

Guidance on Timber Frame Walls

Introduction

There is often confusion between Fire Resistance and Reaction to Fire. Fire resistance is the measurement of the ability of a material or system to resist, and ideally prevent, the passage of fire from one distinct area to another. Reaction to fire is the measurement of how a material or system will contribute to the fire development and spread. While individual construction products used in Timber frame walls e.g. plasterboard, timber studs etc. will have a “Reaction to Fire” designation based on various tests¹ carried out, this does not mean that the wall has a fire resistance.

Timber frame walls should have a fire resistance appropriate to their use and must be considered against various criteria in relation to their fire resistance for standard fire exposure. These are:

R - mechanical resistance i.e. an ability to maintain loadbearing capacity;

E – integrity i.e. an ability to maintain the integrity,

I - insulation i.e. an ability to provide insulation from high temperatures.

Therefore the fire resistance of any such walls is a result of the combination of the materials used, including their thickness, spacing and fixing of those materials, together with the workmanship employed during assembly. The fire resistance of such walls must be determined by fire tests to the relevant European standards by an accredited laboratory.

Fire Safety issue.

External walls are being designed to achieve lower U-values and give greater air tightness than previous practice. This has resulted in some timber frame walls being constructed using internal insulation or in some cases thicker studs with service voids with or without internal insulation.

¹ I.S. EN ISO 1182:2010 Reaction to fire tests for building products - Non-combustibility test.

I.S. EN ISO 1716:2010 Reaction to fire tests for building products - Determination of the gross calorific value.

I.S. EN 13823:2010 Reaction to fire tests for building products - Building products excluding floorings exposed to the thermal attack by a single burning item.

I.S. EN ISO 11925-2:2010 Reaction to fire tests for building Products, Part 2 - Ignitability when subjected to direct impingement of a flame.

In constructions where the internal plasterboard slabs are not fixed directly to the timber frame stud, i.e. where insulation is fitted on the face of the stud, then the construction is not in compliance with I.S. 440:2009 Timber Frame Construction, Dwellings and Other Buildings and cannot be assumed as having a given fire resistance.

Fire tests on generic external and separating (party) wall constructions were commissioned by the Timber Frame Industry in conjunction with the Irish Timber Frame Manufacturers Association (ITFMA) and the fire tests conducted in accredited laboratories in accordance with the appropriate European Test method for load bearing walls².

Constructions which met a fire resistance for external walls of REI 30³ and a separating (party) wall of REI 60⁴ by fire test are detailed below.

It should be noted that in the case of all separating walls the build-up including linings must be carried out in the factory. Jointing strips may be fixed on site where butt joints (Horizontal or vertical) occur.

Walls constructed in the manner shown below must be in accordance with the structural engineer's design and timber frame manufacturer's specifications. It should be noted that the thickness of the structural components may be increased but not decreased. Insulation thickness may vary but the maximum thickness of the continuous insulation should not exceed 50mm.

² The loads used for the test were 7KN per stud where 89mm studs were used and 11KN per stud where 138mm studs were used.

