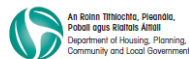


B

Fire Safety
Volume 2
Dwelling Houses

Building
Regulations
2017

Technical
Guidance
Document



Fire Resistance Guidance

By Eamonn Smyth
Advisor
Building Standards Section



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Building Regulations – Current Status

- **Part A** – Structure (2012)
- **Part B** - Fire Safety (2017)
- **Part C** - Site Preparation and Moisture Resistance (2018)
- **Part D** – Materials & Workmanship (2013)
- **Part E** – Sound (2014)
- **Part F** - Ventilation (2009)
- **Part G** – Hygiene (2011)
- **Part H** - Drainage, Waste Water Disposal (2010) **Amendment 2016**
- **Part J** - Heat Producing Appliances (2014)
- **Part K** - Stairways, Ladders, Ramps & Guards (2014)
- **Part L** - Conservation of Fuel & Energy (2018)
- **Part M** - Access & Use (2010)



TGD B Main Changes

Appendix A Performance of Materials and Structures

- A 21 Structural fire design- additional Reference to **Eurocodes and Fire Parts of Structural Eurocodes**
- Application of EU Test methods-design to Eurocodes(TGD Part A Structure -2012)
- Application BS 476-existing buildings

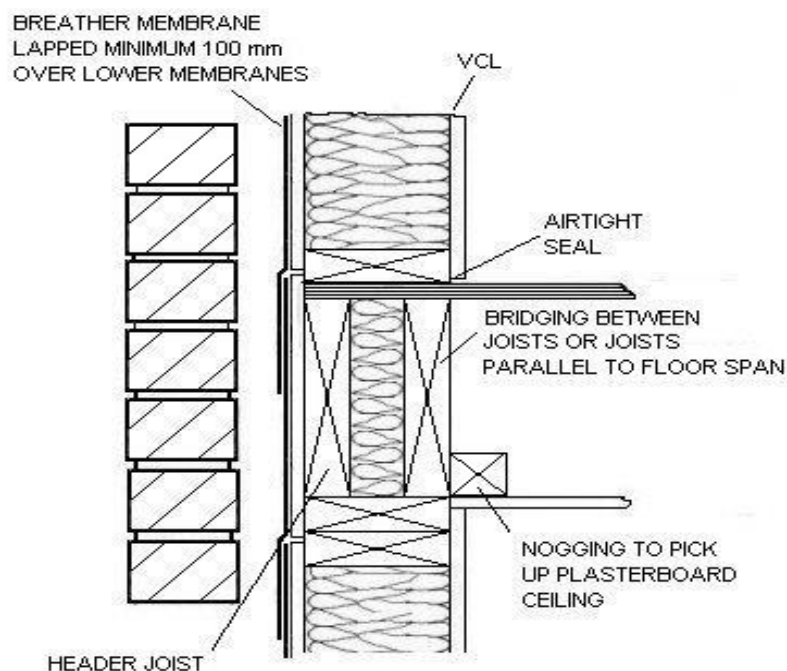


Dept. Concerns

- External walls/loadbearing walls fire resistance
- Party walls in Timber frame
- Flooring types now being used and their fire resistance
ie Engineered joists
- Penetrations of the fire resistant layer
- Trusses requiring fire resistance from the underside



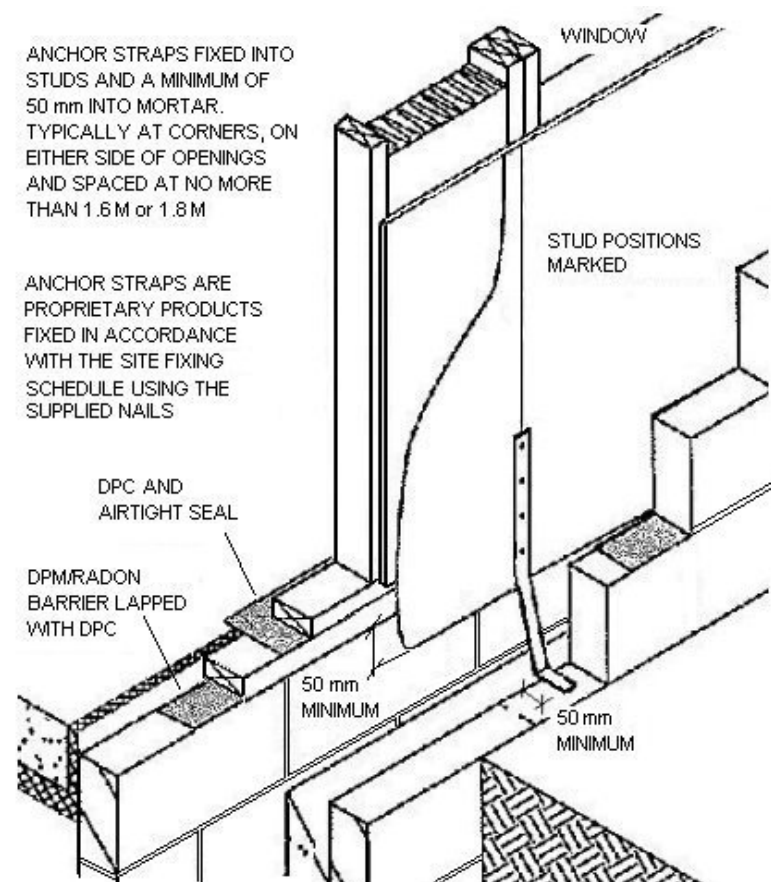
Current IS 440 walls



CHECK ON SITE CONSTRUCTION DETAILS FOR AIRTIGHT SEALS AND VAPOUR CONTROL LAYERS

ANCHOR STRAPS FIXED INTO STUDS AND A MINIMUM OF 50 mm INTO MORTAR. TYPICALLY AT CORNERS, ON EITHER SIDE OF OPENINGS AND SPACED AT NO MORE THAN 1.6 M OR 1.8 M

