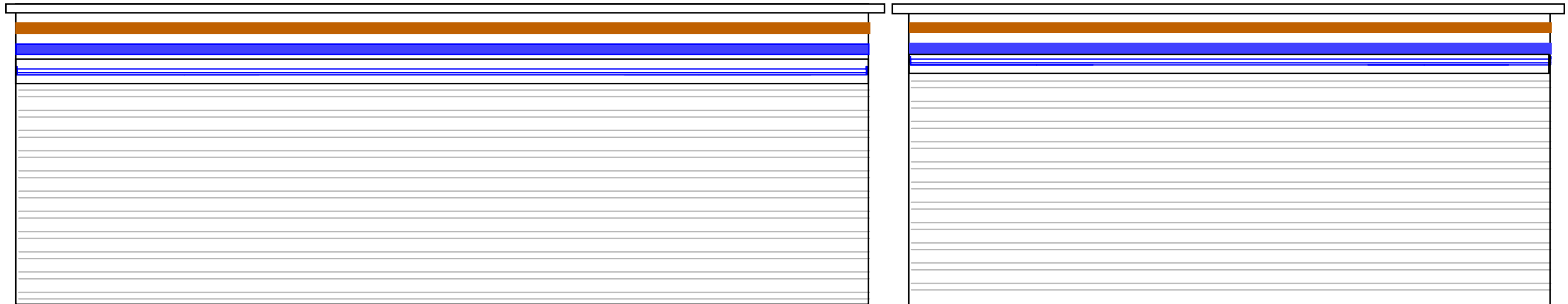
A-Z Building Services

A: Addlestone KT15
E: hthuseyin0809@msn.com
T: 07969925562

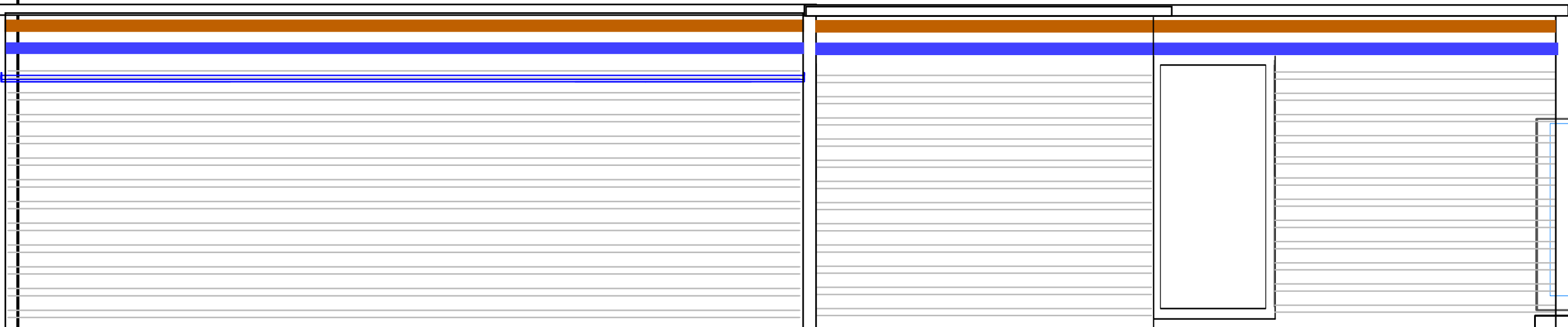


3.35m

FRONT ELEVATION



REAR ELEVATION



FLANK ELEVATION

CLIENT

Mr and Mrs SMITH

PROJECT

Wendover Lower Rochester Road
Higham Rochester Kent ME3 7HD

DRAWING

DRAWING OUTBUILDING ELEVATION

	STAGE
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38	38
39	39
40	40
41	41
42	42
43	43
44	44
45	45
46	46
47	47
48	48
49	49
50	50
51	51
52	52
53	53
54	54
55	55
56	56
57	57
58	58
59	59
60	60
61	61
62	62
63	63
64	64
65	65
66	66
67	67
68	68
69	69
70	70
71	71
72	72
73	73
74	74
75	75
76	76
77	77
78	78
79	79
80	80
81	81
82	82
83	83
84	84
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100

BUILDING
CONTROL

A-Z Building Services

A: Addestone K115
E: hthuseyin0809@msn.com
T: 07969925562

A: Addlestone KT15

E: hthuseyin0809@msn.com

T: 07969925562

CHECKED	APPROVED
---------	----------

APPROVED

SCALE 1:50 @A3

DATE _____

DRAWING No.

k_P-12

REV

REV
A



ANY CHANGES FROM APPROVED DRAWINGS ARE THE RESPONSIBILITY OF CLIENT/CONTRACTOR – PLEASE READ CLAUSED BELOW BEFORE WORKS COMMENCE

Any dimensions taken from this drawing should be cross checked on site and approved prior to any construction works. The contractor shall be responsible for taking all necessary site dimensions and levels and for all exploratory works to verify any existing structure before commencement of works. The contractor will be responsible for all the correct setting out and temporary supports of works on site to property and neighbouring properties

No liability taken of any kind is accepted by Architect for any error or omission Where new work is near/on boundary line/party wall the property owner is to serve party wall notice to the adjoining property/land owner in accordance with the requirements of the 'Party Wall etc.' Act 1996

Contractor responsible for notifying of Building Control Surveyor f each stage of works and ensure inspections have been rade. All details to comply with current building regulations and uilding Control Approval. Work not to commence until approval f plans by Building Control Body. Any works that commence efore Building Regulations drawings have been approved is responsibility of client.

After confirmation from local authority that prior approval is not equired, proposed extension must comply with all permitted evelopment criteria set out under the General Permitted Development Order 1995

Any development carried out without Permitted Development Certificate is at owner's own risk. It is strongly advised that a ermitted Development Certificate/Certificate of Lawfulness is sought prior to commencement of any works

- FD30** All habitable room doors to be replaced with FD30 doors with 38x25mm Door Stops and 3 No Stainless Steel Hinges. Middle Hinge to be installed at least ⅓ of way up door frame
- SD** Mains powered with battery back up interlinked smoke detector to be installed within at least 7.5m of all habitable rooms and at least 30cm from any light fitting or wall
- HD** Mains powered and interlinked operated heat detector with battery back up
- Ex** Extractor fan for shower room - 15l/s and Kitchen 30l/s to be taken through to run and expel externally

or Structural Steelwork refer to Structural Engineer's rawing. Beams indicated by red dashed lines (see right)

ll Steel work to be encased in 2 layers of FireLine Board with staggered oints or fire resisting intumescent paint in accordance with manufacturer's guidance to provide minimum 60min fire resistance

ll Steel work to only be ordered once contractor has confirmed mensions on site and positioning with client. Any discrepancies noted to e discussed with Surveyor prior to ordering any steel work. No esponsibility taken by Surveyor for steels ordered to match site conditions

CLIENT	Mr and Mrs SMITH	PROJECT	Wendover Lower Rochester Road Higham Rochester Kent ME3 7HD	DRAWING	OUTBUILDING ELEVATION	STAGE	BUILDING CONTROL	CHECKED	APPROVED
								SCALE 1:50 @A3	DATE JULY 20
								DRAWING No. k_P-12	REV A

External Wall Construction

(ABOVE RETAINING WALL LEVEL)

100mm Facing Blockwork Finished in Render
100mm Cavity filled with 90mm Kingspan
interlocking Cavity rigid insulation
100mm Blockwork Internal with plasterboard
on plaster dabs

Warm Deck Flat Roof:
200mm x 50mm C24 Timber joists at 400c/c.
Noggings to be used between joists at every 1.5m c/c.
Lateral restraint straps to be used on each flank wall across
noggings - 2 in number.

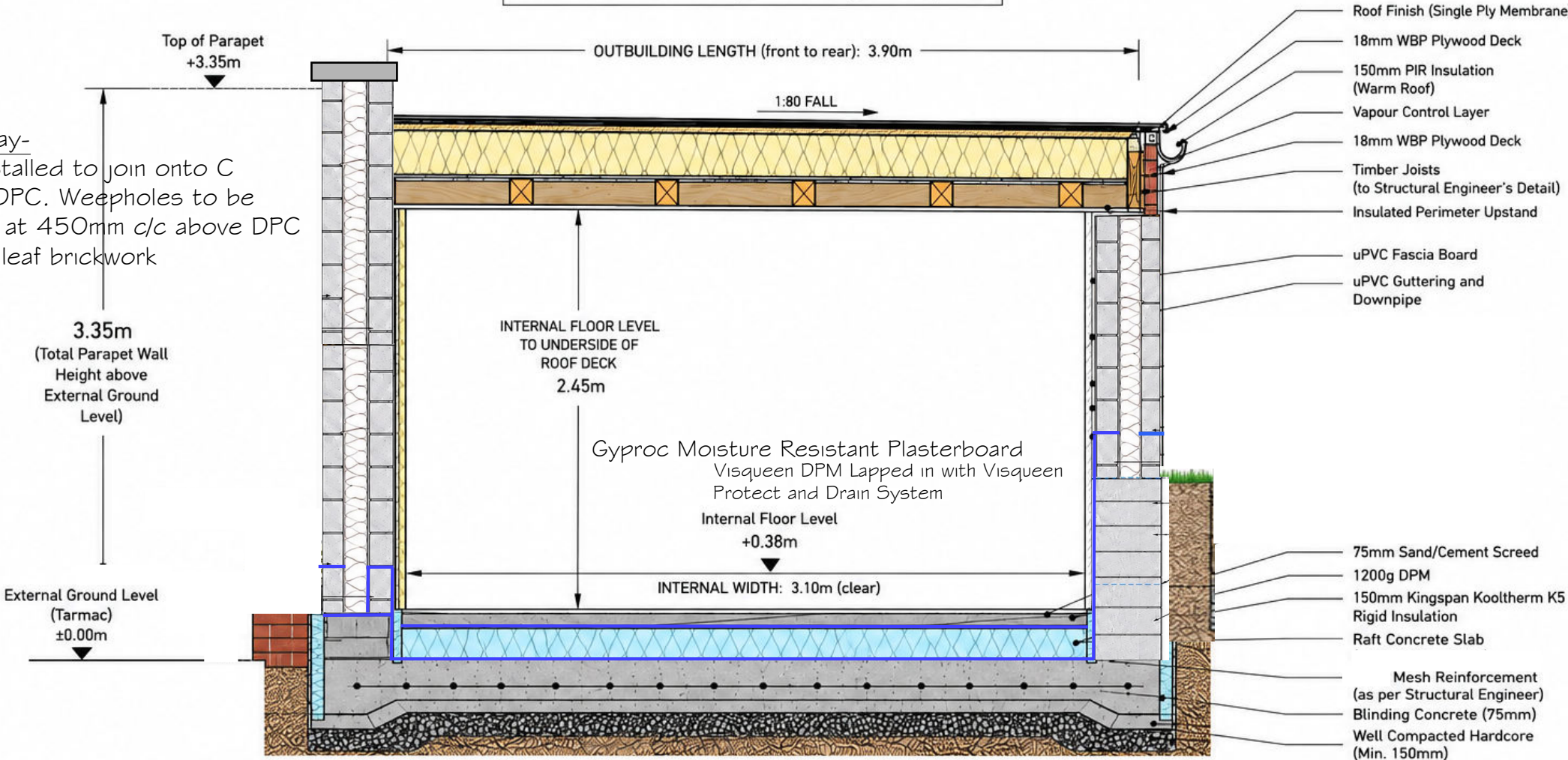
Insulation to meet a minimum U-Value of 0.18W/m2K.
Options - Insulation above deck - 150 TR31 Kingspan
or 150mm Celotex TD4000

DPC - 150mm above GL Minimum and Lapped
in with existing and DPM

CROSS SECTION A-A
OUTBUILDING

TOTAL PARAPET WALL HEIGHT (above external ground level): 3.35m

Cavity Tray-
To be installed to join onto C
Section DPC. Weepholes to be
provided at 450mm c/c above DPC
on outer leaf brickwork



- NOTES:
- All structural elements to Structural Engineer's details.
 - All dimensions in millimetres unless noted otherwise.
 - All work to comply with Building Regulations and relevant British Standards.
 - Insulation to achieve U-values in accordance with current Building Regulations.

OUTBUILDING DIMENSIONS	
Internal Length (front to rear):	3.90m
Internal Width (side to side):	3.10m
Internal Floor Level to Underside of Roof Deck:	2.45m
Total Parapet Wall Height (above external ground level):	3.35m

LEVEL SUMMARY	
Top of Parapet:	+3.35m
Internal Floor Level:	+0.38m
External Ground Level (Tarmac):	±0.00m
Internal floor level is 0.38m higher than external.	

EXTENSION DETAILS

GROUND BEARING SLAB/RAFT:

150mm hardcore, 50mm sharp sand, lapping DPM, 100mm Rigid insulation, followed by 200mm Slab with B283 Mesh Top and Bottom. Shorter Mesh to span horizontally. T25 Bars to be every 3m Vertically and Linked with R8 Bars at 250 c.c

Retaining Wall to Rear and Side:
Hollow Dense 7N Concrete Blocks laid Flat
Infilled holes with T12 @ 200 c.c, connecting
to Foundations and Slab Below.
40mm concrete cover to reinforcements
Tanking to both internal and outside face of wall
protected with boarding.

SUBJECT TO Approval

CLIENT	PROJECT	DRAWING	STAGE	CHECKED	APPROVED
Mr and Mrs SMITH	Wendover Lower Rochester Road Higham Rochester Kent ME3 7HD	DETAILS	Building Control	SCALE @A3	DATE
DRAWING No. 1 7 C H A W O R T H - 1 3				REV A	

ANY CHANGES FROM APPROVED DRAWINGS ARE THE
RESPONSIBILITY OF CLIENT/CONTRACTOR - PLEASE
READ CLAUSED BELOW BEFORE WORKS COMMENCE

Any dimensions taken from this drawing should be cross
checked on site and approved prior to any construction works.
The contractor shall be responsible for taking all necessary site
dimensions and levels and for all exploratory works to verify any
existing structure before commencement of works. The
contractor will be responsible for all the correct setting out and
temporary supports of works on site to property and
neighbouring properties

No liability taken of any kind is accepted by Architect for any
error or omission Where new work is near/on boundary
line/party wall the property owner is to serve party wall notice
to the adjoining property/land owner in accordance with the
requirements of the 'Party Wall etc.' Act 1996

Contractor responsible for notifying of Building Control Surveyor
of each stage of works and ensure inspections have been
made. All details to comply with current building regulations and
Building Control Approval. Work not to commence until approval
of plans by Building Control Body. Any works that commence
before Building Regulations drawings have been approved is
responsibility of client.

