

EXISTING CROSS-SECTION (1:50)

Drawing shows one option for supporting the new rear dormer roof and the front roof-slope by two tandem 203x133-section Universal Beams at dormer roof-joint height directly under the ridge-board. The steel carries the rear joists and front slab joists via hangers, and are themselves supported at their junction by a 100x150mm timber post off a steel within the new first floor, as shown in the Existing First Floor Plan below at left.

The Existing Ground Floor Plan below shows the possibility of an alternative arrangement whereby two 100x100mm timber posts are installed at first-floor level to carry the same ridge-support steels via a lintel, to provide greater flexibility for two back-to-back front- and rear bedrooms and dormers at the north end of the dwelling.

Note, however, that where two back-to-back bedrooms are the clients' sole requirement and no likelihood exists of any subsequent change in their accommodation needs, a third option - not shown here - would be to support the new roof configuration (including a front dormer) by means of a continuous loadbearing studwork wall built off the new floor over or up to 0.5m forward of the 203x133x30 UB which carries the floor-joists over the original lounge area. The structural calculations show that both the steel in question (Item 6 in the calculations schedule) and the new floor-joists (Item 36) are adequate to carry the loads concerned.

New "cold-deck" ventilated roof of rear dormer formed from 50x220mm or 50x200mm joists at 400mm centres, beneath 50mm-wide firings, beneath an 18mm-thick exterior-grade plywood deck and a GRP (fibreglass) built-up roof finished with a Flocoat gel or equivalent. Insulation provided in the form of a filling of 170mm-thick Celotex foam board or equivalent between 220mm-deep joists, or 150mm-thick Celotex between 200mm joists, supplemented respectively by 12mm or 25mm of Celotex across the joist undersides above the 12.5mm plasterboard ceiling. Cross-ventilation of roof achieved by the measures specified in the note at left.

New dormer external cheeks and walls constructed from 100mm-thick timber studwork sheathed externally with 12.5mm plywood and weathered with cement planks over battens and a breather membrane, or with a render finish over Riblath or equivalent metal lath and a breather membrane. Note that Rochford District Council requires studwork render to be drained and ventilated by being fixed in a "stand-off" position on vertical battens. Walls insulated with a min. 90mm thickness of Celotex or equivalent within the studwork voids and a further 25mm of Celotex on the inner face of the wall below the plasterboard lining.

Unventilated "warm-deck" roof over the new side- and rear single-storey extension consisting of Celotex TD4126 boards over firings over 50x200mm joists. All walls built up to underside of insulation to prevent thermal bridging. Roof-covering in GRP (fibreglass).

Approx. 5m-span 203x203x46 UC's (indicated by broken lines) are supported over the openings in the rear wall of the new extension by 152x152 UC's with welded bottom-plates to carry the outer blockwork leaf.

Tripled 75x220mm joists carried between 203x203x46 UC's supporting the rear dormer face and incoming floor- and roof-joists via Simpson Strong-Tie JHA450 or equivalent hangers.

100/100/100mm insulated and rendered new cavity walls.

All dpc's at least 150mm over ground level.

New Plastrain-type inspection chambers in the rear foul-water drain, the invert level of which is some 500-550mm deep.

New soil-pipe from new First-Floor and Ground-Floor WC/shower rooms passing to the existing rear foul-water drain beneath the Ground Floor. Pipework protected by a flexible jacket consisting of a min. 100mm-thick mineral wool quilt wrapping where it passes through the new foundations.

Thermally insulate uneven spaces within the roof apex with up to 300mm of Rockwool quilt, ensuring that the material does not obstruct ventilation pathways.

