

SGT Building Design

Specification

First Floor Side Extension,
Single Storey Front and Rear Extension
and Alterations
at



Job No. 1000

Specification to be read with drawing nos. 1115-01, 02, 03, 04, 05, 06, 07, 08 and structural engineer's design details.

FOUNDATIONS

Refer to drawings 1115-07 and 1115-08 for foundation design details depending on subsoil conditions encountered on site. Designs provided for low/medium shrinkage clay and hoggin subsoil. Ground conditions to be determined at start of work on site and agreed with Local Authority Building Control Surveyor.

Trench fill type, min 600mm wide, taken down to depth(s) shown on plans/sections. In any case foundations to be taken a minimum of 500mm below any visible roots. Subsoil type is believed to be low/medium shrinkage clay but could be hoggin. Concrete to be 1:2:4 mix. Trees as shown on block plan. Oak and Sycamore trees at approx. 14m from nearest point of foundations to rear. Foundation depths designed in accordance with NHBC Standards chapter 4.2 (Building near trees - 2008 edition). Drains to be bridged, where passing through walls/foundations with pre-cast concrete lintels (**not** pre-stressed type). At least 50mm clearance to be maintained all around the pipe.

ANTI-HEAVE PRECAUTIONS

Where required inner face of perimeter foundations to be lined with 50mm of Claymaster low density expanded polystyrene by Vencel Resil Ltd. (*BBA Cert No. 90/2543*). Claymaster to be omitted from bottom 500mm of trench.

EXTERNAL WALLS GROUND FLOOR EXTENSIONS (Cavity Construction)

102mm facing brick outer skin to match existing (or to planning requirements where applicable). 100mm cavity insulated with 100mm **Crown Dritherm 32** cavity wall batts (*BBA Cert No. 95/3212*). 100mm **Celcon Standard** block inner skin (*BBA Cert No. 86/1689*). Internal finish to be 13mm lightweight plaster in accordance with BS 5492:1990. U-value of wall - 0.27W/m²K.

Stainless steel vertical twist wall ties conforming to DD140-2:1987 to be used at 750mm centres horizontally, 450mm centres vertically (staggered), at every block course at the edges of openings and at 450mm centres horizontally at dpc level to support the insulation batts.

Hyload damp proof course (*BBA Cert No. 86/1770*) to be provided to both skins at least 150mm above external ground level linked to existing house dpc. All laps to be a minimum of 100mm, sealed using **Hyload** contact adhesive. Dense concrete blockwork to be used below ground/dpc level as appropriate. Cavity to be filled with fine concrete up to 225mm below lowest dpc level. Walls to be bonded to existing using **Furfix** stainless steel profiles (*BBA Cert No. 91/2682*). **Thermabate 100** insulated cavity closers (*BBA Cert No. 91/2648*) to be provided at all reveals and to all other cavity closers.

Mortar mix to be Class III to BS 5628:Part 1:1978 or 1:1:6, cement:lime:sand.

EXTERNAL WALLS FIRST FLOOR EXTENSION (Cavity Construction)

102mm facing brick outer skin to match existing (or to planning requirements where applicable). 50mm cavity insulated with 50mm **Crown Dritherm 32** cavity wall batts (*BBA Cert No. 95/3212*). 100mm **Celcon Standard** block inner skin (*BBA Cert No. 86/1689*). Internal finish to be Celotex PL4025 insulated plasterboard (25mm insulation plus 12.5mm plasterboard) finished with a plaster skim. U-value of wall - 0.28W/m²K.

Stainless steel vertical twist wall ties conforming to DD140-2:1987 to be used at 750mm centres horizontally, 450mm centres vertically (staggered), at every block course at the edges of openings and at 450mm centres horizontally at dpc level to support the insulation batts.

Hyload damp proof course (*BBA Cert No. 86/1770*) to be provided to both skins at least 150mm above external ground level linked to existing house dpc. All laps to be a minimum of 100mm, sealed using **Hyload** contact adhesive. Dense concrete blockwork to be used below ground/dpc level as appropriate. Cavity to be filled with fine concrete up to 225mm below lowest dpc level. Walls to be bonded to existing using **Furfix** stainless steel profiles (*BBA Cert No. 91/2682*). **Thermabate 100** insulated cavity closers (*BBA Cert No. 91/2648*) to be provided at all reveals and to all other cavity closers.