After confirmation from local authority that prior approval is not
required, proposed extension must comply with all permitted
development criteria set out under the General Permitted
Development Order 1995

Any development carried out without Permitted Development
Certificate is at owner's own risk. It is strongly advised that a
Permitted Development Certificate/Certificate of Lawfulness is
sought prior to commencement of any works

- FD30 All habitable room doors to be replaced with FD30 doors with 38x25mm Door Stops and 3 No Stainless Steel Hinges. Middle Hinge to be installed at least 2/3 of way up door frame
- SD Mains powered with battery back up interlinked smoke detector to be installed within at least 7.5m of all habitable rooms and at least 30cm from any light fitting or wall
- HD Mains powered and interlinked operated heat detector with battery back up
- Ex Extractor fan for shower room - 15l/s and Kitchen 30l/s to be taken through to run and expel externally

For Structural Steelwork refer to Structural Engineer's
Drawing. Beams indicated by red dashed lines (see right)

All Steel work to be encased in 2 layers of FireLine Board with staggered
joints or fire resisting intumescent paint in accordance with manufacturer's
guidance to provide minimum 60min fire resistance

All Steel work to only be ordered once contractor has confirmed
dimensions on site and positioning with client. Any discrepancies noted to
be discussed with Surveyor prior to ordering any steel work. No
responsibility taken by Surveyor for steels ordered to match site
conditions

A-Z Building Services

A: Addlestone KT15
E: hthuseyin0809@msn.com
T: 07969925562

PARAPET ROOF DETAIL

FLAT ROOF SYSTEM BEGINS AT PARAPET



EXTERNAL ELEVATION – PARAPET FINISH (AS SHOWN)



EXTERIOR PARAPET FINISH (AS SHOWN)

- Precast coping stone with drip to front
- Mortar joint / flexible pointing with weep joints at max. 900mm centres
- Decorative terracotta feature band
- Blue & white decorative tile band
- Render finish to match wall below
- All external finishes to weather appropriately

KEY DIMENSIONS

- Parapet height above roof finish: 300mm
- Upstand height above roof finish: min. 150mm
- Parapet wall thickness: 215mm (typical)
- Coping overhang: 15–20mm each side
- Weep joints: max. 900mm centres
- Minimum falls: 1:80 to outlets

NOTES

- Ensure all membranes are installed in accordance with manufacturer’s instructions.
- All upstands to be turned up min. 150mm above finished roof level.
- Parapet coping stones to have min. 15mm drip and be bedded on flexible mortar.
- Provide weep joints to allow drainage and prevent water tracking.
- All dimensions in millimetres unless stated otherwise.

MATERIAL SPECIFICATION

- Roofing membrane: Single ply EPDM / TPO / PVC, fully adhered
- Insulation: PIR board, foil faced both sides
- Vapour control layer: Bituminous VCL
- Roof deck: 18mm WBP plywood
- Parapet wall: Brick / blockwork, rendered
- Render: Cementitious render system
- Coping: Precast concrete coping stone with drip
- Decorative band: Terracotta feature elements
- Mortar joints: Flexible mortar with weep joints at max. 900mm c/c

STANDARDS & COMPLIANCE

- BS 6229:** Flat roofs with continuously supported flexible waterproof coverings
- BS 8217:** Code of practice for reinforced / unreinforced bituminous membranes
- BS EN 1991-1-3:** Actions on structures – Snow loads
- Building Regulations:** Part L (Conservation of fuel and power)
- Guidance:** NHBC Standards 2024 – Flat roofs

DETAIL SUMMARY

- Roof Type:

Warm Flat Roof
- Roof Finish:

Single Ply Membrane
- Parapet Height:

300mm above roof finish
- Roof Build-up:

Insulated, adhered system
- Roof Falls:

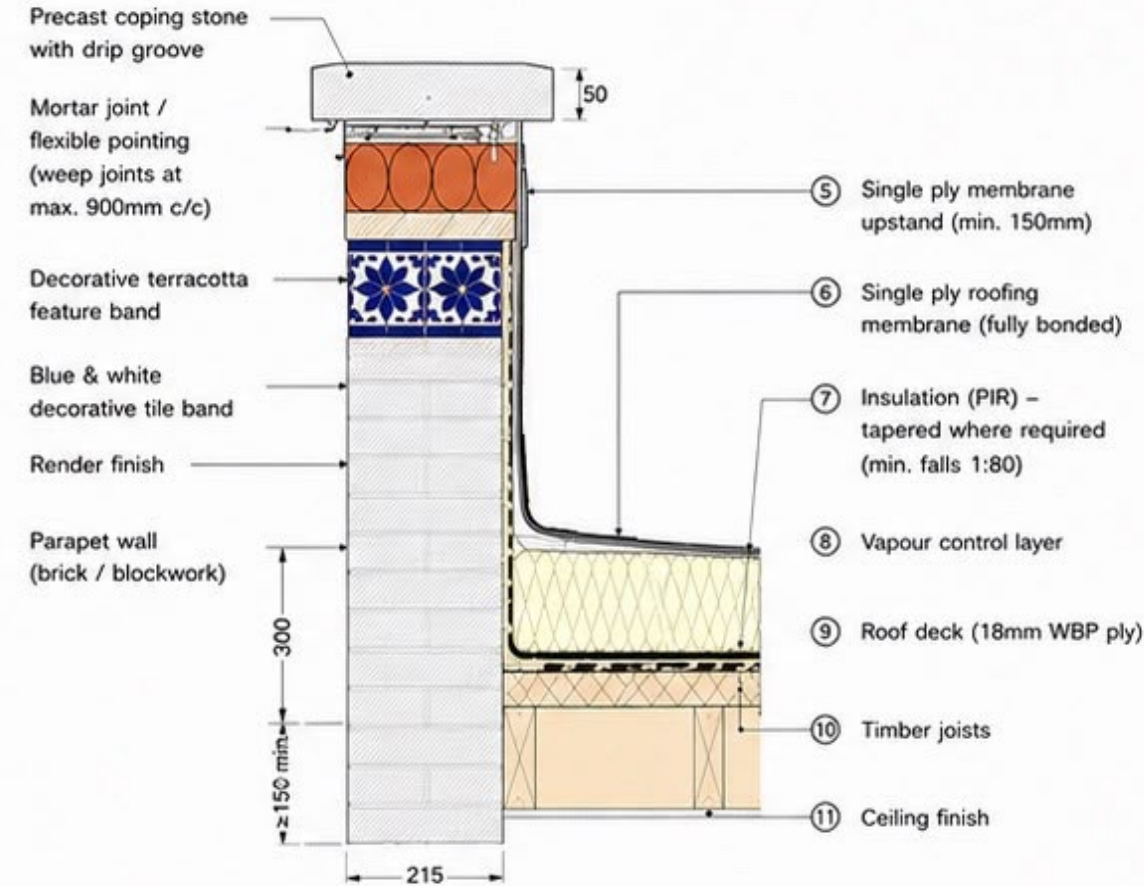
Min. 1:80 to outlets
- Upstand Height:

Min. 150mm above finished roof level
- Weathering:

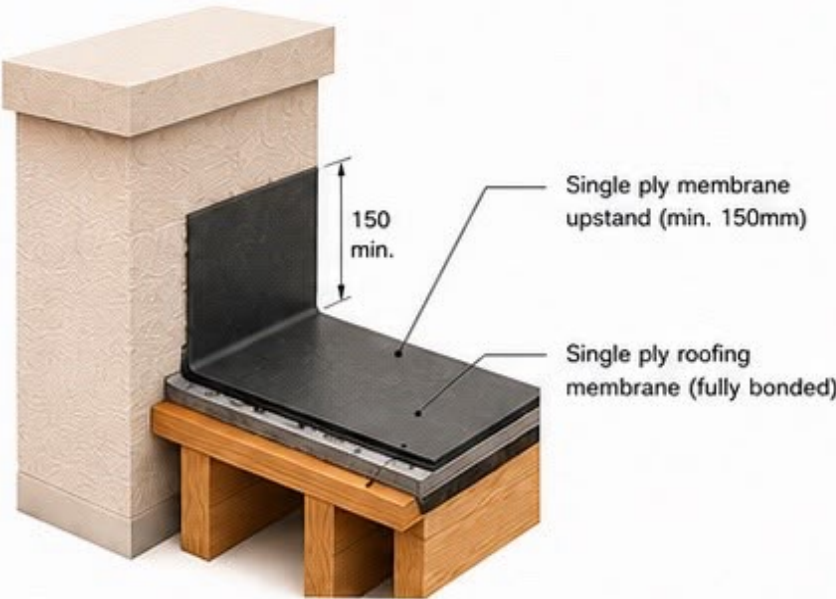
Good – parapet coping with drip
- Thermal Target:

U-value: $\leq 0.18 \text{ W/m}^2\text{K}$
- Compliance:

Building Regs (Part L),
BS EN 1991, BS 6229, BS 8217



FLAT ROOF BUILD-UP (INTERNAL FACE ONLY)



ROOF BUILD-UP (INSIDE TO OUTSIDE)			
No.	Layer	Material	Thickness
1	Ceiling finish	Plasterboard	12.5mm
2	Timber joists	C16 @ 400mm c/c	195mm
3	Roof deck	WBP Plywood	18mm
4	Vapour control layer	Bituminous VCL	–
5	Insulation	PIR rigid board	120–150mm (tapered)
6	Roofing membrane	EPDM / TPO / PVC	1.2–1.5mm
7	Upstand	Membrane upstand	150mm min.
8	Parapet wall	Brick / blockwork (rendered)	215mm typ.
9	Render finish	Cementitious render system	15–20mm
10	Decorative terracotta band	Terracotta feature	–
11	Blue & white tile band	Decorative tile	–
12	Mortar joint	Mortar joint (flexible)	–
13	Coping	Precast coping stone	50mm

Note: Insulation thickness to achieve U-value $\leq 0.18 \text{ W/m}^2\text{K}$

Warm Deck Flat Roof:
200mm x 50mm C24 Timber joists at 400c/c.
Noggings to be used between joists at every 1.5m c/c.
Lateral restraint straps to be used on each flank wall across noggings - 2 in number.

Insulation to meet a minimum U-Value of 0.18W/m2K.
Options - Insulation above deck - 150mm Celotex TD4000
or 150 TR31 Kingspan

Flat roof finished in Approved GRP Roofing System.

Flat Roof Eaves

Retaining Wall :
Hollow Dense 7N Concrete Blocks laid Flat
Infilled holes with T12 @ 200 c.c, connecting to Slab Below.
40mm concrete cover to reinforcements

Tanking to both internal and outside face of wall protected with boarding.

DPC - 150mm above GL Minimum and Lapped in with existing and DPM with Semi Eng bricks below DPC

Cold Bridging to be stopped by ensuring insulation of wall abuts up to insulation in roof

Cold Bridging to be stopped by ensuring insulation of wall abuts up to insulation in roof

External Wall Construction

External Wall Construction

(ABOVE RETAINING WALL LEVEL)

100mm Facing Blockwork Finished in Render
100mm Cavity filled with 90mm Kingspan interlocking Cavity rigid insulation
100mm Blockwork Internal with plasterboard on plaster dabs

GROUND BEARING SLAB:
150mm hardcore, 50mm sharp sand, lapping DPM, 100mm Rigid insulation, followed by 200mm Slab with B283 Mesh Top and Bottom. Shorter Mesh to span horizontally. T25 Bars to be every 3m Vertically and Linked with R8 Bars at 250 c.c

ANY CHANGES FROM APPROVED DRAWINGS ARE THE RESPONSIBILITY OF CLIENT/CONTRACTOR - PLEASE READ CLAUSED BELOW BEFORE WORKS COMMENCE

Any dimensions taken from this drawing should be cross checked on site and approved prior to any construction works. The contractor shall be responsible for taking all necessary site dimensions and levels and for all exploratory works to verify any existing structure before commencement of works. The contractor will be responsible for all the correct setting out and temporary supports of works on site to property and neighbouring properties

No liability taken of any kind is accepted by Architect for any error or omission Where new work is near/on boundary line/party wall the property owner is to serve party wall notice to the adjoining property/land owner in accordance with the requirements of the 'Party Wall etc.' Act 1996

Contractor responsible for notifying of Building Control Surveyor of each stage of works and ensure inspections have been made. All details to comply with current building regulations and Building Control Approval. Work not to commence until approval of plans by Building Control Body. Any works that commence before Building Regulations drawings have been approved is responsibility of client.

After confirmation from local authority that prior approval is not required, proposed extension must comply with all permitted development criteria set out under the General Permitted Development Order 1995

Any development carried out without Permitted Development Certificate is at owner's own risk. It is strongly advised that a Permitted Development Certificate/Certificate of Lawfulness is sought prior to commencement of any works

- FD30 All habitable room doors to be replaced with FD30 doors with 38x25mm Door Stops and 3 No Stainless Steel Hinges. Middle Hinge to be installed at least 2/3 of way up door frame
- SD Mains powered with battery back up interlinked smoke detector to be installed within at least 7.5m of all habitable rooms and at least 30cm from any light fitting or wall
- HD Mains powered and interlinked operated heat detector with battery back up
- Ex Extractor fan for shower room - 15l/s and Kitchen 30l/s to be taken through to run and expel externally

For Structural Steelwork refer to Structural Engineer's Drawing. Beams indicated by red dashed lines (see right)
All Steel work to be encased in 2 layers of FireLine Board with staggered joints or fire resisting intumescent paint in accordance with manufacturer's guidance to provide minimum 60min fire resistance
All Steel work to only be ordered once contractor has confirmed dimensions on site and positioning with client. Any discrepancies noted to be discussed with Surveyor prior to ordering any steel work. No responsibility taken by Surveyor for steels ordered to match site conditions

A-Z Building Services

A: Addlestone KT15
E: hthuseyin0809@msn.com
T: 07969925562

EXTENSION DETAILS

SUBJECT TO Approval

CLIENT	PROJECT	DRAWING	STAGE	CHECKED	APPROVED	DRAWING No.	REV
Mr and Mrs SMITH	Wendover Lower Rochester Road Higham Rochester Kent ME3 7HD	DETAILS	Building Control	SCALE @A3	DATE	1 7 C H A W O R T H - 1 3	A

Warm Deck Flat Roof:
200mm x 50mm C24 Timber joists at 400c/c.
Noggings to be used between joists at every 1.5m c/c.
Lateral restraint straps to be used on each flank wall across noggings - 2 in number.