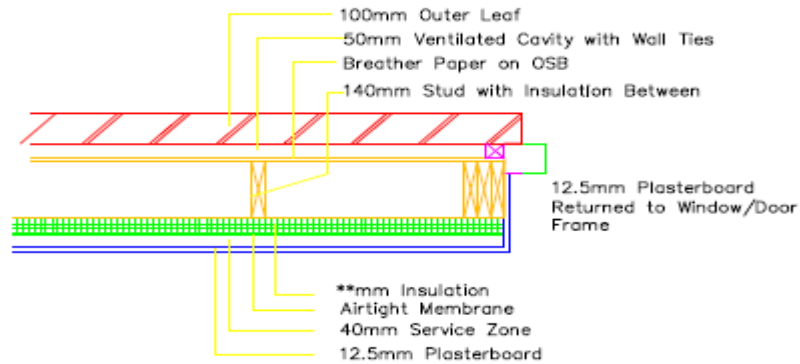
ANCHOR STRAPS ARE PROPRIETARY PRODUCTS FIXED IN ACCORDANCE WITH THE SITE FIXING SCHEDULE USING THE SUPPLIED NAILS



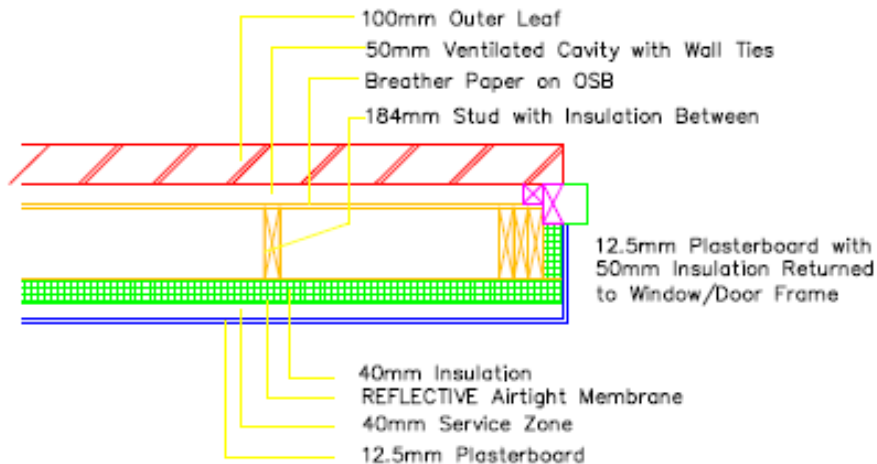
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New verses old wall types

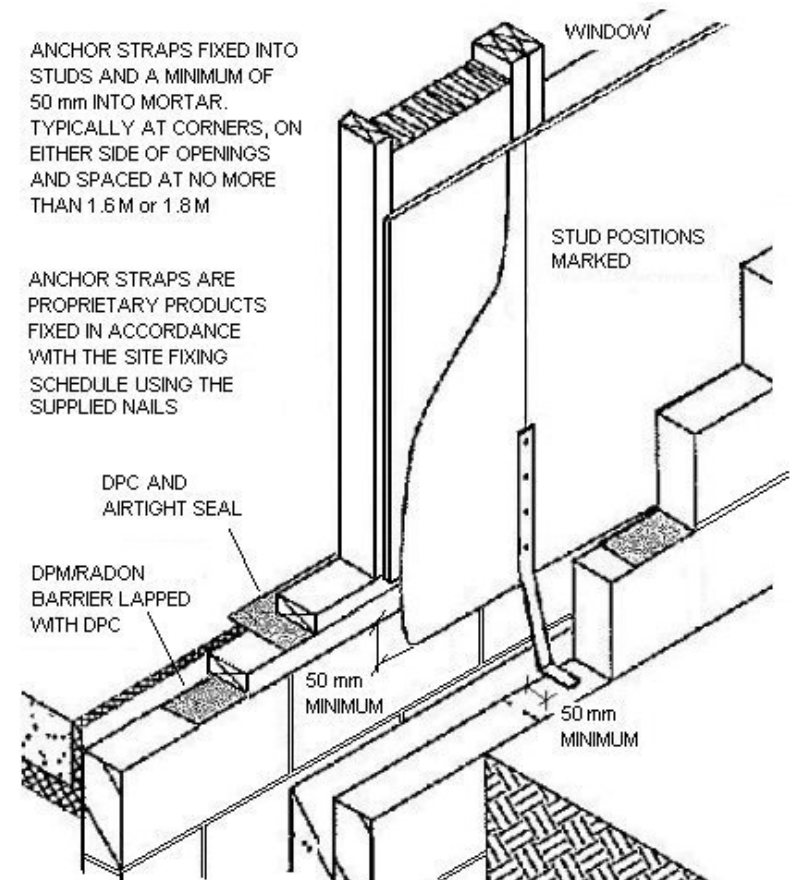


WT1



ANCHOR STRAPS FIXED INTO STUDS AND A MINIMUM OF 50 mm INTO MORTAR. TYPICALLY AT CORNERS, ON EITHER SIDE OF OPENINGS AND SPACED AT NO MORE THAN 1.6 M or 1.8 M