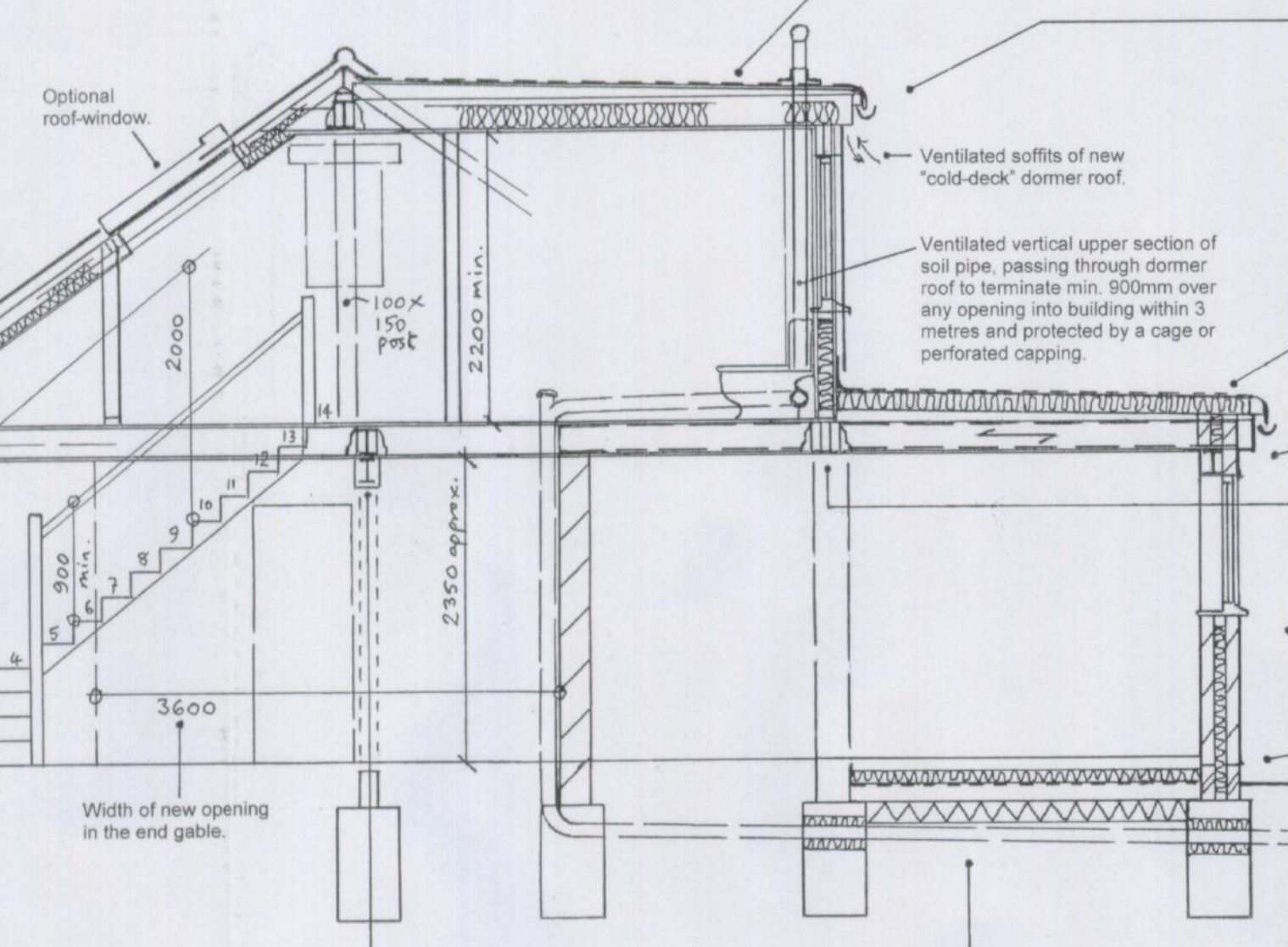
Pitched roofs insulated at rafter level which do not incorporate a "breather" membrane tile underlay need 50mm of Celotex or equivalent board insulation between the rafters - leaving a 50mm-deep air gap in the top half of the rafter depth - plus a further 75mm of the insulant across the underside of the rafters, to meet current Building Regulations insulation standard for roofs insulated at rafter level. The new plasterboard ceiling is attached to the rafters through this lower insulation layer with mechanical fixings of adequate length to achieve satisfactory penetration of the timbers.

Cross-ventilation of the roof-voids utilises the 50mm-deep inter-rafter spaces above the insulation (see above), which connect to the inter-joist spaces of the flat dormer roof. Where a supporting beam is present immediately beneath the ridge (as here), and thus blocks the cross-roof air passages, continuity of insulation will require the drilling of min. 25mm-diameter holes through the ridge-board.

A ventilated soffit, or tile-edge ventilation components, each providing equivalent to a 10mm continuous gap is required at the base of each insulated roof slope which has no breather membrane tile underlay.

** The existing original 152x114x30 RSJ over the front bay has been proved adequate to carry the proposed new roof- and floor loads that will result from a loft conversion with or without a front dormer.

New closed-string staircase consisting of 14 risers of approx. 185mm, with 220mm going; winders with min. 50mm going. Stairs at least 800mm wide between strings, with a clearance (headroom) of min. 2000mm off the stair pitch. Depth of both top and bottom landings min. 800mm. Open side of stairs guarded with a handrail min. 900mm off the stair pitch; gaps between any banisters not to exceed 100mm in width.



