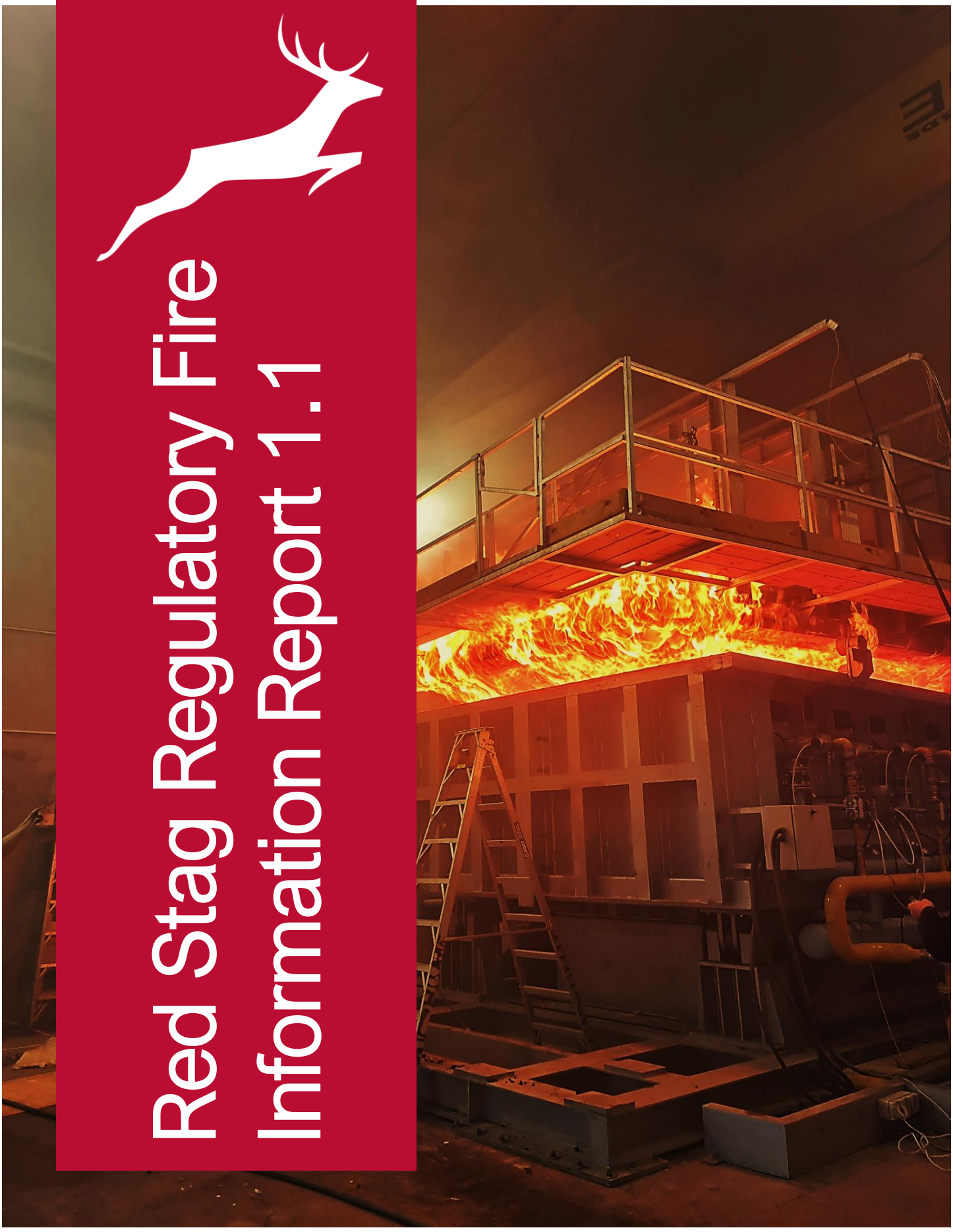
Red Stag Regulatory Fire Information Report 1.1



Penetrations through Red Stag CLT floor and wall systems

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Regulatory Information Report RIR1.1
April 2022

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Regulatory information report

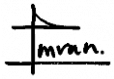
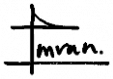
Penetrations through Red Stag CLT floor and wall systems

Sponsor: Red Stag Wood Solutions Limited

Report number: FAS210260 Revision: RIR1.1

Issued date: 5 April 2022 Expiry date: 28 February 2027

Quality management

Version	Date	Information about the report			
RIR1.1	Issue: 05 Apr 2022	Reason for issue	Initial issue		
	Expiry: 28 Feb 2027		**Prepared by**	**Reviewed by**	**Authorised by**
		Name	Kimal Wasalathilake	Imran Ahamed	Imran Ahamed
		Signature			

Executive summary

This report contains the minimum information required for regulatory compliance and refers to the referenced assessment report FAS210260 R1.1.

The analysis conducted in the referenced assessment report documents the findings of the assessment undertaken to determine the expected fire resistance level (FRL) of a series of services penetrating Red Stag cross-laminated timber (CLT) floor/ceiling and wall systems – if tested in accordance with AS 1530.4:2014 and assessed in accordance with AS 4072.1:2005.

The Red Stag CLT floor/wall systems consist of nominally minimum 34 mm thick lamellas bonded together with adhesives to form minimum 103.5 mm thick Red Stag CLT floor and wall systems. The analysis in section 5 of the referenced assessment report found that the proposed systems, together with the described variations, are expected to achieve FRLs as shown in Table 1 and Table 2 – if tested in accordance with AS 1530.4:2014.

Table 1 Summary of the assessment outcome for penetrations through Red Stag CLT floor/ceiling systems

Service penetration type	Description	Fire stopping system	FRL	Report reference	Reference figure
Electrical and communication cables	Up to four 3-core TPS cables	Promaseal-A sealant	-/60/60	FP13961-002	Figure 1
	40 mm diameter uPVC conduit – filled with 3-core TPS cable or 1.5 mm^2 power cable	Promaseal FC40 collar and Promaseal-A sealant	-/60/60	FP13961-002	Figure 2
	16 mm diameter uPVC conduit – filled with 3-core TPS cable or 1.5 mm^2 power cable	Promaseal CFC32 collar and Promaseal-A sealant	-/60/60	FP13961-002	Figure 3
	D1 cable configuration as per AS 1530.4:2014	2 layers of 50 mm Promaseal batts (maximum 800 mm × 400 mm), Promashield® 100 and Promaseal A acrylic sealant	-/60/60	FP13961-001 A-18-029	Figure 4
	D1 cable configuration as per AS 1530.4:2014	2 layers of 50 mm Promaseal batts (maximum 800 mm × 400 mm) and Promaseal A acrylic sealant	-/60/30	PF20012	Figure 5
	D2 cable configuration as per AS 1530.4:2014	2 layers of 50 mm Promaseal batts, (maximum 800 mm × 400 mm), Promashield® 100 and Promaseal A acrylic sealant	-/60/60	FP13961-001 A-18-030	Figure 6
	D2 cable configuration as per AS 1530.4:2014	2 layers of 50 mm Promaseal batts (maximum 800 mm × 400 mm) and Promaseal A acrylic sealant	-/60/30	PF20008	Figure 7

Service penetration type	Description	Fire stopping system	FRL	Report reference	Reference figure
Metal pipes	19 – 50 mm diameter copper pipes	Promaseal A acrylic sealant, 10 mm IBS backing rod and Promat SupaWrap 40 for a length of 300 mm on the unexposed side	-/60/60	PF20012	Figure 8
	50 – 150 diameter copper pipes	Promaseal A acrylic sealant, Promaseal IBS foam strip for the full depth of the floor and Promat SupaWrap for a length of 600 mm on the unexposed side	-/60/60	FP13961-001	Figure 9
	19 – 50 mm diameter copper pipes	Promaseal A acrylic sealant and 10 mm IBS backing rod	-/60/-	PF20012	Figure 10
	50 – 150 diameter copper pipes	Promaseal A acrylic sealant and Promaseal IBS form strip for the full depth of the floor	-/60/-	FP13961-001	Figure 11
	60 mm diameter, 4.3BMT metal pipe	Promaseal-A and 10 mm IBS Backing rod	-/60/30	FP13961-002	Figure 12
	60 – 100 mm diameter, 0.6BMT metal (Zincalume) down pipe	Promaseal-A and 10 mm IBS Backing rod	-/60/-	FP13961-002	Figure 13
	32 - 100 mm steel sprinkler pipes	Promaseal A acrylic sealant and 10 mm IBS backing rod	-/60/-	PF20012 and FP13961-001	Figure 14
Metal pipes and electrical and communication cables	1 × standard pair coil pipework with polyethylene insulation and 3-core TPS cable	Promaseal FC80 collar backfilled with Grafitex	-/30/30	FP13961-002	Figure 15
	2 × standard pair coil pipework with polyethylene insulation and 3-core TPS cable	Promaseal FC100 collar backfilled with Grafitex	-/30/30	FP13961-002	Figure 16
Miscellaneous Services	Blank seal of up to 800 mm × 400 mm in size	2 layers of 50 mm Promaseal batt	-/60/60	FP13961-001	Figure 17
Plastic pipes	16 mm diameter PE-Xa water pipes (Kembla Pex)	Promaseal CFC32 collar and Promaseal-A sealant	-/60/60	FP13961-002	Figure 18
	25 mm diameter PE-Xa water pipes (Kembla Pex)	Promaseal CFC32 collar and Promaseal-A sealant	-/60/30	FP13961-002	Figure 19
	32 mm diameter PE-Xa water pipes (Kembla Pex)	Promaseal CFC32 collar and Promaseal-A sealant	-/30/30	FP13961-002	Figure 20

Service penetration type	Description	Fire stopping system	FRL	Report reference	Reference figure
	40 – 110 mm diameter Rehau Raupiano sanitary pipes	Promaseal A acrylic sealant and Promaseal Fire collars FC40 – FC100 as appropriate	-/60/60	FP13961-001	Figure 21
	40 – 100 uPVC pipes	Promaseal A acrylic sealant and Promaseal Fire collars FC40 – FC100 as appropriate	-/60/60	PF20008	Figure 22
	100 mm uPVC floor waste assembly with grate	SNAP Fire Collar - LP100R and Boss Firemastic 300 sealant	-/60/60	PF20012	Figure 23
	50 – 110 dBlue PP/PP- MD/PP pipes	Boss Firemastic 300 sealant and Boss maxi collar 50 – 110 mm as appropriate	-/60/60	PF20012	Figure 24
	40 mm diameter uPVC conduit – empty	Promaseal FC40 collar and Promaseal-A sealant	-/60/60	FP13961-002	Figure 25
	16 mm diameter uPVC conduit – empty	Promaseal CFC32 collar and Promaseal-A sealant	-/60/60	FP13961-002	Figure 26

Table 2 Summary of the assessment outcome for penetrations through Red Stag CLT wall systems

Service penetration type	Description	Fire stopping system	FRL	Report reference	Reference figure
Electrical and communication cables	Single 3-core TPS cables	Promaseal-A sealant	-/60/60	FP13961-003	Figure 27
	Up to four 3-core TPS cables	Promaseal-A sealant and Promaseal CFC32 collar on both sides of the wall	-/60/60	FP13961-003	Figure 28
	Up to four 3-core TPS cables	Promaseal-A sealant	-/60/60	FP13961-007	Figure 29
	40 mm diameter uPVC conduit – filled with 3-core TPS cables or 1.5 mm^2 power cable	Promaseal-A sealant and Promaseal FC40 collar on both sides of the wall	-/60/60	FP13961-004	Figure 30
	16 mm diameter uPVC conduit – filled with 3-core TPS cables or 1.5 mm^2 power cable	Promaseal-A sealant and Promaseal CFC32 collar on both sides of the wall	-/60/60	FP13961-004	Figure 31
Metal pipes	19 – 150 mm diameter copper pipe	Promaseal A sealant, Promaseal IBS foam strip for the full depth of the floor and Promat SupaWrap for a length of 600 mm on both sides of the wall	-/60/60	PF20012	Figure 32

Service penetration type	Description	Fire stopping system	FRL	Report reference	Reference figure
	19 – 150 mm diameter copper pipe	Promaseal-A and 10 mm IBS backing rod	-/60/-	FP13961-005	Figure 33
	60 mm diameter, 4.3BMT metal pipe	Promaseal-A and 10 mm IBS backing rod	-/60/30	FP13961-004	Figure 34
	60 mm diameter, 4.3BMT metal pipe	Promaseal-A, 10 mm IBS backing rod and Promat SupaWrap for a length of 300 mm on both sides of the wall	-/60/60	FP13961-004	Figure 35
	100 mm diameter, 0.6BMT metal (Zincalume) down pipe	Promaseal-A and 10 mm IBS backing rod	-/60/-	FP13961-004	Figure 36
	100 mm diameter, 0.6BMT metal (Zincalume) down pipe	Promaseal-A, 10 mm IBS backing rod and Promat SupaWrap for a length of 300 mm on both sides of the wall	-/60/60	FP13961-004	Figure 37
	32 - 100 mm steel sprinkler pipes	Promaseal-A and 10 mm IBS backing rod	-/60/-	FP13961-005	Figure 36
Metal pipes and electrical and communication cables	1 x Standard pair coil pipework with polyethylene insulation and 3-core TPS cable	Promaseal FC80 collar backfilled with Grafitex	-/60/60	FP13961-005	Figure 38
	2 x Standard pair coil pipework with polyethylene insulation and 3-core TPS cable	Promaseal FC100 collar backfilled with Grafitex	-/60/30	FP13961-005	Figure 39
Miscellaneous Services	Blank Promaseal batt system in an 800 mm × 400 mm opening	2 layers of 50 mm Promaseal batt	-/60/60	FP13961-006	Figure 40
Plastic pipes	16 – 32 mm diameter PE-Xa water pipe (Kembla Pex)	Promaseal-A sealant and Promaseal CFC32 collar on both sides of the wall	-/60/60	FP13961-004	Figure 41
	40 - 110 mm diameter Rehau Raupiano sanitary pipe	Promaseal-A sealant and Promaseal fire collars FC40 - FC100 on both sides of the wall as appropriate	-/60/60	FP13961-003	Figure 42
	40 – 100mm WT PVC-U pipe	Promaseal-A sealant and Promaseal fire collars FC40 - FC100 on both sides of the wall as appropriate	-/60/60	FP13961-003	Figure 43
	50 - 110DN dBlue PP/PP- MD/PP Pipe	Promaseal-A sealant and Promaseal fire collars FC50 - FC100 on both sides of the wall as appropriate	-/60/60	FP13961-004	Figure 44

Service penetration type	Description	Fire stopping system	FRL	Report reference	Reference figure
	40 mm diameter conduit – empty	Promaseal-A sealant and Promaseal FC40 collar on both sides of the wall	-/60/60	FP13961-003	Figure 45
	16 mm diameter conduit – empty	Promaseal-A sealant and Promaseal CFC32 collar on both sides of the wall	-/60/60	FP13961-003	Figure 46

The variations and outcome of the referenced assessment report are subject to the limitations and requirements described in sections 2, 3 and 6 of this report. The results of this report are valid until 28 February 2027.

Contents

1. Introduction

This report contains the minimum information sufficient for regulatory compliance and refers to the assessment report FAS210260 R1.1.

The analysis conducted in the referenced assessment report documents the findings of the assessment undertaken to determine the expected fire resistance level (FRL) of a series of services penetrating Red Stag CLT floor and wall systems – if tested in accordance with AS 1530.4:2014[1] and assessed in accordance with AS 4072.1:2005[2].

The referenced assessment report is prepared to meet the evidence of suitability in accordance with the requirements of the relevant National Construction Code (NCC) to support the use of the material, product, form of construction or design as given within the scope of the referenced assessment report. It also references test evidence for meeting the deemed-to-satisfy (DTS) provisions of the NCC as applicable to the assessed systems.