Mortar mix to be Class III to BS 5628:Part 1:1978 or 1:1:6, cement:lime:sand.

INTERNAL WALLS/PARTITIONS (Blockwork)

100mm **Celcon Standard** block built off of **Hyload** damp proof course constructed off of foundations(s) as shown on sections. 13mm lightweight plaster finish to both sides.

INTERNAL WALLS/PARTITIONS (Studwork)

50mm x 100mm vertical timber studs @ 600mm centres (400mm centres to kitchens and bathrooms) with top and bottom plates and intermediate noggins. 100mm **Rockwool** insulation between studs and 12.5mm **Gyproc SoundBloc** plasterboard (10.6Kg/m²) to both sides with joints taped and skimmed.

INTERNAL LINING TO SINGLE SKIN WALL (Garage Conversion)

50mm x 100mm vertical timber studs @ 600mm with top and bottom plates and intermediate noggins. 100mm **Celotex GA4000** insulation between studs and 12.5mm plasterboard and skim. Provide a layer of breathable felt behind studwork as shown on drawing 1115-07.

GROUND FLOOR CONSTRUCTION (Solid)

75mm thick cement/sand screed (1:3-opc: sharp sand) on separating layer of building paper (BIF grade to BS 1521:1972) on 75mm thick **Celotex GA4000 (GA4075)** floor insulation, 25mm thickness turned up around the perimeter of screed. Min.100mm thick concrete oversite on 1200 gauge **Visqueen** polyethylene damp proof membrane (*BBA Cert No. 94/3068*) linked to existing dpc with Synthaprufe dpm. Min.150mm sand blinded hardcore bed of clean broken brick or similar inert material. Concrete to be 1:2:4 mix or min. grade ST2 (in accordance with BS 5328: Pt2: 1991 - 10.0N/mm² @ 28 days).
P/A= 0.7. U-value of floor - 0.22W/m²K.

GROUND FLOOR CONSTRUCTION (Converted Garage)

75mm thick cement/sand screed (1:3-opc: sharp sand) on separating layer of building paper (BIF grade to BS 1521:1972) on 75mm thick **Celotex GA4000 (GA4075)** floor insulation, 25mm thickness turned up around the perimeter of screed on Synthaprufe liquid dpm linked to existing dpc's.

SUSPENDED CONCRETE FLOOR (Block and Beam)

75mm thick cement/sand screed (1:3-opc: sharp sand) on separating layer of building paper (BIF grade to BS 1521:1972) on 75mm thick **Celotex GA4000 (GA4075)** floor insulation, 25mm thickness turned up around the perimeter of screed. on **Bison Housefloor** (*BBA Cert No. 85/1520 - detail sheet 3*) 155mm x 110mm pre-cast concrete beams with concrete block infill. Infill blocks to be 440mm x 215mm x 100mm solid concrete blocks with a minimum compressive strength of 3.5N/mm² complying with BS 6073:Parts 1&2:1981. Floor beams to be laid at 510mm centres as per condition no. 1 on the Bison House Beam (HB) Load Span Tables (See page 9 of specification). Floor beams to be laid on **Hyload** damp proof course laid continuously along the support wall. A minimum 175mm void is to be maintained between the underside of the floor and the ground surface. Cross ventilation to be provided on two opposing sides to achieve a ventilation opening equivalent to at least

1500mm² per metre run of wall (i.e. 215mm x 65mm plastic louvered air bricks @ 1500mm centres – telescopic vents as appropriate).