³ See appendix A of TGD B fire Safety Volume 2 Dwelling Houses

⁴ See appendix A of TGD B fire Safety Volume 2 Dwelling Houses

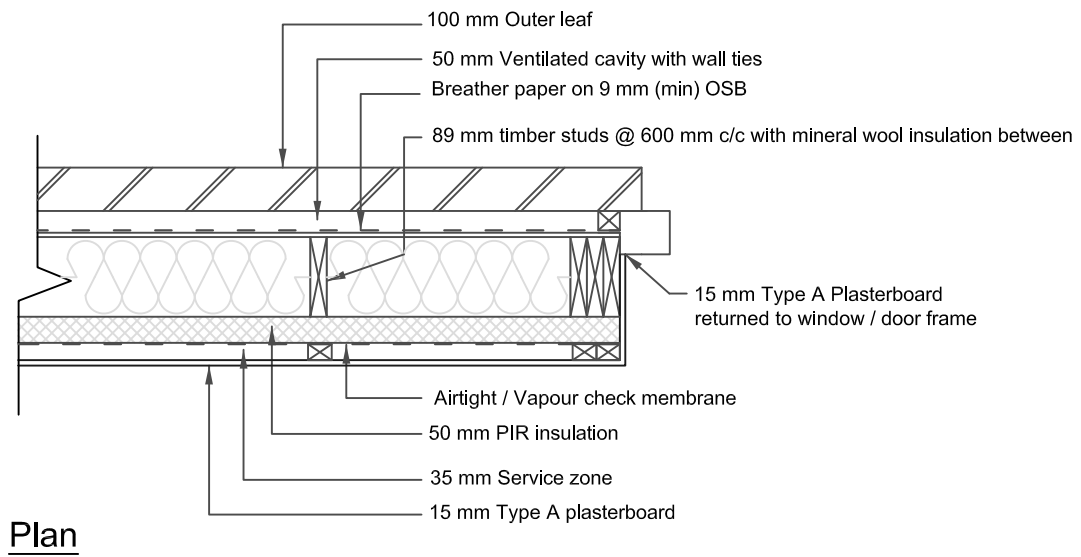


Figure 1 Wall Type 1 (WT1) - Service Cavity Wall

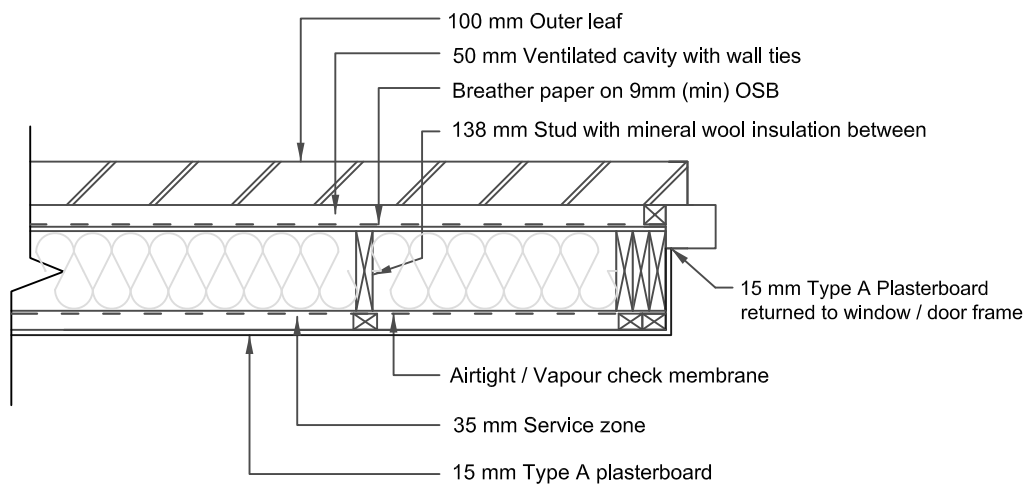
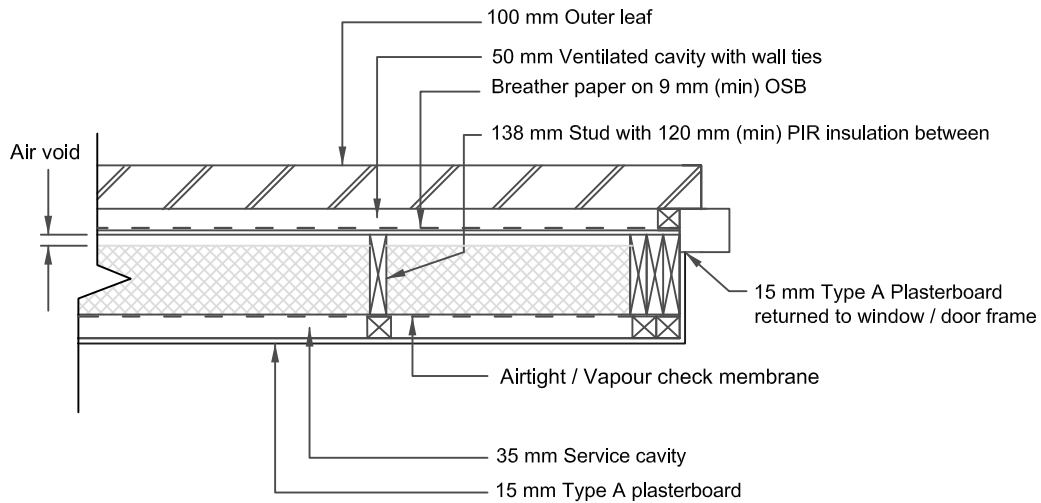
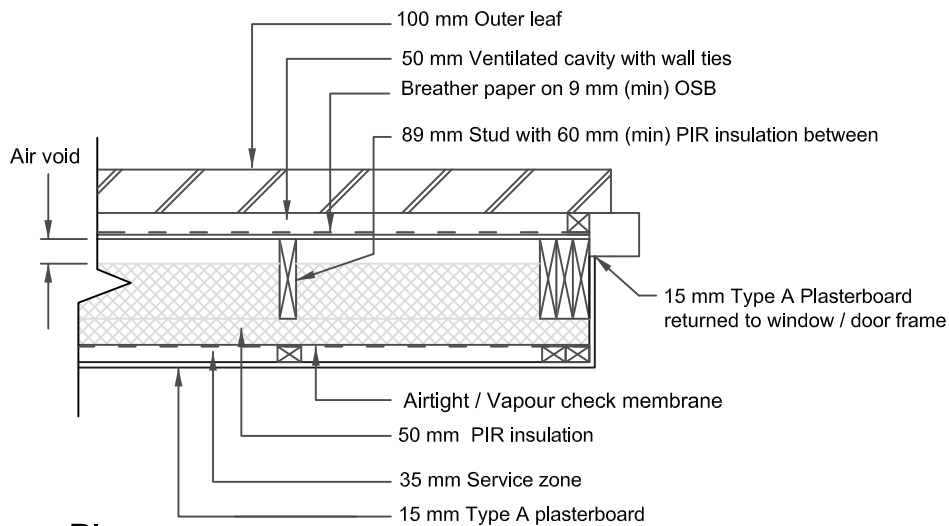