Insulation to meet a minimum U-Value of 0.18W/m2K.
Options - Insulation above deck - 150 TR31 Kingspan
or 150mm Celotex TD4000

DPC - 150mm above GL Minimum and Lapped
in with existing and DPM

External Wall Construction
(ABOVE RETAINING WALL LEVEL)

100mm Facing Blockwork Finished in Render
100mm Cavity filled with 90mm Kingspan
interlocking Cavity rigid insulation
100mm Blockwork Internal with plasterboard
on plaster dabs

Retaining Wall :
Hollow Dense 7N Concrete Blocks laid Flat
Infilled holes with T12 @ 200 c.c, connecting
to Slab Below.
40mm concrete cover to reinforcements

Tanking to both internal and outside face of wall
protected with boarding.

GROUND BEARING SLAB/RAFT:
150mm hardcore, 50mm sharp sand, lapping DPM, 100mm
Rigid insulation, followed by 200mm Slab with B283 Mesh Top
and Bottom. Shorter Mesh to span horizontally. T25 Bars to
be every 3m Vertically and Linked with R8 Bars at 250 c.c

BACK WALL - SECTION DETAIL

Solid block on side up to 1/4 height,
then cavity wall above

SCALE 1:10

- Solid block on side up to 1/4 height to retain soil (bank)
- External insulation and damp protection to solid block on side section
- Cavity wall above to match main building construction
- Provide weep holes at max. 900mm centres at base of cavity
- All work to comply with current Building Regulations

Visqueen DPM Lapped in with Visqueen
Protect and Drain System

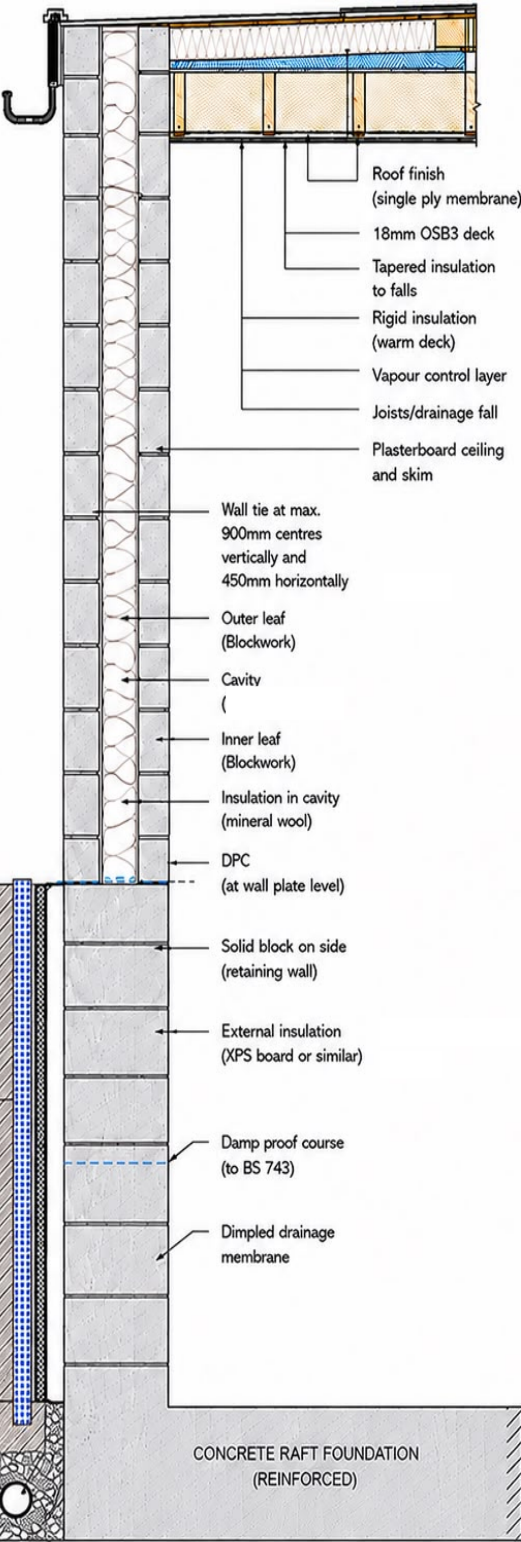
Cavity Tray-
To be installed to join onto C
Section DPC. Weepholes to be
provided at 450mm c/c above DPC
on outer leaf brickwork

RETAINED BANK
(soil)

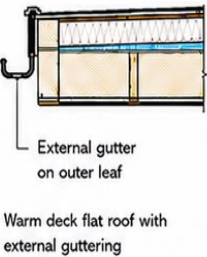
APPROX.
1/4 HEIGHT
(TO SUIT SITE
CONDITIONS)

Drainage channel
or perforated land drain
at base (connect to
suitable outfall)

CONCRETE RAFT FOUNDATION
(REINFORCED)



ROOF SECTION (WARM DECK)
SCALE 1:10



KEY

- Blockwork (outer & inner leaf)
- Insulation
- DPC
- External Insulation
- Dimpled Drainage Membrane
- Drainage Channel / Land Drain

ANY CHANGES FROM APPROVED DRAWINGS ARE THE
RESPONSIBILITY OF CLIENT/CONTRACTOR - PLEASE
READ CLAUSED BELOW BEFORE WORKS COMMENCE

Any dimensions taken from this drawing should be cross
checked on site and approved prior to any construction works.
The contractor shall be responsible for taking all necessary site
dimensions and levels and for all exploratory works to verify any
existing structure before commencement of works. The
contractor will be responsible for all the correct setting out and
temporary supports of works on site to property and
neighbouring properties

No liability taken of any kind is accepted by Architect for any
error or omission Where new work is near/on boundary
line/party wall the property owner is to serve party wall notice
to the adjoining property/land owner in accordance with the
requirements of the 'Party Wall etc.' Act 1996

Contractor responsible for notifying of Building Control Surveyor
of each stage of works and ensure inspections have been
made. All details to comply with current building regulations and
Building Control Approval. Work not to commence until approval
of plans by Building Control Body. Any works that commence
before Building Regulations drawings have been approved is
responsibility of client.

After confirmation from local authority that prior approval is not
required, proposed extension must comply with all permitted
development criteria set out under the General Permitted
Development Order 1995

Any development carried out without Permitted Development
Certificate is at owner's own risk. It is strongly advised that a
Permitted Development Certificate/Certificate of Lawfulness is
sought prior to commencement of any works

- FD30** All habitable room doors to be replaced with FD30 doors with 38x25mm Door Stops and 3 No Stainless Steel Hinges. Middle Hinge to be installed at least 2/3 of way up door frame
- SD** Mains powered with battery back up interlinked smoke detector to be installed within at least 7.5m of all habitable rooms and at least 30cm from any light fitting or wall
- HD** Mains powered and interlinked operated heat detector with battery back up
- Ex** Extractor fan for shower room - 15l/s and Kitchen 30l/s to be taken through to run and expel externally

For Structural Steelwork refer to Structural Engineer's
Drawing. Beams indicated by red dashed lines (see right)

All Steel work to be encased in 2 layers of FireLine Board with staggered
joints or fire resisting intumescent paint in accordance with manufacturer's
guidance to provide minimum 60min fire resistance

All Steel work to only be ordered once contractor has confirmed
dimensions on site and positioning with client. Any discrepancies noted to
be discussed with Surveyor prior to ordering any steel work. No
responsibility taken by Surveyor for steels ordered to match site
conditions

A-Z Building Services

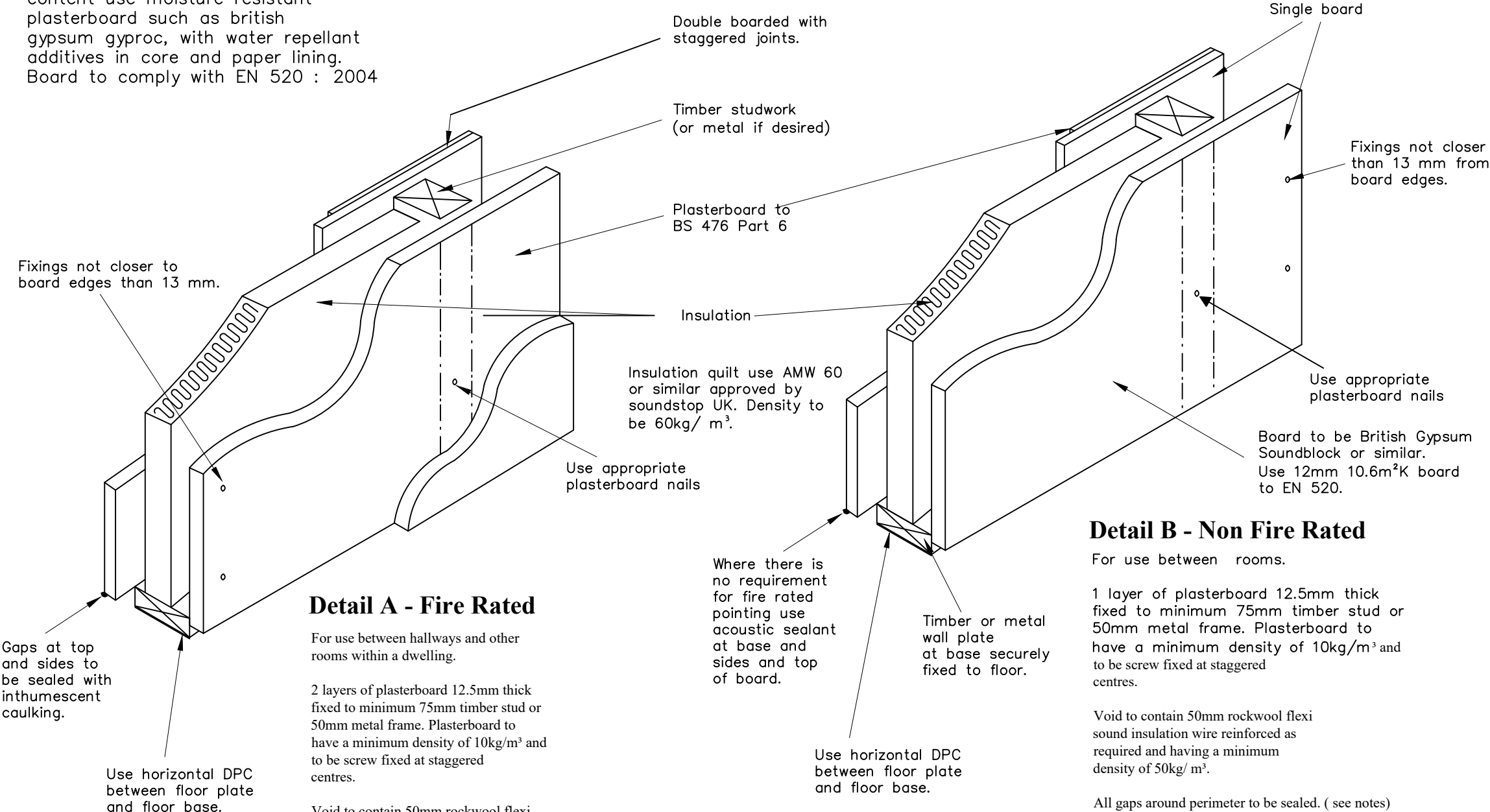
A: Addlestone KT15
E: hthuseyin0809@msn.com
T: 07969925562

EXTENSION DETAILS

Gyproc Moisture Resistant Plasterboard

SUBJECT TO Approval				CHECKED .		APPROVED .	
CLIENT	PROJECT	DRAWING	STAGE	SCALE	@A3	DATE	REV
Mr and Mrs SMITH	Wendover Lower Rochester Road Higham Rochester Kent ME3 7HD	DETAILS	Building Control	DRAWING No.			
1 7 C H A W O R T H - 1 3				A			

Note
In areas prone to high moisture content use moisture resistant plasterboard such as british gypsum gyproc, with water repellant additives in core and paper lining.
Board to comply with EN 520 : 2004



ANY CHANGES FROM APPROVED DRAWINGS ARE THE RESPONSIBILITY OF CLIENT/CONTRACTOR – PLEASE READ CLAUSED BELOW BEFORE WORKS COMMENCE

Any dimensions taken from this drawing should be cross checked on site and approved prior to any construction works. The contractor shall be responsible for taking all necessary site dimensions and levels and for all exploratory works to verify any existing structure before commencement of works. The contractor will be responsible for all the correct setting out and temporary supports of works on site to property and neighbouring properties

No liability taken of any kind is accepted by Architect for any error or omission Where new work is near/on boundary line/party wall the property owner is to serve party wall notice to the adjoining property/land owner in accordance with the requirements of the 'Party Wall etc.' Act 1996

Contractor responsible for notifying of Building Control Surveyor of each stage of works and ensure inspections have been made. All details to comply with current building regulations and Building Control Approval. Work not to commence until approval of plans by Building Control Body. Any works that commence before Building Regulations drawings have been approved is responsibility of client.

