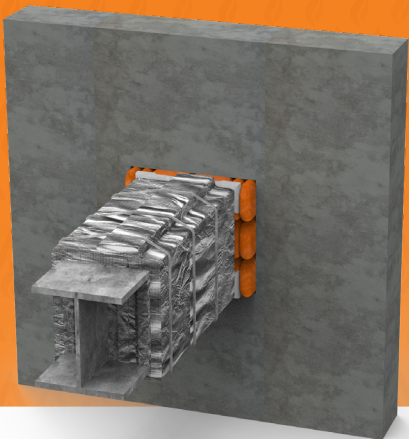


STEEL PURLINS and Beams Penetrations Application Manual



Steel beams and purlins that penetrate through a fire rated barrier will cause issues associated with the FRL of the wall, which could lead to failure of the fire compartmentalization in the building.

This manual covers Trafalgar’s range of steel beam and purlin penetration systems through different types of fire-rated walls that are approved to maintain the Fire Resistance Level (FRL).



KEY FEATURES



- Flexible penetration seal caters for movement of steel members
- Insulation/coatback with by either TWRAP or Trafalgar Corex
- Approved to AS 1530.4-2014

APPLICATIONS



- Hollow and open web steel sections
- Penetrations approved through:
 - ◊ Fire rated plasterboard walls
 - ◊ 78mm Speedpanel walls
 - ◊ 75mm Hebel walls
 - ◊ Concrete and masonry walls
- Up to 2 hour FRL’s
- Head of wall penetrations

SYSTEMS



- FyreBATT**
- FyreFLEX**
- FyrePLUG**
- TWRAP**
- TRAFALGAR coreX**

TRADES



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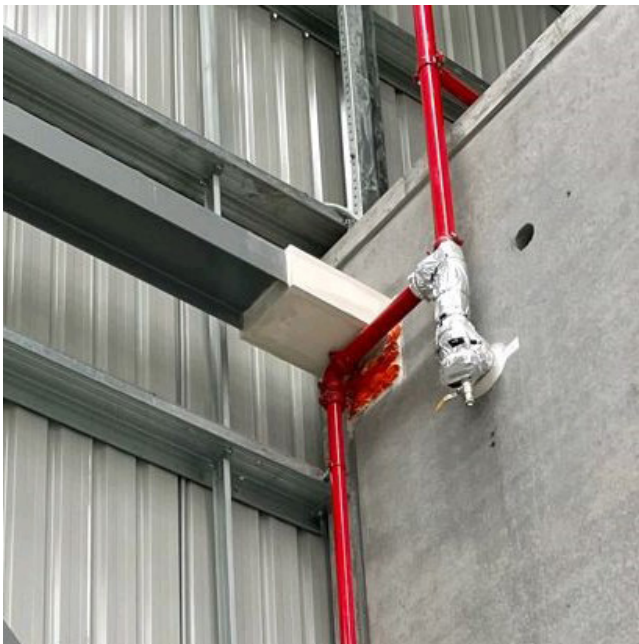
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APPLICATIONS EXPANDED

Just like any pipe or cable penetration through a fire barrier, it is also common to see steel beams and purlins penetrating through fire rated barriers to support and brace other parts of the structure. And just like any other opening in a fire rated wall, the requirements to correctly seal any barrier penetration for this application would still apply and cannot be left unnoticed.

In order to comply with building code (NCC), we have to achieve the required FRL (both integrity and insulation) to maintain the fire rating of the fire wall with a system that has been tested or assessed to AS1530.4:2014.

It is also important to note that a gap is required in between the steel member and the aperture to allow for any form of movement or thermal expansion of the steel member as it bows/flexes during its life and under fire conditions, otherwise the heavy steel can compromise the fire wall it passes through! This also means that any penetration system used to seal the steel must be capable of withstanding this movement, which is why Trafalgar recommend the use of FyrePLUG Pillows, or FyreBATTs to plug the gaps between the steel and the wall.



APPROVED STEEL SECTIONS



Various thicknesses of the steel plate have been tested to represent real fire scenarios with common steel sections in the market ranging from thin steel purlins to large I-beams and hollow sections.

Please note that a minimum of 20mm gap all around the penetrated steel and aperture must be maintained in order to prevent any damage to the fire barrier caused by steel deflection. FyrePLUG Pillows or FyreBATTs are a good choice to fill these gaps and allow for flexibility, and so have been approved for this application packed tightly in around the annular gaps of the penetration.

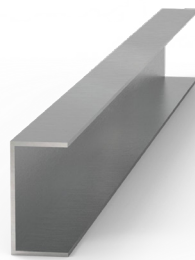
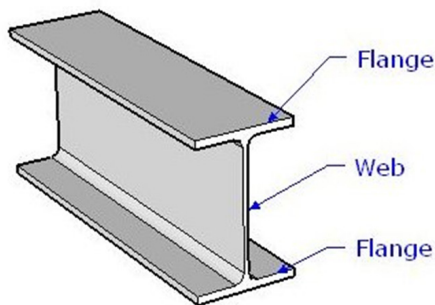


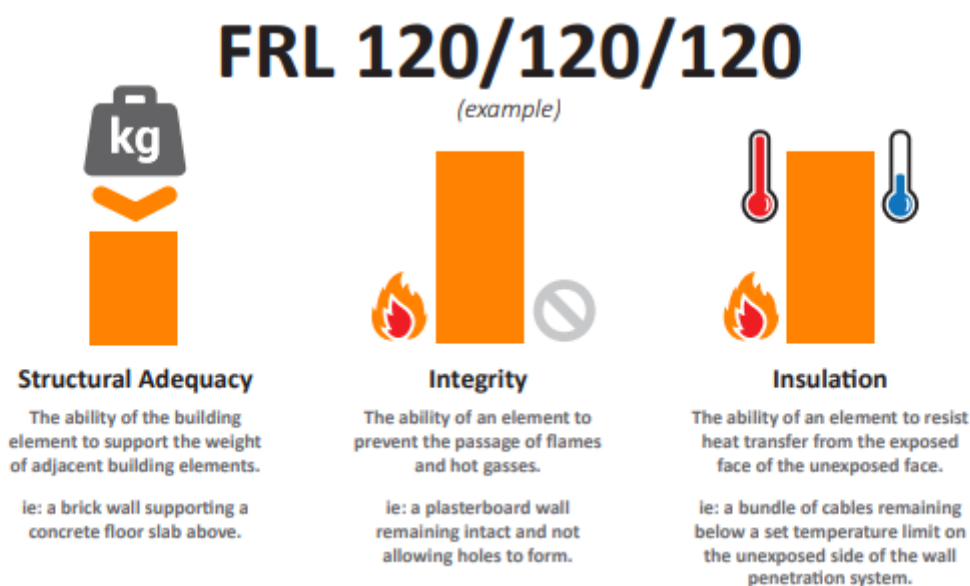
Figure 1- Typical examples of common steel sections covered

To address any heat transfer through the penetration during a fire (insulation performance) the steel can be wrapped with TWrap or encased with Corex board for 500mm on both sides of the wall. All gaps at the end of open web steel (like I-beams) should be sealed up appropriately to prevent combustible materials from building up inside the web.