The referenced assessment report can also be used as Evidence of Suitability in accordance with the requirements of the relevant clauses of the New Zealand Building Code to support the use of the material, product, form of construction or design as given within the scope of the referenced assessment report. It also references test evidence that meets the normative requirements for demonstrating fire resistance performance as stated in the New Zealand acceptable solutions.

The referenced assessment was carried out at the request of Red Stag Wood Solutions Limited.

The sponsor details are included in Table 3.

Table 3 Sponsor details

Sponsor	Address
Red Stag Wood Solutions Limited	53 Ingram Road, Rukuhia Hamilton 3282 New Zealand

2. Framework for the assessment

2.1 Assessment approach

An assessment is a formal opinion issued by an accredited testing laboratory (ATL) about the expected performance of a component or element of structure if it was subject to a fire test.

No specific framework, methodology, standard or guidance documents exist in Australia for doing these assessments. We have therefore followed the 'Guide to undertaking technical assessments of the fire performance of construction products based on fire test evidence' prepared by the Passive Fire Protection Forum (PFPF) in the UK in 2021[3].

This guide provides a framework for undertaking assessments in the absence of specific fire test results. Some areas where assessments may be offered are:

- Where a modification is made to a construction which has already been tested.
- The interpolation or extrapolation of results of a series of fire resistance tests, or utilisation of a series of fire test results to evaluate a range of variables in a construction design or a product.
- Where, for various reasons – eg size or configuration – it is not possible to subject a construction or a product to a fire test.

[1] Standards Australia, 2014, Methods for fire tests on building materials, components and structures – Part 4: Fire-resistance tests for elements of construction, AS 1530.4:2014, Standards Australia, NSW.
[2] Standards Australia, 2005, Components for the protection of openings in fire-resistant separating elements: Service penetrations and control joints (Reconfirmed 2016), AS 4072.1:2005 (R2016), Standards Australia, NSW.
[3] Passive Fire Protection Forum (PFPF), 2021, Guide to undertaking technical assessments of the fire performance of construction products based on fire test evidence, Passive Fire Protection Forum (PFPF), UK.

Assessments will vary from relatively simple judgements on small changes to a product or construction through to detailed and often complex engineering assessments of large or sophisticated constructions.

The referenced assessment uses established empirical methods and our experience of fire testing similar products to extend the scope of application by determining the limits for the design based on the tested constructions and performances obtained. The assessment is an evaluation of the potential fire resistance performance if the elements were to be tested in accordance with AS 1530.4:2014.

The referenced assessment has been written using appropriate test evidence generated at accredited laboratories to the relevant test standard. The supporting test evidence has been deemed appropriate to support the manufacturer's stated design.

2.2 Compliance with the National Construction Code, Australia

The referenced assessment report has been prepared to meet the Evidence of Suitability requirements of the NCC 2019, including amendments[4] under A5.2 (1) (d).

The referenced assessment has been written in accordance with the general principles outlined in EN 15725:2010[5] for extended application reports on the fire performance of construction products and building elements. It also references test evidence for meeting a performance requirement or deemed-to-satisfy (DTS) provision of the NCC under A5.4 for fire resistance levels, as applicable to the assessed systems.

The referenced assessment report can also be used to demonstrate compliance with the requirements for Evidence of Suitability under NCC 2016, including amendments[6].

2.3 Compliance with the New Zealand Building Code (NZBC), Clause C

The referenced assessment report has been prepared to meet the evidence of suitability requirements for the relevant clauses of the New Zealand Building Code (NZBC)[7], Part C.

The referenced assessment has been written in accordance with the general principles outlined in EN 15725:2010 for extended application reports on the fire performance of construction products and building elements. It also references test evidence for meeting a performance requirement for a fire resistance rating as applicable to the assessed systems.

The referenced assessment report may also be used to demonstrate compliance with the requirements for evidence of suitability that meet the normative requirements for demonstrating fire resistance performance as stated in the New Zealand acceptable solutions.

2.4 Declaration

The 'Guide to undertaking technical assessments of the fire performance of construction products based on fire test evidence' prepared by the PFPF in the UK requires a declaration from the client. By accepting our fee proposal on 25 November 2021, Red Stag Wood Solutions Limited confirmed that:

- To their knowledge, the variations assessed in the referenced assessment report have not been subjected to a fire test to the standard against which the referenced assessment is being made.
- They agree to withdraw the referenced assessment from circulation if the component or element of structure is the subject of a fire test by a test authority in accordance with the standard against which the referenced assessment is being made and the results are not in agreement with the referenced assessment. It is to be noted that all testing of Red Stag

[4] National Construction Code Volumes One and Two - Building Code of Australia 2019 including Amendments, Australian Building Codes Board, Australia
[5] European Committee for Standardization, 2010, Extended application reports on the fire performance of construction products and building elements, EN 15725:2010, European Committee for Standardization, Brussels, Belgium.
[6] National Construction Code Volumes One and Two - Building Code of Australia 2016 including Amendments, Australian Building Codes Board, Australia
[7] New Zealand Building Code - Building Regulations 1992 including Amendments, Ministry of Business, Innovation, and Employment, New Zealand

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Products and Systems is subject to written permission by Red Stag's Managing Director, prior to testing.

- They are not aware of any information that could adversely affect the conclusions of the referenced assessment and – if they subsequently become aware of any such information – they agree to ask the assessing authority to withdraw the assessment.

3. Limitations of the referenced assessment

- The scope of the referenced assessment report is limited to an assessment of the variations to the tested systems described in section 4.3.
- The referenced assessment report details the methods of construction, test conditions and assessed results that are expected if the systems were tested in accordance with AS 1530.4:2014.
- The referenced assessment is applicable to Red Stag floor/ceiling systems exposed to fire from below – in accordance with the requirements of AS 1530.4:2014 where horizontal elements must be exposed to heat from the underside only.
- The referenced assessment is also applicable to Red Stag wall systems exposed to fire from either side but not simultaneously – in accordance with the requirements of AS 1530.4:2014 where vertical elements must be exposed to heat from the direction required to resist fire exposure.
- The referenced assessment report is valid for Red Stag CLT floor/ceiling and wall systems with a minimum thickness of 103.5 mm and including either 3, 5 or 7 layer Red Stag CLT floor/ceiling and wall panels.
- Any service penetrating a Promaseal® Bulkhead sealer system with an established FRL achieved through testing or assessment can be installed in a Promaseal® Bulkhead sealer system in Red Stag CTL floor or wall. The FRL of those penetration services must be obtained from the relevant Promat PROMASEAL® Bulkhead sealer system assessment report.
- The referenced assessment report is only valid for the assessed system/s and must not be used for any other purpose. Any changes with respect to size, construction details, loads, stresses, edge or end conditions – other than those identified in the referenced assessment report – may invalidate the findings of the referenced assessment. If there are changes to the system, a reassessment will need to be done by an Accredited Testing Laboratory (ATL) that is accredited to the same nominated standards of the referenced assessment report.
- The documentation that forms the basis for the referenced assessment is listed in Appendix A and Appendix B of the referenced assessment report.
- The referenced assessment report has been prepared based on information provided by others. Warringtonfire has not verified the accuracy and/or completeness of that information and will not be responsible for any errors or omissions that may be incorporated into the referenced assessment report as a result.
- The referenced assessment is based on the proposed systems being constructed under comprehensive quality control practices and following appropriate industry regulations and Australian and New Zealand Standards on quality of materials, design of structures, guidance on workmanship and expert handling, placing and finishing of the products on site. These variables are beyond the control and consideration of the referenced assessment report.

4. Description of the specimen and variations

4.1 System description

The proposed systems consist of a series of penetrations passing through a minimum 103.5 mm thick Red Stag CLT floor and wall systems. The services are protected locally with sealant or other fire-stopping elements as appropriate.

4.2 Referenced test data

The assessment of the variation to the tested systems and the determination of the expected performance is based on the results of the fire tests documented in the reports summarised in Table 4. Further details of the tested systems are included in in Appendix B of the referenced report. Promat Australia Pty. Ltd. has given Warringtonfire Australia permission to refer to their test reports in the referenced assessment.

Table 4 Referenced test data

Report number	Test sponsor	Test date	Testing authority
FP13961-001	Red Stag Wood Solutions Limited	16 September 2021	BRANZ
FP13961-002		5 October 2021	
FP13961-003		10 September 2021	
FP13961-004		13 August 2021	
FP13961-005		11 August 2021	
FP13961-006		9 August 2021	
FP13961-007		19 October 2021	
PF20008		11 June 2020	PFITS (Passive Fire Inspection & Test laboratory
PF20012		19 January 2021	
A-18-029	Promat Australia Pty. Ltd.	23 August 2018	Fire Science Research Group
A-18-030		6 August 2018	

4.3 Variations to the tested systems

An identical system has not been subject to a standard fire test. We have therefore assessed the systems using baseline test information for similar systems. The variations to the tested systems – together with the referenced standard fire tests – are described in Table 5.

Table 5 Variations to tested systems

Floor/wall type	Item	Reference test	Description	Variations
Red Stag CLT floor	Electrical and communication cables	FP13961-002 PF20012 PF20008 A-18-029 A-18-030	Test reports included TPS cables, uPVC conduits with 3-core TPS cable or 1.5 mm^2 power cable, and AS 1530.4:2014 Appendix D1 and D2 cables passing through a 103.5 mm thick CLT floor. A-18-029 and A-18-030 reports included AS 1530.4:2014 Appendix D1 and D2 cables penetrating two layers of Promaseal batt.	Assess the FRLs of electrical and communication cables, metal pipes, metal pipes and electrical and communication cables, blank seals, and plastic pipes with a range of local fire protection systems passing through Red Stag CLT floors. Assess the FRLs of services passing through a CLT floor of thickness equal to or greater than 103.5 mm and consisting of either 3, 5 or 7 layer Red Stag CLT panels.
	Metal pipes	PF20012 FP13961-001 FP13961-002	Test reports included various metal pipes passing through a 103.5 mm thick CLT floor system.	
	Metal pipes and electrical and communication cables	FP13961-002	Test report included single and double standard pair coils with polyethylene insulation and 2.5 mm^2 3-core TPS cable passing through a 103.5 mm thick CLT floor.	

Floor/wall type	Item	Reference test	Description	Variations
	Miscellaneous services	FP13961-001	Test report included two layers of blank batts fitted into a 103.5 mm thick CLT floor.	
	Plastic pipes	FP13961-001 FP13961-002 PF20008 PF20012	Test reports included various plastic pipes passing through a 103.5 mm thick CLT floor.	
Red Stag CLT wall	Electrical and communication cables	FP13961-003 FP13961-004 FP13961-007	Test reports included TPS cables, uPVC conduits with 3-core TPS cable or 1.5 mm^2 power cable passing through a 103.5 mm thick CLT wall.	Assess the FRLs of electrical and communication cables, metal pipes, metal pipes and electrical and communication cables, blank seals, and plastic pipes with a range of local fire protection systems passing through Red Stag CLT walls. Assess the FRLs of services passing through a CLT wall of thickness equal to or greater than 103.5 mm and consisting of either 3, 5 or 7 layer Red Stag CLT panels.
	Metal pipes	FP13961-004 FP13961-005	Test reports included various metal pipes passing through a 103.5 mm thick CLT wall.	
	Metal pipes and electrical and communication cables	FP13961-005	Test report included single and double standard pair coils with polyethylene insulation and 2.5 mm^2 3-core TPS cable passing through a 103.5 mm thick CLT wall.	
	Miscellaneous services	FP13961-006	Test report included two layers of blank batts fitted into a 103.5 mm thick CLT wall.	
	Plastic pipes	FP13961-003 FP13961-004	Test reports included various plastic pipes passing through a 103.5 mm thick CLT wall.	

4.4 Schedule of components

Table 6 outlines the schedule of components for the assessed systems subject to a fire test, as referenced in in Appendix B of the referenced report.

Figure 1 to Figure 46 show the assessed systems.

Table 6 Schedule of components of assessed systems

Item		
Separating element (SE)		
1.	Item name	Red Stag cross-laminated timber (CLT) floor/ceiling panel
	Size	Minimum 103.5 mm thick and either 3, 5 or 7 layer Red Stag CLT
	Specification	Nominally minimum 34.5 mm thick lamellas bonded together with Henkel Purbond PUR adhesive. The orientation of the middle lamella must be at 90° to the outer lamellas.
2.	Item name	Red Stag Cross-laminated timber (CLT) wall
	Size	Minimum 103.5 mm thick and either 3, 5 or 7 layer Red Stag CLT
	Specification	Nominally minimum 34.5 mm thick lamellas bonded together with Henkel Purbond PUR adhesive. The orientation of the middle lamella must be at 90° to the outer lamellas.

Item		
Fire-stopping protections		
Sealant		
3.	Item name	Acrylic sealant
	Product name	Promaseal® -A acrylic sealant
4.	Item name	Acrylic intumescent sealant
	Product name	Boss FireMastic-300™
5.	Item name	Intumescent compound
	Product name	Promaseal Grafitex (GRAF4T)
Fire collar		
6.	Item name	Promaseal FC 40, FC 50, FC 65, FC 80, FC 100 or FC 150 – as appropriate
	Product name	Promaseal® retrofit collars
7.	Item name	Promaseal CFC 32
	Product name	Promaseal® conduit collar
8.	Item name	SNAP collar LP100R
	Product name	Retrofit fire collar
	Intumescent details	1 layer of 56.72 mm high × 5.97 mm thick intumescent
9.	Item name	Boss Maxi collar™ 50 mm, 80 mm or 100 mm – as appropriate
	Product name	Retrofit pipe collar
	Intumescent details	3 layers of 29.99 mm high × 2.44 mm thick intumescent
Backing strip		
10.	Item name	Foam backing rod
	Product name	Promaseal IBS rod
11.	Item name	Foam strip
	Product name	Promaseal ® IBS™ foam strip
Fire wrap		
12.	Item name	Pipe wrap
	Product name	Promaseal ® SupaWrap 40
Coated mineral wool slab		
13.	Item name	Coated mineral wool slab
	Product name	Promaseal ® Bulkhead sealer system
	Description	50 mm thick high density mineral wool coated with Promaseal ® on both faces
Services		
14.	Item name	3-core TPS cables
15.	Item name	AS 1530.4:2014 Appendix D1 cables
16.	Item name	AS 1530.4:2014 Appendix D2 cables
17.	Item name	Copper pipes with diameters of 19 – 150 mm
18.	Item name	60 mm diameter 4.3BMT metal pipe
19.	Item name	60 – 100 mm diameter, 0.6BMT metal (Zincalume) down pipe
20.	Item name	Steel sprinkler pipes with diameters of 32 – 100 mm

Item		
21.	Item name	Standard pair coil pipe with polyethylene insulation
22.	Item name	PE-Xa water pipes with diameters of 16 – 32 mm
23.	Item name	Rehau Raupiano sanitary pipes with diameters of 40 – 110 mm
24.	Item name	uPVC pipes with diameters of 40 – 100 mm
25.	Item name	100 mm uPVC floor waste assembly with grate
26.	Item name	dBlue PP/PP-MD/PP pipes with diameters of 50 – 110 mm
27.	Item name	uPVC conduits with diameters of 16 – 40 mm