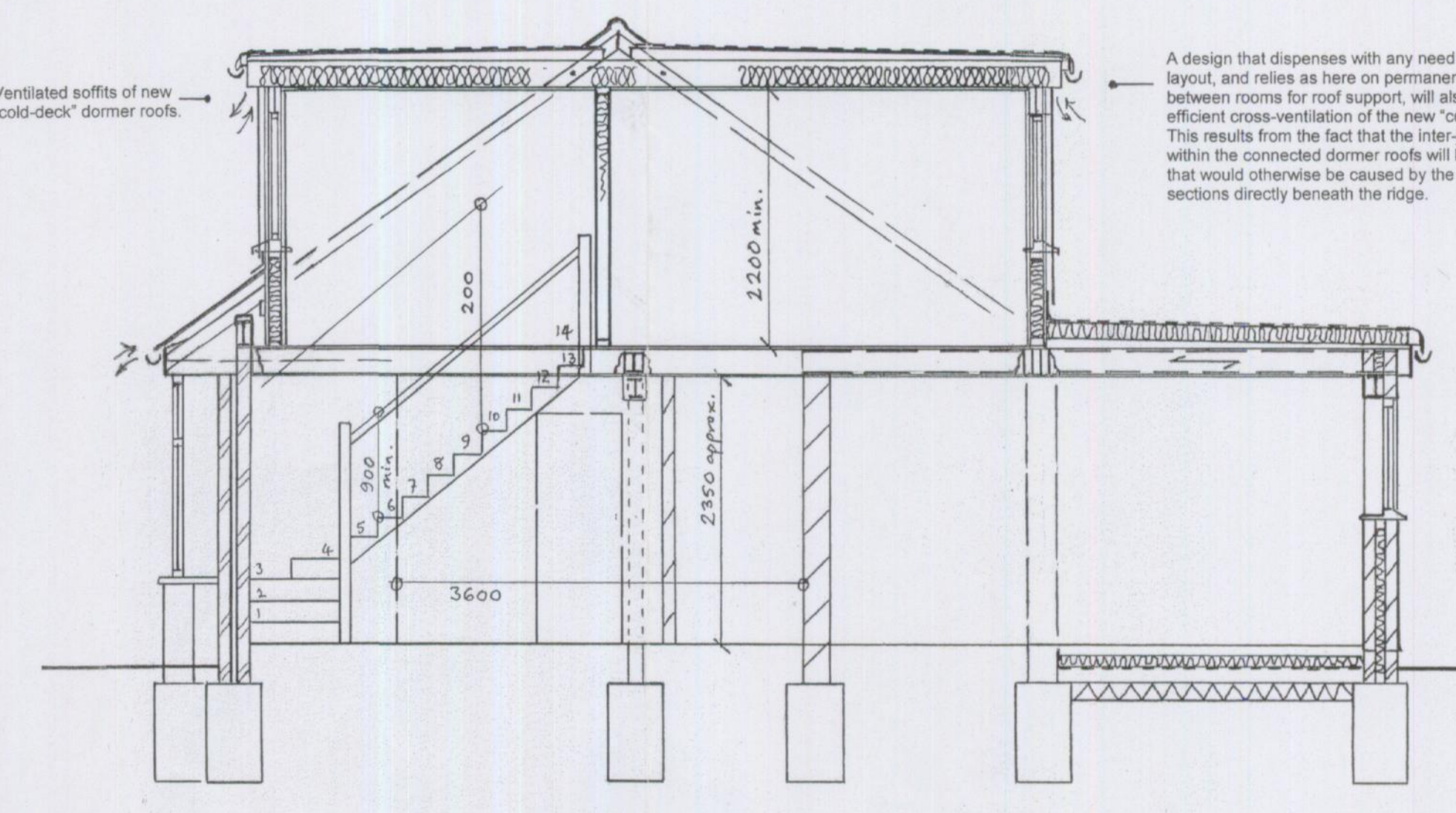
PROPOSED CROSS-SECTION

A: DORMER CONSTRUCTION USING HIGH-LEVEL RIDGE-SUPPORT BEAMS FOR DESIGN FLEXIBILITY. As shown in the structural calculations for Items 2 and 19 - the two high-level steel beam sections below the main ridge - these members are designed to carry the inner ends of the joists forming both the rear- and front dormer roofs, thus making it possible to change the First-Floor layout as required over time with non-loadbearing internal partitions alone, and with no need to make structural alterations for this purpose.