Figure 2 Wall Type 2 (WT2) - Service Cavity Wall



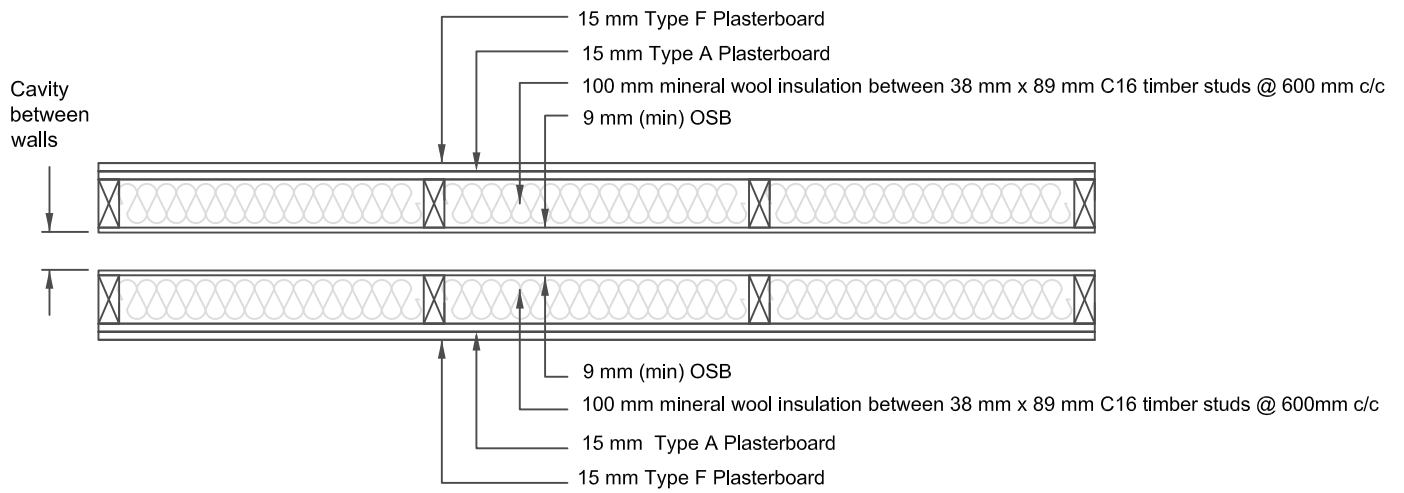
Plan

Figure 3 Wall Type 3 (WT3) - Service Cavity Wall



Plan

Figure 4 Wall Type 4 (WT4) - Service Cavity Wall



Plan

Figure 5 Separating Wall Type 1 (SWT1)

NOT TO SCALE