After confirmation from local authority that prior approval is not required, proposed extension must comply with all permitted development criteria set out under the General Permitted Development Order 1995

Any development carried out without Permitted Development Certificate is at owner's own risk. It is strongly advised that a Permitted Development Certificate/Certificate of Lawfulness is sought prior to commencement of any works

- FD30** All habitable room doors to be replaced with FD30 doors with 38x25mm Door Stops and 3 No Stainless Steel Hinges. Middle Hinge to be installed at least ⅓ of way up door frame
- SD** Mains powered with battery back up interlinked smoke detector to be installed within at least 7.5m of all habitable rooms and at least 30cm from any tight fitting or wall
- HD** Mains powered and interlinked operated heat detector with battery back up
- Ex** Extractor fan for shower room - 15l/s and Kitchen 30l/s to be taken through to run and expel externally

For Structural Steelwork refer to Structural Engineer's Drawing. Beams indicated by red dashed lines (see right)

All Steel work to be encased in 2 layers of FireLine Board with staggered joints or fire resisting intumescent paint in accordance with manufacturer's guidance to provide minimum 60min fire resistance

All Steel work to only be ordered once contractor has confirmed dimensions on site and positioning with client. Any discrepancies noted to be discussed with Surveyor prior to ordering any steel work. No responsibility taken by Surveyor for steels ordered to match site conditions

A-Z Building Services

A: Addlestone KT15
E: hthuseyin0809@msn.com
T: 07969925562

SUBJECT TO Approval				CHECKED .		APPROVED .	
CLIENT	PROJECT	DRAWING	STAGE	SCALE	@A3	DATE	REV
Mr and Mrs SMITH	Wendover Lower Rochester Road Higham Rochester Kent ME3 7HD	DETAILS	Building Control	DRAWING No.			
1 7 C H A W O R T H - 1 4				A			

Pipe work above ground

(All size are minimum)

Trap size

Trape size for whb	diameter 32mm	seal depth 75mm
Trape size for bath	diameter 40mm	seal depth 75mm
Trape size for shower	diameter 40mm	seal depth 50mm
Trape size for wc	diameter 100mm	seal depth 50mm
Trape size for sink	diameter 40mm	seal depth 75mm

- All points of discharge in to stack/ branch to have a trap as noted above.
- (All traps deep seal and tubular).
- All traps fitted directly to appliance to be removeable and have cleaning eye.
- Branch pipe should discharge into stack so as to avoid cross flow. the minimum offset should be 250mm.
- No connections to branch pipe lower than 500mm above drain invert.
- All branch pipes should have same minimum diameter as trap size noted above.
- All discharge systems to be air tight and capable of withstanding an air test of positive pressure of at least 38mm water guage for 5 minutes.

Maximum Branch Lenghts (unventilated)

- Are to be as follows.
- WC maximum branch length 15m.
 - Urinal maximum branch length 3m.
 - WHB maximum branch length 3m for 40mm dia pipe.

For other variants consult table 2 building regs part h1.
For longer lengths the branch pipe should be ventilated.
Dimension a to b on attached plan should ideally not exceed 3m.

Maximum Gradients

WC	–	18 to 90 mm fall per metre
Urinal	–	18 to 90 mm fall per metre
Bath	–	18 to 25 mm fall per metre
WHB	–	18 to 25 mm fall per metre
Shower	–	18 to 25 mm fall per metre

- All pipe work should be securely fixed.
- All pipe work should be fitted with rodding/ cleaning access at the end of pipe runs.
- Where appliances cannot be fitted to a stack/ svp directly a common pipe connection is acceptable provided that:
- WC basins and other high level fittings are drained separately from ow level fittings such as showers.
- Individual pipes should discharge into the upper third of the perimeter of the common pipe.
- The diameter of the common pipe should be not less than 50mm and agreed on site subject to the number of fittings connecting to it (generally use 100mm)
- Venting should be provided at the end of the common pipe by means of an air admittance valve.

Note

Sub floor of all bathroom areas to have moisture resistant base eg plywood plus aquaboard or 2 layer WBP lapped plywood.

See G.A. plans for location of any heated towel rails or radiator.

All bathroom doors to open outwards.

NOTE

- Qualified plumber to install all pipe work.
- Exact routes for pipes finalised on site.
- Inspection to be undertaken prior to covering up.
- Drains and pressure test will be required upon completion.

Indicative Bathroom Layout

(See general arrangement plans for proposed layout of the scheme to which this drawing relates)

See Project Layout Drawings For Exact Plans.

CLIENT		PROJECT	DRAWING	STAGE	SUBJECT TO Approval	
Mr and Mrs SMITH		Wendover Lower Rochester Road Higham Rochester Kent ME3 7HD	DETAILS	Building Control		
		CHECKED	SCALE	APPROVED		
			@A3	DATE		
DRAWING No.		REV				
1 7 C H A W O R T H - 1 5		A				

ANY CHANGES FROM APPROVED DRAWINGS ARE THE RESPONSIBILITY OF CLIENT/CONTRACTOR – PLEASE READ CLAUSED BELOW BEFORE WORKS COMMENCE

Any dimensions taken from this drawing should be cross checked on site and approved prior to any construction works. The contractor shall be responsible for taking all necessary site dimensions and levels and for all exploratory works to verify any existing structure before commencement of works. The contractor will be responsible for all the correct setting out and temporary supports of works on site to property and neighbouring properties

No liability taken of any kind is accepted by Architect for any error or omission Where new work is near/on boundary line/party wall the property owner is to serve party wall notice to the adjoining property/land owner in accordance with the requirements of the 'Party Wall etc.' Act 1996

Contractor responsible for notifying of Building Control Surveyor of each stage of works and ensure inspections have been made. All details to comply with current building regulations and Building Control Approval. Work not to commence until approval of plans by Building Control Body. Any works that commence before Building Regulations drawings have been approved is responsibility of client.

After confirmation from local authority that prior approval is not required, proposed extension must comply with all permitted development criteria set out under the General Permitted Development Order 1995

Any development carried out without Permitted Development Certificate is at owner's own risk. It is strongly advised that a Permitted Development Certificate/Certificate of Lawfulness is sought prior to commencement of any works

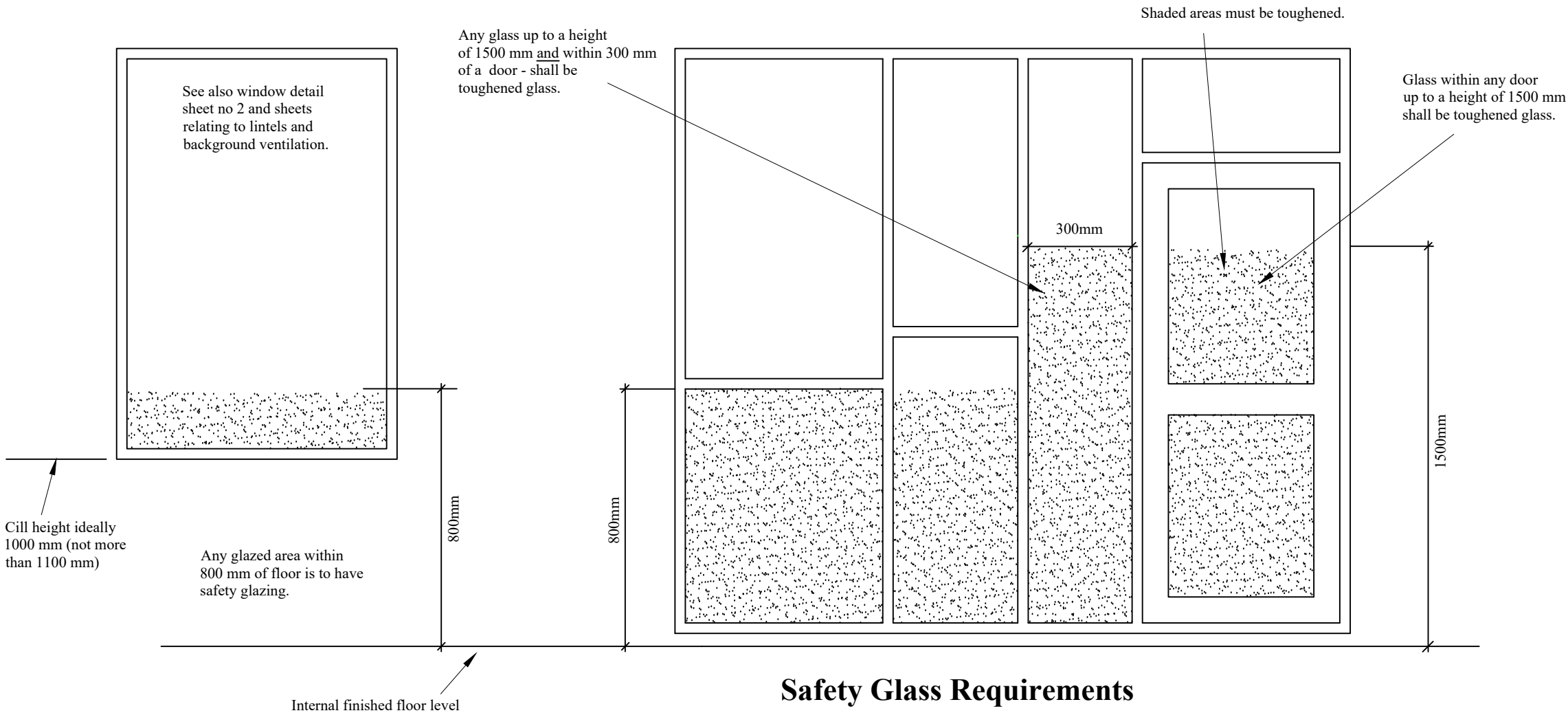
- FD30 All habitable room doors to be replaced with FD30 doors with 38x25mm Door Stops and 3 No Stainless Steel Hinges. Middle Hinge to be installed at least ⅓ of way up door frame
- SD Mains powered with battery back up interlinked smoke detector to be installed within at least 7.5m of all habitable rooms and at least 30cm from any light fitting or wall
- HD Mains powered and interlinked operated heat detector with battery back up
- Ex Extractor fan for shower room - 15l/s and Kitchen 30l/s to be taken through to run and expel externally

For Structural Steelwork refer to Structural Engineer's Drawing. Beams indicated by red dashed lines (see right)

All Steel work to be encased in 2 layers of FireLine Board with staggered joints or fire resisting intumescent paint in accordance with manufacturer's guidance to provide minimum 60min fire resistance
All Steel work to only be ordered once contractor has confirmed dimensions on site and positioning with client. Any discrepancies noted to be discussed with Surveyor prior to ordering any steel work. No responsibility taken by Surveyor for steels ordered to match site conditions

A-Z Building Services

A: Addlestone KT15
E: hthuseyin0809@msn.com
T: 07969925562



Safety Glass Requirements

Glazing In Critical Locations

Glazing in critical locations is to be glass which breaks safely. this defined in BS 6206 1981 and basically means toughened glass which shatters into small blunt pieces.

The critical locations are

- Any glass between finished floor and a level 800mm above it.
- Any glass within 300mm of the side of a door (glazed or otherwise) and at a height less than 1500mm above finished floor level.
- Any glass within a glazed door that is less than 1500mm above finished floor level.
- Any glass in a full height side panel adjacent to a door.

These are minimum requirements. any glass in a panel less than 250mm wide in any direction and not more than 0.5m² need not be safety glass.

Alternatives To Safety Glazing.

As an alternative to the use of safety glazing, a screen may be erected in front of a glazed area. In such cases the screen should be

- Such that no apertures in it are greater than 75mm wide.
- At least 850mm above finished floor.
- Securely fixed.
- Strong enough to resist being moved or significantly deflected.
- Not capable of being easily climbed (i.e. not just horizontal bars).

Manifestation

Consult diagrams 5 and 6 Building Regs part M for guidance on need for glazing manifestation. In domestic circumstances this is not normally required unless the doors have a narrow frame or none.

Safe Opening

All window catches and locks to be located not higher than 1700mm above floor level.

Except in life time homes buildings where they must be a maximum 1100 mm above floor level.

Safe Cleaning

For non-domestic buildings refer to Building Regulations part No4 for details of safe access for cleaning etc.

Daylight

Adequate levels of daylight. In accordance with BS 8206 part 2 code of practice for day-lighting are to be provided in all habitable spaces.

Note
For Building Regulation purposes
a new bay window is an extension.

Window And Glazing Details Sheet 1

ANY CHANGES FROM APPROVED DRAWINGS ARE THE RESPONSIBILITY OF CLIENT/CONTRACTOR – PLEASE READ CLAUSED BELOW BEFORE WORKS COMMENCE

Any dimensions taken from this drawing should be cross checked on site and approved prior to any construction works. The contractor shall be responsible for taking all necessary site dimensions and levels and for all exploratory works to verify any existing structure before commencement of works. The contractor will be responsible for all the correct setting out and temporary supports of works on site to property and neighbouring properties

No liability taken of any kind is accepted by Architect for any error or omission Where new work is near/on boundary line/party wall the property owner is to serve party wall notice to the adjoining property/land owner in accordance with the requirements of the 'Party Wall etc.' Act 1996

Contractor responsible for notifying of Building Control Surveyor of each stage of works and ensure inspections have been made. All details to comply with current building regulations and Building Control Approval. Work not to commence until approval of plans by Building Control Body. Any works that commence before Building Regulations drawings have been approved is responsibility of client.