If the existing roof structure has been configured with such built-in flexibility as shown in the Section on the left, altering it to incorporate a new front dormer will be a comparatively simple matter of unbolting the front infill timbers (together with the stub roof-joists attached to them) from the outer web of each beam section, substituting new infill timbers to which hangers have been pre-fixed with both face- and top-nailing, and inserting and securing the inner ends of the new front dormer's roof-joists into these hangers to span the distance between the roof apex and the dormer face, which is to sit over the new First-Floor joists.

B: SIMPLIFYING THE MEANS OF SUPPORTING THE NEW DORMER ROOFS. However, if the clients should have decided that the flexibility described above is not required in the First-Floor layout, they are likely to have required a simpler support arrangement for the main roof apex and the inner ends of the rear dormer roof-joists that will avoid the need for high-level steel beams.

Such an arrangement is shown below in the form of a loadbearing timber studwork wall separating the new Bedrooms 1 and 2 and built off the new First Floor which, in combination with the 203x133x30 UB positioned within the depth of the new floor across the lounge, has been designed with the capacity to support all the new floor- and roof loads above it. The roof-joists of the rear dormer will also have been taken forward to be bolted to the front rafters as shown, where they will stiffen the roof apex and will in due course be lapped by, and bolted to, the front dormer's incoming roof-joists. Note that Item 36 in the accompanying structural calculations proves the adequacy of the new floor-joists (consisting of doubled 50x200mm C24-grade timbers at 400mm centres) comfortably to carry a roof-supporting studwork wall as much as 0.5m forward of the floor-supporting beam Item 6, thus allowing the new rear Bedroom 1 at the north end of the dwelling to be considerably deeper than its neighbour Bedroom 2. The fact that all First-Floor joists are of moderate or short span and thus have a high loading capacity indicates that the clients will have a considerable degree of choice as to where the new roof-supporting studwork wall sections will be built.



EXISTING FLOOR PLANS (1:50)

Set the rear dormer cheeks here approx. 250mm in from the centerline of the party wall.

Top-venting section of soil pipe, passing through dormer roof and terminating min. 300mm over top of windows.

Descending soil-pipe section.

Remove the existing chimney masonry here and make good the party wall. Note the heads for a thermal upgrade to the solid brick structure.

Proposed new partition over the foot of the stairs to carry the possible future dormer face here at rafter level and to preserve the generous headroom over the stairs.

Rear dormer cheek is to be set approx. 300mm in from the face of the end gable.

New underground 100mm-diameter foul-water drain serving ground- & first-floor WC/shower rooms.

Uninsulated masonry external walls.

