

SPECIFICATION

For

Rear Extension

at

34, Cwrt-y-clafdy,

Skewen,

Neath.

February 2020

ROOF CONSTRUCTION

Roof construction to two storey extension to be pre-fabricated roof trusses, pitch to match existing and be accurately established on site prior to manufacture. The trusses shall be designed in accordance with BS 5268 Part 3 and manufactured by a company that is a member of the TRADA Trussed Roofing Quality Assurance Scheme, marked accordingly, and installed in accordance with their recommendations.

Trusses to be fixed using proprietary truss clips. Wind bracing shall be provided as detailed in Technical Bulletin Number 1 produced by the Truss Plate Association Ltd., and current Building Regulations. Calculations of the trusses to be provided by company prior to manufacture and installation. Calculations to include for provision of steel beam to carry rear leg of pitched roof.

Roof construction to single storey extension to be Fibre Glass construction on 22mm marine quality ply on 200 x 50mm Grade C24 joists at 400mm centres with herringbone strutting at 1/3rd and 2/3rd span.

Roof covering to two storey extension be slate or composite slate to match existing fixed in accordance with manufacturer's instructions to 38 x 25mm treated softwood battens on VPU breathable felt to BS 5534. Ridge tiles to be terracotta smooth faced clay or concrete angular tiles bedded in tinted cement mortar.

Ceilings to be 12.5mm or 15mm plasterboards to BS 1230 Part 1, screwed to underside of joist section of truss with plaster skim or taped joint finish to provide 30mins fire resistance.

All structural timber to be Grade GS treated with tanlith preservative treatment in accordance with BS 5268 Part 5 (1977).

All carcassing and first fix softwood timbers in roof or in positions exposed to possible dampness are to be pressure impregnated to BS 5268 Part 5 with severity rating high.

All soffits and fascia boards to be uPVC to BS 7619 incorporating a minimum 25mm continuous air vent with insect proof mesh screen, to allow cross ventilation of roof void areas conforming to Approved Document F Part F2.

Roof voids to be insulated with 300mm Rockwool (or similar) glass fibre insulation quilt laid between and over joists, to achieve a U- Value of 0.15W/m²K.

Rainwater goods to be uPVC complying with BS 4576 Part 1. Rainwater gutters to be 100mm with 68mm diameter rainwater pipes all clipped and bracketed strictly in accordance with manufacturer's specification.

Provide Code 4 lead flashing and soakers at abutment of extension walls and single storey roof, dressed over cavity trays built into outer skin of walls.

Provide Code 4 lead to valleys dressed over 175 x 25mm valley boards.

EXTERNAL WALLS

Cavity walls to be 325mm thick, comprising outerskin of Class A dense concrete block, 125mm cavity with 75mm Kingspan (or similar) rigid insulation batts, with inner skin of 100mm thick Class A dense concrete block. Cavity wall to achieve a minimum U-Value of 0.21 W/m²K.

Wall ties to be stainless steel vertical twist type at 450mm vertical and 600mm horizontal centres, staggered and doubled up at all openings. All ties to be to BS 1243 and fixed in accordance with BS 5628. Cavities to be closed at eaves, cills and jambs with Thermabate (or similar) closers incorporating a DPC. Cavity to be adequately firestopped at eaves level using a suitable non-combustible material such as Rockwool cavity wall batts. Below ground level, cavity to be filled to within 150 of DPC with lean mix concrete to BS 5328.

Provide Hyload DPC by Ruberoid at 150mm above outside ground level and to all vertical and horizontal openings in accordance with BS 743 and CP 121. Lintels over all external openings to be 2 Nr p.c. concrete lintels incorporating a DPC.

Steel beams to be as detailed in Structural Calculations.

INTERNAL PARTITION WALLS

All ground floor partition walls to be 100mm Class A dense concrete blockwork, bonded to external cavity wall with plaster skim finish.