FRL DETAILS

FIRE RATING – HOW IS FIRE PERFORMANCE MEASURED?

An FRL (fire resistance level) is a handy way of summarising the performance of a building element. It consists of 3 numbers, all given in minutes:



Note: Penetrations are not required to have a Structural Adequacy rating and is usually expressed as a dash. For example, a penetration through a 2 hour load bearing wall would be written as -/120/120.

INTEGRITY

The FyrePLUG™ and FyreBATT system will achieve the integrity performance for up to 2 hours physically stopping the direct spread of fire, however the insulation performance of the penetration will be limited to the type of wall being used and conductivity of the services in the penetration.

INSULATION (TEMPERATURE RISE)

Heat transfer via conduction (or heat rise) will occur through the conductive parts of any penetration system. To limit the heat rise through the FyreFLEX™ sealant, our 25mm thick TWRAP™ foil encased blanket can be wrapped around the services to achieve up to 2 hours of insulation performance. There are some applications that can be replaced with Trafalgar COREX Board to achieve the full FRL, please refer to the tables below for specific details.

APPROVED WALL SYSTEMS

FRL of steel sections penetrating protected with TWRAP or Corex

Fire Barrier	Max Penetration Size	Minimum Annular Gap between Steel and Wall	Local Fire Stopping	Heat transfer protection	Maximum FRL
2 hour Plasterboard Wall (min 116mm thick)*	Up to 550x550mm OR 1000x300mm	20mm	FyrePLUG Pillows packed tight into annular gaps and sealed with FyreFLEX Sealant OR FyreBATT friction fitted into the opening OR FyreBATT surface mounted over opening with 100mm overlap on all sides	TWrap 25mm foil encased blanket minimum 500mm both sides OR Encased with 20mm Traflagar Corex Board - Minimum 500mm both sides	-/120/120 (Report FAS210378)
75mm Hebel Walls					
78mm Speedpanel Walls					
120mm Concrete / Masonry Walls					

* Openings in plasterboard walls must be lined with FyreBATT (or stud/plaster) to protect the wall cavity. Refer to drawings in this manual. Approved Installation Configurations

Note: FRL's as per [Warrington Fire Report FAS210378](#). Contact technical@tgroup.com.au for more details.

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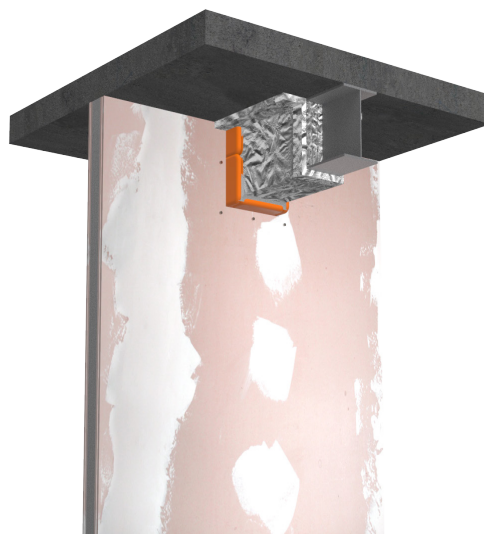
APPROVED WALL SYSTEMS

FyrePLUG Fire Rated Pillows

Pillows - Mid Wall with TWrap



Pillows – Head of Wall with TWrap



Pillows - Mid Wall with Corex



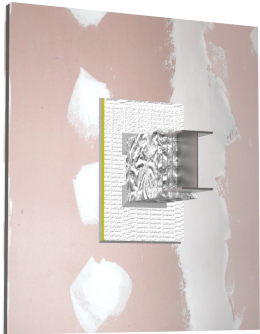
Pillows – Head of Wall with Corex



APPROVED WALL SYSTEMS

FyreBATT Fire Rated Mineral Fibre Batt

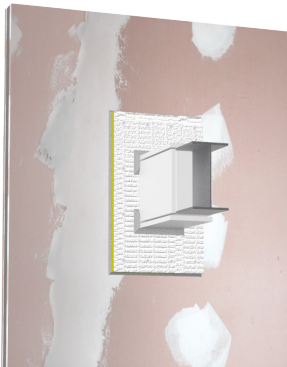
Batts (Surface Mounted/Friction Fitted) – Mid wall with TWrap



Batts (Surface Mounted/Friction Fitted) – Head of Wall with TWrap



Batts (Surface Mounted/Friction Fitted) – Mid Wall with Corex

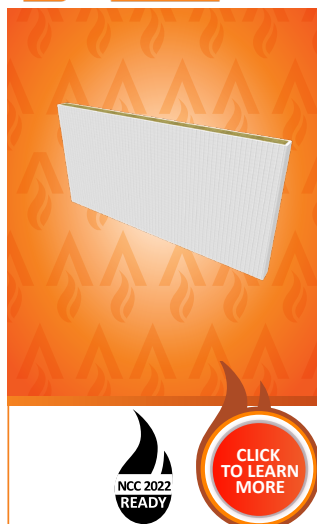


Batts (Surface Mounted/Friction Fitted) – Head of Wall with Corex



RELATED SYSTEMS

FyreBATT



TRAFALGAR coreX



FyrePLUG



FyreFLEX



TWRAP



Item number (fishbowl code)	Description (includes dimensions)	Min Order Qty	Pallet Qty
FyrePLUG-S Pillows	Small (100 x 250)mm	30	1200
FyrePLUG-M Pillows	Medium (200 x 250)mm	20	800
FyrePLUG-L Pillows	Large (300 x 250)mm	15	600
FyreBATT	60mm	1	50
FyreFLEX Sealant 300	White/ Grey	1	1920
FyreFLEX Sealant 600	White/Grey	1	1040
Trafalgar COREX	20,25	-	24
TWrap	300, 450, 600	-	24