REAR MONOPITCHED ROOF CONSTRUCTION (Non-Ventilated Cold Pitched Roof System)

Forticrete Centurion smooth type concrete interlocking tiles, colour to match existing on 38mm x 25mm tanalised timber battens on **Klober Permo Forte** breathable roof tile underlay (*BBA Cert No.00/3749*). Rafters to be 50mm x 200mm C16 grade timber @ 400mm centres fixed to 50mm x 150mm timber plate bolted to existing wall @ 600mm centres. Feet of rafters to be fixed to 50mm x 100mm timber wall plate anchored to inner skin of cavity wall with 600mm long 30mm x 5mm galvanised mild steel straps at max. 1.8m centres. Ceiling finish to be 12.5mm foil backed plasterboard and 5mm Gypsum plaster skim. Roof to be insulated with 165mm **Celotex GA4000** between rafters. The underlay should be laid draped in the traditional manner and the insulation should be pressed tightly into the eaves against the underlay to ensure no gaps are present. Roof to remain unvented. Allow underlay to discharge over a wide dpc draped into guttering - underlay should not be left exposed to daylight. Provide doubled and bolted rafters either side of Fakro roof-lights.

FRONT MONOPITCHED ROOF CONSTRUCTION (Non-Ventilated Cold Pitched Roof System)

Tiles to match existing on 38mm x 25mm tanalised timber battens on **Klober Permo Forte** breathable roof tile underlay (*BBA Cert No.00/3749*). Rafters to be 50mm x 100mm C16 grade timber @ 400mm centres fixed to 50mm x 100mm timber plate bolted to new wall @ 600mm centres. Feet of rafters to be fixed to 50mm x 100mm timber wall plate anchored to inner skin of cavity wall with 600mm long 30mm x 5mm galvanised mild steel straps at max. 1.8m centres. Ceiling finish to be 12.5mm foil backed plasterboard and 5mm Gypsum plaster skim. Roof to be insulated with 165mm **Celotex GA4000** between rafters. The underlay should be laid draped in the traditional manner and the insulation should be pressed tightly into the eaves against the underlay to ensure no gaps are present. Roof to remain unvented. Allow underlay to discharge over a wide dpc draped into guttering - underlay should not be left exposed to daylight. Provide doubled and bolted rafters either side of Fakro roof-lights.

MAIN PITCHED ROOF CONSTRUCTION

Tiles to match existing on 38mm x 25mm tanalised timber battens on sarking felt. Rafters to be 50mm x 100mm C16 grade timber @ 400mm centres birdmouthed over 50mm x 100mm timber wall plate anchored to inner skin of cavity wall with 600mm long 30mm x 5mm galvanised mild steel straps at max. 1.8m centres. 75mm x 150mm C16 grade timber purlin to side slope of roof to break span of rafters – see section through side extension. Purlin to be strutted as shown.

Main roof to be insulated with 270mm thick **Rockwool Rollbatts**. U- value - 0.16W/m²K. Maintain ventilation gap above insulation at eaves using proprietary eaves ventilators. 10mm ventilation gap to be provided at eaves level with proprietary ventilators to all new soffits.

Valleys to be formed in code 5 lead sheet on 12mm plywood or pre-formed GRP gutters installed in accordance with the manufacturers instructions.

FLASHINGS

Lead flashings to be laid in accordance with BS 6915:1988 as follows:

- (a) Minimum 150mm upstand in Code 4 lead to BS 1178:1982 chased 25mm into wall with lead wedges at approx. 450mm centres. Maximum single length of lead to be 1500mm. Patination oil to be applied to lead as soon as possible after fixing to prevent carbonation of the surface;
- (b) Horizontal and racking abutment flashings to have a minimum 100mm upstand in Code 4 lead to BS 1178:1982 chased 25mm into wall with lead wedges at approx. 450mm

centres (lead wedges at each step to stepped flashings). Lead to extend over the tiles/slates at least 150mm (200mm where plain tiles are used). Soakers to be Code 3 lead.

CAVITY TRAYS (Existing wall)

Cavity trays to be provided to existing masonry where new roofs abut using **IG** refurbishment cavity tray system - **Type RFT** (from *IG Lintels Ltd.*) installed in accordance with the manufacturers' instructions. Trays to be folded as specified on tray to form left and right hand stop ends.

VALLEY GUTTER

Code 5 Lead valley gutter to rear section of main roof laid to a fall of 1:80 with drips at max 2.0m centres. Min. width of gutter to be 225mm. Lead supported on ply sheeting. Patination Oil to be applied to all leadwork.