After confirmation from local authority that prior approval is not required, proposed extension must comply with all permitted development criteria set out under the General Permitted Development Order 1995

Any development carried out without Permitted Development Certificate is at owner's own risk. It is strongly advised that a Permitted Development Certificate/Certificate of Lawfulness is sought prior to commencement of any works

- FD30** All habitable room doors to be replaced with FD30 doors with 38x25mm Door Stops and 3 No Stainless Steel Hinges. Middle Hinge to be installed at least ⅓ of way up door frame
- SD** Mains powered with battery back up interlinked smoke detector to be installed within at least 7.5m of all habitable rooms and at least 30cm from any light fitting or wall
- HD** Mains powered and interlinked operated heat detector with battery back up
- Ex** Extractor fan for shower room - 15l/s and Kitchen 30l/s to be taken through to run and expel externally

For Structural Steelwork refer to Structural Engineer's Drawing. Beams indicated by red dashed lines (see right)

All Steel work to be encased in 2 layers of FireLine Board with staggered joints or fire resisting intumescent paint in accordance with manufacturer's guidance to provide minimum 60min fire resistance

All Steel work to only be ordered once contractor has confirmed dimensions on site and positioning with client. Any discrepancies noted to be discussed with Surveyor prior to ordering any steel work. No responsibility taken by Surveyor for steels ordered to match site conditions

A-Z Building Services

A: Addlestone KT15
E: hthuseyin0809@msn.com
T: 07969925562

SUBJECT TO Approval

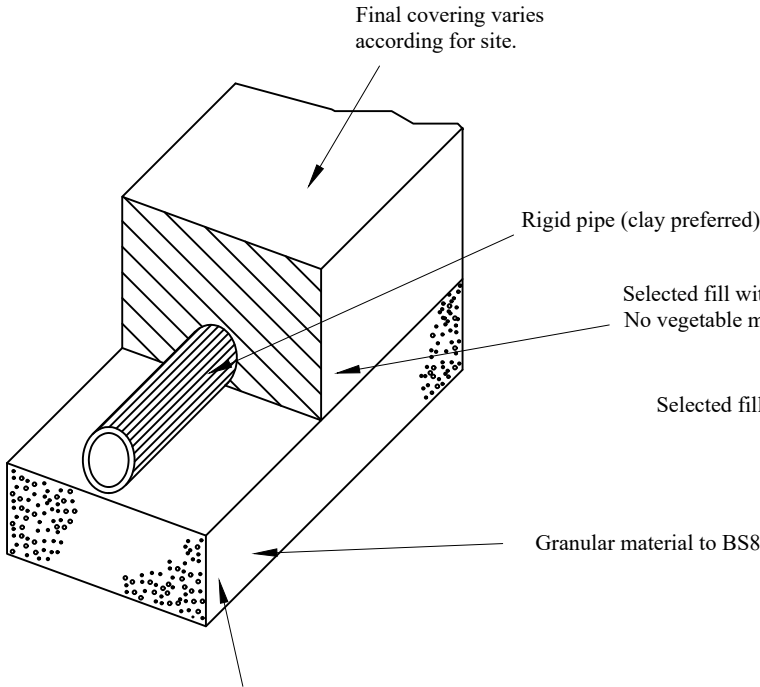
CLIENT	PROJECT	DRAWING	STAGE	CHECKED	APPROVED	DRAWING No.	REV
Mr and Mrs SMITH	Wendover Lower Rochester Road Higham Rochester Kent ME3 7HD	DETAILS	Building Control	SCALE 1:100 @A3	DATE	1 7 C H A W O R T H - 1 6	A

Note RD1 - Rainwater Drainage Above Ground

- Unless otherwise indicated on drawings:
- Gutters are to be formed in black 115mm half round UPVC.
 - If roof area drained per gutter exceeds 50m2 then gutter size is to be increased, consult designer or part H3 of Building regs.
 - Use 75mm diameter black UPVC down pipes with fixing clips at 300mm centres.
 - Gutters are to have suitable connections, end caps, corner bends and outlets.
 - Gutters generally laid to to fall of 1 in 50.
 - Roofs with an area less than 6 sq m need not have gutters.
 - Down pipes to connect into existing or new underwater system via trapped gulley.
 - All paved areas adjacent to building should fall at 1 in 60 away from building if impervious.
 - All paved areas adjacent to building should be adequately drained into an underground drainage system if not impervious.

Note RD2 - Underground Rainwater Drainage

- Rainwater drains should not discharge into the sewer system.
- Where practical discharge into existing surface water drains.
- Alternatively where possible rainwater should discharge into soakaways 5m away from building. See Soakaway specification.(right)
- Underground rain water pipes up to 100mm in diameter should have a fall of 1 in 100.
- A 1 in 150 fall is permissible for drains above 100mm diameter.
- Drainage pipes to be flexible jointed and have a minimum 500mm cover.
- Pipes to be clay to BS 65, or UPVC to BS EN 1401.



BEDDING FOR RIDDING PIPES

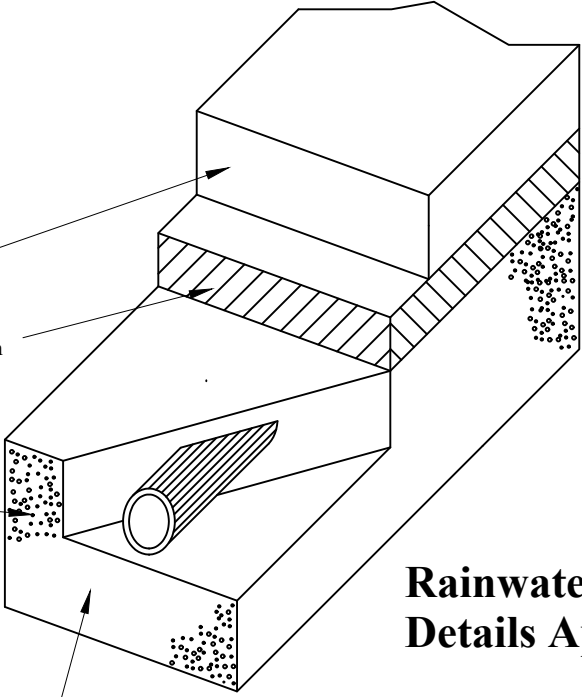
Rigid pipes in vitrified clay to comply with BS63
Rigid pipes in concrete to comply with BS5911

Soakaways

- Soakaway located at least 5m from house.
- Soakaway located at least 2.5m from boundary.
- Bottom of soakaway to be above water table.
- Soakaway must not served a drained area of more than 100 sq. m.
- Soakaway formed in prefabricated concrete rings or UPVC unit.
- Soakaway left as empty chamber.
- Soakaway to be renewed every 8 years.
- Internal volume of soakaway calculated on the basis of 1 cubic metre per 40 sq m of run off.
- Soakaway based on design rainfall of 10 mm in 5 minutes.
- Soakaway design based upon and checked against BRE Digest 365.
- No soakaway to be within 5m of another.
- Check with architect or building control officer if percolation tests shall be carried out to determine the permeability of the soil and the storage volume calculated on site using the methodology outlined in part H of the building regulations.

Do not use soakaways where there is a risk of contaminated run off.

NOTE See also manhole notes on underground drainage detail sheet 2.



BEDDING FOR FLEXIBLE PIPES

Flexible UPVC pipes to comply with BS46690 and BS4581

Access points

Access points to the drains should be a minimum of 225mm x 100mm or 150mm diameter.

- Access points should be located at;
- The head of the drain.
 - At bends or changes in level.
 - Generally at majors junctions.

Manholes to be a maximum distance of 45m from start of drain.
Access points to be a maximum of 12m from start of drain.

ANY CHANGES FROM APPROVED DRAWINGS ARE THE RESPONSIBILITY OF CLIENT/CONTRACTOR – PLEASE READ CLAUSED BELOW BEFORE WORKS COMMENCE

Any dimensions taken from this drawing should be cross checked on site and approved prior to any construction works. The contractor shall be responsible for taking all necessary site dimensions and levels and for all exploratory works to verify any existing structure before commencement of works. The contractor will be responsible for all the correct setting out and temporary supports of works on site to property and neighbouring properties

No liability taken of any kind is accepted by Architect for any error or omission Where new work is near/on boundary line/party wall the property owner is to serve party wall notice to the adjoining property/land owner in accordance with the requirements of the 'Party Wall etc.' Act 1996

Contractor responsible for notifying of Building Control Surveyor of each stage of works and ensure inspections have been made. All details to comply with current building regulations and Building Control Approval. Work not to commence until approval of plans by Building Control Body. Any works that commence before Building Regulations drawings have been approved is responsibility of client.

After confirmation from local authority that prior approval is not required, proposed extension must comply with all permitted development criteria set out under the General Permitted Development Order 1995

Any development carried out without Permitted Development Certificate is at owner's own risk. It is strongly advised that a Permitted Development Certificate/Certificate of Lawfulness is sought prior to commencement of any works

- FD30** All habitable room doors to be replaced with FD30 doors with 38x25mm Door Stops and 3 No Stainless Steel Hinges. Middle Hinge to be installed at least ⅓ of way up door frame
- SD** Mains powered with battery back up interlinked smoke detector to be installed within at least 7.5m of all habitable rooms and at least 30cm from any tight fitting or wall
- HD** Mains powered and interlinked operated heat detector with battery back up
- Ex** Extractor fan for shower room - 15l/s and Kitchen 30l/s to be taken through to run and expel externally

For Structural Steelwork refer to Structural Engineer's Drawing. Beams indicated by red dashed lines (see right)
All Steel work to be encased in 2 layers of FireLine Board with staggered joints or fire resisting intumescent paint in accordance with manufacturer's guidance to provide minimum 60min fire resistance
All Steel work to only be ordered once contractor has confirmed dimensions on site and positioning with client. Any discrepancies noted to be discussed with Surveyor prior to ordering any steel work. No responsibility taken by Surveyor for steels ordered to match site conditions

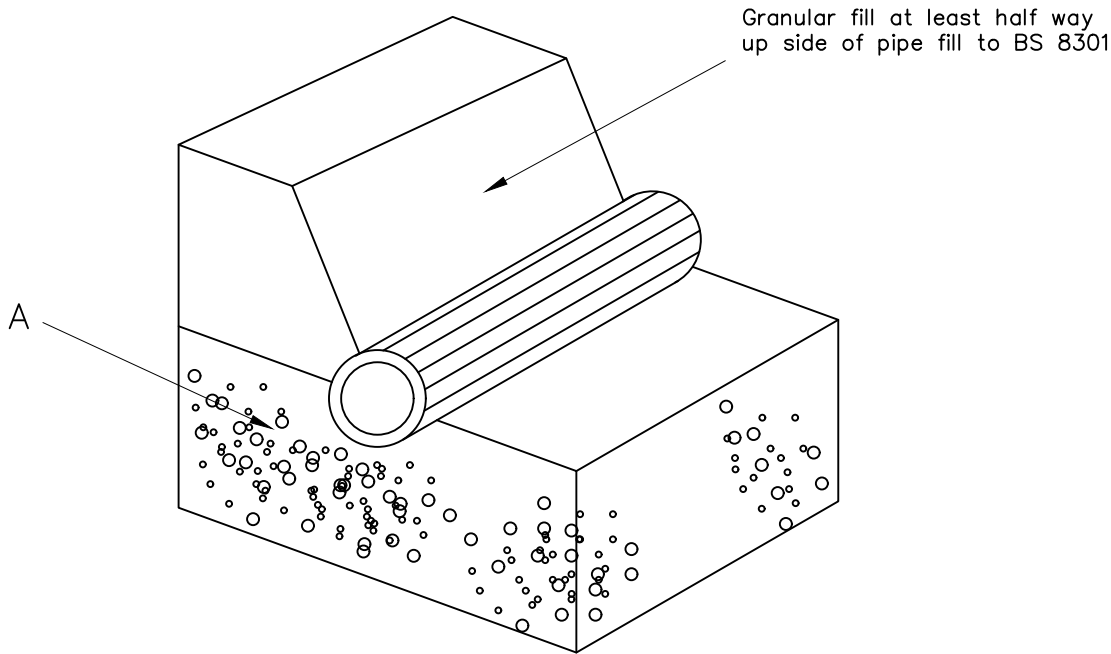
A-Z Building Services

A: Addlestone KT15
E: hthuseyin@msn.com
T: 07969925562

TESTING

Drains to be water tested after completion.
Test to show that drains can withstand pressure equal to 1.5m head of water.
(as an alternative drains may be air tested)

SUBJECT TO Approval				
CLIENT	PROJECT	DRAWING	STAGE	
Mr and Mrs SMITH	Wendover Lower Rochester Road Higham Rochester Kent ME3 7HD	DETAILS	Building Control	
DRAWING No.				REV
1 7 C H A W O R T H - 1 7				A



A' denotes good quality fill free of stones larger than 40mm, tree or vegetation material etc.

3 D VIEW

Note D5 - Drains under buildings.

- Foul drains or sewers should not extend more than 6m under a building without the sewer and building owners permission.
- Where drains or sewers pass under buildings they should do so in a straight line and have access points or manholes at either end.
- Sewers running under the building must have an invert level higher than the level of the building foundations.
- Where drainage pipes pass through an external wall they should have adequate lintels above them and pass above the top of adjacent foundations.
- Where drainage pipes pass through an external wall there should be a minimum 50mm gap around the pipe and the gap should be filled with flexible foam sealant. The sealant should have a rigid anti rodent sheet on the outside face.
- Where drainage pipes pass through an external wall use a joint at a max 150mm from the wall on either side.
- Drains in trenches under buildings to be fully surrounded by at least 100mm shingle.
- All dis - used or abandoned drains to be back filled with concrete or shingle.

Pipe Trough Wall / Footing

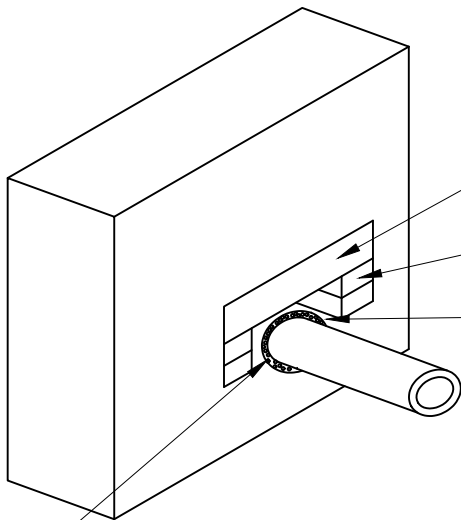
Where pipe passes through wall or footing use minimum 150mm deep concrete lintols over pipe to act as a bridge. Pipe to be surrounded by minimum 25mm polystyrene where it passes through wall or footing.

Arrangement to be inspected prior to covering.

Note D3 - Underground Foul Drainage

- Wherever possible foul drains should discharge into the sewer system.
- The next best alternative is a private sewer connection to a public sewer.
- The next best alternative is a private sewer treatment plant.
- Wherever possible lay pipes straight.
- Use access points or manholes at change of direction.
- Underground foul water pipes up to 100mm in diameter should have a fall of 1 in 80.
- A 1in 100 fall is permissible for drains above 150mm diameter.
- Drainage pipes to be bedded and surrounded with minimum 600mm cover. Unless note on drawings use 150mm diameter.
- Pipes to be clay to BS 65, or UPVC to BS EN 1401.
- Manhole or access fitting to be provided within 12m of start of drain and thereafter not more than 20m apart except by agreement with designer.
- Workmanship to be in accordance with BS 8000 part 14 code of practice for below ground drains.
- Upon completion drains to be air or water tested by agreement with local building control department.