FAQ

Q. What kind of steel sections can these penetration systems apply to?

A. Any kind of open or closed web steel sections with a flange thickness between 2mm to 20mm

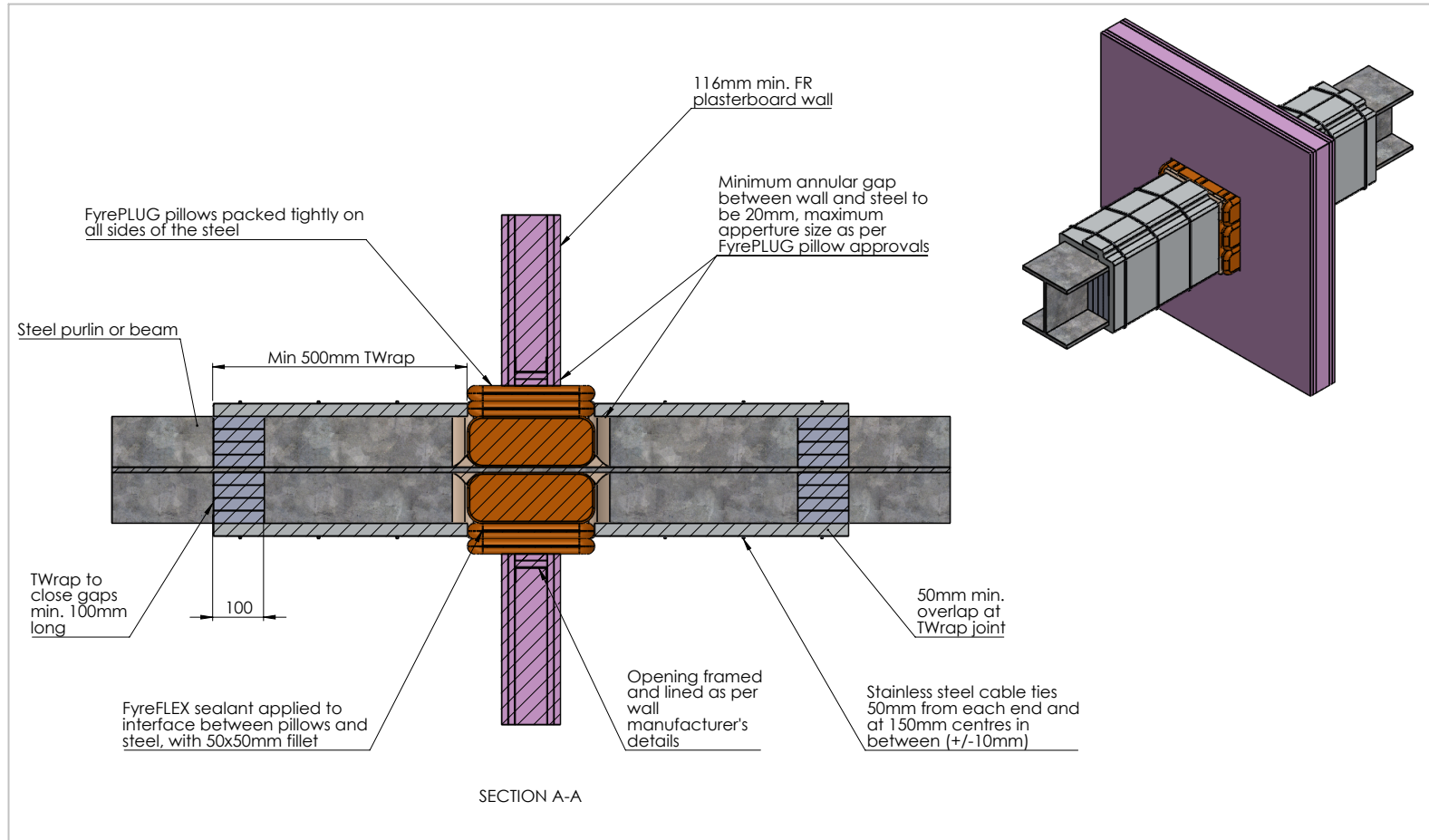
Q. Can I apply these penetration systems at the head of a wall?

A. Yes, using the 3-sided details, refer to the system drawings in this manual.

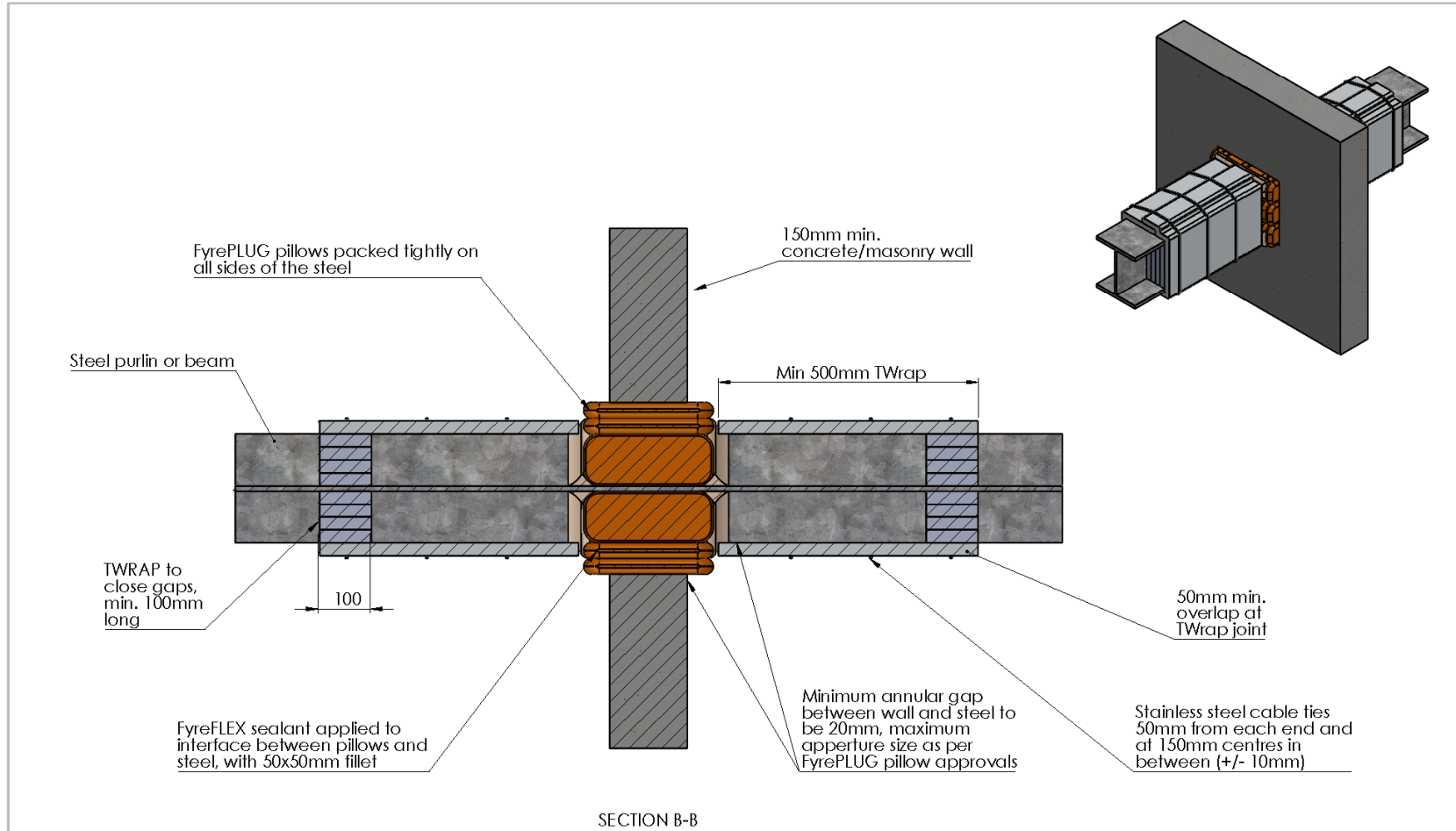
Q. I don't have a fire rated slab above the purlin, can I still use this system?

A. Where a roof is not required to be a fire rated element, the NCC does not consider any risk of firespread above the head of the wall. In practice, our recommendation is that as long as the roof sheeting materials are non-combustible, the 3-sided drawing details can be applied.