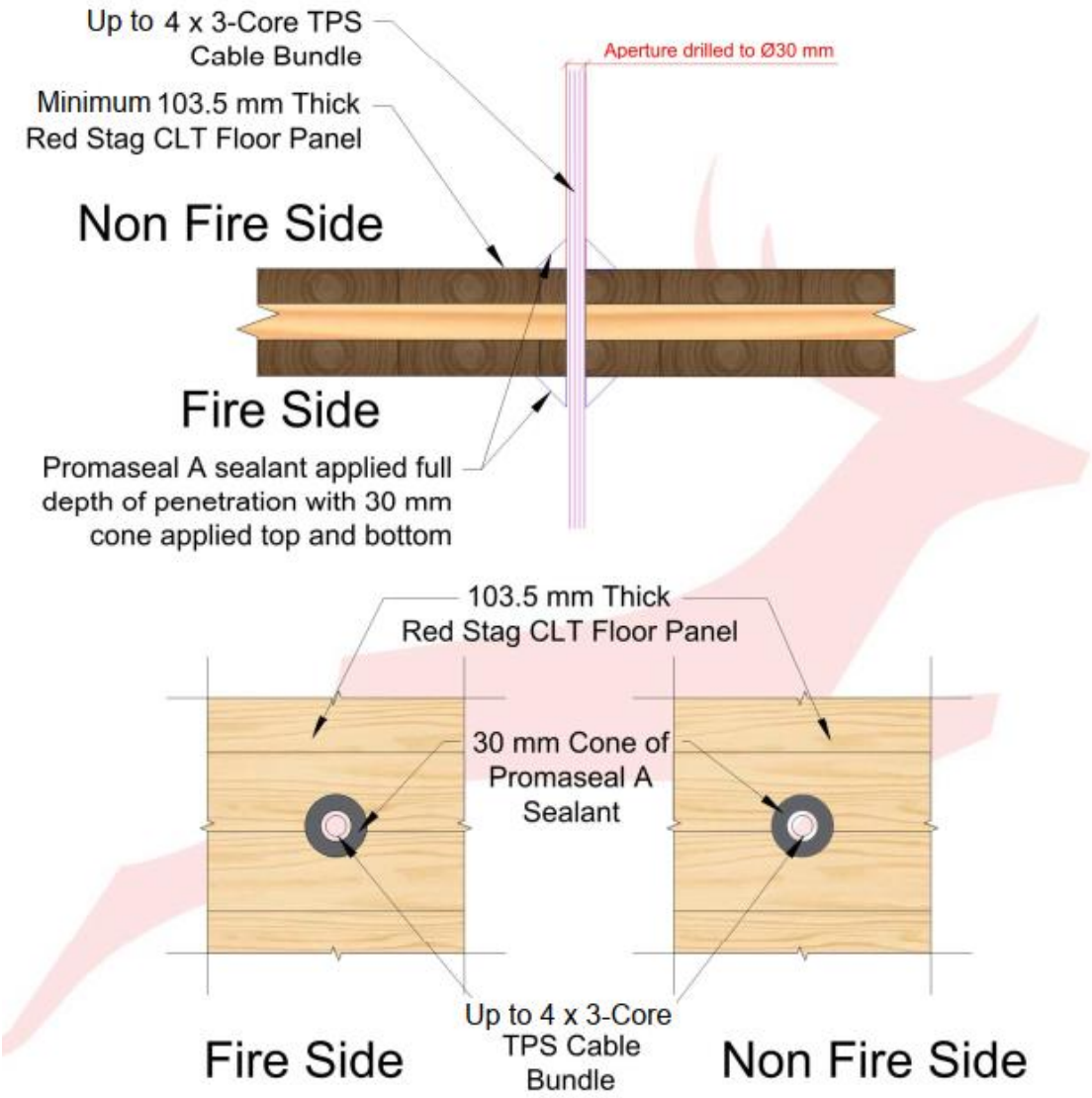

Figure 1 Elevation and plan view of 3-core TPS cable bundles in Red Stag CLT floor

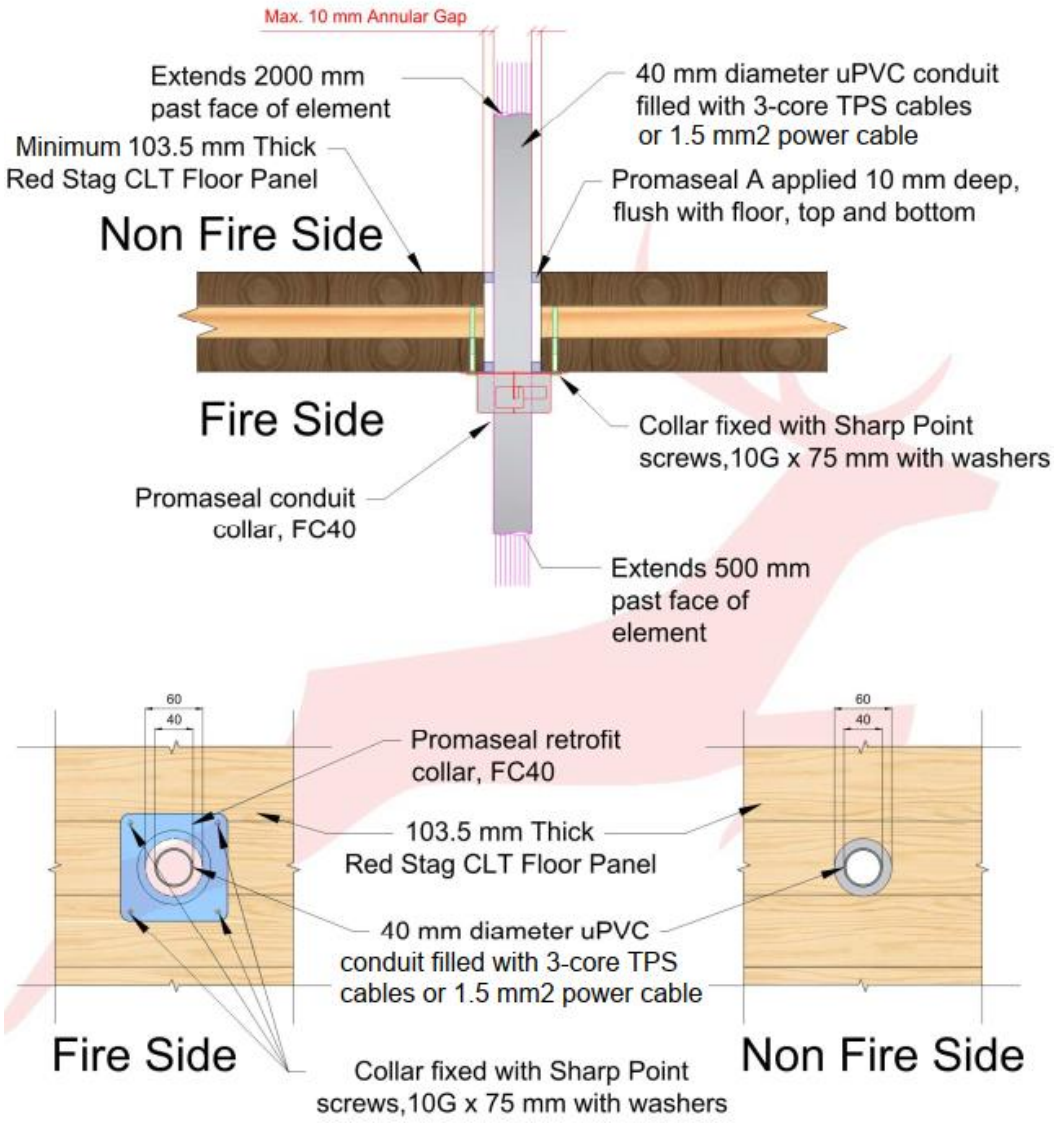

Figure 2 Elevation and plan view of 40 mm diameter uPVC conduit filled with 3-core TPS cables or 1.5 mm^2 power cable in Red Stag CLT floor

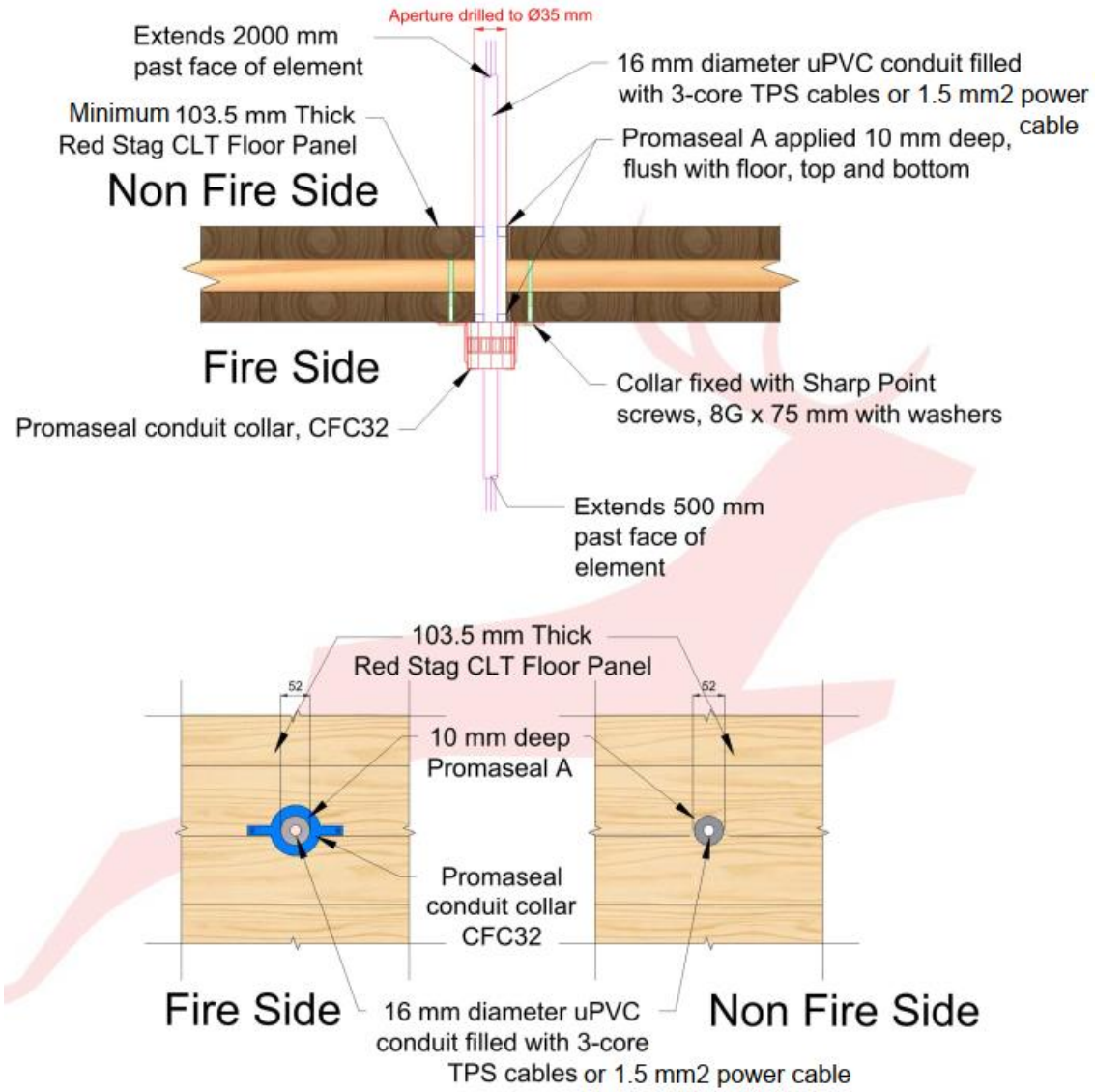

Figure 3 Elevation and plan view of 16 mm diameter uPVC conduit filled with 3-core TPS cables or 1.5 mm^2 power cable in Red Stag CLT floor

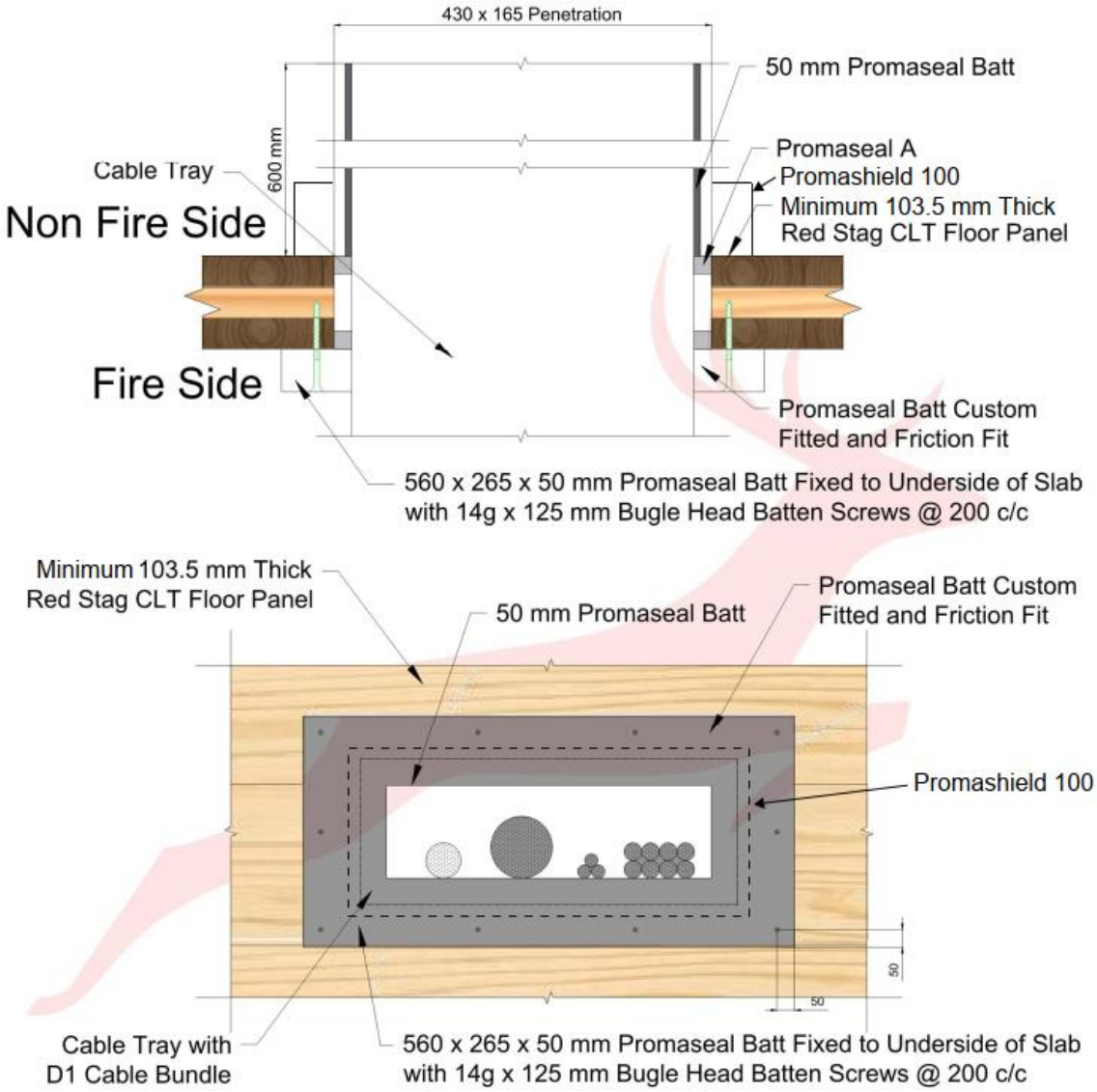

Figure 4 Elevation and plan view of D1 cable configuration as per AS 1530.4:2014 in Red Stag CLT floor with Promashield 100