All first-floor partition walls to be stud partition, consisting 90 x 38mm CLS studs and noggins at 600mm centres, faced both faces with 15mm plasterboard with plaster skim finish. Provide 100mm Rockwool (or similar) insulation quilt as sound insulation.

WALL FINISHES

External block work walls to receive 2 number coats of sand cement render with dash finish to match existing.

Ground Floor partition walls to be 100mm dense concrete blockwork with 2 number coats of sand cement render and skim finish.

First floor partition walls to be stud partition, consisting 90 x 38mm CLS studs and noggins at 600mm centres, faced both faces with 15mm plasterboard with plaster skim finish. Provide 100mm Rockwool (or similar) insulation quilt as sound insulation.

Provide architectural skirting to BS 1186 Part 3 to client's choice to all walls. Backs of skirting shall be knotted and primed prior to fixing. All softwood to receive one coat of primer, two coats of undercoat and one coat of gloss finishing paint to BS 5358.

All plastered walls and ceilings to receive one thinned coat and two full coats of vinyl matt emulsion to BS 7719.

FOUNDATIONS

Foundations to be 600 x 300mm concrete strip type, 30N/mm² strength concrete, with nominal A142 fabric mesh in bottom, to a minimum depth of 750mm below ground level, and below invert level of any adjacent drains. Actual depth of foundations to be determined following examination of the sub-grade site condition.

FLOORS

Ground floor construction to achieve U-Value of 0.22 W/m²K comprising 65mm thick cement mortar screed on 75mm thick Kingspan (or similar) insulation batts on 1200 gauge Visqueen damp proof membrane on 100mm thick concrete oversite slab to BS 5328 on 150mm thick well compacted Type 1 granular sub base material.

First floor to be 25mm thick Weyroc t & g chipboard flooring on 200 x 50mm Grade C24 timber joists at 400mm centres. Provide herringbone strutting at 1/3rd and 2/3rd of joist span. Ceiling to be 12.5mm plasterboard screwed to underside of joist section with taped joints or skim finish to provide 30mins fire resistance. Provide 100mm Rockwool (or similar) insulation and plasterboard of density 10kg /m² to provide sound insulation.

WINDOWS AND DOORS

All windows to be uPVC double glazed units to BS 6375, incorporating draft proof trickle vents. Windows to provide a minimum of 1/10th daylight and 1/20th ventilated opening area of the floor area of the served room. Background ventilation (trickle vents) to be provided having a total area not less than 65,000mm² as per table 1.2a of Approved Document F1. Opening should be controllable, secure and located so as to avoid undue draughts.

Security locks to be fitted to all ground floor windows. Windows are to be double glazed with clear sealed units to BS 6262. Obscure glass to be provided in bathroom window. Glazing to be low emissivity Pilkington K glass (or similar) with 16-18mm air gap to achieve a U Value of 1.8W/m²K.

Internal cill levels to be agreed with client, but shall be no higher than 1100mm or lower than 800mm.

External doors to be uPVC fitted complete with all ironmongery. Any glazing below 1500mm to be toughened glass. Door size to comply with requirements of Approved Document M. Glazing to be as for windows and to achieve a minimum U Value of 1.8W/m²K.

Provide mechanical ventilation of 60 litres/second to the kitchen area or 30 litres/second if incorporated into cooker hood facility. Provide mechanical ventilation of 15 litres/second to WC, Utility and Bathroom.

Internal doors to be metric timber flush doors with self-veneer finish with hardwood lipping of long edges, 35mm thick and provided with blocks for the ironmongery specified. Doors are to be hung on one pair of SAA butts with SAA mortise latch and handle set. Bathroom doors are to be fitted with SAA indicator bolt incorporating a facility for opening from outside. All doors

to be sized so as to comply with the requirements of Approved Document M, i.e. 770mm width minimum.