See rainwater drainage detail sheet for further notes on bedding and testing of pipes



Lintel
Minimum 150mm thick concrete

Engineering brick support at side to provide minimum end bearing of 200mm for lintel

Sand, shingle or polystyrene fill around pipe

Note

Above ground and rainwater drainage details, including runs, connections and discharging points, are to be agreed on site with Building Control.

Note D2 - Manholes

- Manholes with invert less than 900mm below ground to be UPVC "off the shelf ", installed in accordance with manufactures notes and back filled.
- If circular use 1200mm clear internal diameter with similar opening size.
- If rectangular use 1200 x 700mm. With similar opening size.
- If deeper than 1500mm refer to designer for detail.
- Manholes located as GA plans but generally not more than 45m apart.
- Manhole benching to be smooth, impervious and slope towards main channel at 1 in 12.
- Manholes deeper than 1m to have secure step irons.
- All manholes within buildings to have double sealed bolt down covers.
- All manhole covers to be screwed down or at least child resistant.
- Cast iron covers to be to BS 497.
- Refer to designer if cover is on a vehicle route.

ANY CHANGES FROM APPROVED DRAWINGS ARE THE RESPONSIBILITY OF CLIENT/CONTRACTOR – PLEASE READ CLAUSED BELOW BEFORE WORKS COMMENCE

Any dimensions taken from this drawing should be cross checked on site and approved prior to any construction works. The contractor shall be responsible for taking all necessary site dimensions and levels and for all exploratory works to verify any existing structure before commencement of works. The contractor will be responsible for all the correct setting out and temporary supports of works on site to property and neighbouring properties

No liability taken of any kind is accepted by Architect for any error or omission Where new work is near/on boundary line/party wall the property owner is to serve party wall notice to the adjoining property/land owner in accordance with the requirements of the 'Party Wall etc.' Act 1996

Contractor responsible for notifying of Building Control Surveyor of each stage of works and ensure inspections have been made. All details to comply with current building regulations and Building Control Approval. Work not to commence until approval of plans by Building Control Body. Any works that commence before Building Regulations drawings have been approved is responsibility of client.

After confirmation from local authority that prior approval is not required, proposed extension must comply with all permitted development criteria set out under the General Permitted Development Order 1995

Any development carried out without Permitted Development Certificate is at owner's own risk. It is strongly advised that a Permitted Development Certificate/Certificate of Lawfulness is sought prior to commencement of any works

- FD30** All habitable room doors to be replaced with FD30 doors with 38x25mm Door Stops and 3 No Stainless Steel Hinges. Middle Hinge to be installed at least ⅓ of way up door frame
- SD** Mains powered with battery back up interlinked smoke detector to be installed within at least 7.5m of all habitable rooms and at least 30cm from any light fitting or wall
- HD** Mains powered and interlinked operated heat detector with battery back up
- Ex** Extractor fan for shower room - 15l/s and Kitchen 30l/s to be taken through to run and expel externally

For Structural Steelwork refer to Structural Engineer's Drawing. Beams indicated by red dashed lines (see right)

All Steel work to be encased in 2 layers of FireLine Board with staggered joints or fire resisting intumescent paint in accordance with manufacturer's guidance to provide minimum 60min fire resistance

All Steel work to only be ordered once contractor has confirmed dimensions on site and positioning with client. Any discrepancies noted to be discussed with Surveyor prior to ordering any steel work. No responsibility taken by Surveyor for steels ordered to match site conditions

A-Z Building Services

A: Addlestone KT15

E: hthuseyin@OBO9@msn.com

T: 07969925562

SUBJECT TO Approval

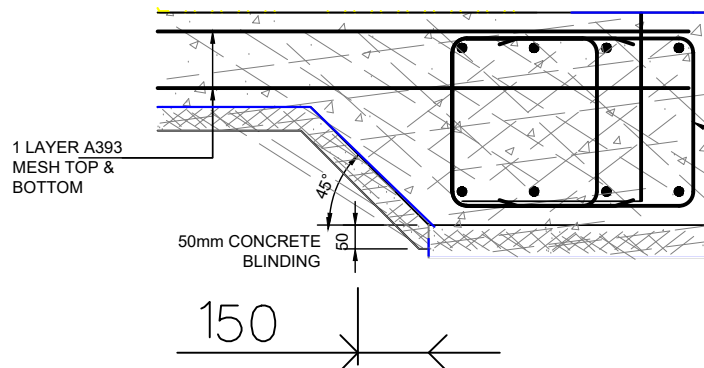
Underground Foul Drainage Details Applicable Sheet 2

CLIENT	PROJECT	DRAWING	STAGE	DRAWING No.	REV
Mr and Mrs SMITH	Wendover Lower Rochester Road Higham Rochester Kent ME3 7HD	DETAILS	Building Control	1 7 C H A W O R T H - 1 8	A

A-Z Building Services A: Addlestone KT15 E: h@huseyni0609@gmail.com T: 01969925562	Project Rear 1 storey extension - RAFT FOUNDATION - 150mm slab				Job no. 2023-7459	
	Calcs for Wendover Lower Rochester Road Higham Rochester Kent ME3 7HD				Start page no./Revision 1	
	Calcs by SB	Calcs date 13/08/2026	Checked by DB	Checked date	Approved by SB	Approved date

RAFT FOUNDATION DESIGN (BS8110 : PART 1 : 1997)

Tedds calculation version 1.0.12



Soil and raft definition

Soil definition

Allowable bearing pressure

$$q_{allow} = 50.0 \text{ kN/m}^2$$

Number of types of soil forming sub-soil

One type only

Soil density

Firm

Depth of hardcore beneath slab

$$h_{hcoreslab} = 150 \text{ mm (Dispersal allowed for bearing pressure check)}$$

Depth of hardcore beneath thickenings

$$h_{hcorethick} = 150 \text{ mm (Dispersal allowed for bearing pressure check)}$$

Density of hardcore

$$\gamma_{hcore} = 20.0 \text{ kN/m}^3$$

Basic assumed diameter of local depression

$$\phi_{depbasic} = 1500 \text{ mm}$$

Diameter under slab modified for hardcore

$$\phi_{depslab} = \phi_{depbasic} - h_{hcoreslab} = 1350 \text{ mm}$$

Diameter under thickenings modified for hardcore

$$\phi_{depthick} = \phi_{depbasic} - h_{hcorethick} = 1350 \text{ mm}$$

Raft slab definition

Max dimension/max dimension between joints

$$l_{max} = 3.000 \text{ m}$$

Slab thickness

$$h_{slab} = 150 \text{ mm}$$

Concrete strength

$$f_{cu} = 35 \text{ N/mm}^2$$

Poissons ratio of concrete

$$\nu = 0.2$$

Slab mesh reinforcement strength

$$f_{yslab} = 500 \text{ N/mm}^2$$

Partial safety factor for steel reinforcement

$$\gamma_s = 1.15$$

From C&CA document 'Concrete ground floors' Table 5

A142

Minimum mesh required in top for shrinkage

$$\mathbf{A393 (A_{sslabtop} = 393 \text{ mm}^2/\text{m})}$$

Actual mesh provided in top

$$\mathbf{A393 (A_{sslabbtm} = 393 \text{ mm}^2/\text{m})}$$

Mesh provided in bottom

Top mesh bar diameter

$$\phi_{slabtop} = 10 \text{ mm}$$

Bottom mesh bar diameter

$$\phi_{slabbtm} = 10 \text{ mm}$$

Cover to top reinforcement

$$C_{top} = 20 \text{ mm}$$

Cover to bottom reinforcement

$$C_{btm} = 35 \text{ mm}$$

Average effective depth of top reinforcement

$$d_{tslabav} = h_{slab} - C_{top} - \phi_{slabtop} = 120 \text{ mm}$$

Average effective depth of bottom reinforcement

$$d_{bslabav} = h_{slab} - C_{btm} - \phi_{slabbtm} = 105 \text{ mm}$$

A-Z Building Services A: Addlestone K115 E: hthuseq@OBO9@men.com T: 01969925562	Project 1 storey outbuilding - RAFT FOUNDATION - 150mm slab				Job no. 2023-7459	
	Calcs for Wendover Lower Rochester Road Higham Rochester Kent ME3 7HD				Start page no./Revision 2	
	Calcs by SB	Calcs date 13/08/2026	Checked by	Checked date	Approved by	Approved date

Overall average effective depth

$$d_{slabav} = (d_{slabav} + d_{bslabav})/2 = \mathbf{113 \text{ mm}}$$

Minimum effective depth of top reinforcement

$$d_{slabmin} = d_{slabav} - \phi_{slabtop}/2 = \mathbf{115 \text{ mm}}$$

Minimum effective depth of bottom reinforcement

$$d_{bslabmin} = d_{bslabav} - \phi_{slabbtm}/2 = \mathbf{100 \text{ mm}}$$

Edge beam definition

Overall depth

$$h_{edge} = \mathbf{300 \text{ mm}}$$

Width

$$b_{edge} = \mathbf{300 \text{ mm}}$$

Depth of boot

$$h_{boot} = \mathbf{200 \text{ mm}}$$

Width of boot

$$b_{boot} = \mathbf{175 \text{ mm}}$$

Angle of chamfer to horizontal

$$\alpha_{edge} = \mathbf{60 \text{ deg}}$$

Strength of main bar reinforcement

$$f_y = \mathbf{500 \text{ N/mm}^2}$$

Strength of link reinforcement

$$f_{ys} = \mathbf{500 \text{ N/mm}^2}$$

Reinforcement provided in top

$$\mathbf{3 \text{ H12 bars } (A_{sedgetop} = 339 \text{ mm}^2)}$$

Reinforcement provided in bottom

$$\mathbf{3 \text{ H12 bars } (A_{sedgebtm} = 339 \text{ mm}^2)}$$

Link reinforcement provided

$$\mathbf{2 \text{ H12 legs at 300 ctrs } (A_{sv/s_v} = 0.754 \text{ mm})}$$

Bottom cover to links

$$C_{beam} = \mathbf{35 \text{ mm}}$$

Effective depth of top reinforcement

$$d_{edgetop} = h_{edge} - C_{top} - \phi_{slabtop} - \phi_{edgelinek} - \phi_{edgetop}/2 = \mathbf{252 \text{ mm}}$$

Effective depth of bottom reinforcement

$$d_{edgebtm} = h_{edge} - C_{beam} - \phi_{edgelinek} - \phi_{edgebtm}/2 = \mathbf{247 \text{ mm}}$$

Boot main reinforcement

$$\mathbf{H12 \text{ bars at 300 ctrs } (A_{sboot} = 377 \text{ mm}^2/\text{m})}$$

Effective depth of boot reinforcement

$$d_{boot} = h_{boot} - C_{beam} - \phi_{boot}/2 = \mathbf{159 \text{ mm}}$$

Internal slab design checks

Basic loading

Slab self weight

$$w_{slab} = 24 \text{ kN/m}^3 \times h_{slab} = \mathbf{3.6 \text{ kN/m}^2}$$

Hardcore

$$w_{hcoreslab} = \gamma_{hcore} \times h_{hcoreslab} = \mathbf{3.0 \text{ kN/m}^2}$$

Applied loading

Uniformly distributed dead load

$$w_{Dudl} = \mathbf{5.0 \text{ kN/m}^2}$$

Uniformly distributed live load

$$w_{Ludl} = \mathbf{5.0 \text{ kN/m}^2}$$

Slab load number 1

Load type

Two way line load

Dead load 1

$$w_{D11} = \mathbf{2.0 \text{ kN/m}}$$

Live load 1

$$w_{L11} = \mathbf{2.0 \text{ kN/m}}$$

Ultimate load 1

$$w_{ult11} = 1.4 \times w_{D11} + 1.6 \times w_{L11} = \mathbf{6.0 \text{ kN/m}}$$

Line load 1 width

$$b_{11} = \mathbf{600 \text{ mm}}$$

Dead load 2

$$w_{D21} = \mathbf{2.0 \text{ kN/m}}$$

Live load 2

$$w_{L21} = \mathbf{2.0 \text{ kN/m}}$$

Ultimate load 2

$$w_{ult21} = 1.4 \times w_{D21} + 1.6 \times w_{L21} = \mathbf{6.0 \text{ kN/m}}$$

Line load 2 width

$$b_{21} = \mathbf{500 \text{ mm}}$$

Internal slab bearing pressure check

Total uniform load at formation level

$$w_{udl} = w_{slab} + w_{hcoreslab} + w_{Dudl} + w_{Ludl} = \mathbf{16.6 \text{ kN/m}^2}$$

Bearing pressure beneath load number 1

Net bearing pressure available to resist line load

$$q_{net} = q_{allow} - w_{udl} = \mathbf{33.4 \text{ kN/m}^2}$$

Line load 1

Net 'ultimate' bearing pressure available

$$q_{netult1} = q_{net} \times w_{ult11}/(w_{D11} + w_{L11}) = \mathbf{50.1 \text{ kN/m}^2}$$

Loaded width required at formation

$$l_{req11} = w_{ult11}/q_{netult1} = \mathbf{0.120 \text{ m}}$$

Effective loaded width at u/side slab

$$l_{eff11} = \max(b_{11}, l_{req11} - 2 \times h_{hcoreslab} \times \tan(30)) = \mathbf{0.600 \text{ m}}$$

Effective net ult bearing pressure at u/side slab

$$q_{netulteff1} = q_{netult1} \times l_{req11}/l_{eff11} = \mathbf{10.0 \text{ kN/m}^2}$$

A-Z Building Services A: Addlestone K115 E: h@huseyniOBO9@men.com T: 01969925562	Project 1 storey outbuilding - RAFT FOUNDATION - 150mm slab				Job no. 2023-7459	
	Calcs for Wendover Lower Rochester Road Higham Rochester Kent ME3 7HD				Start page no./Revision 3	
	Calcs by SB	Calcs date 13/08/2026	Checked by	Checked date	Approved by	Approved date

Cantilever bending moment

$$M_{cant11} = q_{netulteff1} \times [(l_{eff11} - b_{11})/2]^2/2 = \mathbf{0.0 \text{ kNm/m}}$$

Line load 2

Net 'ultimate' bearing pressure available

$$q_{netult2} = q_{net} \times w_{ult21}/(w_{D21} + w_{L21}) = \mathbf{50.1 \text{ kN/m}^2}$$