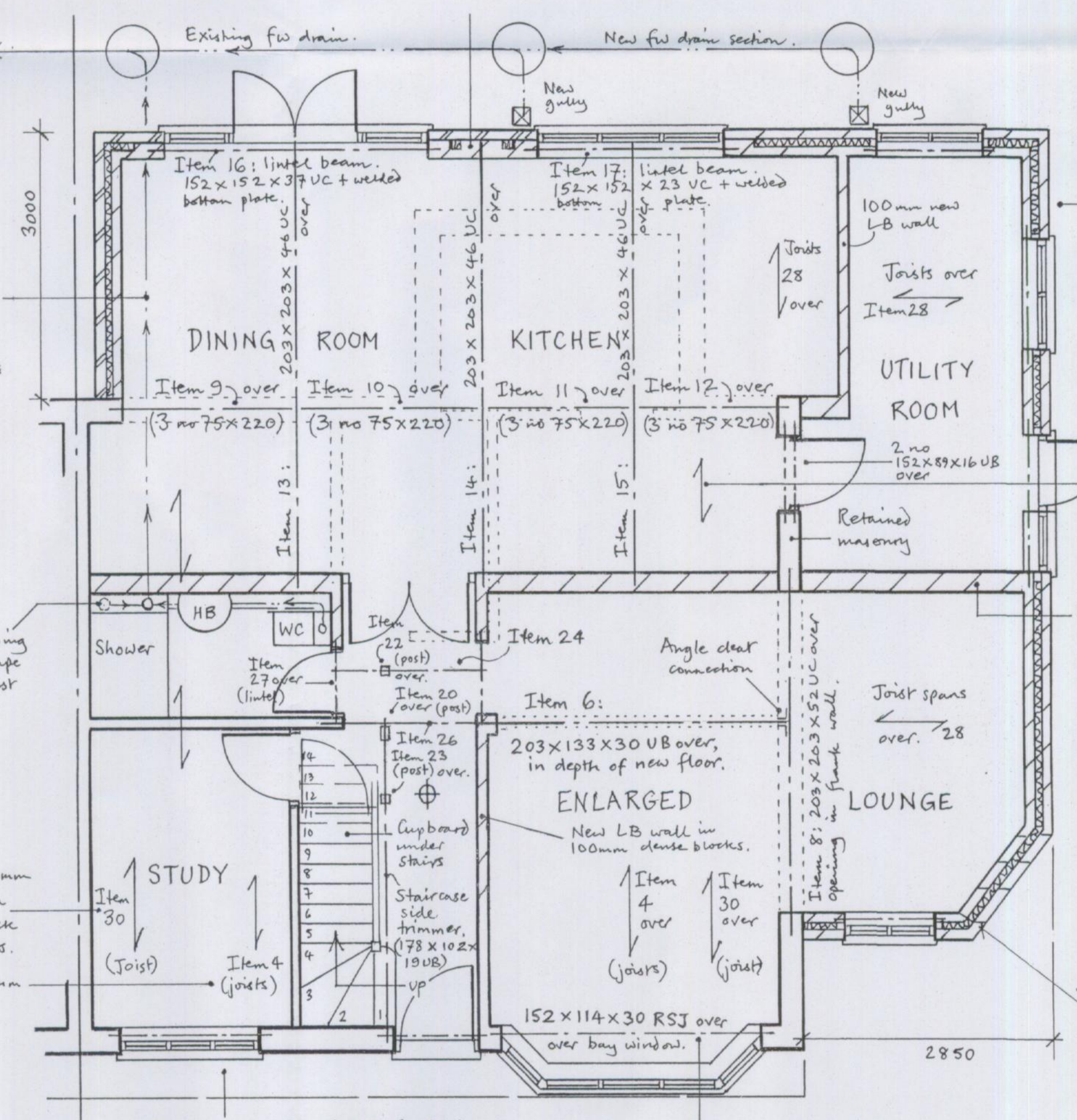
Thermally upgrade the external walls with Celotex PL4060 or an equivalent thermal composite board wherever these walls adjoin the new living-space.

Item 7: New lintel carrying the new ridge-beam over the existing gable window; see Item 7 in the structural calculations. * = If window is retained.

Item 30: Double 50x220mm C24-grade joists to carry a possible future dormer cheek together with doubled rafters.

Item 4: Double 50x220mm C24-grade joists to carry a possible future dormer face.

⊕ = Ceiling-mounted fire/smoke alarm.

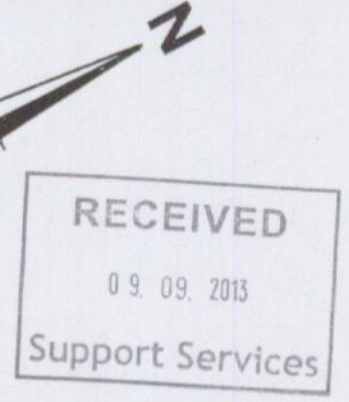


Form new external ground-floor external walls in 100/100/100mm rendered cavity blockwork. Different Cavity Slab 32 or equivalent 85mm thick to form cavity filling. See the full specification in the printed notes. Connect new walls to existing with Firfix stainless steel wall extension profiles.

Short 50x200mm C24 joists carried on Simpson JHA450 hangers off Items 9-12 here. Use single joists at 400 centres under dormer face, and double joists (and double rafters) beneath dormer cheeks.

New shaded internal loadbearing walls to be built in min. 100mm- and 200mm-thick dense aggregate blocks with a compressive strength of at least 7.3 N/mm² off foundations min. 1.0m deep or as otherwise agreed with the Building Inspector on site.

3m-wide drive access to be maintained here.



EXISTING FIRST FLOOR

EXISTING GROUND FLOOR

PLANNING & BUILDING REGULATIONS APPLICATION

Sheet 2 of 2

CLIENTS:
MR AND MRS DABBS,
15, HAINAULT AVENUE, ROCHFORD, ESSEX, SS4 1UH.

SITE LOCATION:
18, WOODVILLE CLOSE, ROCHFORD, ESSEX, SS4 1SN.

PROPOSALS:
CONSTRUCT A NEW FLAT-ROOFED FRONT DORMER AND A GABLED FRONT ENTRANCE PORCH.

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DRAWING NUMBER 13/0820: 2(2)

AUGUST 2013.

SHEET 2 OF 2: EXISTING FLOOR PLANS;
EXISTING AND PROPOSED CROSS-SECTIONS.