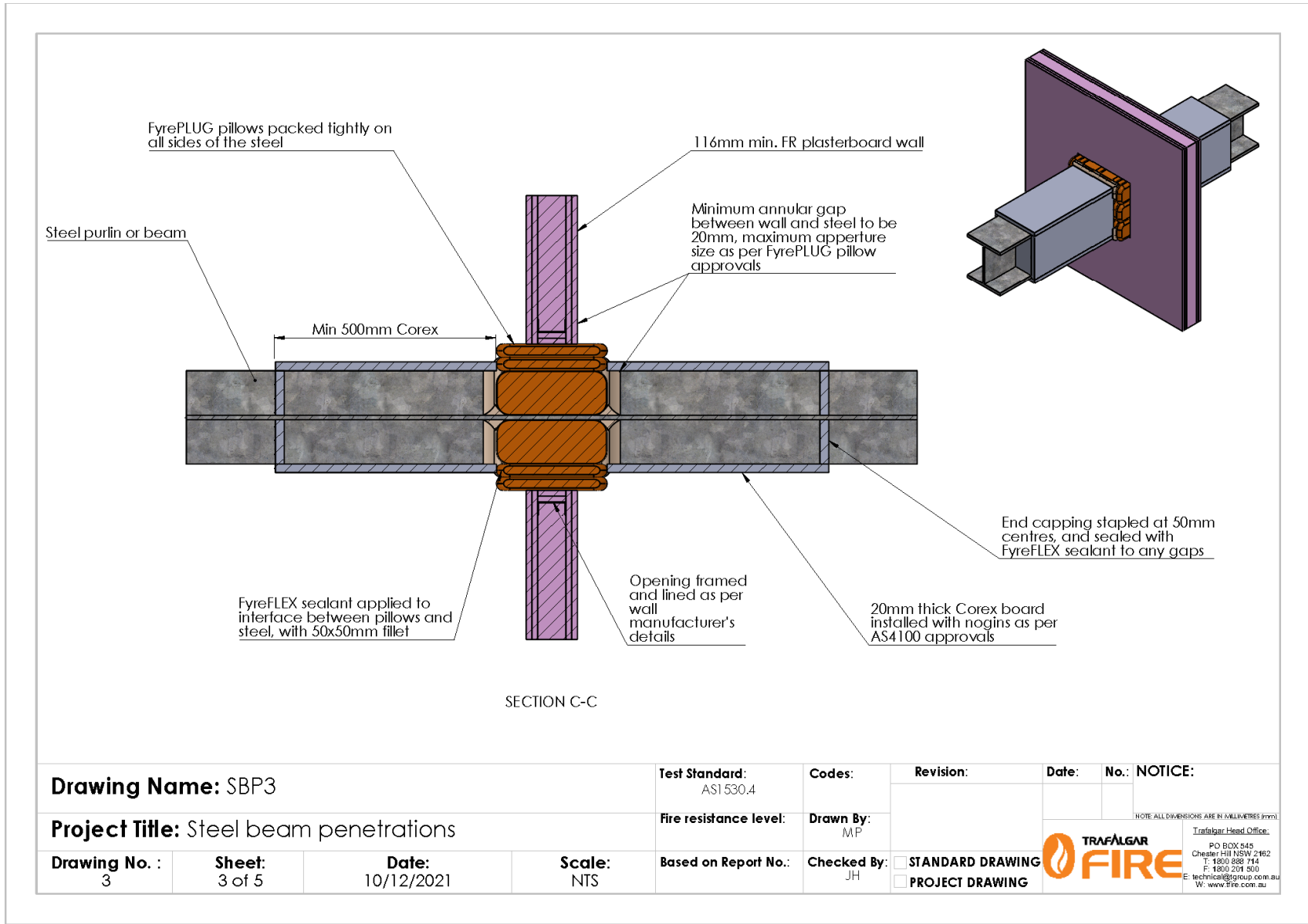
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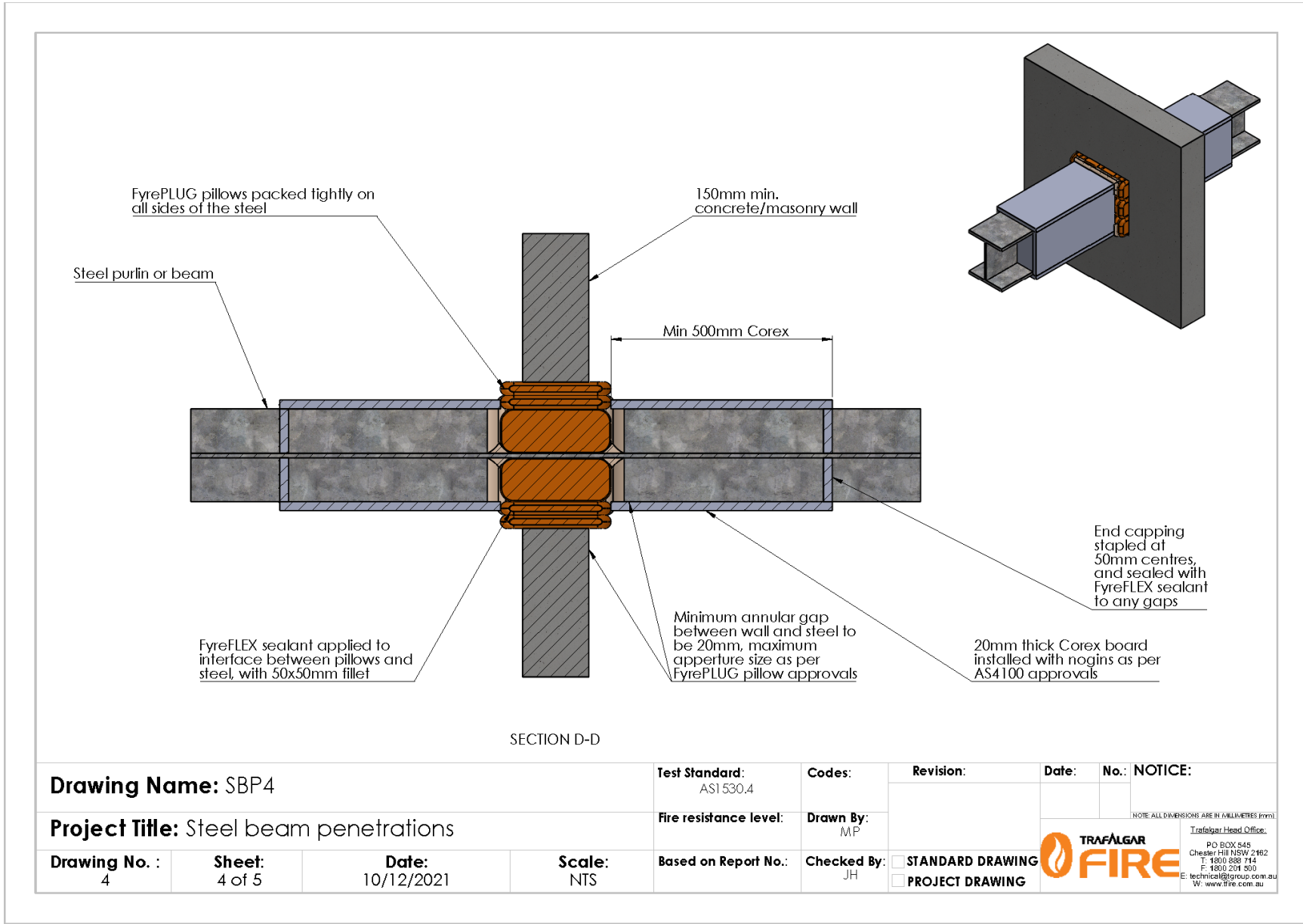
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Drawing No. : 1	Sheet: 1 of 5	Date: 10/12/2021	Scale: NTS	Based on Report No.:	Checked By: JH				