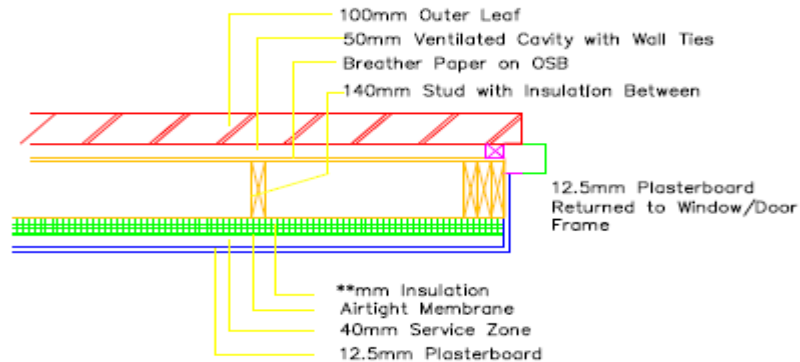
ANCHOR STRAPS ARE PROPRIETARY PRODUCTS FIXED IN ACCORDANCE WITH THE SITE FIXING SCHEDULE USING THE SUPPLIED NAILS



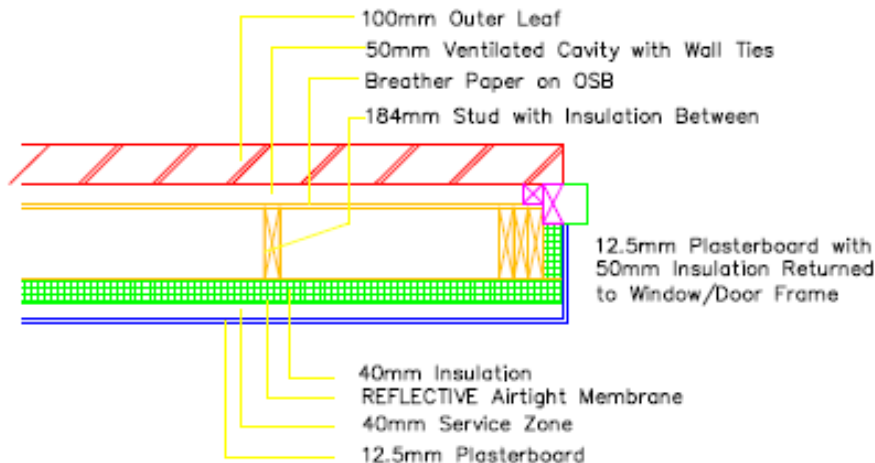
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Fire Requirement for loadbearing walls



WT1



3.4.2 Fire Resistance Standard

Structural frames, beams, columns, **loadbearing walls (internal and external), floor structures**, should have at least the fire resistance given in Appendix A, Table A1



Fire Test Chamber

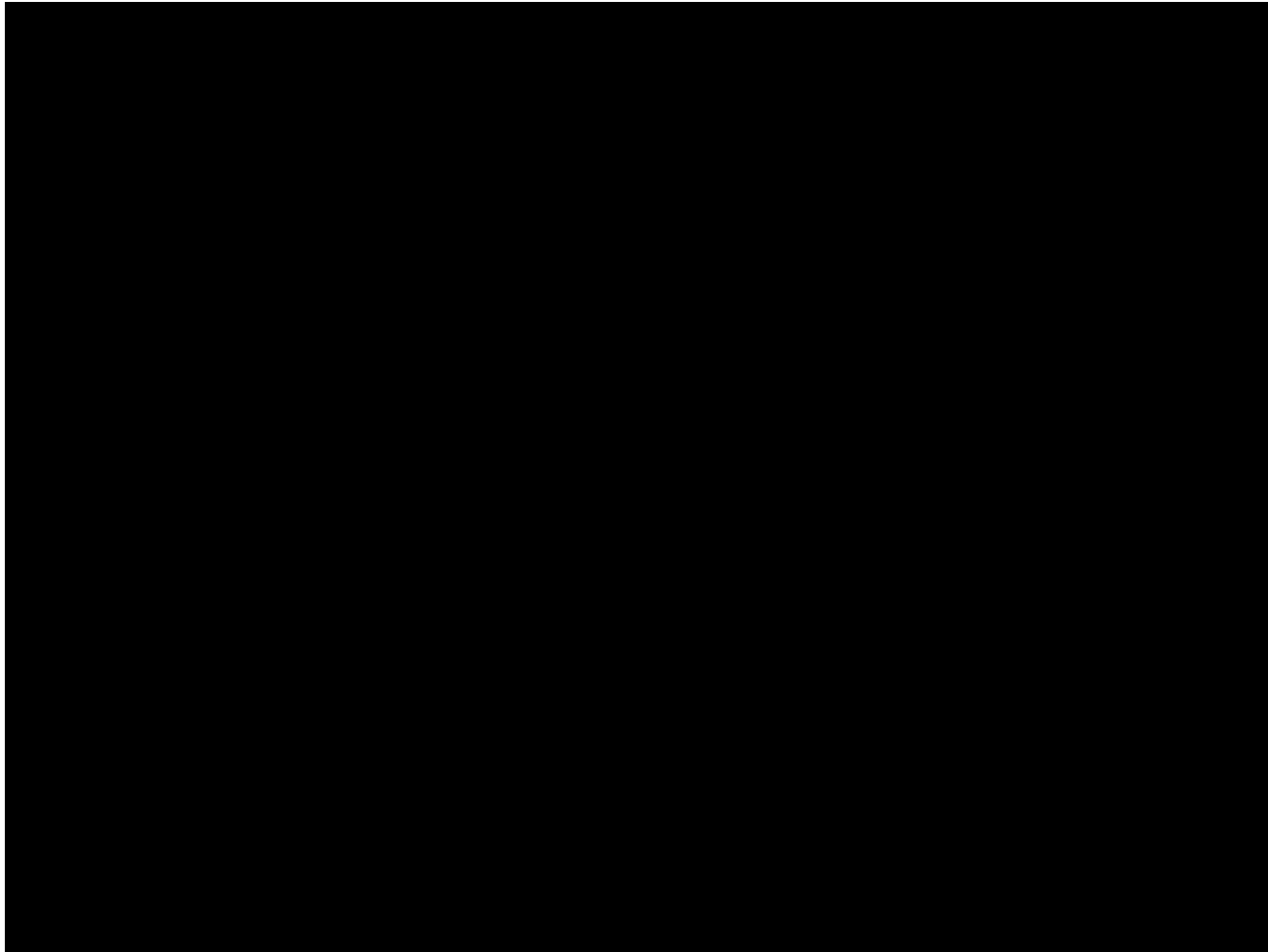
Thermocouples in Chamber



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External wall just after fire test