Softwood linings to be built into openings in internal walls with architrave both sides to BS 1186 Part 3. Internal doors to be metric timber flush doors with self-veneer finish with hardwood lipping of long edges, 35mm thick and provided with blocks for the ironmongery specified. Doors are to be hung on one pair of SAA butts with SAA mortise latch and handle set. Bathroom doors are to be fitted with SAA indicator bolt incorporating a facility for opening from outside. All doors to be sized so as to comply with the requirements of Approved Document M, i.e. 770mm width minimum.

STORM WATER DRAINAGE

Downpipes to discharge to uPVC roddable back inlet gulleys. All pipework to be 'Osma' 110mm uPVC below ground quality pipes bedded on and encased in granular material to BS 882, laid to fall as specified by manufacturer. Storm water to discharge to soakaway located 5.0m from dwelling.

FOUL WATER DRAINAGE

All foul water to discharge to existing sewer – location and direction of flow to public sewer be ascertained on site prior to works commencing.

Kitchen waste to discharge via 40mm uPVC waste pipe with minimum 75mm deep sealed trap to roddable trapped back inlet gulley.

All waste pipes and fittings to be in accordance with BS 3380 and BS 5255 and installed to BS 5572. All deep sealed traps to be to BS 3943.

All drainage below ground to be 100mm uPVC Osma (or similar) to BS 4660 or BS 5481 laid strictly in accordance with manufacturer's instructions and Approved Document H of the Building Regulations 2002. Drains to be laid to a minimum fall of 1 in 40 at a minimum depth of 0.6m, bedded on granular material to BS 882.

Where drains pass through walls or foundations provide 2 number 100 x 150 x 450mm concrete lintels over pipe giving a minimum 50mm clearance all around pipe with both sides masked with a rigid sheet material. Any drain passing under a floor or within 1.0m of a building to be encased in 150mm of concrete.

Inspection Chambers (minimum internal size 450 x 450mm) to be either preformed uPVC chambers or 225mm thick engineering brick to BS 3921. Base to be 150mm thick concrete slab, fitted with standard air tight medium duty frame and cover to BS EN 124. Half round channels to be used in chambers with branches discharging into channel at or above the level of the horizontal diameter. Channel and branches should be benched up to at least the top of the outgoing pipe and at a slope of 1 in 12. The benching should be rounded at the channel with a radius of at least 25mm.

SANITARY FITTINGS

Hot and cold water distribution pipework to be 15 and 22mm diameter copper pipes fixed to solid backgrounds with clips. Stop taps to be fitted under sink units. All pipework to be installed strictly in accordance with requirements of Dŵr Cymru's requirements and current legislation to BS 6700.

Kitchen and Utility room sink and units to be to client's specification and in accordance with BS 1195 and BS 4875.

Provide white glazed vitreous china close coupled WC to BS 5503, pedestal washbasins to BS 1188, and shower / bath units to BS 1390 to bathroom to client's specification.

Provide ceramic tile splash backs 300mm high behind sink. Fittings to be properly supported and silicon mastic applied at all edges adjacent to walls.

CENTRAL HEATING

All heating works to be carried out strictly in accordance with the requirements of Approved Document J of the current Building Regulations. Provide thermostatic valves to all radiators. System to be installed by a 'Gas Safe' registered contractor.

ELECTRICAL INSTALLATION

To be fully in accordance with the Regulations of the I.E.E. (18th Edition), to BS 7671 and undertaken by an approved electrician, registered on a competent persons scheme. Completion certificates to be submitted to Building Control. All power and lighting points to be at locations agreed with client. All sockets and switches to be located at a height between 450 and 1200mm above floor level. Lighting to be energy efficient lights as supplied by Lampholder (ref www.lampholder.co.uk).

EXTERNAL WORKS

In situ concrete paths or block paving to BS 7263 Part1, to be provided around extension, min. 900mm width. All paths to be laid to falls to ensure that rainwater drains away from building.

Garden areas to be as directed by client.

ALL WORKS TO COMPLY WITH THE CURRENT BUILDING REGULATIONS.

ALL MEASUREMENTS ARE GIVEN IN MILLIMETERS UNLESS OTHERWISE STATED AND SHOULD BE CHECKED ON SITE PRIOR TO COMMENCEMENT OF WORKS.