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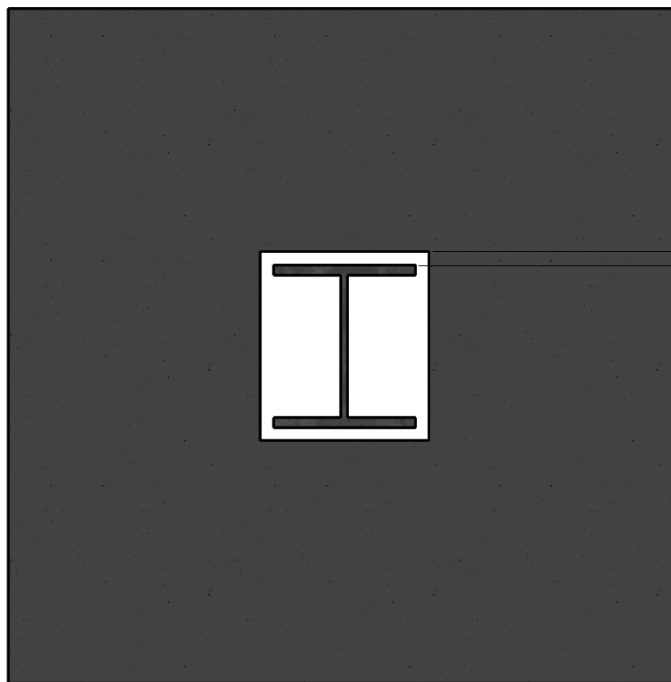


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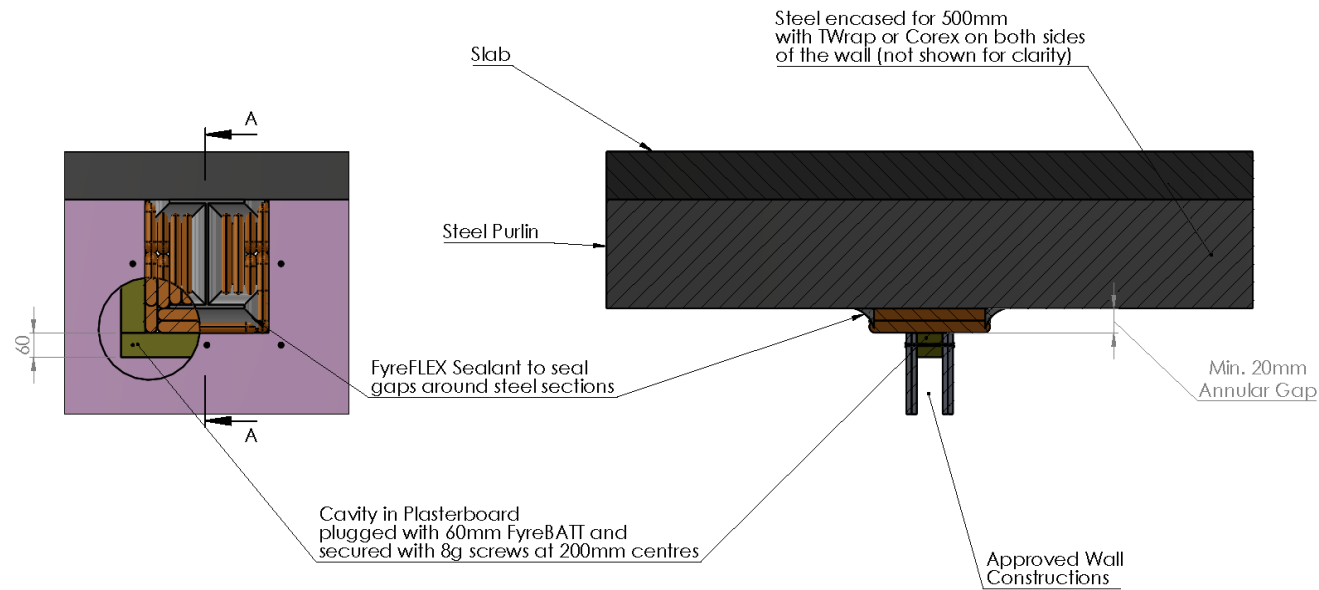
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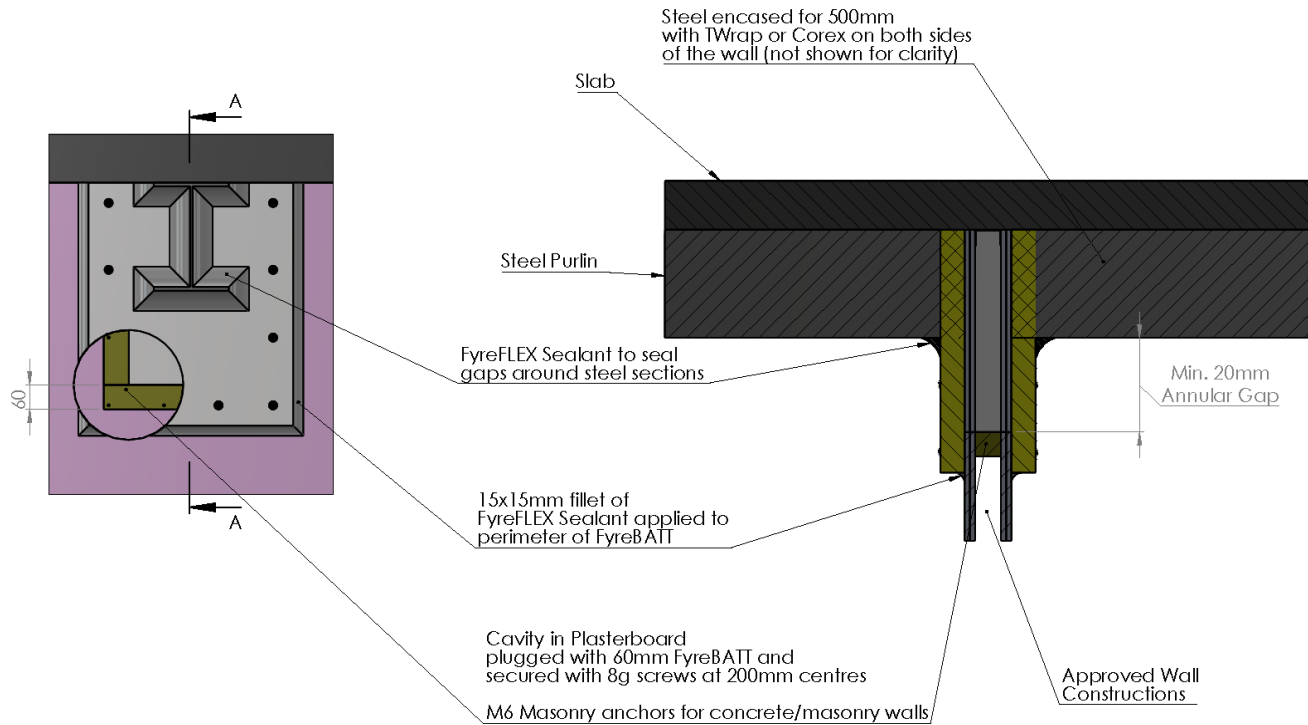