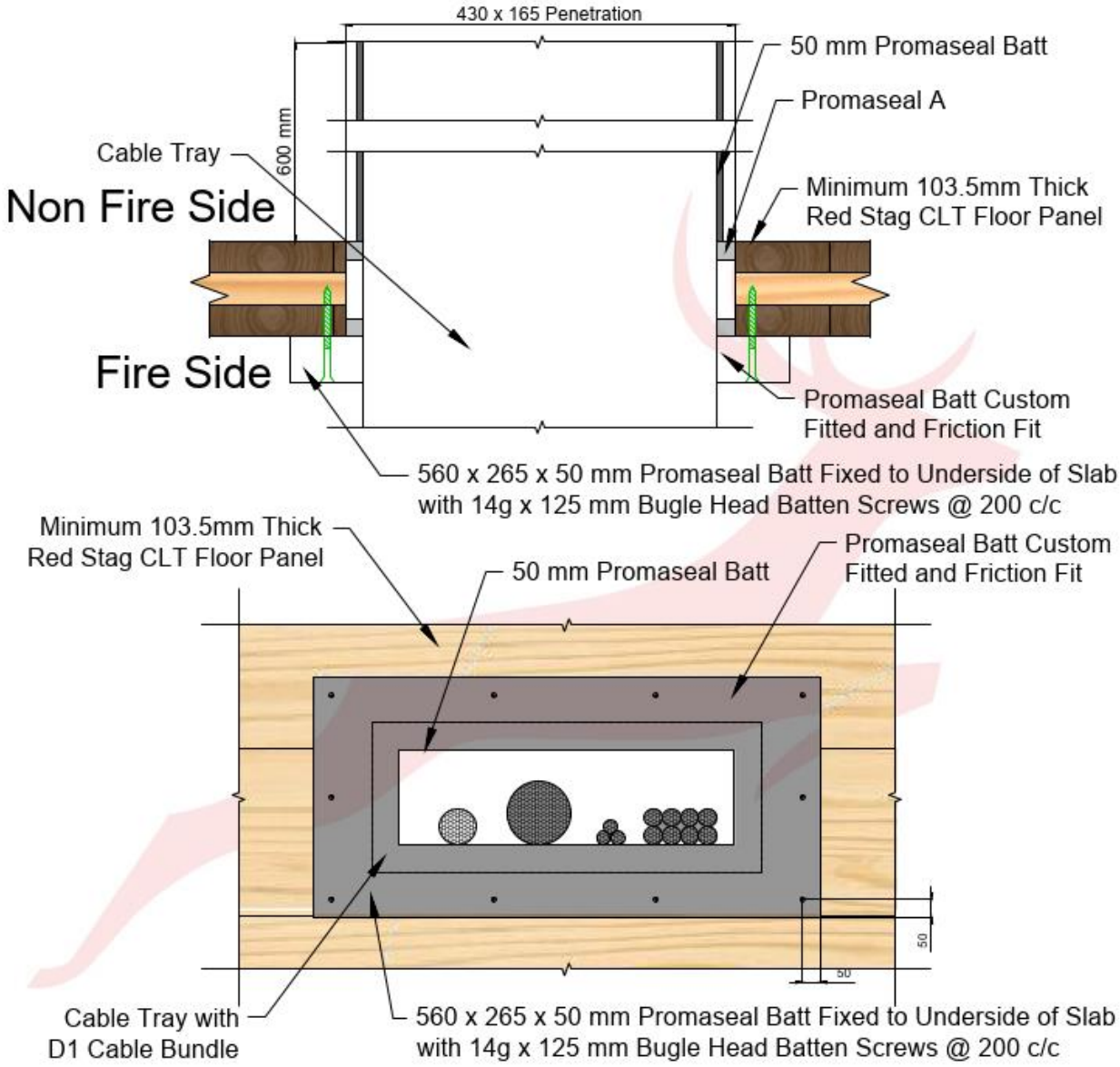

Figure 5 Elevation and plan view of D1 cable configuration as per AS 1530.4:2014 in Red Stag CLT floor

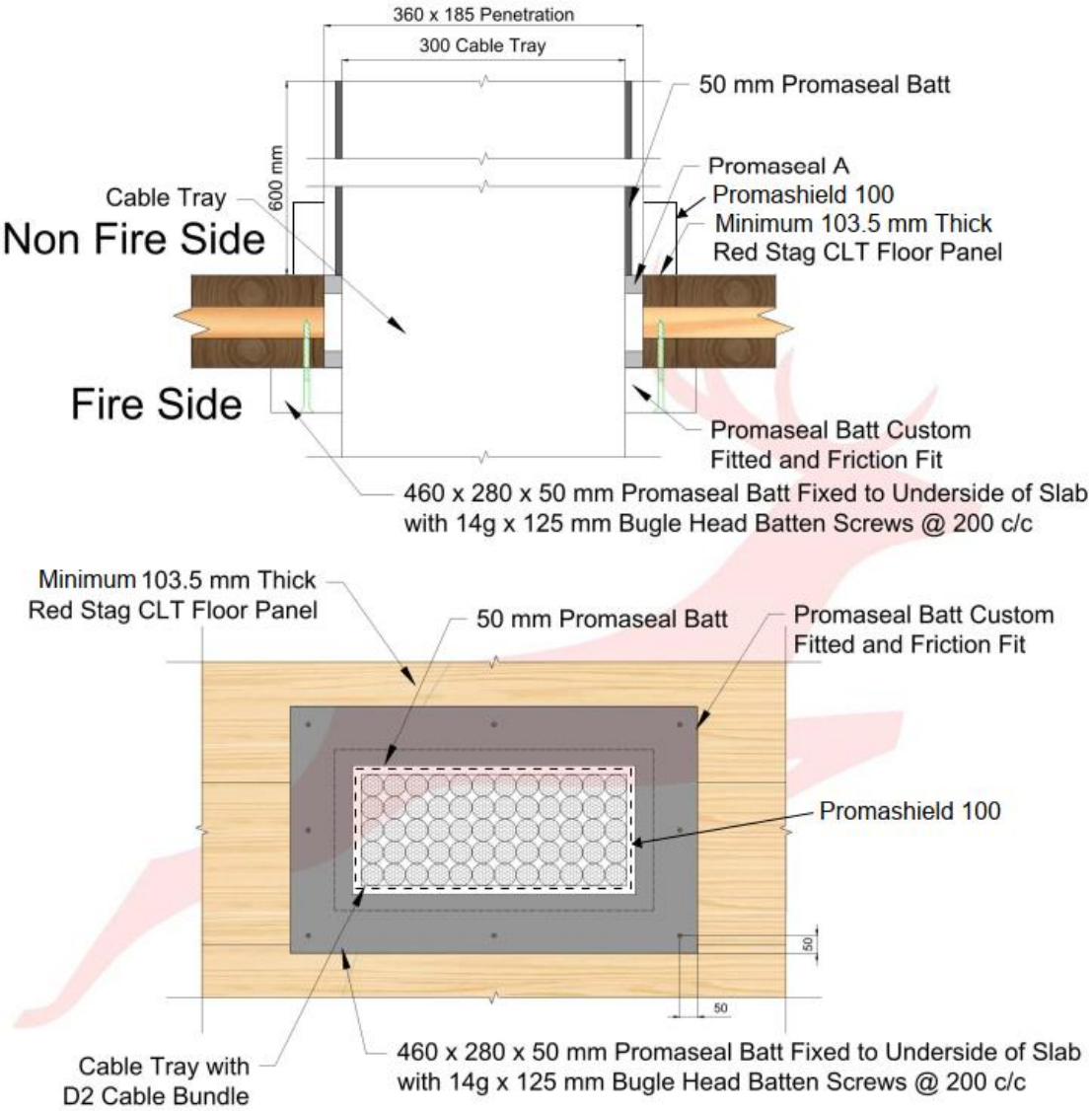

Figure 6 Elevation and plan view of D2 cable configuration as per AS 1530.4:2014 in Red Stag CLT floor with Promashield 100

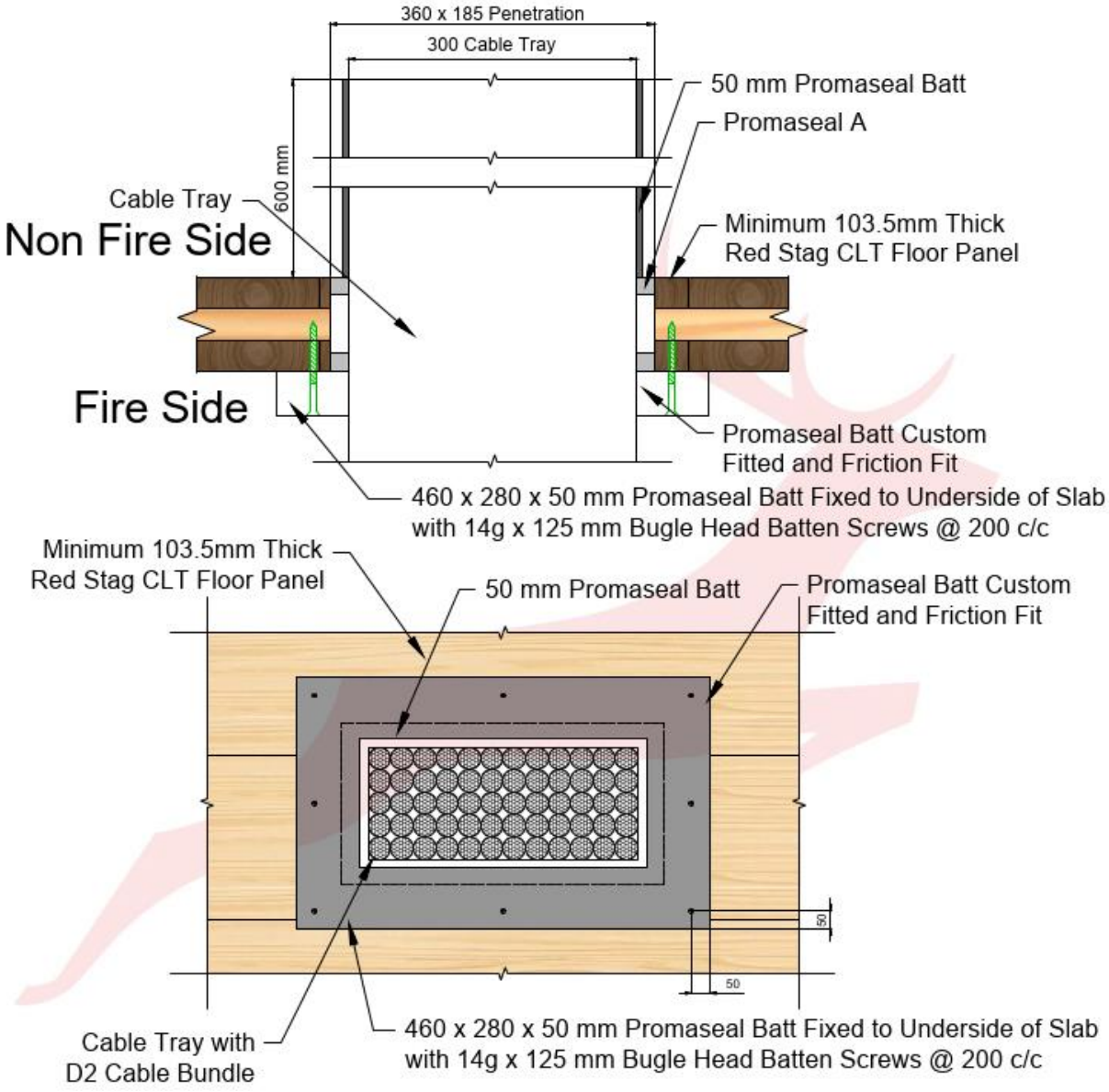

Figure 7 Elevation and plan view of D2 cable configuration as per AS 1530.4:2014 in Red Stag CLT floor

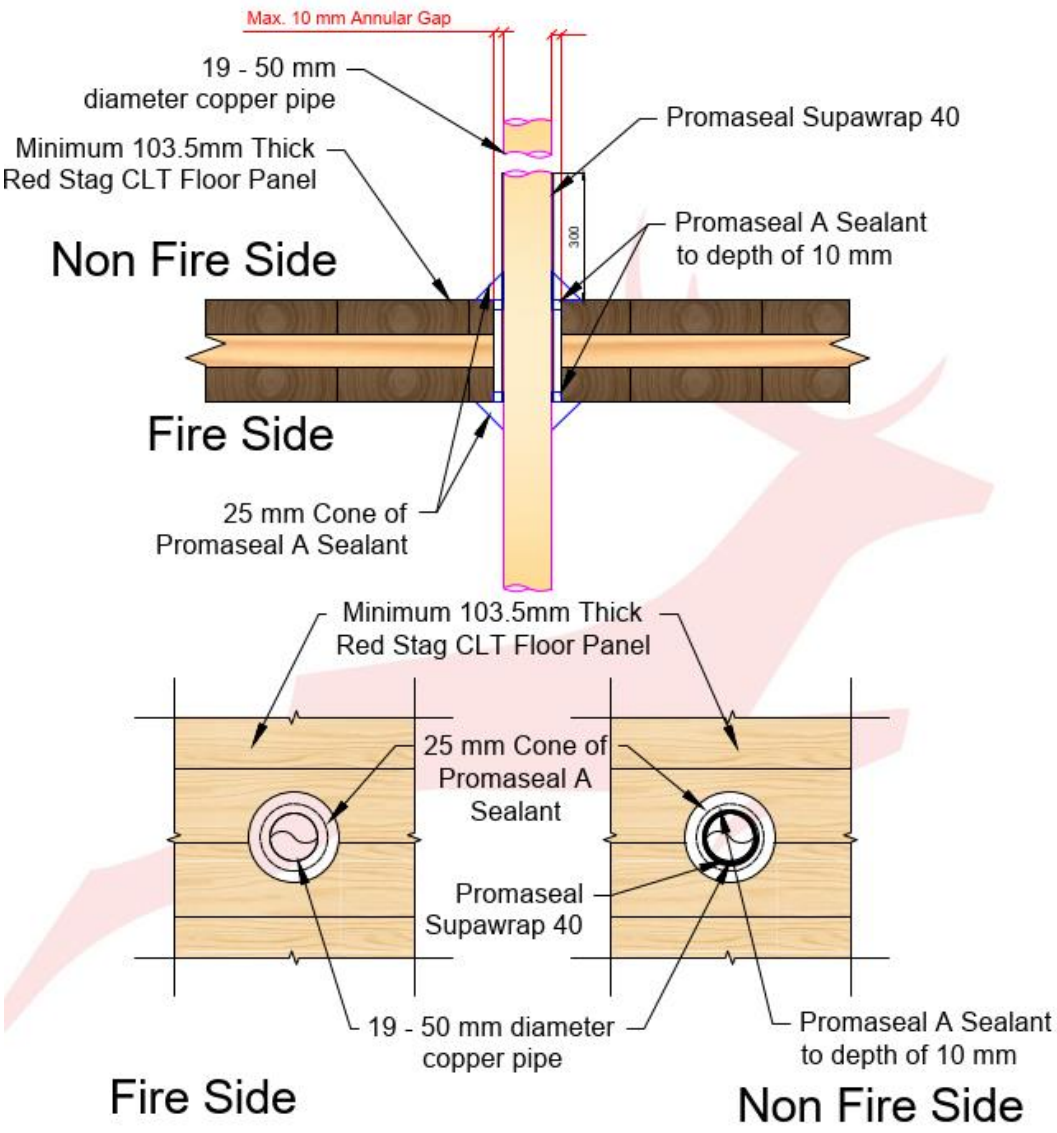

Figure 8 **Elevation and plan view of 19 – 50 mm copper pipes wrapped with Promaseal SupaWrap 40 in Red Stag CLT floor**

Figure 11 Elevation and plan view of 50 – 150 mm copper pipes in Red Stag CLT floor