DESIGN OF STEEL BEAMS

34, CURT.Y. CLAFDY, SIGENEN

Design to BS 5950

February 2020

2nd Beams reqd between existing kitchen and extension
Worst case scenario is inner beam.

$$\text{Clear Span} = 3200\text{mm} \quad \therefore \text{Design Span} = 3200 + \frac{4b}{2} = 3375.$$

Loading Criteria

$$\begin{array}{ll} \text{Roof} & \text{DL} = 0.75 \text{ kN/m}^2; \quad \text{IL} = 0.75 \text{ kN/m}^2 \\ \text{1st Floor} & \text{DL} = 0.50 \text{ kN/m}^2; \quad \text{IL} = 1.50 \text{ kN/m}^2 \\ \text{Wall} & \text{DL} = 2.20 \text{ kN/m}^2 \end{array}$$

$$\delta_f = 1.4 \text{ Gk and } 1.6 \text{ Qk.}$$

Loads

Roof	DL	$0.75 \times 2.5 \times 3.375 = 6.33$	$\times 1.4 = 8.86$
	IL	$0.75 \times 2.5 \times 3.375 = 6.33$	$\times 1.6 = 10.13$
1st Fl	DL	$0.50 \times 1.1 \times 3.375 = 1.86$	$\times 1.4 = 2.60$
	IL	$1.50 \times 1.1 \times 3.375 = 5.57$	$\times 1.6 = 8.91$
Wall	DL	$2.20 \times 2.4 \times 3.375 = 17.82$	$\times 1.4 = 24.95$
		Σ	<u>55.45 kN</u>

$$M_x = \frac{W_l}{8} = \frac{55.45 \times 3.375}{8} = 23.39 \text{ kN.m.}$$

Select Beam Size 203x102x23 kg/m UB.

Section Properties

$r_{yy} = 2.36$	$I = 2105$
$k = 5.4$	$\lambda = 22.5$
$D = 203.2$	$S_x = 234$

Check Bending

$$M_x < M_{cb} \quad M_{cb} = P_b \cdot S_x.$$

$$P_b = ? \quad \lambda = \frac{kL}{r_{yy}} = \frac{3375}{2.36 \times 10} = 143$$

$$\text{From table 19(b)} \quad P_b = 130$$

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$$\therefore M_b = 130 \times 234 \times 10^{-3} = 30.42 \text{ kN.m}$$

$\therefore M_b > M_u \checkmark$ OK in Bending

• Check Shear

$$\text{Max}^m \text{ SF} = \frac{55.45}{2} = 27.73 \text{ kN.}$$

$$P_v = 0.6 P_u A_v \quad A_v = t.D.$$

$$P_v = 0.6 \times 275 \times 5.4 \times 203.2 \times 10^{-3} = 181.05 \text{ kN}$$

$\therefore P_v > \text{Max SF} \checkmark$ OK in Shear

• Check Deflection

$$\delta_{\text{allow}} = \frac{L}{360} = \frac{3375}{360} = 9.375 \text{ mm}$$

$$\delta_{\text{actual}} = \frac{5}{384} \frac{W L^3}{EI} \quad W = u.F.I.L = 11.90 \text{ kN}$$

$$\delta_{\text{act}} = \frac{5}{384} \times \frac{11.9 \times 3.375^3 \times 10^{12}}{205 \times 2405 \times 10^7} = 1.38 \text{ mm}$$

$\therefore \delta_{\text{act}} < \delta_{\text{allow}} \checkmark$ OK in Deflection

• Check Bearing at Supports

Allow 175 mm end bearing.

$$\sigma = \frac{L}{A} = \frac{27.73 \times 10^3}{175 \times 102} = 1.55 \text{ N/mm}^2 \checkmark \text{ OK}$$

Provide p.c. concrete padstones at supports.

$\therefore$ OK to use 2N^R 203 × 102 × 23 u/s

Bolt Beams Together.

END