LINTELS

Lintels to be **Catnic CG50/100** to 50mm cavity construction and **CG90/100** to 100mm cavity construction unless otherwise specified. Lintels to be installed with at least 150mm end bearings. Void within lintels to be filled with insulation material to prevent cold bridging. Weep holes to be provided above all lintels to external walls.

STEEL BEAMS

Steel beams and bearings to structural engineer's design details.

FIRE PROTECTION TO STEEL BEAMS

Encasement to steel beams to be expanded metal lathing (EML) with minimum 12.5mm thick Gypsum plaster finish to achieve a 30 minute period of fire resistance. Alternatively beams to be painted with intumescent – fire resisting – paint to achieve 30 minute period of fire resistance. i.e. Nullifire or similar product.

SAFETY GLAZING

Glazing within 800mm of finished floor level in internal and external walls/partitions to be toughened or laminated safety glazing achieving a Class C standard when tested to BS 6206:1981.

Glazing within 1500mm of finished floor level in doors or side panels within 300mm of a door to be toughened or laminated safety glass achieving at least a Class C standard when tested to BS 6206:1981. If the width of a panel exceeds 900mm then that panel should achieve at least a Class B standard when tested to BS 6206:1981.

Glazing in small panes (maximum area 0.5m², maximum width 250mm) should comply with the above or may be annealed glass at least 6.0mm thick.

GLAZING

All new windows and external glazed doors to be PVC-U fitted with double glazed units with a minimum 20mm gap between panes and low-e glass (i.e. Pilkington k-glass). Maximum U-value of 1.6W/m²K or a Window Energy Rating (WER) of band C or better.

ESCAPE WINDOWS (First Floor Rooms)

New first floor windows to bedrooms and games/play room to be provided with escape windows with a clear opening of at least 735mm high x 450mm wide. Bottom of opening to be within 800-1100mm above finished floor. Window fitted with fire escape hinges.

Existing first floor bedroom windows to be altered to give clear 450mm opening width by changing existing hinges. Refer to drawing 1115-06. Alternatively a door can be provided to the opening between the kitchen and the hallway.

SUNPIPE

Provide **Sunpipe** by **Monodraught Ltd.** over existing landing area as shown on plans. Final size and fittings to be agreed with the client. **Sunpipe** to be installed strictly in accordance with manufacturers details.

VENTILATION

Ventilation to habitable rooms to be provided by opening windows at least $\frac{1}{20}^{\text{th}}$ of the floor area of the room. Some part of the ventilation opening to be at least 1.75m above floor level.

Ventilation to the kitchen, in addition to any opening windows, to be provided by mechanical extract ventilation capable of extracting at a rate of not less than 60 litres per second or not less than 30 litres per second if incorporated within a cooker hood.

Ventilation to bathrooms/shower rooms to be provided by mechanical extract ventilation capable of extracting at a rate of not less than 15 litres per second operated intermittently.

Ventilation to w.c. room to be provided by an opening window at least $\frac{1}{20}^{\text{th}}$ of the floor area of the room or by mechanical extract ventilation capable of extracting at a rate of not less than 3 air changes per hour operated intermittently with a 15 minute overrun.

Ventilation to utility room to be provided by mechanical extract ventilation capable of extracting at a rate of not less than 30 litres per second.

Background ventilation to be provided to habitable rooms and kitchen having a total area not less than 8000mm². (i.e. a trickle ventilator, which should be controllable and secure and located, so as to avoid undue draughts.)

Background ventilation to be provided to bathrooms, utility rooms and w.c. accommodation having a total area of not less than 4000 mm².

All mechanical extract ventilation to extract to external air.

BELOW GROUND DRAINAGE (Foul & Surface Water)

110mm diameter **Osmadrain** PVC-U system to be used complying with BS 4660:1989 and laid in accordance with BS 8301:1985 and BS 5955:Part 6:1980. Pipes to be laid to a minimum gradient of 1:40 (1:80 where serving at least 1 w.c.) on a 100mm base of pea shingle. Trench to be backfilled to the top of the pipe with pea shingle then a 100mm layer of selected granular fill, free from stones larger than 40mm, to be placed before back filling with suitable as dug material. Access points to be provided as shown on plans.

Drains to be bridged, where passing through walls/foundations with pre-cast concrete lintels (**not** pre-stressed type). At least 50mm clearance to be maintained all around the pipe.