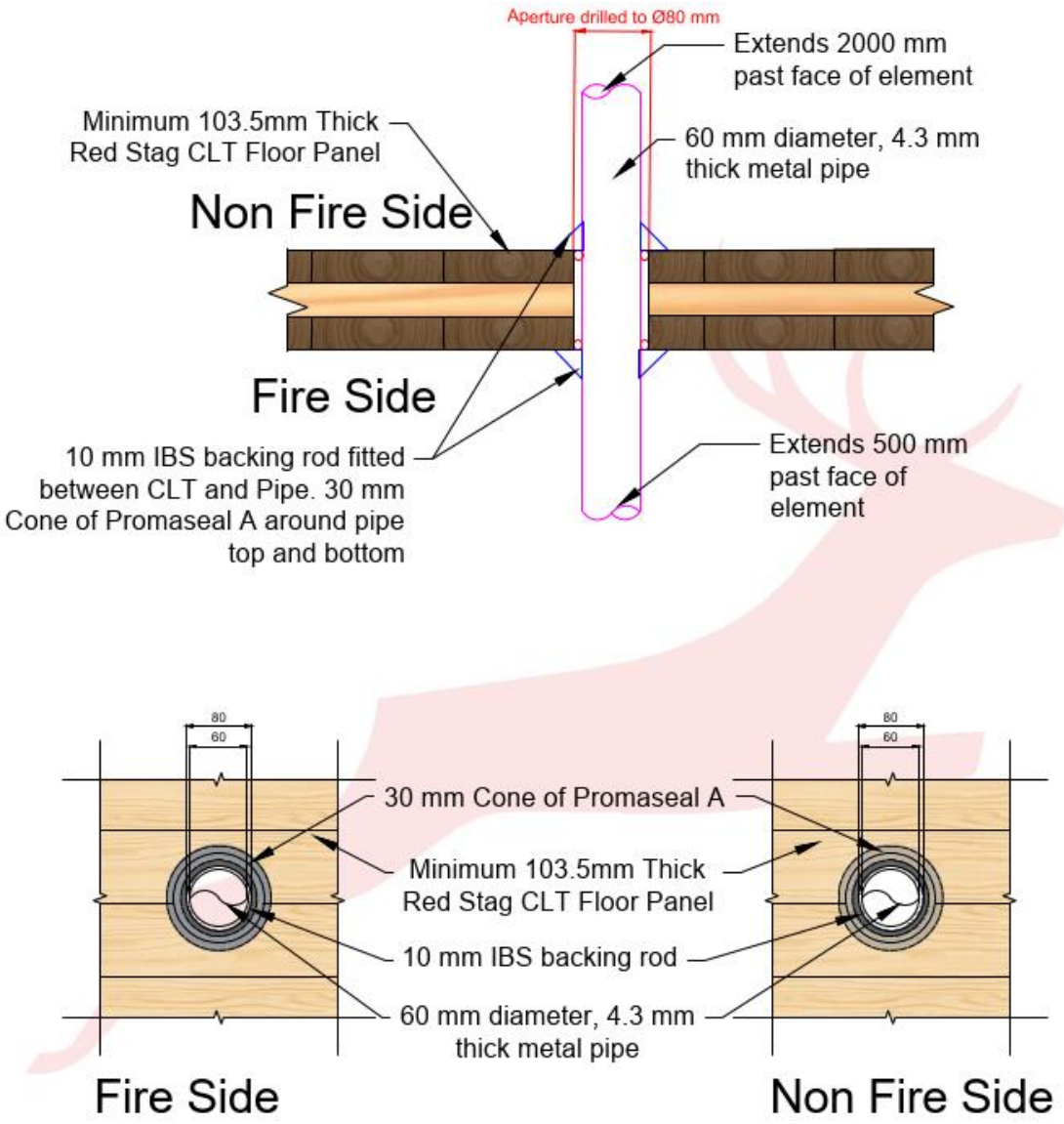

Figure 12 Elevation and plan view of 60 mm diameter, 4.3BMT metal pipe in Red Stag CLT floor

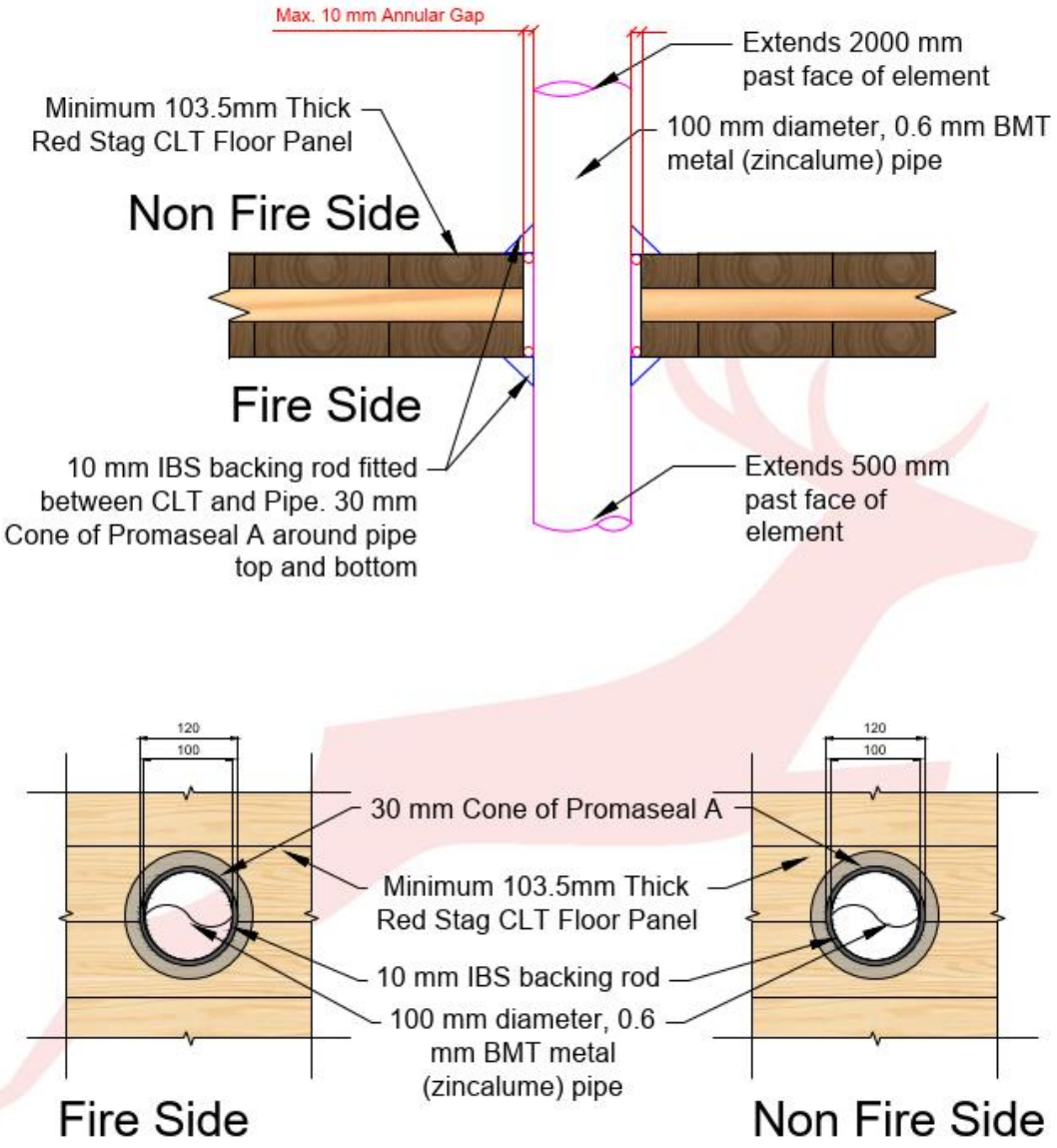

Figure 13 Elevation and plan view of 60 – 100 mm diameter, 0.6BMT metal (Zincalume) down pipe in Red Stag CLT floor

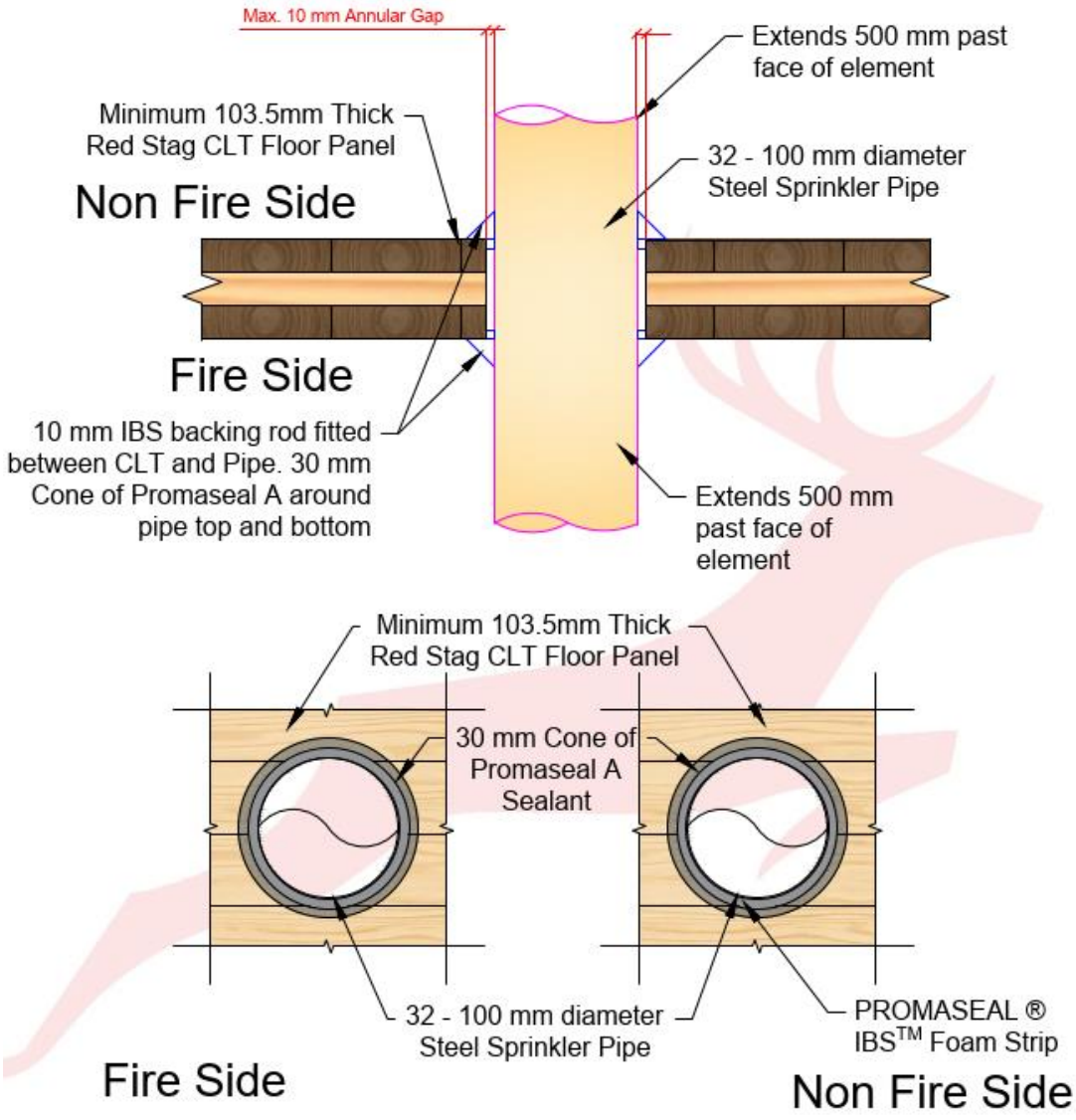

Figure 14 Elevation and plan view of 32 - 100 mm diameter steel sprinkler pipes in Red Stag CLT floor

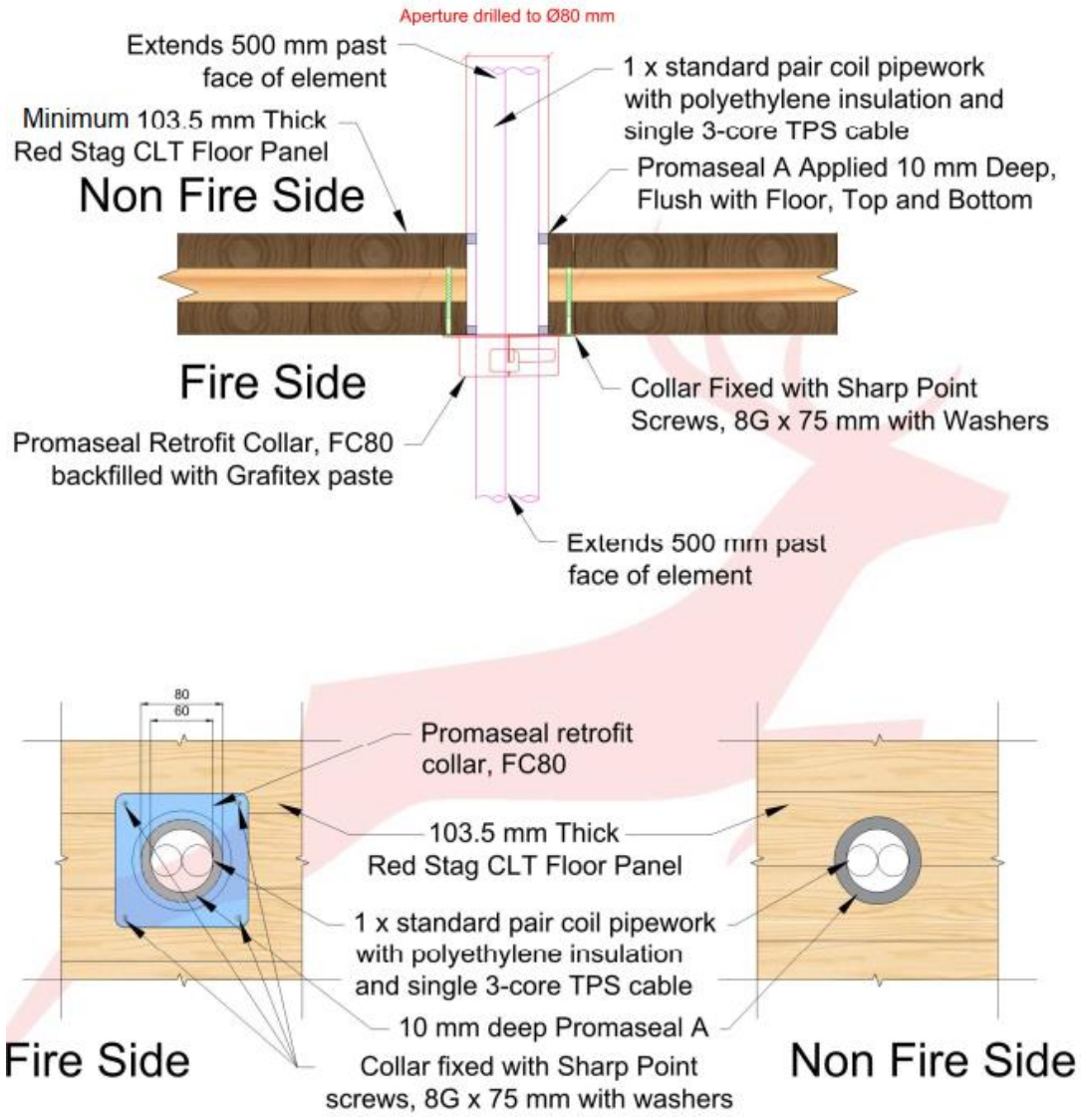

Figure 15 Elevation and plan view of 1 × Standard pair coil pipework with polyethylene insulation and single 3-core TPS cable in Stag CLT floor