Loaded width required at formation

$$l_{req21} = w_{ult21}/q_{netult2} = \mathbf{0.120 \text{ m}}$$

Effective loaded width at u/side slab

$$l_{eff21} = \max(b_{21}, l_{req21} - 2 \times h_{coreslab} \times \tan(30)) = \mathbf{0.500 \text{ m}}$$

Effective net ult bearing pressure at u/side slab

$$q_{netulteff2} = q_{netult2} \times l_{req21}/l_{eff21} = \mathbf{12.0 \text{ kN/m}^2}$$

Cantilever bending moment

$$M_{cant21} = q_{netulteff2} \times [(l_{eff21} - b_{21})/2]^2/2 = \mathbf{0.0 \text{ kNm/m}}$$

Maximum cantilever moment

$$M_{cant1} = \max(M_{cant11}, M_{cant21}) = \mathbf{0.0 \text{ kNm/m}}$$

Reinforcement required in bottom

Maximum cantilever moment

$$M_{cantmax} = \mathbf{0.0 \text{ kNm/m}}$$

K factor

$$K_{slabbp} = M_{cantmax}/(f_{cu} \times d_{bslabmin}^2) = \mathbf{0.000}$$

Lever arm

$$Z_{slabbp} = d_{bslabmin} \times \min(0.95, 0.5 + \sqrt{(0.25 - K_{slabbp}/0.9)}) = \mathbf{95.0 \text{ mm}}$$

Area of steel required

$$A_{sslabbpreq} = M_{cantmax}/((1.0/\gamma_s) \times f_{yslab} \times Z_{slabbp}) = \mathbf{0 \text{ mm}^2/\text{m}}$$

**PASS - $A_{sslabbpreq} \leq A_{sslabbtm}$ - Area of reinforcement provided to distribute the load is adequate
The allowable bearing pressure will not be exceeded**

Internal slab bending and shear check

Applied bending moments

Span of slab

$$l_{slab} = \phi_{depslab} + d_{tslabav} = \mathbf{1470 \text{ mm}}$$

Ultimate self weight udl

$$w_{swult} = 1.4 \times w_{slab} = \mathbf{5.0 \text{ kN/m}^2}$$

Self weight moment at centre

$$M_{csw} = w_{swult} \times l_{slab}^2 \times (1 + \nu) / 64 = \mathbf{0.2 \text{ kNm/m}}$$

Self weight moment at edge

$$M_{esw} = w_{swult} \times l_{slab}^2 / 32 = \mathbf{0.3 \text{ kNm/m}}$$

Self weight shear force at edge

$$V_{sw} = w_{swult} \times l_{slab} / 4 = \mathbf{1.9 \text{ kN/m}}$$

Moments due to applied uniformly distributed loads

Ultimate applied udl

$$w_{udult} = 1.4 \times w_{Dudl} + 1.6 \times w_{Ludl} = \mathbf{15.0 \text{ kN/m}^2}$$

Moment at centre

$$M_{cudl} = w_{udult} \times l_{slab}^2 \times (1 + \nu) / 64 = \mathbf{0.6 \text{ kNm/m}}$$

Moment at edge

$$M_{eudl} = w_{udult} \times l_{slab}^2 / 32 = \mathbf{1.0 \text{ kNm/m}}$$

Shear force at edge

$$V_{udl} = w_{udult} \times l_{slab} / 4 = \mathbf{5.5 \text{ kN/m}}$$

Moment due to load number 1

Approximate equivalent udl line load 1

$$w_{udl11} = w_{ult11}/(2 \times 0.3 \times l_{slab}) = \mathbf{6.8 \text{ kN/m}^2}$$

Approximate equivalent udl line load 2

$$w_{udl21} = w_{ult21}/(2 \times 0.3 \times l_{slab}) = \mathbf{6.8 \text{ kN/m}^2}$$

Moment at centre

$$M_{c1} = (w_{udl11} + w_{udl21}) \times l_{slab}^2 \times (1 + \nu) / 64 = \mathbf{0.6 \text{ kNm/m}}$$

Moment at edge

$$M_{e1} = (w_{udl11} + w_{udl21}) \times l_{slab}^2 / 32 = \mathbf{0.9 \text{ kNm/m}}$$

Shear force at edge

$$V_1 = (w_{udl11} + w_{udl21}) \times l_{slab} / 4 = \mathbf{5.0 \text{ kN/m}}$$

Resultant moments and shears

Total moment at edge

$$M_{\Sigma e} = \mathbf{2.3 \text{ kNm/m}}$$

Total moment at centre

$$M_{\Sigma c} = \mathbf{1.4 \text{ kNm/m}}$$

Total shear force

$$V_{\Sigma} = \mathbf{12.4 \text{ kN/m}}$$

Reinforcement required in top

K factor

$$K_{slabtop} = M_{\Sigma e}/(f_{cu} \times d_{tslabav}^2) = \mathbf{0.005}$$

Lever arm

$$Z_{slabtop} = d_{tslabav} \times \min(0.95, 0.5 + \sqrt{(0.25 - K_{slabtop}/0.9)}) = \mathbf{114.0 \text{ mm}}$$

Area of steel required for bending

$$A_{sslabtopbend} = M_{\Sigma e}/((1.0/\gamma_s) \times f_{yslab} \times Z_{slabtop}) = \mathbf{46 \text{ mm}^2/\text{m}}$$

Minimum area of steel required

$$A_{sslabmin} = 0.0013 \times h_{slab} = \mathbf{195 \text{ mm}^2/\text{m}}$$

Area of steel required

$$A_{sslabtopreq} = \max(A_{sslabtopbend}, A_{sslabmin}) = \mathbf{195 \text{ mm}^2/\text{m}}$$

PASS - $A_{sslabtopreq} \leq A_{sslabtop}$ - Area of reinforcement provided in top to span local depressions is adequate

A-Z Building Services A: Addlestone KT15 E: hthuse@n0809@msn.com T: 07969925562	Project 1 storey outbuilding - RAFT FOUNDATION - 150mm slab				Job no. 2023-7459	
	Calcs for Wendover Lower Rochester Road Higham Rochester Kent ME3 7HD				Start page no./Revision 4	
	Calcs by SB	Calcs date 13/08/2026	Checked by	Checked date	Approved by	Approved date

Reinforcement required in bottom

K factor

$$K_{slab\text{btm}} = M_{\Sigma c} / (f_{cu} \times d_{slab\text{av}}^2) = \mathbf{0.004}$$

Lever arm

$$Z_{slab\text{btm}} = d_{slab\text{av}} \times \min(0.95, 0.5 + \sqrt{(0.25 - K_{slab\text{btm}}/0.9)}) = \mathbf{99.7 \text{ mm}}$$

Area of steel required for bending

$$A_{ssl\text{ab}\text{btm}\text{bend}} = M_{\Sigma c} / ((1.0/\gamma_s) \times f_{yslab} \times Z_{slab\text{btm}}) = \mathbf{31 \text{ mm}^2/\text{m}}$$

Area of steel required

$$A_{ssl\text{ab}\text{btm}\text{req}} = \max(A_{ssl\text{ab}\text{btm}\text{bend}}, A_{ssl\text{ab}\text{min}}) = \mathbf{195 \text{ mm}^2/\text{m}}$$

PASS - $A_{ssl\text{ab}\text{btm}\text{req}} \leq A_{ssl\text{ab}\text{btm}}$ - Area of reinforcement provided in bottom to span local depressions is adequate

Shear check

Applied shear stress

$$v = V_{\Sigma} / d_{tslab\text{min}} = \mathbf{0.108 \text{ N/mm}^2}$$

Tension steel ratio

$$\rho = 100 \times A_{ssl\text{ab}\text{top}} / d_{tslab\text{min}} = \mathbf{0.342}$$

From BS8110-1:1997 - Table 3.8

Design concrete shear strength

$$v_c = \mathbf{0.675 \text{ N/mm}^2}$$

PASS - $v \leq v_c$ - Shear capacity of the slab is adequate

Internal slab deflection check

Basic allowable span to depth ratio

$$\text{Ratio}_{\text{basic}} = \mathbf{26.0}$$

Moment factor

$$M_{\text{factor}} = M_{\Sigma c} / d_{bslab\text{av}}^2 = \mathbf{0.124 \text{ N/mm}^2}$$

Steel service stress

$$f_s = 2/3 \times f_{yslab} \times A_{ssl\text{ab}\text{btm}\text{bend}} / A_{ssl\text{ab}\text{btm}} = \mathbf{26.660 \text{ N/mm}^2}$$

Modification factor

$$MF_{\text{slab}} = \min(2.0, 0.55 + [(477\text{N/mm}^2 - f_s) / (120 \times (0.9\text{N/mm}^2 + M_{\text{factor}}))])$$

$$MF_{\text{slab}} = \mathbf{2.000}$$

Modified allowable span to depth ratio

$$\text{Ratio}_{\text{allow}} = \text{Ratio}_{\text{basic}} \times MF_{\text{slab}} = \mathbf{52.000}$$

Actual span to depth ratio

$$\text{Ratio}_{\text{actual}} = l_{\text{slab}} / d_{bslab\text{av}} = \mathbf{14.000}$$

PASS - $\text{Ratio}_{\text{actual}} \leq \text{Ratio}_{\text{allow}}$ - Slab span to depth ratio is adequate

Edge beam design checks

Basic loading

Hardcore

$$W_{h\text{corethick}} = \gamma_{h\text{core}} \times h_{h\text{corethick}} = \mathbf{3.0 \text{ kN/m}^2}$$

Edge beam

Rectangular beam element

$$W_{\text{beam}} = 24 \text{ kN/m}^3 \times h_{\text{edge}} \times b_{\text{edge}} = \mathbf{2.2 \text{ kN/m}}$$

Boot element

$$W_{\text{boot}} = 24 \text{ kN/m}^3 \times h_{\text{boot}} \times b_{\text{boot}} = \mathbf{0.8 \text{ kN/m}}$$

Chamfer element

$$W_{\text{chamfer}} = 24 \text{ kN/m}^3 \times (h_{\text{edge}} - h_{\text{slab}})^2 / (2 \times \tan(\alpha_{\text{edge}})) = \mathbf{0.2 \text{ kN/m}}$$

Slab element

$$W_{\text{slab}\text{elmt}} = 24 \text{ kN/m}^3 \times h_{\text{slab}} \times (h_{\text{edge}} - h_{\text{slab}}) / \tan(\alpha_{\text{edge}}) = \mathbf{0.3 \text{ kN/m}}$$

Edge beam self weight

$$W_{\text{edge}} = W_{\text{beam}} + W_{\text{boot}} + W_{\text{chamfer}} + W_{\text{slab}\text{elmt}} = \mathbf{3.5 \text{ kN/m}}$$

Edge load number 1

Load type

Longitudinal line load

Dead load

$$W_{\text{Dedge1}} = \mathbf{5.0 \text{ kN/m}}$$

Live load

$$W_{\text{Ledge1}} = \mathbf{2.0 \text{ kN/m}}$$

Ultimate load

$$W_{\text{ultedge1}} = 1.4 \times W_{\text{Dedge1}} + 1.6 \times W_{\text{Ledge1}} = \mathbf{10.2 \text{ kN/m}}$$

Longitudinal line load width

$$b_{\text{edge1}} = \mathbf{175 \text{ mm}}$$

Centroid of load from outside face of raft

$$X_{\text{edge1}} = \mathbf{88 \text{ mm}}$$

Edge beam bearing pressure check

Effective bearing width of edge beam

$$b_{\text{bearing}} = b_{\text{edge}} + b_{\text{boot}} + (h_{\text{edge}} - h_{\text{slab}}) / \tan(\alpha_{\text{edge}}) = \mathbf{562 \text{ mm}}$$

Total uniform load at formation level

$$W_{\text{udledge}} = W_{\text{Dudl}} + W_{\text{Ludl}} + W_{\text{edge}} / b_{\text{bearing}} + W_{h\text{corethick}} = \mathbf{19.2 \text{ kN/m}^2}$$

Centroid of longitudinal and equivalent line loads from outside face of raft

Load x distance for edge load 1

$$\text{Moment}_1 = W_{\text{ultedge1}} \times X_{\text{edge1}} = \mathbf{0.9 \text{ kN}}$$

Sum of ultimate longitud'l and equivalent line loads

$$\Sigma \text{UDL} = \mathbf{10.2 \text{ kN/m}}$$

Sum of load x distances

$$\Sigma \text{Moment} = \mathbf{0.9 \text{ kN}}$$

Centroid of loads

$$x_{bar} = \Sigma \text{Moment} / \Sigma \text{UDL} = 87 \text{ mm}$$

Initially assume no moment transferred into slab due to load/reaction eccentricity

Sum of unfactored longitudinal and effective line loads $\Sigma \text{UDLs} = 7.0 \text{ kN/m}$

Allowable bearing width $b_{allow} = 2 \times x_{bar} + 2 \times h_{coreslab} \times \tan(30) = 348 \text{ mm}$

Bearing pressure due to line/point loads $q_{linepoint} = \Sigma \text{UDLs} / b_{allow} = 20.1 \text{ kN/m}^2$

Total applied bearing pressure $q_{edge} = q_{linepoint} + w_{udl} = 39.3 \text{ kN/m}^2$

PASS - $q_{edge} \leq q_{allow}$ - Allowable bearing pressure is not exceeded

Edge beam bending check

Divider for moments due to udl's

$$\beta_{udl} = 10.0$$

Applied bending moments

Span of edge beam

$$l_{edge} = \phi_{depth} + d_{edgetop} = 1602 \text{ mm}$$

Ultimate self weight udl

$$w_{edgeult} = 1.4 \times w_{edge} = 4.9 \text{ kN/m}$$

Ultimate slab udl (approx)

$$w_{edgeslab} = \max(0 \text{ kN/m}, 1.4 \times w_{slab} \times ((\phi_{depth}/2 \times 3/4) - (b_{edge} + (h_{edge} - h_{slab})/\tan(\alpha_{edge}))))$$

$$w_{edgeslab} = 0.6 \text{ kN/m}$$

Self weight and slab bending moment

$$M_{edgesw} = (w_{edgeult} + w_{edgeslab}) \times l_{edge}^2 / \beta_{udl} = 1.4 \text{ kNm}$$