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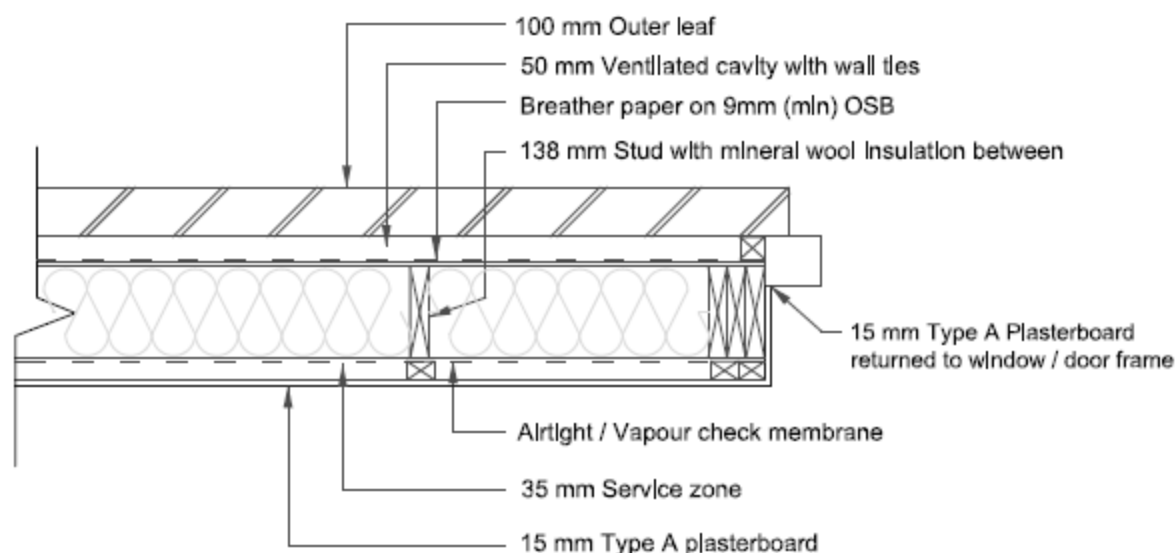
External wall after fire test



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External Wall 30 Min. Fire Resistance



Plan

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



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External Wall 30 Min. Fire Resistance