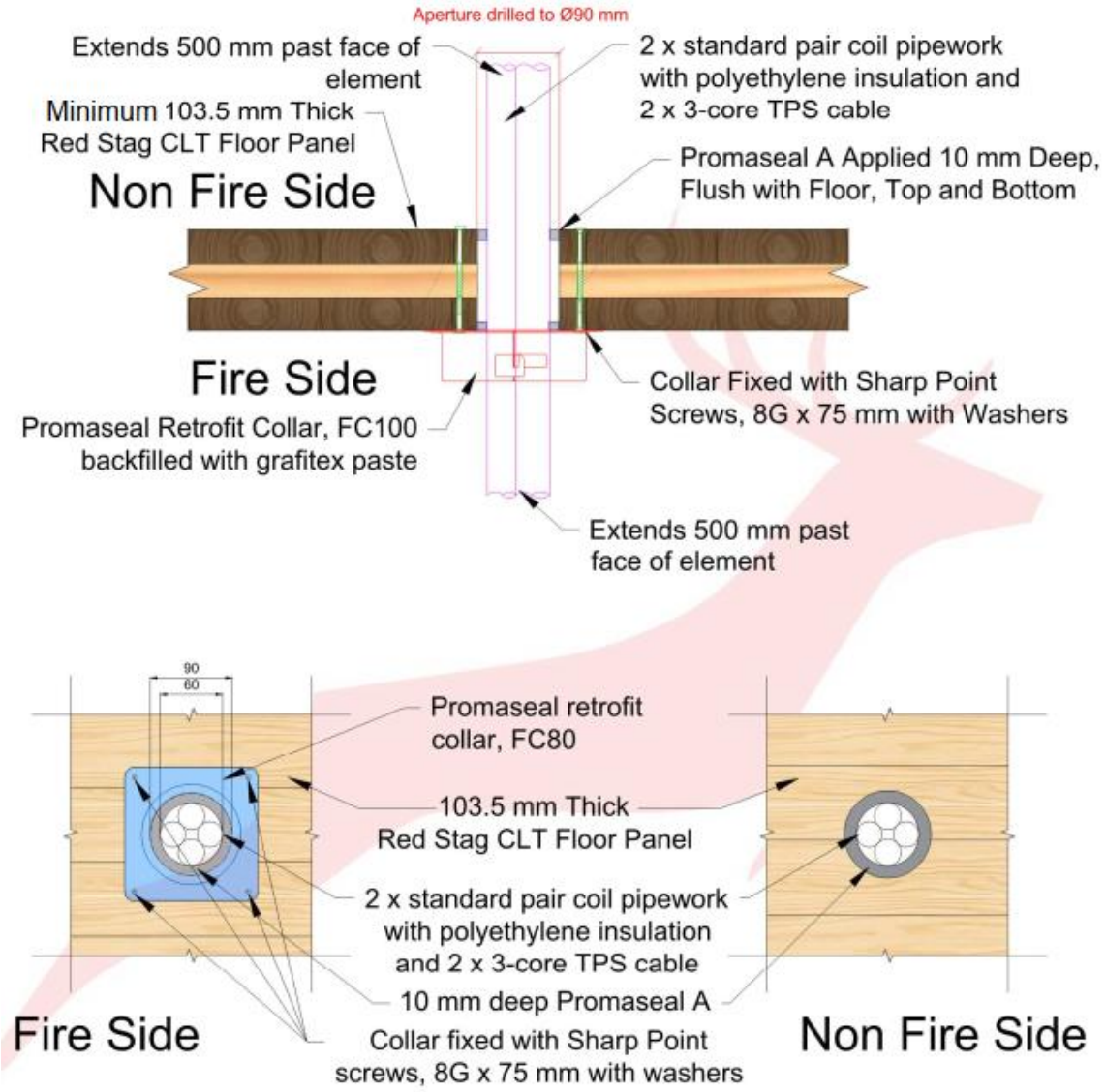

Figure 16 Elevation and plan view of 2 × Standard pair coil pipework with polyethylene insulation and 2 × 3-core TPS cable

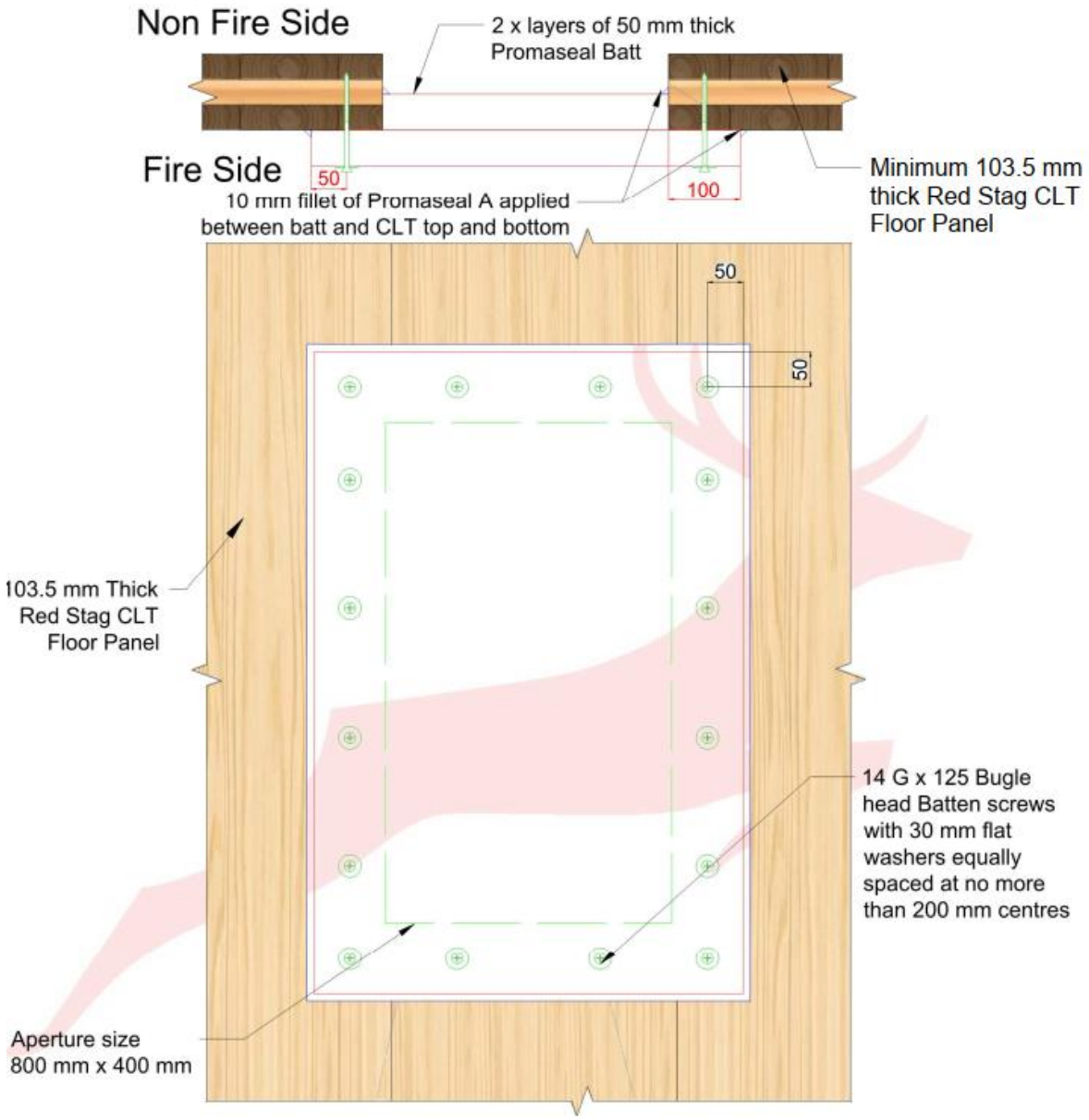

Figure 17 Elevation and plan view of blank seal of size up to 800 mm × 400 mm in Red Stag CLT floor

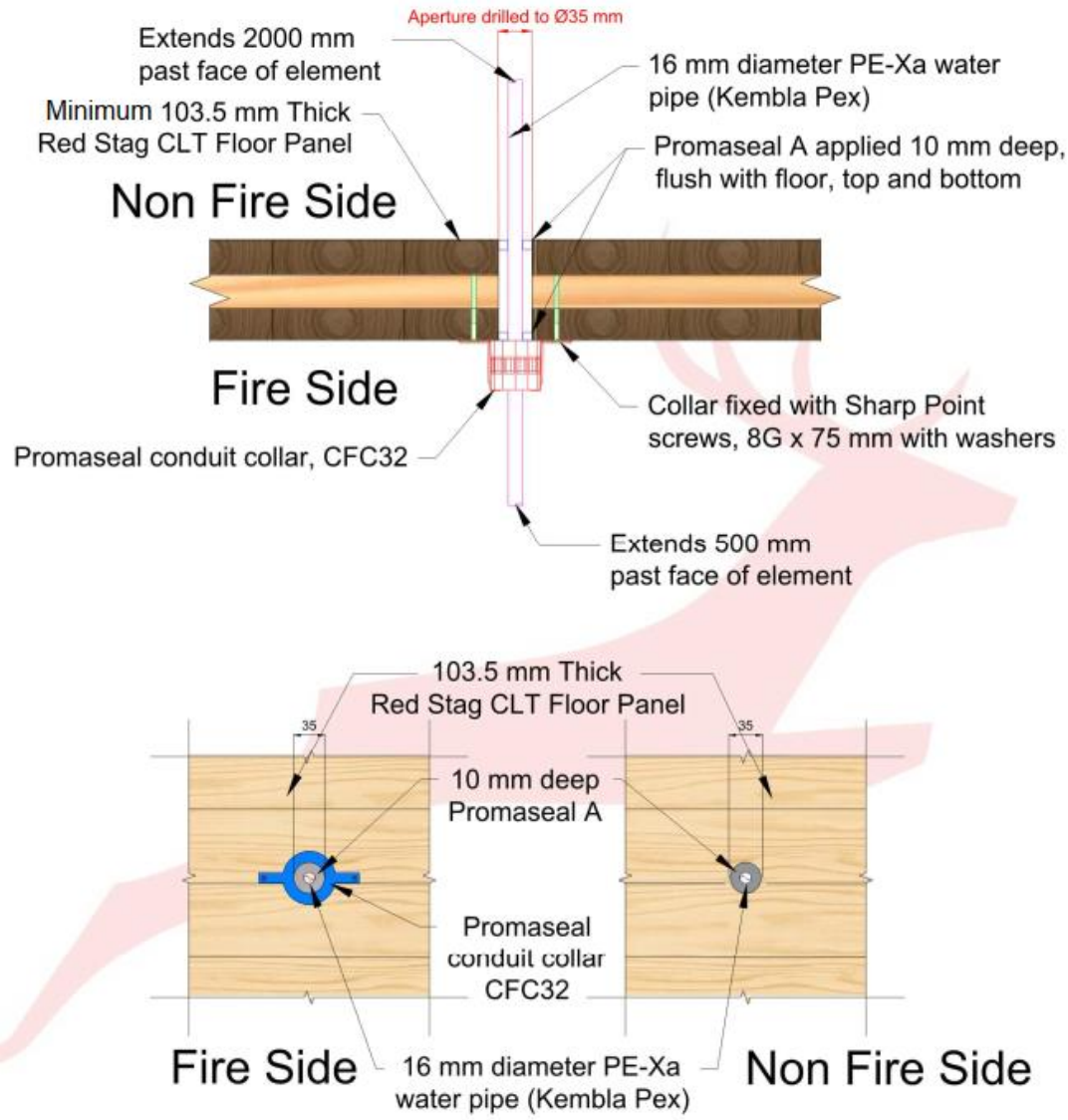

Figure 18 Elevation and plan view of 16 mm diameter PE-Xa water pipes (Kembla Pex) in Red Stag CLT floor

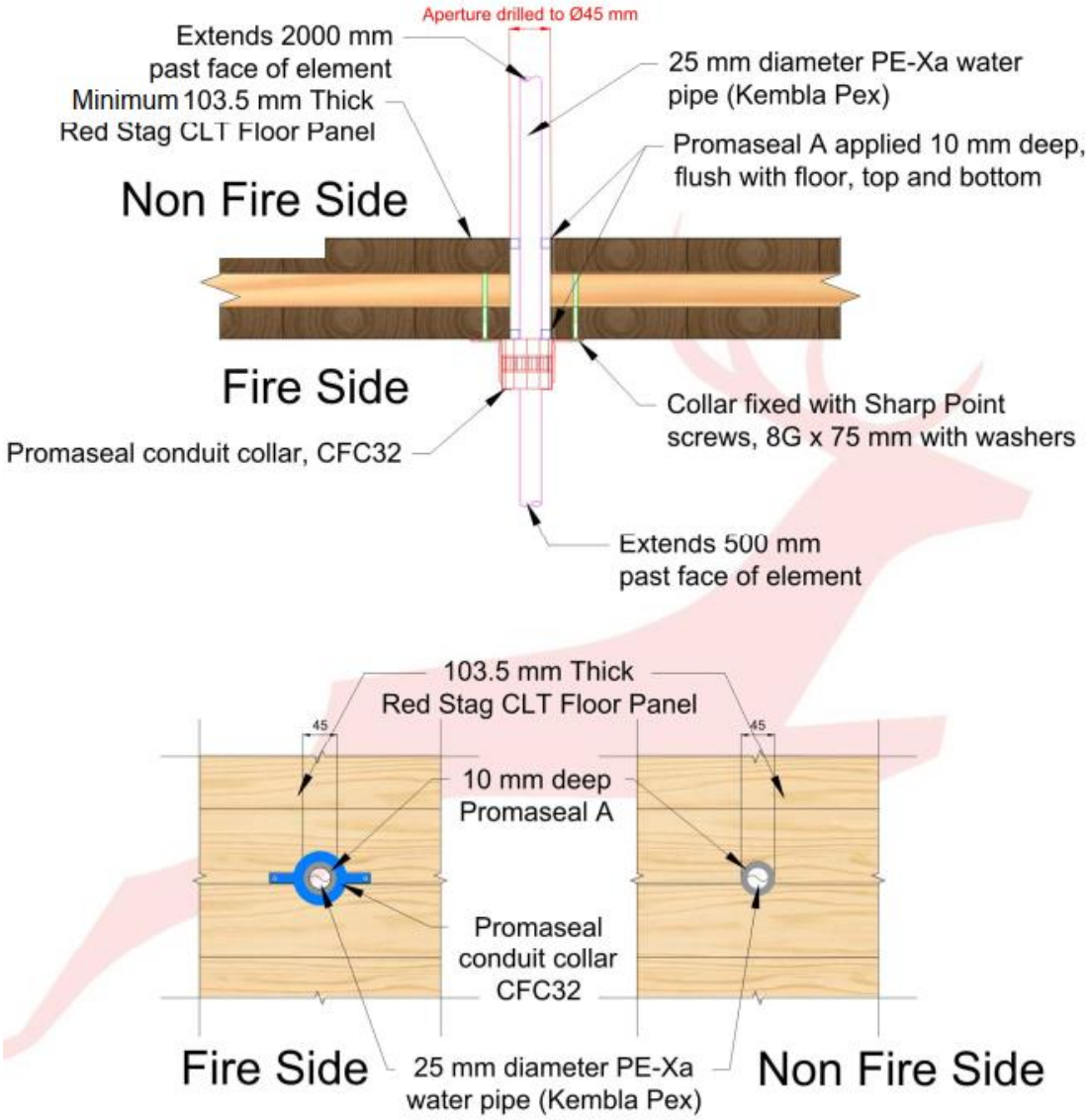

Figure 19 Elevation and plan view of 25 mm diameter PE-Xa water pipes (Kembla Pex) in Red Stag CLT floor