Minimum annular gap
between wall and steel to
be 20mm, maximum
aperture size as per
FyrePLUG pillow approvals

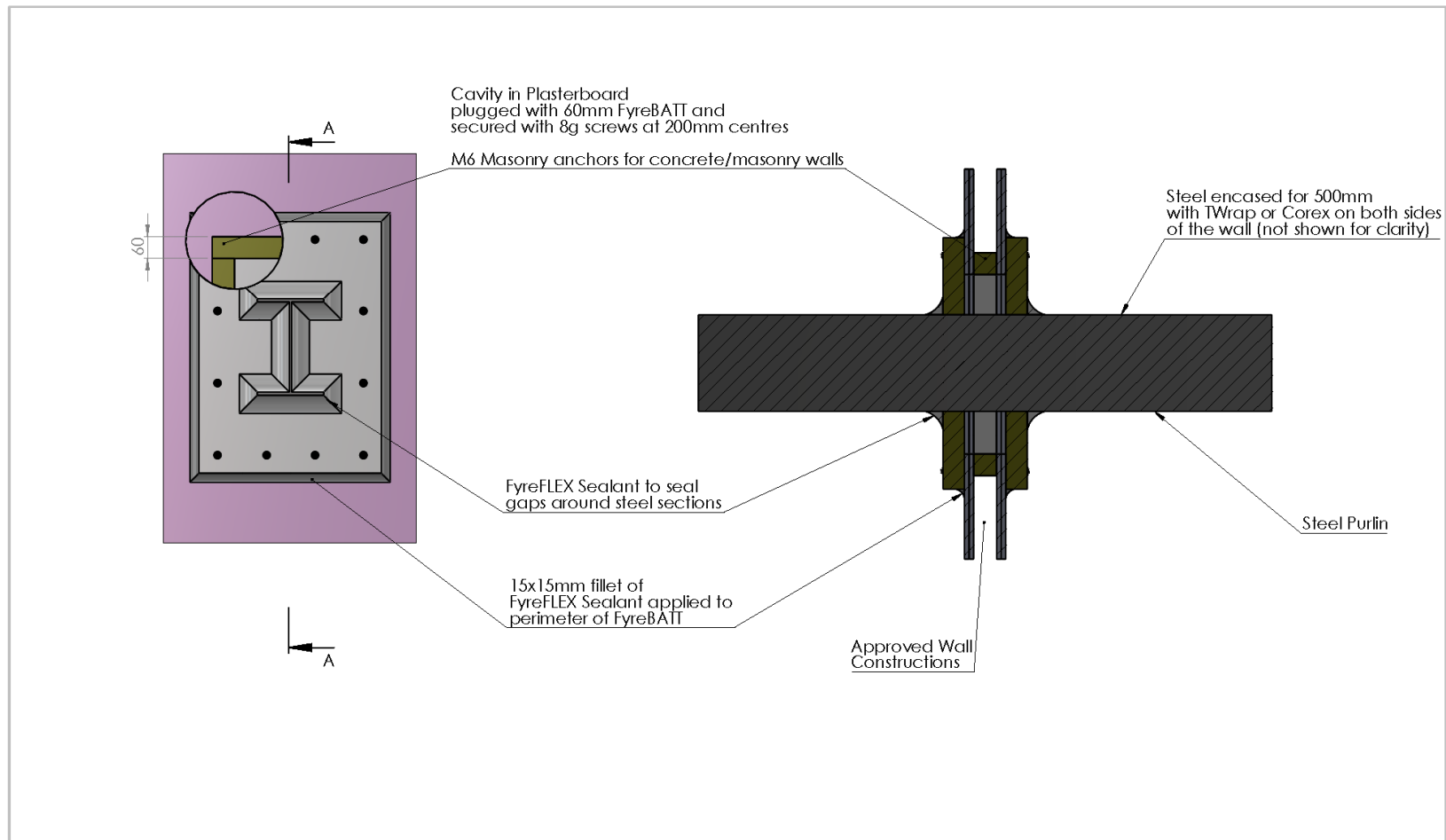
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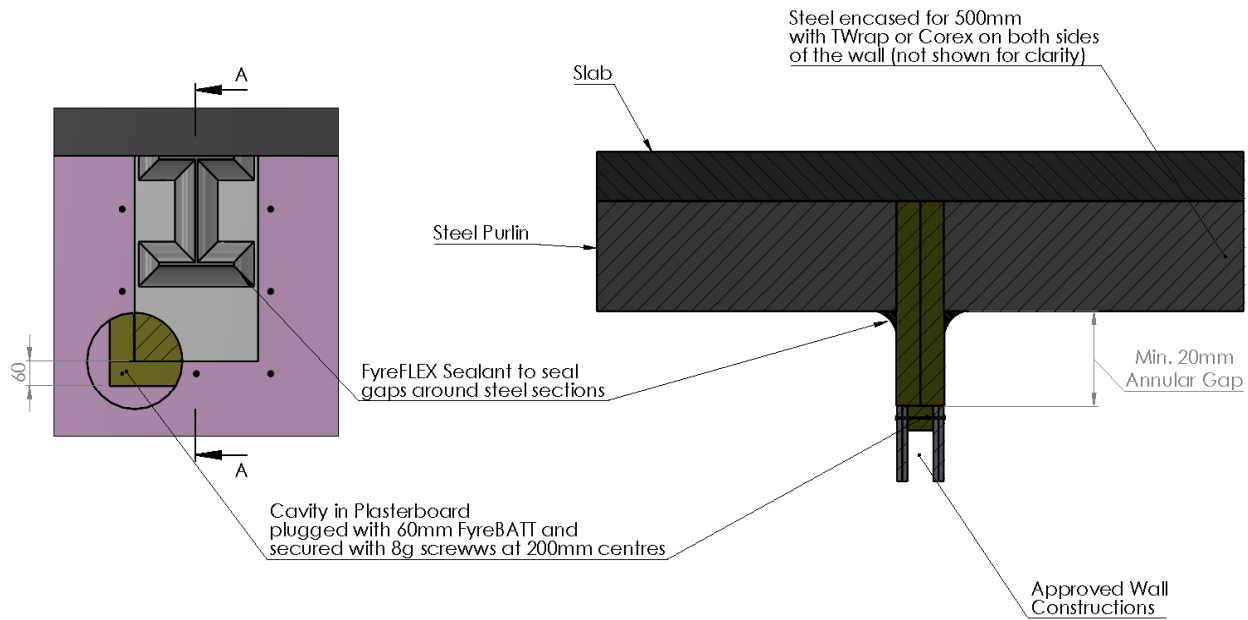