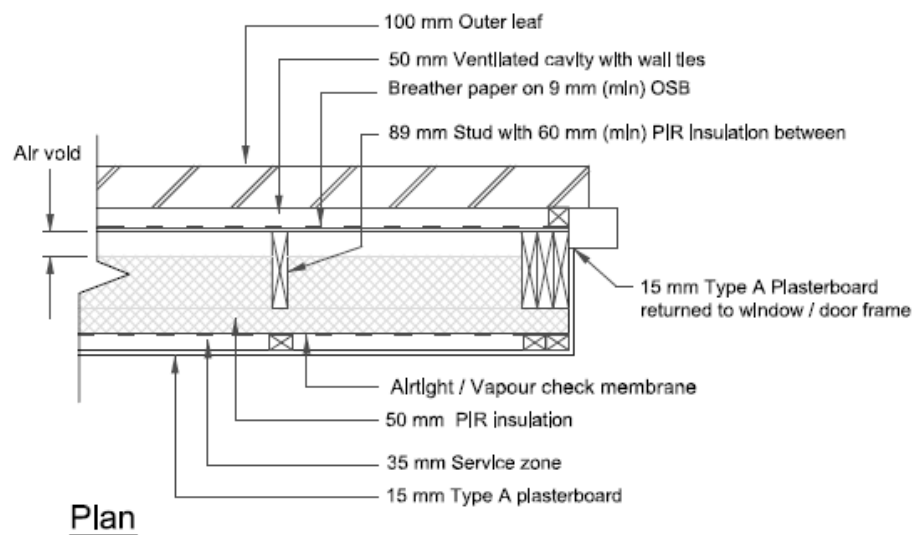


Figure 4 Wall Type 4 (WT4) - Service Cavity Wall



Hot News External wall 30 Min. Fire Resistance

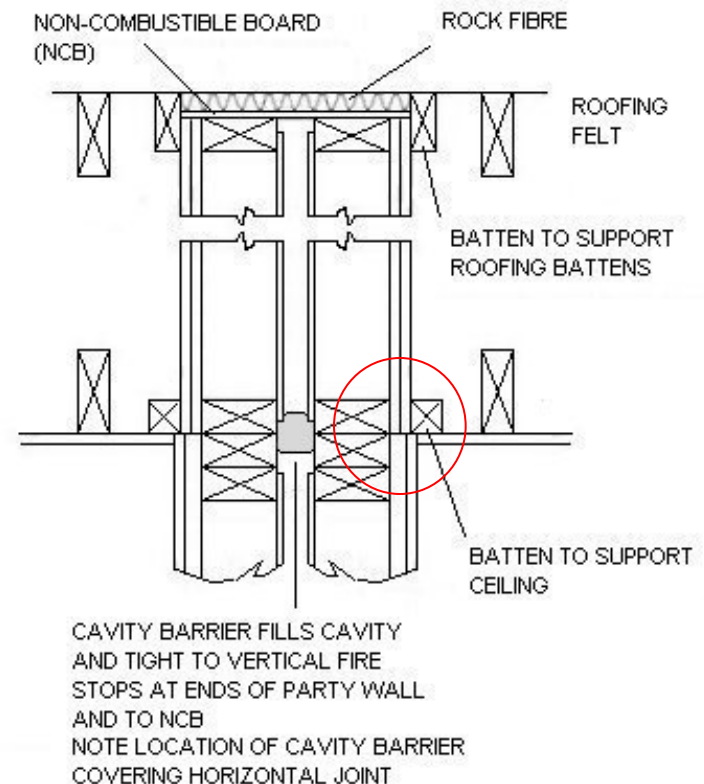
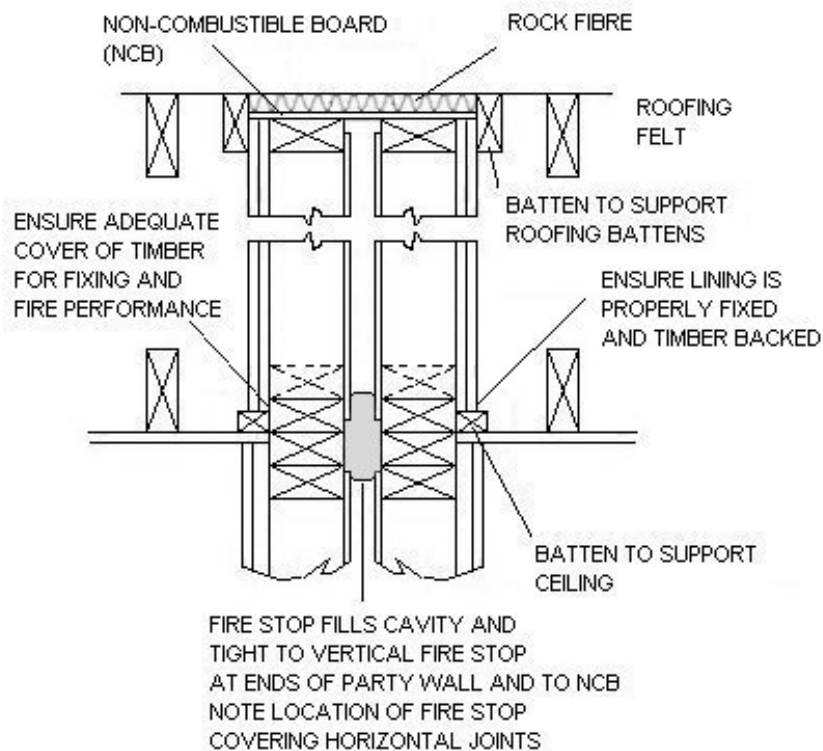
- New Fire tests since the release of the Guidance
- Wall Types WT 2 & WT4 tested with 12.5mm Type F board.
- Both lasted substantially longer than 30 minutes.
- 12.5mm Type F (Fire line board) can be used in place of 15mm Type A plasterboard on these constructions.



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IS 440 Party Wall



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Separating (Party) Wall

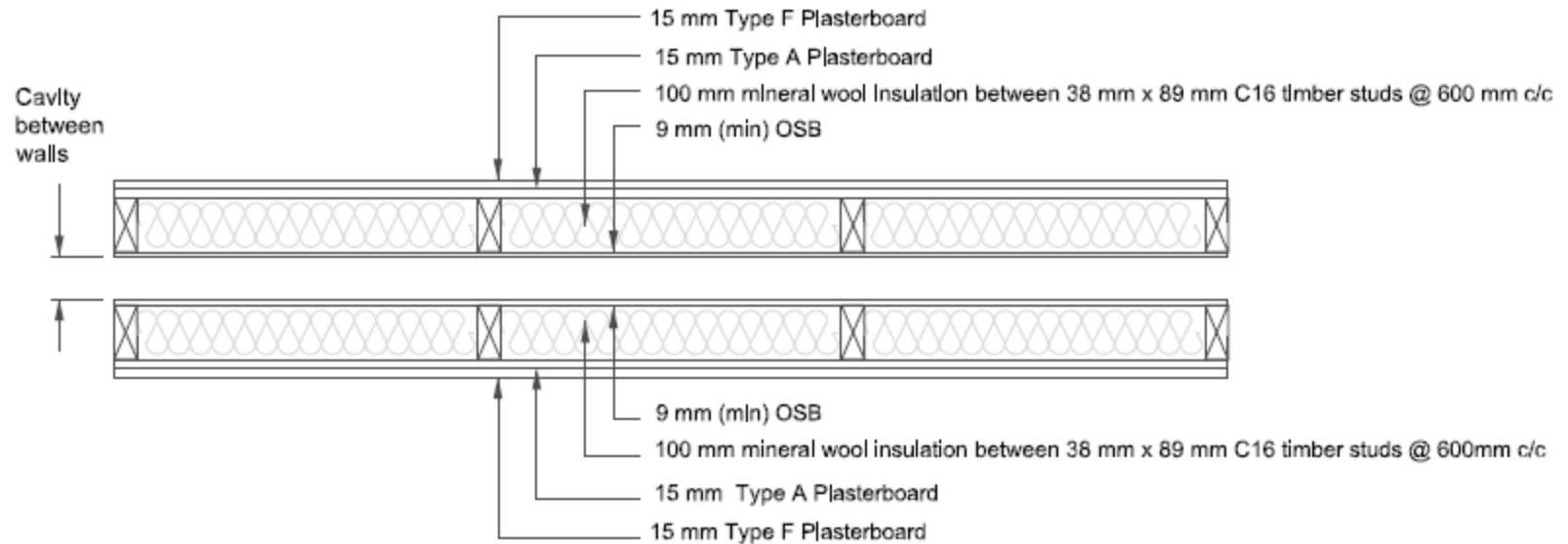
- Integrity of wall just being breached
- Note jacks underneath loading studs
- 15mm Type F facing board
- 15mm Type A behind
- Both fixed directly to studs with screws or staples
- 9mm OSB racking board.
- Fibreglass between studs.