MANHOLES/INSPECTION CHAMBERS

Manholes/Inspection chambers to be **Osmadrain** PVC-U type complying with BS 7158:1989. Sizes and invert levels as noted on plans.

ABOVE GROUND DRAINAGE

Waste plumbing to be Osma MUPVC solvent weld system or similar complying with BS 4514:1983, laid in accordance with BS 5572:1994.

Trap and branch sizes as follows:

Appliance Type	Trap & Branch Pipe Minimum diameter (mm)	Maximum length of run (m)
Wash Hand Basin	32 (<i>max. gradient 20mm/m</i>)	1.7
"	40	3.0
Sink/Waste Disposal	40	3.0
Bath/Shower	40	3.0
Washing Machine	50	4.0
Dish Washer	50	4.0

All appliances to be fitted with 75mm deep seal traps. Rodding access to be provided at all changes of direction.

Vertical stack to be 110mm diameter **Osmasoil** system vented to external air. Top of ventilation stack to terminate at least 900mm above any opening into the building within 3.0m and be fitted with a balloon grating.

Drainage runs and stack position as shown on plans.

Stub stack serving utility room to be 110mm diameter **Osmasoil** system terminated with an **Osmavent** 110mm diameter air admittance valve (*BBA Cert No. 86/1643*). Air admittance valve to be installed above the flood level of the highest appliance.

SMOKE DETECTORS

Smoke detectors/alarms to be provided as noted on plans to ground floor hallway and first floor landing. Heat detectors to be provided to kitchen area. The smoke/heat alarms should be mains-operated, interlinked and conform to BS 5446:1990 - components of automatic fire alarm systems for residential premises, Part 1 Specification for self-contained smoke alarms and point-type smoke detectors. Smoke detectors to have battery back-up.

LIGHTING

New lighting to proposed extension to be by way of energy efficient units having a luminous efficacy greater than 45 lumens/circuit watt and a total output of greater than 400 lamp lumens – e.g. dedicate fittings which will have separate control gear and will take only low energy lamps (pin based fluorescent or compact fluorescent lamps) or standard fittings supplied with low energy lamps with integrated control gear (bayonet or Edison screw base compact fluorescent lamps). **Not** GLS tungsten filament lamps or tungsten halogen lamps.

ELECTRICAL WORK

Provide electrical sockets and lighting to Client's requirements.

All electrical installations required to meet the requirements of Part P (Electrical Safety) **must** be designed, installed and tested by a person competent to do so. Prior to completion the Council should be satisfied that the requirements of Part P has been complied with. This may require an appropriate BS 7671 electrical installation certificate to be issued for the work by a person competent to do so.

A person who is a competent person registered with an electrical self-certification scheme authorised by the Secretary of State should preferably, undertake the proposed installation work. In this case, this person is responsible for ensuring compliance with BS 7671: 2001 and all relevant Building Regulations. On completion of the work, the

person ordering the work should receive a signed Building Regulations self-certification certificate, and the relevant building control body (The Local Authority) should receive a copy of the certificate. The person ordering the work should also receive a duly completed Electrical Installation Certificate as or similar to the model in BS 76713 (see paragraphs 1.6 to 1.12). As required by BS 7671, the certificate must be made out and signed by the competent person or persons who carried out the design, construction, inspection and testing work.

CENTRAL HEATING

Extend existing central heating system to serve new radiators. Suitability/condition of existing boiler to be checked. Extended system to be fitted with a suitable control device (i.e. a room thermostat or thermostatic radiator valves).

Where the existing boiler is to be replaced, the replacement boiler should be a gas condensing boiler with a SEDBUK 2009 efficiency of not less than 88% together with appropriate controls.

Work to any gas appliance/gas heating system to be carried out by a **Gas-Safe** Registered Installer competent to do so.

PLANNING CONDITIONS

Any conditions attached to the Planning Permission for these proposals to be complied with.