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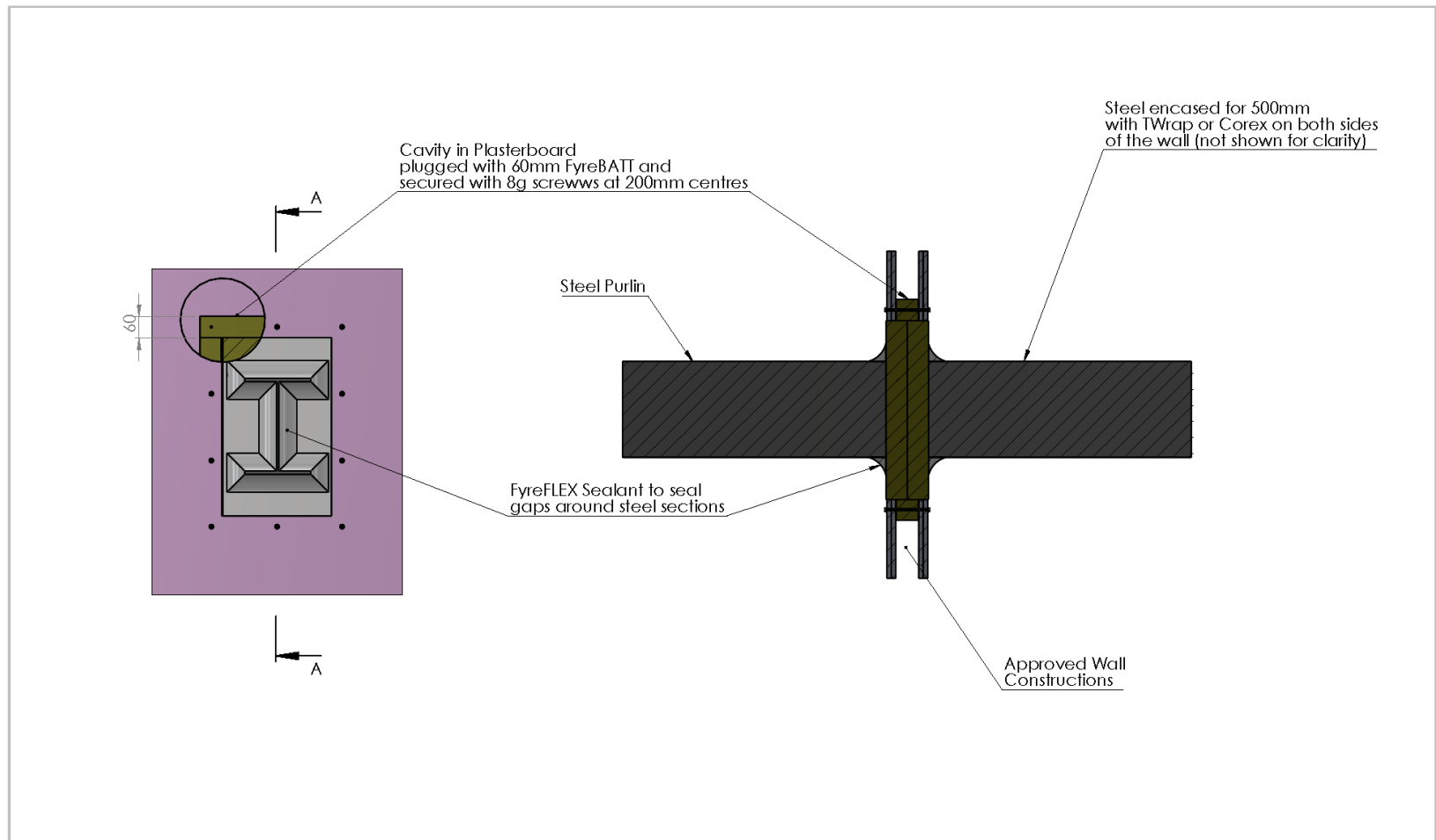
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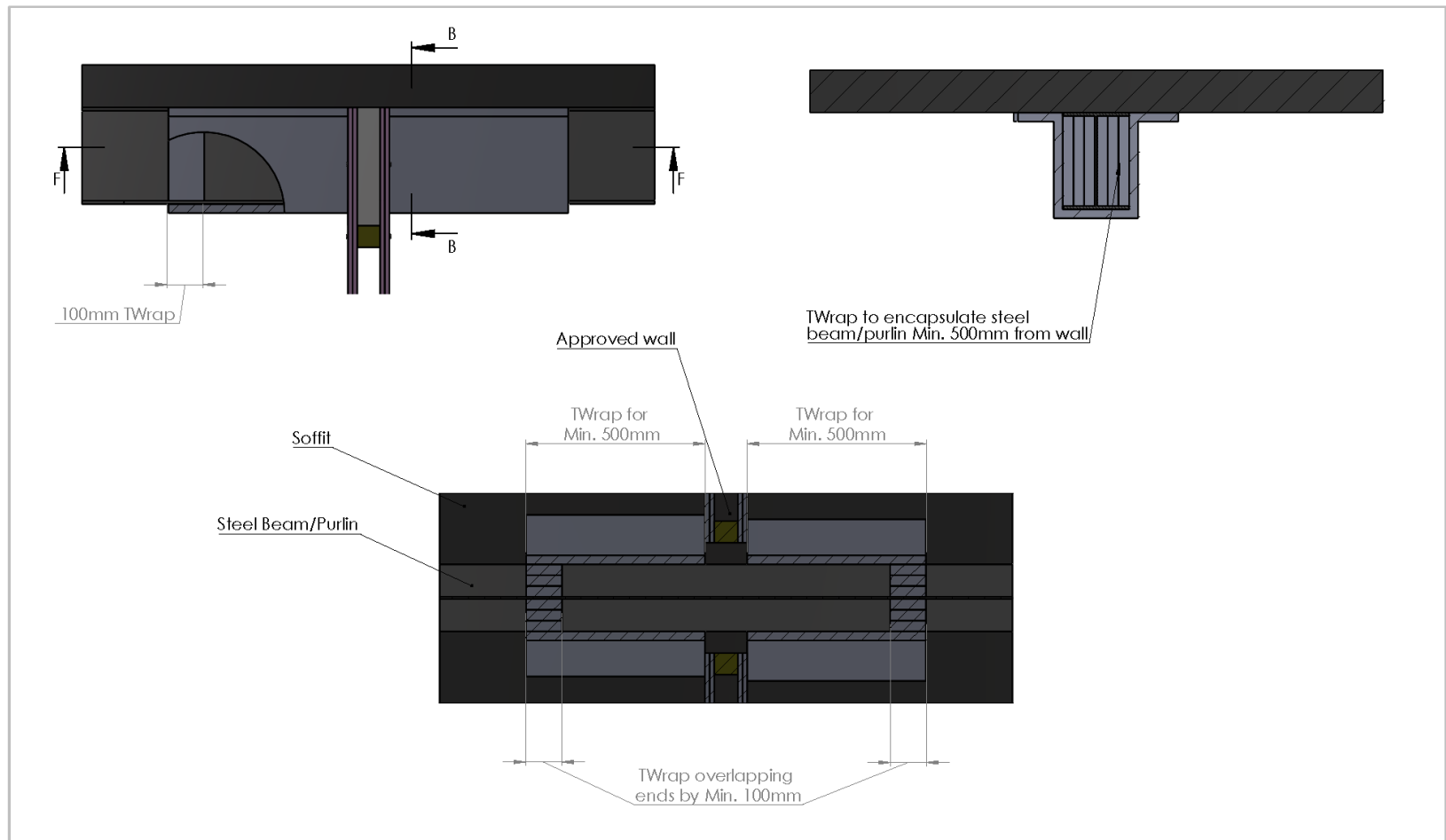
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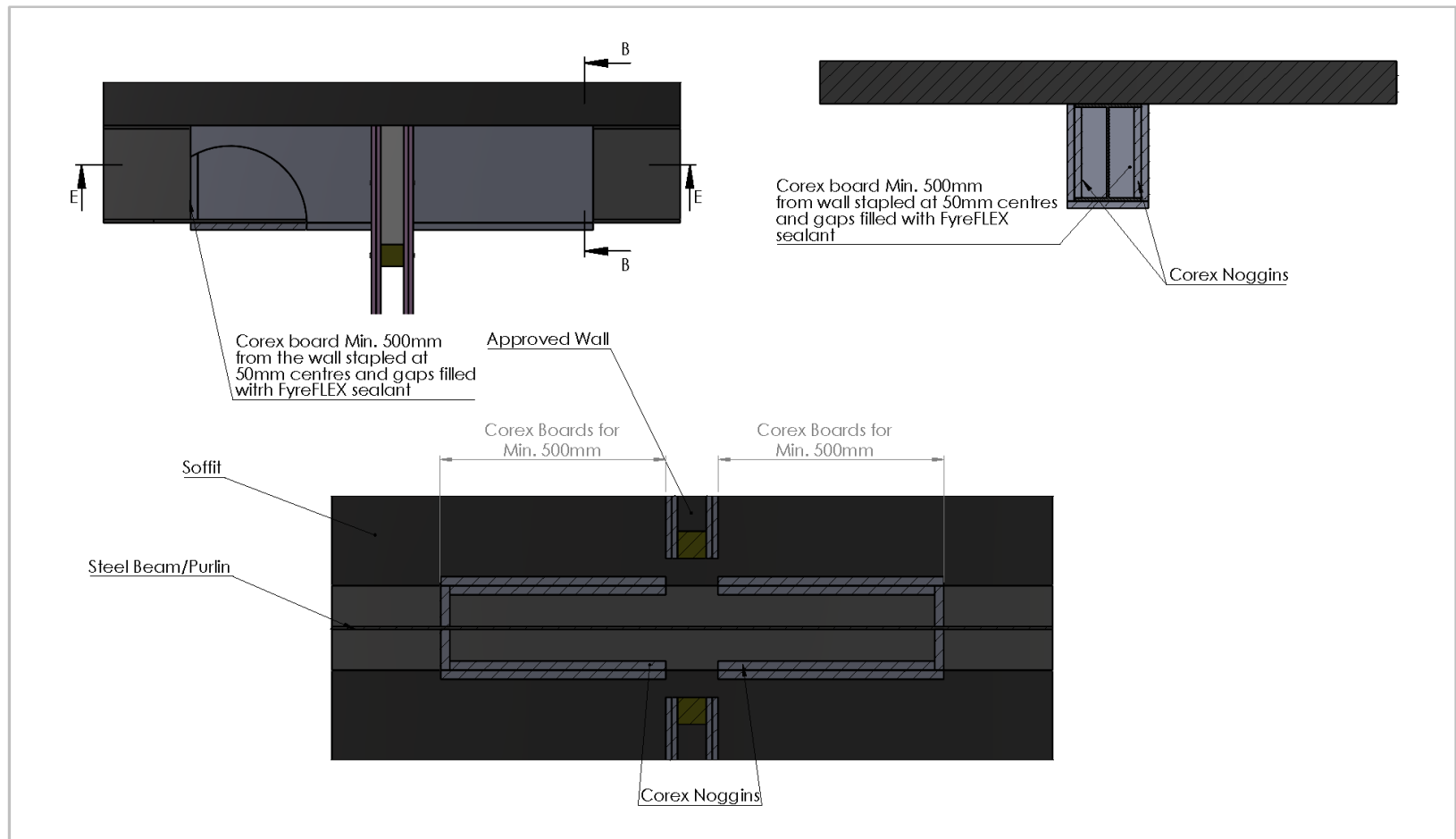