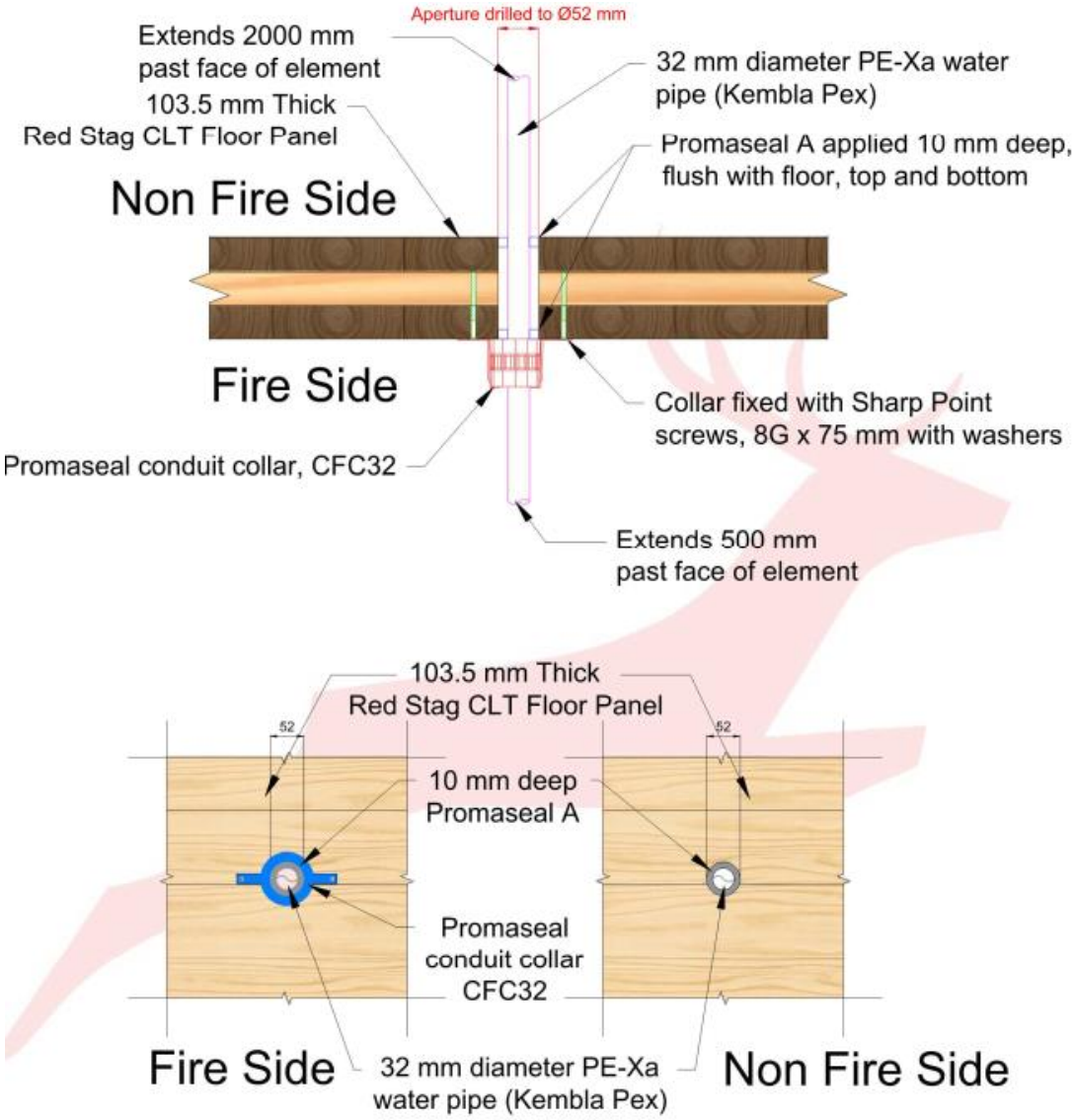

Figure 20 Elevation and plan view of 32 mm diameter PE-Xa water pipes (Kembla Pex) in Red Stag CLT floor

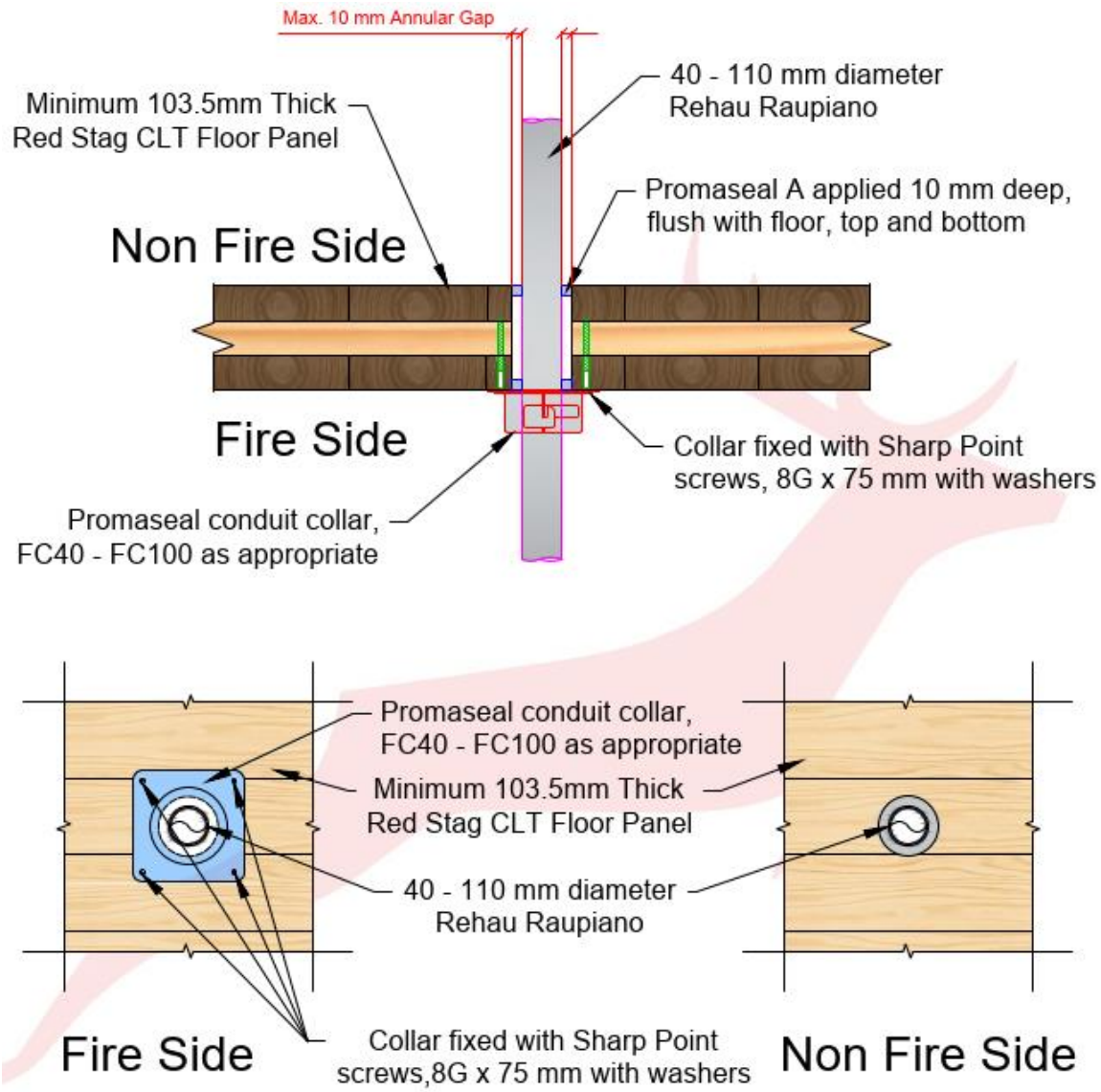

Figure 21 Elevation and plan view of 40 – 110 mm diameter Rehau Raupiano sanitary pipes in Red Stag CLT floor

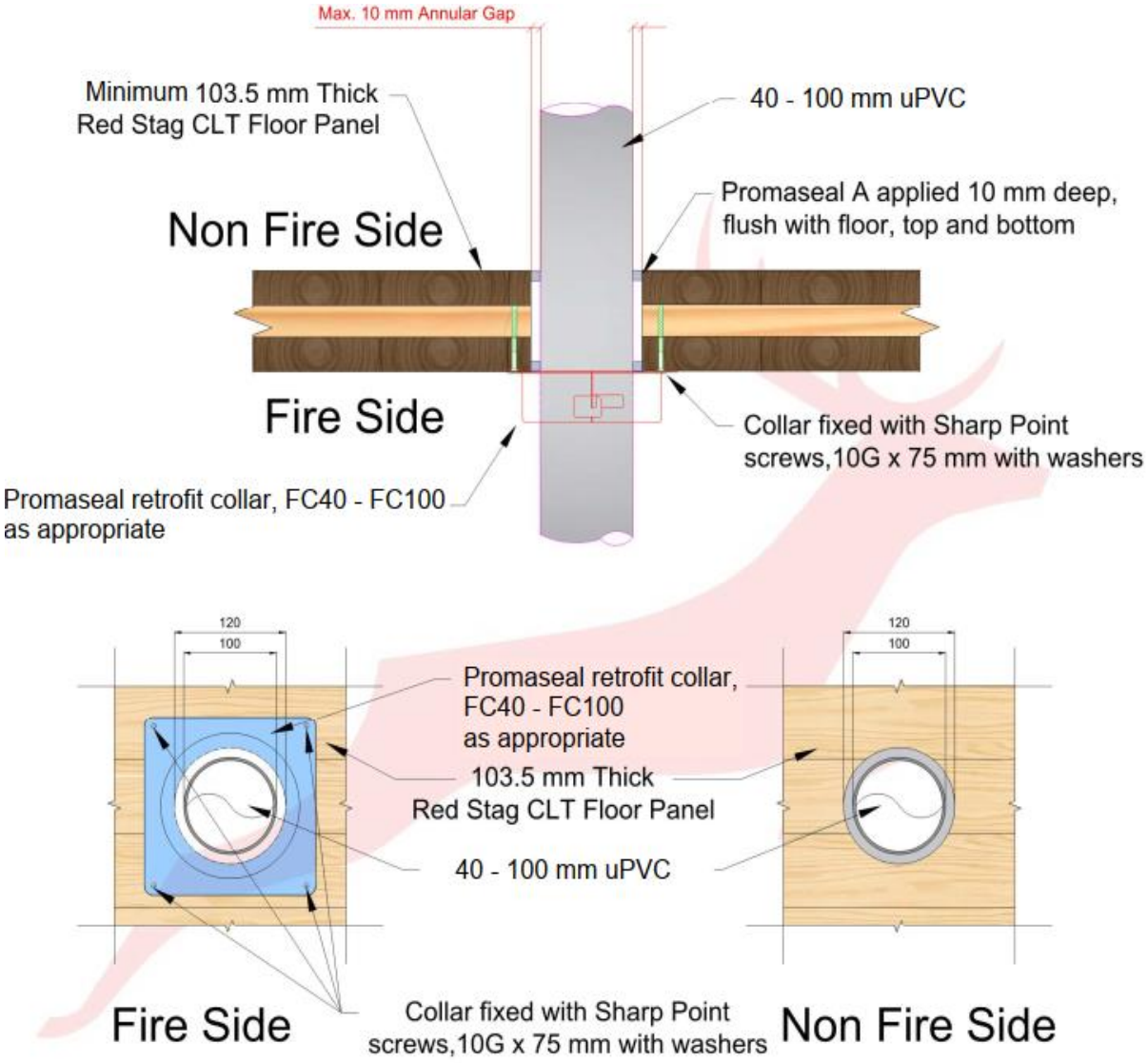

Figure 22 Elevation and plan view of 40 – 100 mm diameter uPVC pipes in Red Stag CLT floor

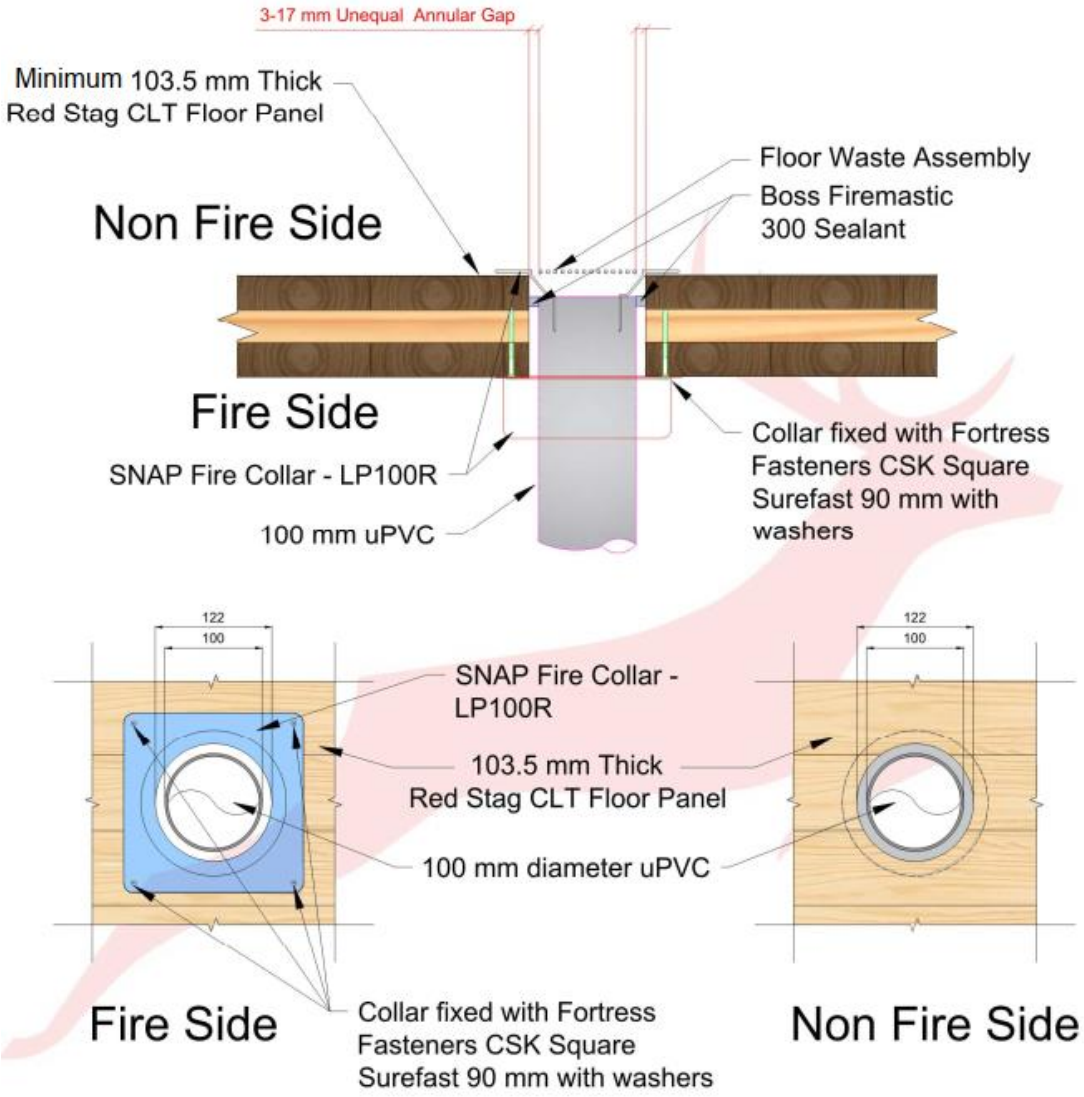

Figure 23 Elevation and plan view of 100 mm uPVC Floor Waste Assembly with grate in Red Stag CLT floor