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Separating Wall 60 Min. Fire resistance



Plan

Figure 5 Separating Wall Type 1 (SWT1)

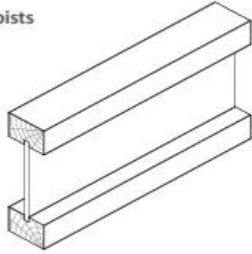


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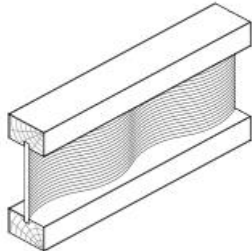


Examples of forms of modern engineered construction covered by this Guide.

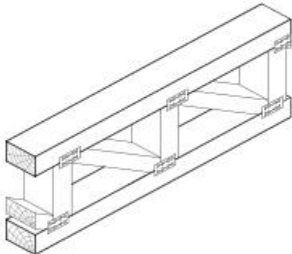
Floor Joists



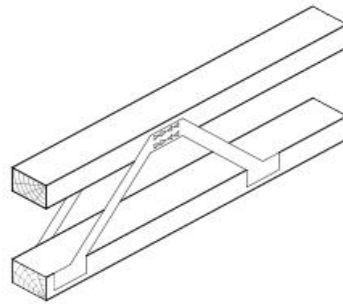
Timber 'I' beams; consisting of Orientated Strand Board (OSB) or plywood webs with solid timber top and bottom chords.



Steel webbed, timber 'I' beams; consisting of corrugated steel webs with timber top and bottom chords

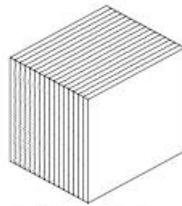


Punched metal plate connected 'truss' joists

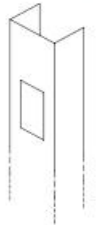


Space joists; consisting of timber top and bottom chords spaced apart by pressed steel 'boomerangs' Narrow stress graded softwood joints (less than 38mm)

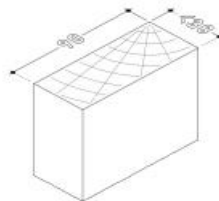
Studs



Glue laminated 'timber' studs



Steel 'C' studs



Narrow stress graded softwood studs (less than 38 mm)

Engineered Joists

IS 440 8.8.3 States

“These joists usually have specific ceiling constructions for fire resistance (different to those for solid joists) and the designer's recommendations (or those in this Standard if they are more onerous) in these areas shall be followed.”



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Engineered Joists



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Engineered Joists

- 15mm Type A plasterboard
- Metal web joists @400mm centres
- Noggins at edge
- Flooring over
- Loaded for dwelling



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Engineered Joists



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Floor Fire Test



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Floor Fire Test



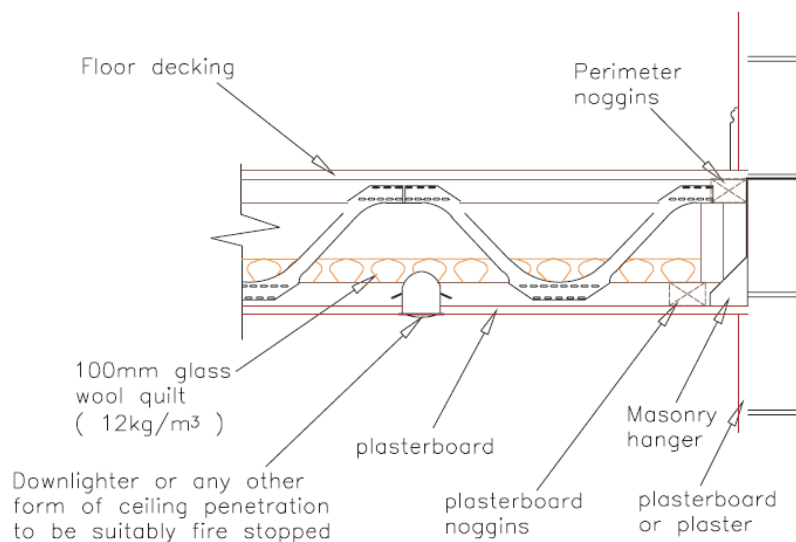
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Engineered Joists

30 minutes fire resistance:
No apertures (downlighters, service penetrations etc.) should be present except where fitted with an **approved light fitting** or an appropriate proven penetration sealing system.