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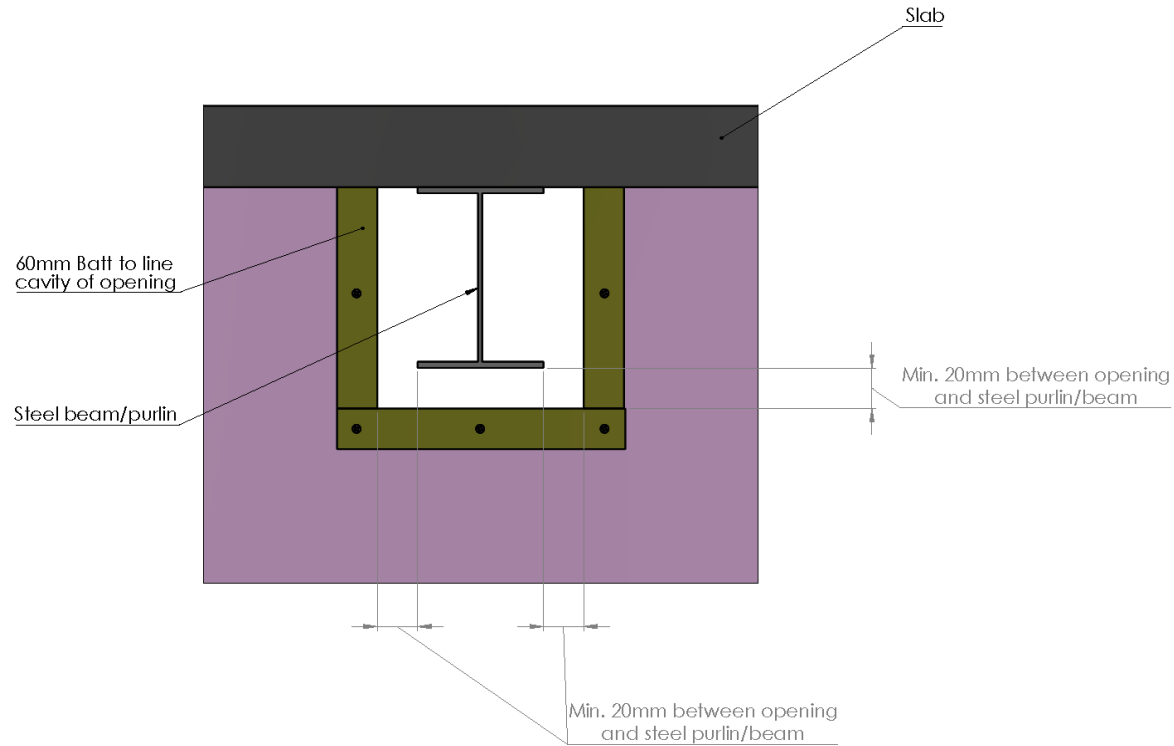



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