Self weight shear force

$$V_{edgesw} = (w_{edgeult} + w_{edgeslab}) \times l_{edge} / 2 = 4.4 \text{ kN}$$

Moments due to applied uniformly distributed loads

Ultimate udl (approx)

$$w_{edgeudl} = w_{udlult} \times \phi_{depth} / 2 \times 3/4 = 7.6 \text{ kN/m}$$

Bending moment

$$M_{edgeudl} = w_{edgeudl} \times l_{edge}^2 / \beta_{udl} = 1.9 \text{ kNm}$$

Shear force

$$V_{edgeudl} = w_{edgeudl} \times l_{edge} / 2 = 6.1 \text{ kN}$$

Moment and shear due to load number 1

Bending moment

$$M_{edge1} = w_{ultedge1} \times l_{edge}^2 / \beta_{udl} = 2.6 \text{ kNm}$$

Shear force

$$V_{edge1} = w_{ultedge1} \times l_{edge} / 2 = 8.2 \text{ kN}$$

Resultant moments and shears

Total moment (hogging and sagging)

$$M_{\Sigma edge} = 6.0 \text{ kNm}$$

Maximum shear force

$$V_{\Sigma edge} = 18.6 \text{ kN}$$

Reinforcement required in top

Width of section in compression zone

$$b_{edgetop} = b_{edge} + b_{boot} = 475 \text{ mm}$$

Average web width

$$b_w = b_{edge} + (h_{edge} / \tan(\alpha_{edge})) / 2 = 387 \text{ mm}$$

K factor

$$K_{edgetop} = M_{\Sigma edge} / (f_{cu} \times b_{edgetop} \times d_{edgetop}^2) = 0.006$$

Lever arm

$$Z_{edgetop} = d_{edgetop} \times \min(0.95, 0.5 + \sqrt{(0.25 - K_{edgetop}/0.9)}) = 239 \text{ mm}$$

Area of steel required for bending

$$A_{sedgetopbend} = M_{\Sigma edge} / ((1.0/\gamma_s) \times f_y \times Z_{edgetop}) = 57 \text{ mm}^2$$

Minimum area of steel required

$$A_{sedgetopmin} = 0.0013 \times 1.0 \times b_w \times h_{edge} = 151 \text{ mm}^2$$

Area of steel required

$$A_{sedgetopreq} = \max(A_{sedgetopbend}, A_{sedgetopmin}) = 151 \text{ mm}^2$$

PASS - $A_{sedgetopreq} \leq A_{sedgetop}$ - Area of reinforcement provided in top of edge beams is adequate

Reinforcement required in bottom

Width of section in compression zone

$$b_{edgebtm} = b_{edge} + (h_{edge} - h_{slab}) / \tan(\alpha_{edge}) + 0.1 \times l_{edge} = 547 \text{ mm}$$

K factor

$$K_{edgebtm} = M_{\Sigma edge} / (f_{cu} \times b_{edgebtm} \times d_{edgebtm}^2) = 0.005$$

Lever arm

$$Z_{edgebtm} = d_{edgebtm} \times \min(0.95, 0.5 + \sqrt{(0.25 - K_{edgebtm}/0.9)}) = 235 \text{ mm}$$

Area of steel required for bending

$$A_{sedgetmbend} = M_{\Sigma edge} / ((1.0/\gamma_s) \times f_y \times Z_{edgebtm}) = 58 \text{ mm}^2$$

Minimum area of steel required

$$A_{sedgetmbmin} = 0.0013 \times 1.0 \times b_w \times h_{edge} = 151 \text{ mm}^2$$

Area of steel required

$$A_{sedgetmbreq} = \max(A_{sedgetmbend}, A_{sedgetmbmin}) = 151 \text{ mm}^2$$

PASS - $A_{sedgetmbreq} \leq A_{sedgetmb}$ - Area of reinforcement provided in bottom of edge beams is adequate

A-Z Building Services A: Addlestone K115 E: hihuseyni@btopenworld.com T: 01969925562	Project 1 storey outbuilding - RAFT FOUNDATION - 150mm slab			Job no. 2023-7459	
	Calcs for Wendover Lower Rochester Road Higham Rochester Kent ME3 7HD			Start page no./Revision 6	
	Calcs by SB	Calcs date 13/08/2026	Checked by	Checked date	Approved by Approved date

Edge beam shear check

Applied shear stress

$$V_{edge} = V_{\Sigma edge} / (b_w \times d_{edgetop}) = \mathbf{0.191 \text{ N/mm}^2}$$

Tension steel ratio

$$\rho_{edge} = 100 \times A_{sedge} / (b_w \times d_{edgetop}) = \mathbf{0.348}$$

From BS8110-1:1997 - Table 3.8

Design concrete shear strength

$$V_{cedge} = \mathbf{0.558 \text{ N/mm}^2}$$

$$V_{edge} \leq V_{cedge} + 0.4 \text{ N/mm}^2 - \text{Therefore minimum links required}$$

Link area to spacing ratio required

$$A_{sv_upon_svreqedge} = 0.4 \text{ N/mm}^2 \times b_w / ((1.0/\gamma_s) \times f_{ys}) = \mathbf{0.356 \text{ mm}}$$

Link area to spacing ratio provided

$$A_{sv_upon_svproedge} = N_{edgeline} \times \pi \times \phi_{edgeline}^2 / (4 \times S_{vedge}) = \mathbf{0.754 \text{ mm}}$$

$$\text{PASS} - A_{sv_upon_svreqedge} \leq A_{sv_upon_svproedge} - \text{Shear reinforcement provided in edge beams is adequate}$$

Boot design check

Effective cantilever span

$$l_{boot} = b_{boot} + d_{boot}/2 = \mathbf{255 \text{ mm}}$$

Approximate ultimate bearing pressure

$$q_{ult} = 1.55 \times q_{allow} = \mathbf{77.5 \text{ kN/m}^2}$$

Cantilever moment

$$M_{boot} = q_{ult} \times l_{boot}^2 / 2 = \mathbf{2.5 \text{ kNm/m}}$$

Shear force

$$V_{boot} = q_{ult} \times l_{boot} = \mathbf{19.7 \text{ kN/m}}$$

K factor

$$K_{boot} = M_{boot} / (f_{cu} \times d_{boot}^2) = \mathbf{0.003}$$

Lever arm

$$Z_{boot} = d_{boot} \times \min(0.95, 0.5 + \sqrt{(0.25 - K_{boot}/0.9)}) = \mathbf{151 \text{ mm}}$$

Area of reinforcement required

$$A_{sbootreq} = M_{boot} / ((1.0/\gamma_s) \times f_{yboot} \times Z_{boot}) = \mathbf{38 \text{ mm}^2/\text{m}}$$

$$\text{PASS} - A_{sbootreq} \leq A_{sboot} - \text{Area of reinforcement provided in boot is adequate for bending}$$

Applied shear stress

$$V_{boot} = V_{boot} / d_{boot} = \mathbf{0.124 \text{ N/mm}^2}$$

Tension steel ratio

$$\rho_{boot} = 100 \times A_{sboot} / d_{boot} = \mathbf{0.237}$$

From BS8110-1:1997 - Table 3.8

Design concrete shear strength

$$V_{cboot} = \mathbf{0.551 \text{ N/mm}^2}$$

$$\text{PASS} - V_{boot} \leq V_{cboot} - \text{Shear capacity of the boot is adequate}$$

Corner design checks

Basic loading

Corner bearing pressure check

Total uniform load at formation level

$$W_{udlcorner} = W_{Dudl} + W_{Ludl} + W_{edge}/b_{bearing} + W_{hcorethick} = \mathbf{19.2 \text{ kN/m}^2}$$

$$\text{PASS} - W_{udlcorner} \leq q_{allow} - \text{Applied bearing pressure is less than allowable}$$

Corner beam bending check

Cantilever span of edge beam

$$l_{corner} = \phi_{depththick} / \sqrt{(2)} + d_{edgetop}/2 = \mathbf{1081 \text{ mm}}$$

Moment and shear due to self weight

Ultimate self weight udl

$$W_{edgeult} = 1.4 \times W_{edge} = \mathbf{4.9 \text{ kN/m}}$$

Average ultimate slab udl (approx)

$$W_{cornerslab} = \max(0 \text{ kN/m}, 1.4 \times W_{slab} \times (\phi_{depththick} / (\sqrt{(2)} \times 2) - (b_{edge} + (h_{edge} - h_{slab}) / \tan(\alpha_{edge}))))$$

$$W_{cornerslab} = \mathbf{0.5 \text{ kN/m}}$$

Self weight and slab bending moment

$$M_{cornersw} = (W_{edgeult} + W_{cornerslab}) \times l_{corner}^2 / 2 = \mathbf{3.1 \text{ kNm}}$$

Self weight and slab shear force

$$V_{cornersw} = (W_{edgeult} + W_{cornerslab}) \times l_{corner} = \mathbf{5.7 \text{ kN}}$$

Moment and shear due to udl's

Maximum ultimate udl

$$W_{cornerudl} = ((1.4 \times W_{Dudl}) + (1.6 \times W_{Ludl})) \times \phi_{depththick} / \sqrt{(2)} = \mathbf{14.3 \text{ kN/m}}$$

Bending moment

$$M_{cornerudl} = W_{cornerudl} \times l_{corner}^2 / 6 = \mathbf{2.8 \text{ kNm}}$$

Shear force

$$V_{cornerudl} = W_{cornerudl} \times l_{corner} / 2 = \mathbf{7.7 \text{ kN}}$$

Resultant moments and shears

Total design moment

$$M_{\Sigma corner} = M_{cornersw} + M_{cornerudl} = \mathbf{5.9 \text{ kNm}}$$

Total design shear force

$$V_{\Sigma corner} = V_{cornersw} + V_{cornerudl} = \mathbf{13.5 \text{ kN}}$$

Project 1 storey outbuilding - RAFT FOUNDATION - 150mm slab				Job no. 2023-7459	
Calcs for Wendover Lower Rochester Road Higham Rochester Kent ME3 7HD				Start page no./Revision 7	
Calcs by SB	Calcs date 16/10/2023	Checked by	Checked date	Approved by	Approved date

Reinforcement required in top of edge beam

K factor

$$K_{\text{corner}} = M_{\Sigma \text{corner}} / (f_{\text{cu}} \times b_{\text{edgetop}} \times d_{\text{edgetop}}^2) = 0.006$$

Lever arm

$$z_{\text{corner}} = d_{\text{edgetop}} \times \min(0.95, 0.5 + \sqrt{(0.25 - K_{\text{corner}}/0.9)}) = 239 \text{ mm}$$

Area of steel required for bending

$$A_{\text{scornerbend}} = M_{\Sigma \text{corner}} / ((1.0/\gamma_s) \times f_y \times z_{\text{corner}}) = 57 \text{ mm}^2$$

Minimum area of steel required

$$A_{\text{scornermin}} = A_{\text{sedgetopmin}} = 151 \text{ mm}^2$$

Area of steel required

$$A_{\text{scorner}} = \max(A_{\text{scornerbend}}, A_{\text{scornermin}}) = 151 \text{ mm}^2$$

PASS - $A_{\text{scorner}} \leq A_{\text{sedgetop}}$ - Area of reinforcement provided in top of edge beams at corners is adequate

Corner beam shear check

Average web width

$$b_w = b_{\text{edge}} + (h_{\text{edge}}/\tan(\alpha_{\text{edge}}))/2 = 387 \text{ mm}$$

Applied shear stress

$$v_{\text{corner}} = V_{\Sigma \text{corner}} / (b_w \times d_{\text{edgetop}}) = 0.138 \text{ N/mm}^2$$

Tension steel ratio

$$\rho_{\text{corner}} = 100 \times A_{\text{sedgetop}} / (b_w \times d_{\text{edgetop}}) = 0.348$$

From BS8110-1:1997 - Table 3.8

Design concrete shear strength

$$v_{\text{ccorner}} = 0.497 \text{ N/mm}^2$$

$$v_{\text{corner}} \leq v_{\text{ccorner}} + 0.4 \text{ N/mm}^2 - \text{Therefore minimum links required}$$

Link area to spacing ratio required

$$A_{\text{sv_upon_svreqcorner}} = 0.4 \text{ N/mm}^2 \times b_w / ((1.0/\gamma_s) \times f_{ys}) = 0.356 \text{ mm}$$

Link area to spacing ratio provided

$$A_{\text{sv_upon_svprovedge}} = N_{\text{edgelink}} \times \pi \times \phi_{\text{edgelink}}^2 / (4 \times s_{\text{vedge}}) = 0.754 \text{ mm}$$

PASS - $A_{\text{sv_upon_svreqcorner}} \leq A_{\text{sv_upon_svprovedge}}$ - Shear reinforcement provided in edge beams at corners is adequate

Corner beam deflection check

Basic allowable span to depth ratio

$$\text{Ratio}_{\text{basiccorner}} = 7.0$$

Moment factor

$$M_{\text{factorcorner}} = M_{\Sigma \text{corner}} / (b_{\text{edgetop}} \times d_{\text{edgetop}}^2) = 0.195 \text{ N/mm}^2$$

Steel service stress

$$f_{\text{scorner}} = 2/3 \times f_y \times A_{\text{scornerbend}} / A_{\text{sedgetop}} = 55.574 \text{ N/mm}^2$$

Modification factor

$$MF_{\text{corner}} = \min(2.0, 0.55 + [(477 \text{ N/mm}^2 - f_{\text{scorner}}) / (120 \times (0.9 \text{ N/mm}^2 + M_{\text{factorcorner}}))])$$

$$MF_{\text{corner}} = 2.000$$

Modified allowable span to depth ratio

$$\text{Ratio}_{\text{allowcorner}} = \text{Ratio}_{\text{basiccorner}} \times MF_{\text{corner}} = 14.000$$

Actual span to depth ratio

$$\text{Ratio}_{\text{actualcorner}} = l_{\text{corner}} / d_{\text{edgetop}} = 4.288$$

PASS - $\text{Ratio}_{\text{actualcorner}} \leq \text{Ratio}_{\text{allowcorner}}$ - Edge beam span to depth ratio is adequate