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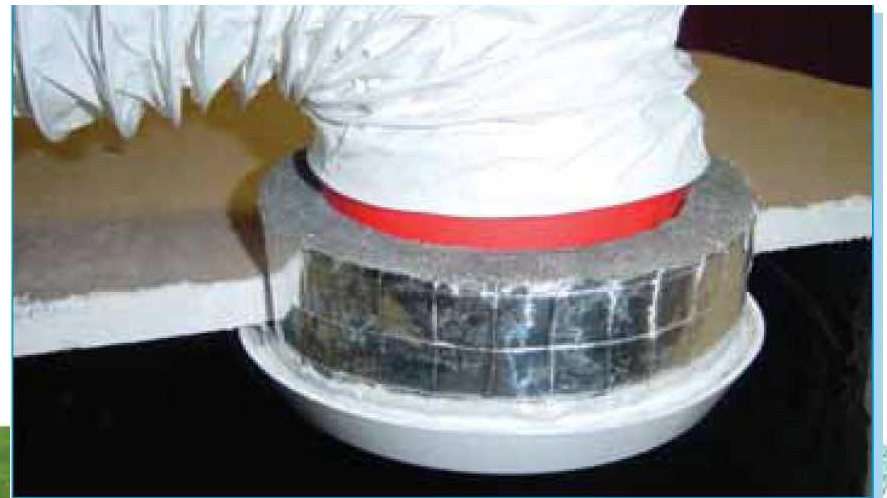
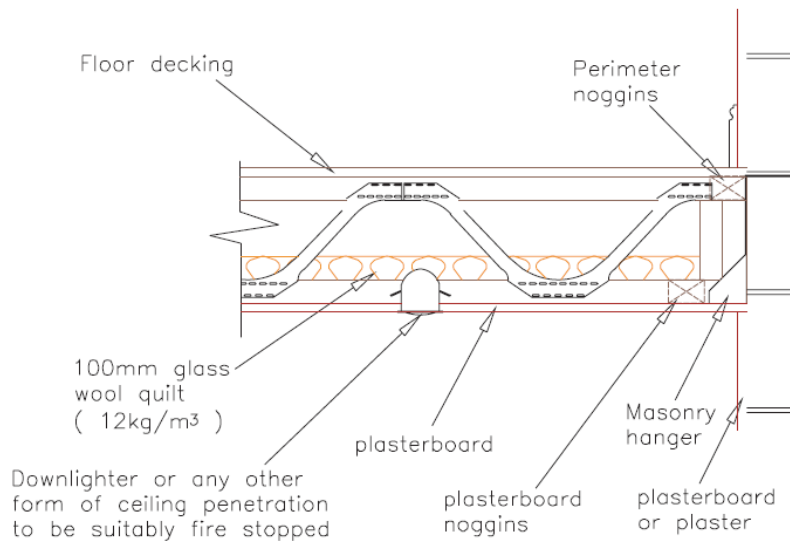




Engineered Joists

30 minutes fire resistance:

No apertures (downlighters, service penetrations etc.) should be present except where fitted with an approved light fitting or an appropriate proven penetration sealing system.





Engineered Joists

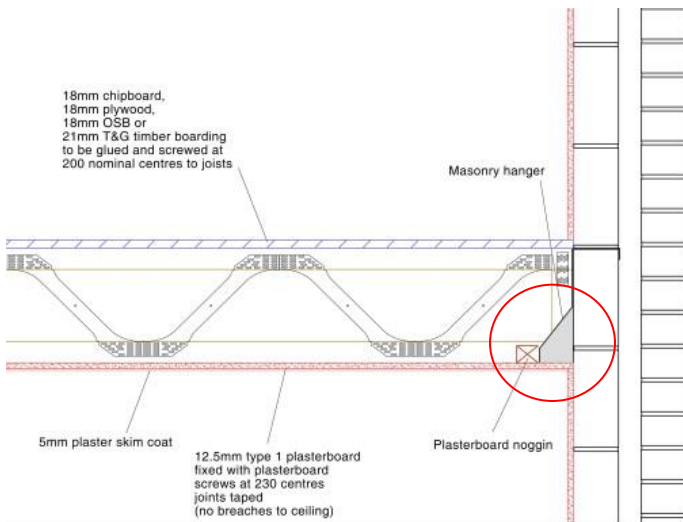


Fire Rated Ceiling Air Valve installed before a fire



Fire Rated Ceiling Air Valve sealed after a fire

30 minutes fire resistance:
Only openings fitted with an approved light fitting or an appropriate proven penetration system are satisfactory. No other openings are permitted.



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Hot News Internal wall 30 Min. Fire Resistance to EN 1365

- Load bearing
Timber stud
- 12.5mm Type A
plasterboard both
sides
- Meets 30 Minutes
requirement.
- Also achieved 30
Min. with 9mm OSB
as racking board