BUILDING CONTROL


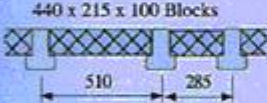
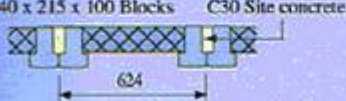
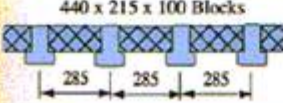
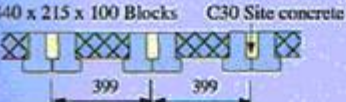
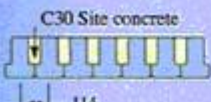
Local Authority Building Control department to be notified of commencement of work at least 48 hours before starting work. Builder to ensure that all required inspections are carried out by Building Control including the final inspection of the work.

THE PARTY WALL ACT

It is the owners responsibility to ensure that the requirements of the **Party Wall etc. Act 1996** are complied with. A copy of an Explanatory Booklet on the Party Wall etc. Act 1996 can be downloaded from the government website - www.communities.gov.uk.

HOUSE BEAM (HB)

LOAD SPAN TABLE

MOST COMMON APPLICATIONS		Block density assumed at kg/m ³	WL of Beam + Block + Grout kN/m ²	Load / span C.m.m. (effective span in metres) Self Wl. (as shown) + finish (1.2 kN/m ²) + S.L.L. kN/m ² shown.									
				0.75	1.50	2.00	2.50	3.00					
CONDITION No.1 	Beams @ 510mm c/c						650	1.14	5.51	4.95	4.65	4.10	4.19
	1325	1.72	5.06	4.61	4.37	4.17	3.99						
	1900	2.41	4.93	4.50	4.17	3.92	3.60						
CONDITION No.2 	Beams @ 510 & 285mm c/c (eq. to 398mm c/c average)						650	1.28	6.11	5.50	5.19	4.92	4.69
	1325	1.83	5.64	5.16	4.89	4.67	4.47						
	1900	2.30	5.32	4.91	4.68	4.48	4.31						
CONDITION No.3 	Double Beams @ 624mm c/c (eq. to 312mm c/c average)						650	1.46	6.71	6.08	5.74	5.46	5.24
	1325	1.98	6.25	5.73	5.45	5.20	4.99						
	1900	2.42	5.93	5.47	5.23	5.01	4.82						
CONDITION No.4 	Beams @ 285mm c/c						650	1.54	6.90	6.30	5.96	5.67	5.41
	1325	2.04	6.49	5.95	5.66	5.41	5.19						
	1900	2.48	6.16	5.70	5.64	5.22	5.02						
CONDITION No.5 	Double Beams @ 399mm c/c (eq. to 200mm c/c average)						650	1.92	6.90	6.90	6.84	6.53	6.26
	1325	2.36	6.90	6.88	6.56	6.29	6.04						
	1900	2.74	6.90	6.64	6.35	6.10	5.88						
CONDITION No.6 	Beams @ 114mm c/c with Concrete between							3.65	6.90	6.90	6.90	6.90	6.90
		3.65	6.90	6.90	6.90	6.90	6.90						
		3.65	6.90	6.90	6.90	6.90	6.90						

DETAILS OF BEAM

SECTION CONSTANTS							FINAL PRESTRESS				ULTIMATE		
Area mm ²	ANA mm	BNA mm	I M(mm ⁴)	Za M(mm ³)	Zb M(mm ³)	Self wt. kN/m	Force kN	ECC mm	FPT N/mm ²	FPB N/mm ²	DC mm	MU kNm	VCO kN
12656	86.7	68.3	26.137	0.30	0.383	0.298	74.94	22.7	0.29	10.36	65.64	9.10	16.31

DESIGN EXAMPLE

Normal domestic house loading 1.5kN/m², span 3.75 metres, finishes of 40mm screed plus tiles (say 1.2kN/m²). Select: Bison House Beam @ 510mm c/c (Max. permissible span 4.61 metres with 1325 kg/m³ blocks).

The table is given as a guide only. When using maximum or near maximum spans consideration must be given to the effect of camber and deflection on partitions or finishes. Allowance should be given to specific line and point loads from partitions etc. Bison Concrete Products Limited will be pleased to offer design advice on request.

FIRE RESISTANCE

When assessed in accordance with B.S.8110 pt 2. sect 4.3.1 the House Beam has a fire resistance period of 0.5 hour.

BEAM SECTION