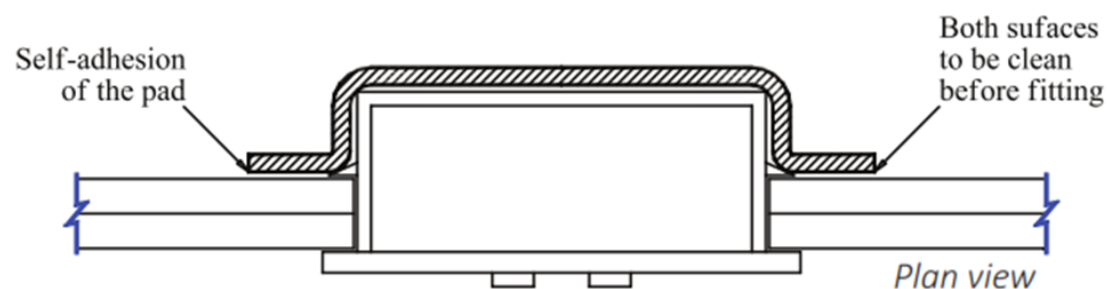


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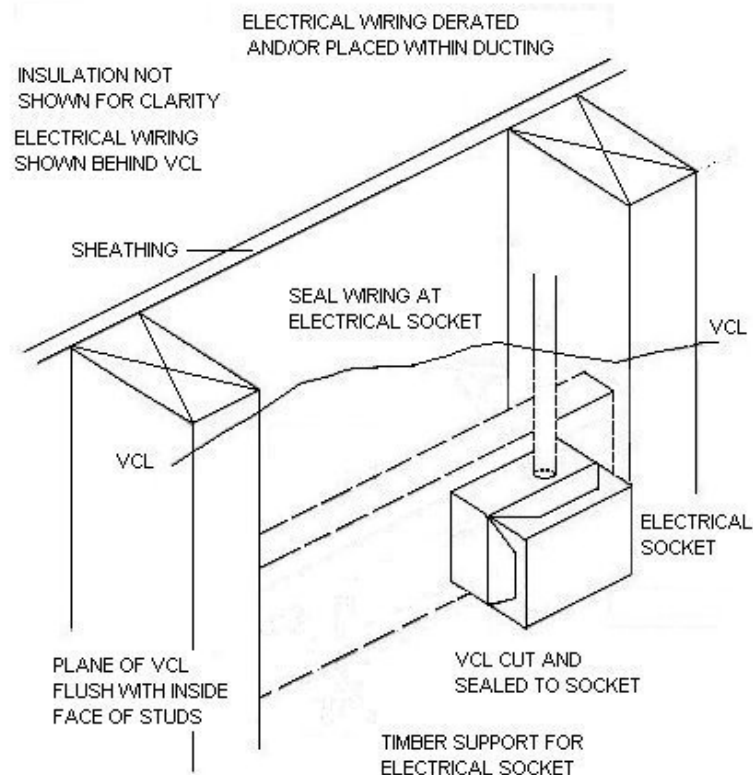




IS 440 Detail



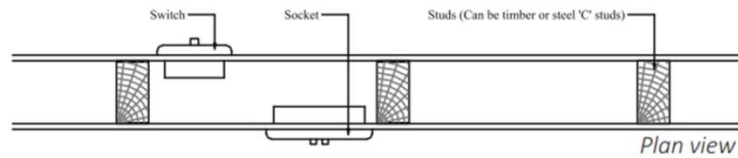
Fire protection pad fitted externally



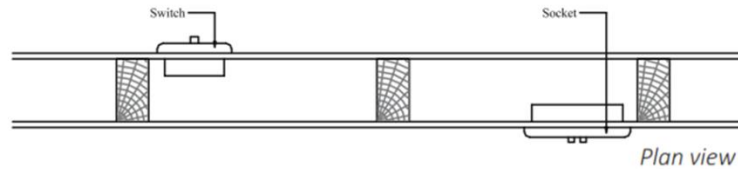
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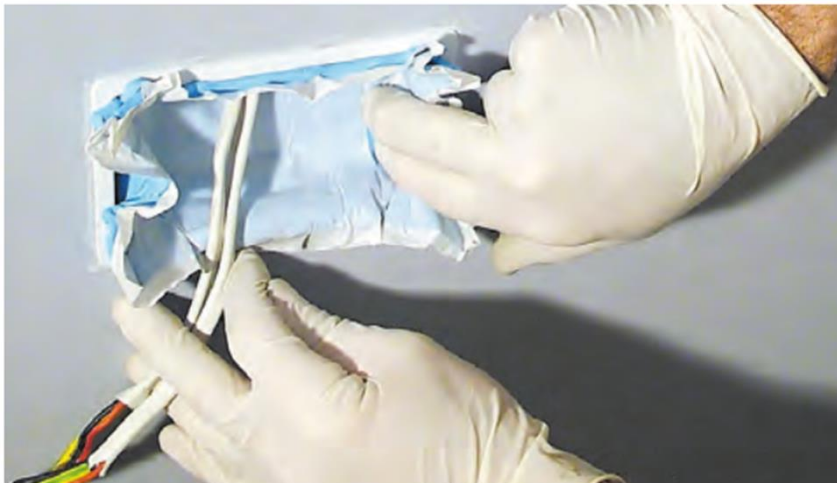
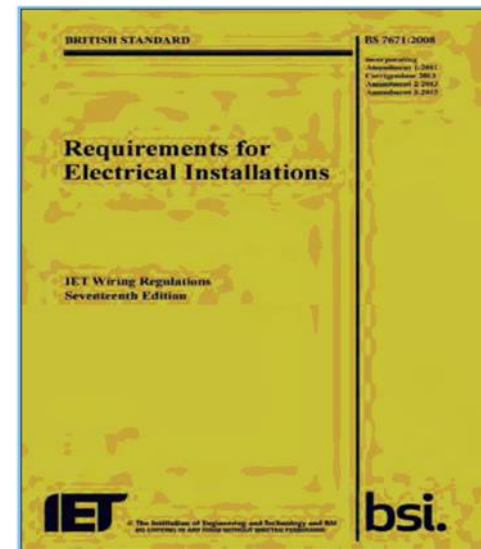
Penetrations in fire resisting construction



Example of accessories being back-to-back in the same cavity space (can be at different heights)



Example of accessories not being back-to-back in the same cavity



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Fire putty to fire stop socket



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Back to Back penetrations
in stud partition



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Truss roofs requiring 30 min. ceiling

- 15mm type F plasterboard.
- On 47mm thick trusses at 600mm centres.
- Board joints nogged with 35x70mm @ 1200mm centres
- With insulation over



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Truss roofs requiring 30 min. ceiling



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Truss roofs requiring 30 min. ceiling

- Roof Loading
- service loading



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Truss roofs requiring 30 min. ceiling



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Joint with Gang nail plate after fire



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Thank You for your attention !



GENERAL ENQUIRIES

- [*www.housing.gov.ie/housing/building-standards/building-standard*](http://www.housing.gov.ie/housing/building-standards/building-standard)
- buildingstandards@housing.gov.ie



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