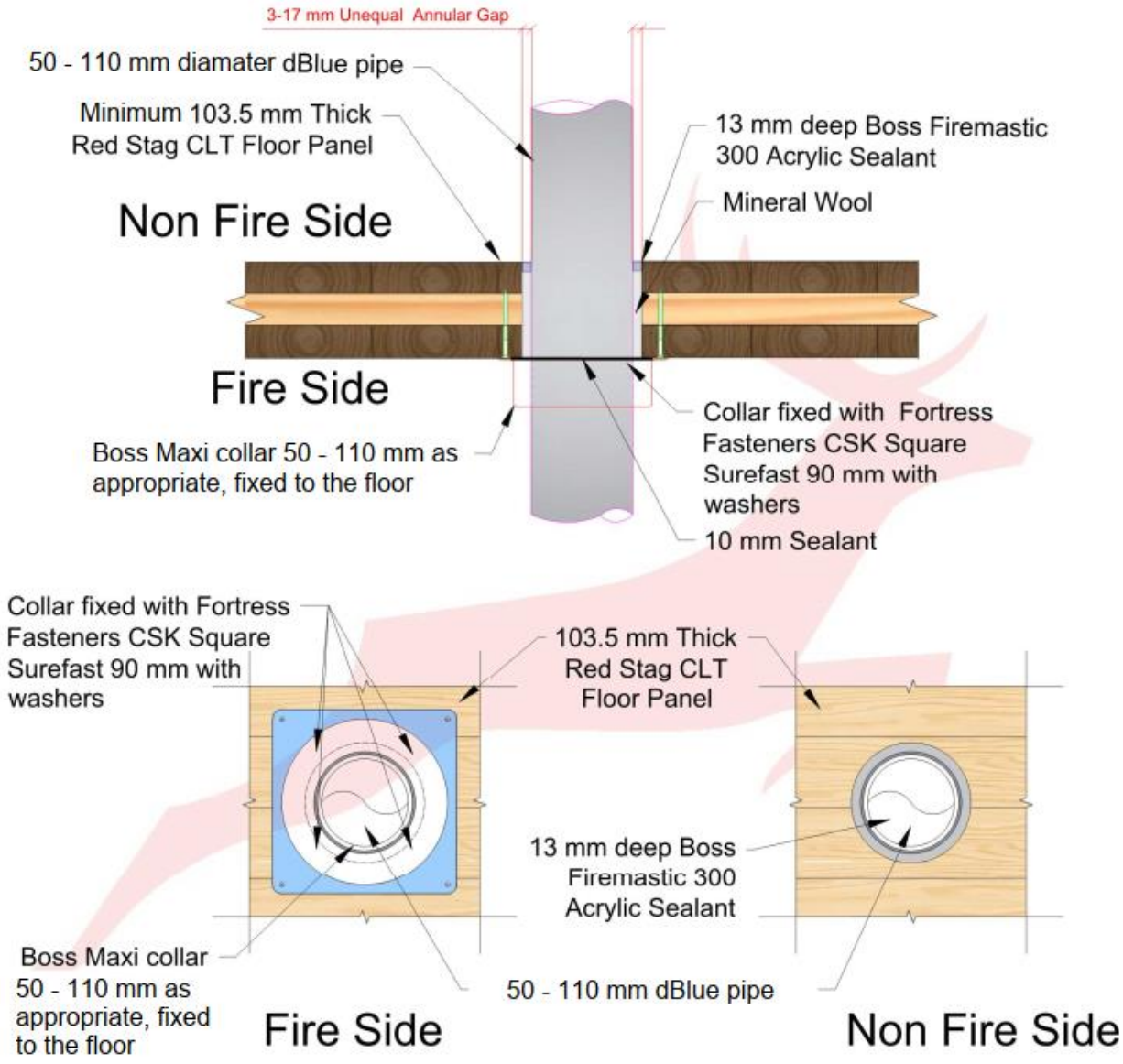

Figure 24 Elevation and plan view of 50 – 110 mm diameter dBlue PP/PP- MD/PP pipes

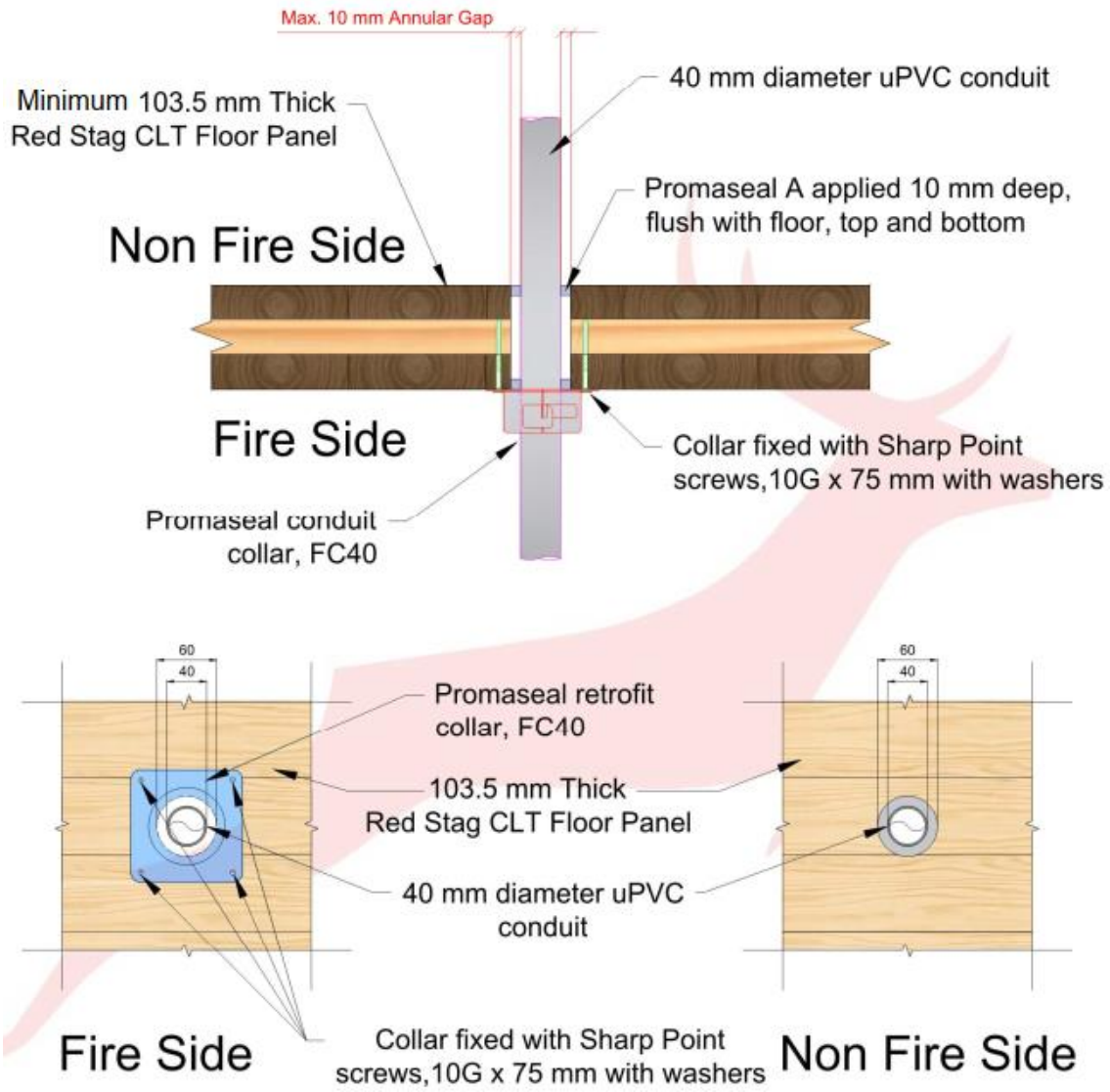

Figure 25 Elevation and plan view of 40 mm diameter conduit in Red Stag CLT floor

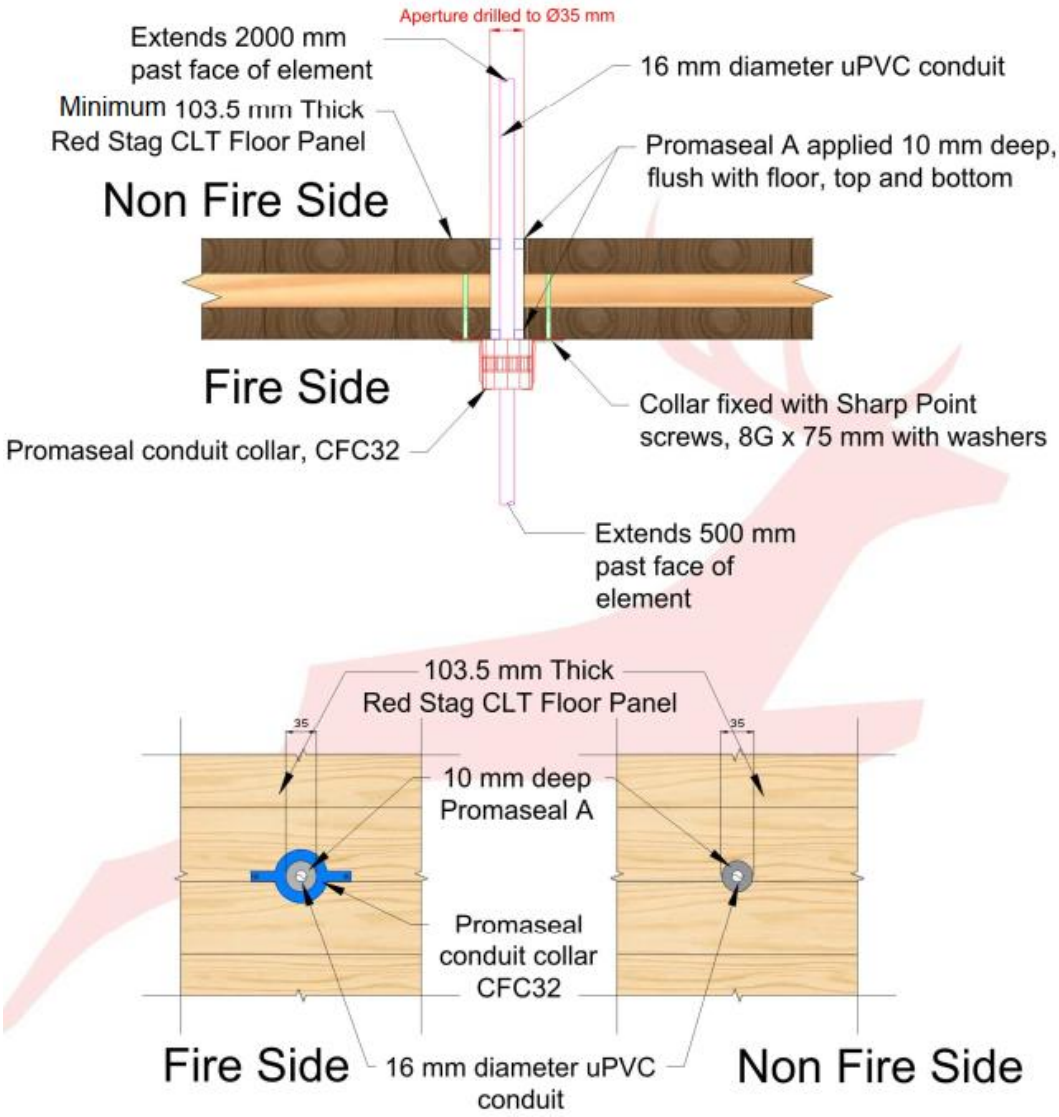

Figure 26 Elevation and plan view of 16 mm diameter conduit in Red Stag CLT floor

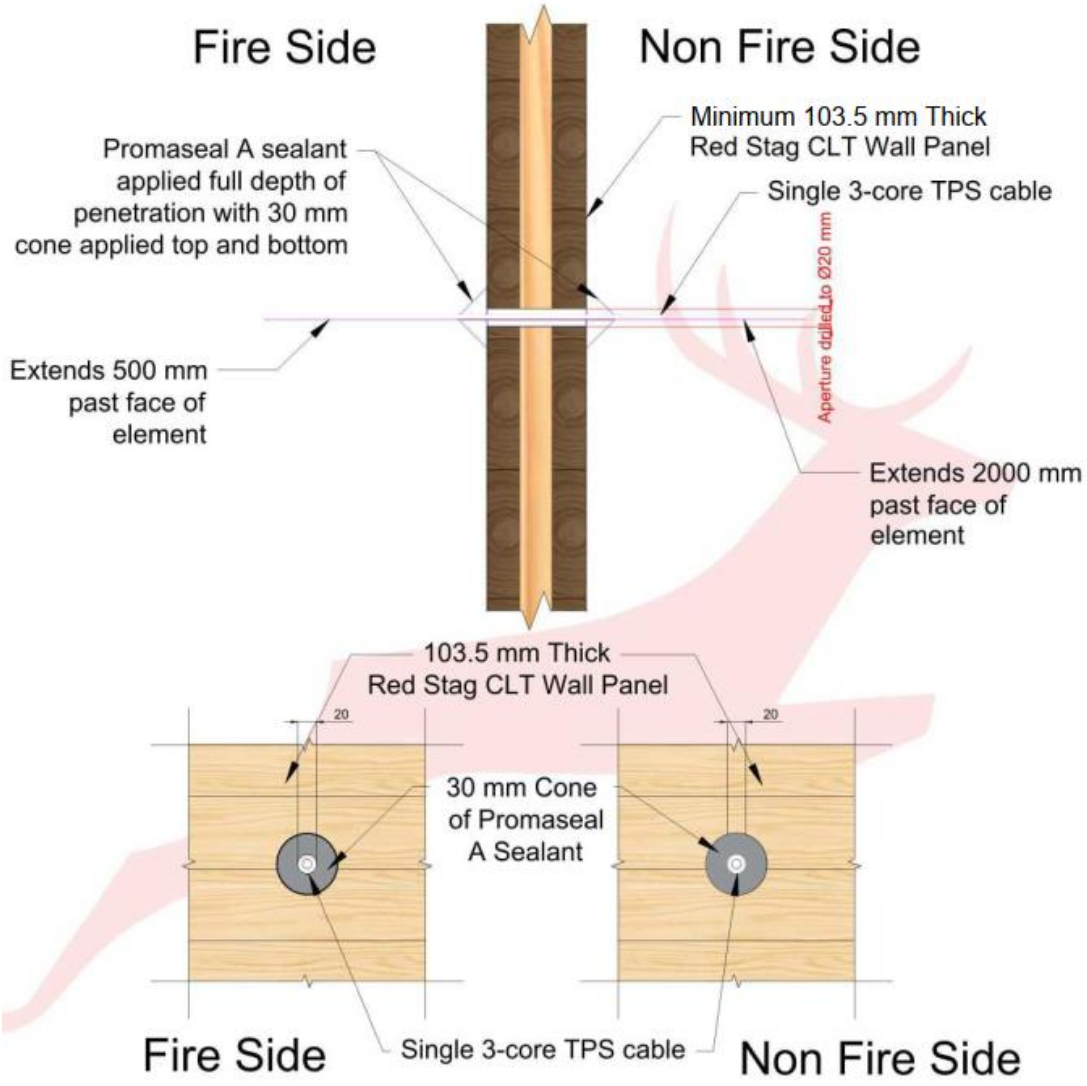

Figure 27 Elevation and plan view of single 3-core TPS Cables in Red Stag CLT wall

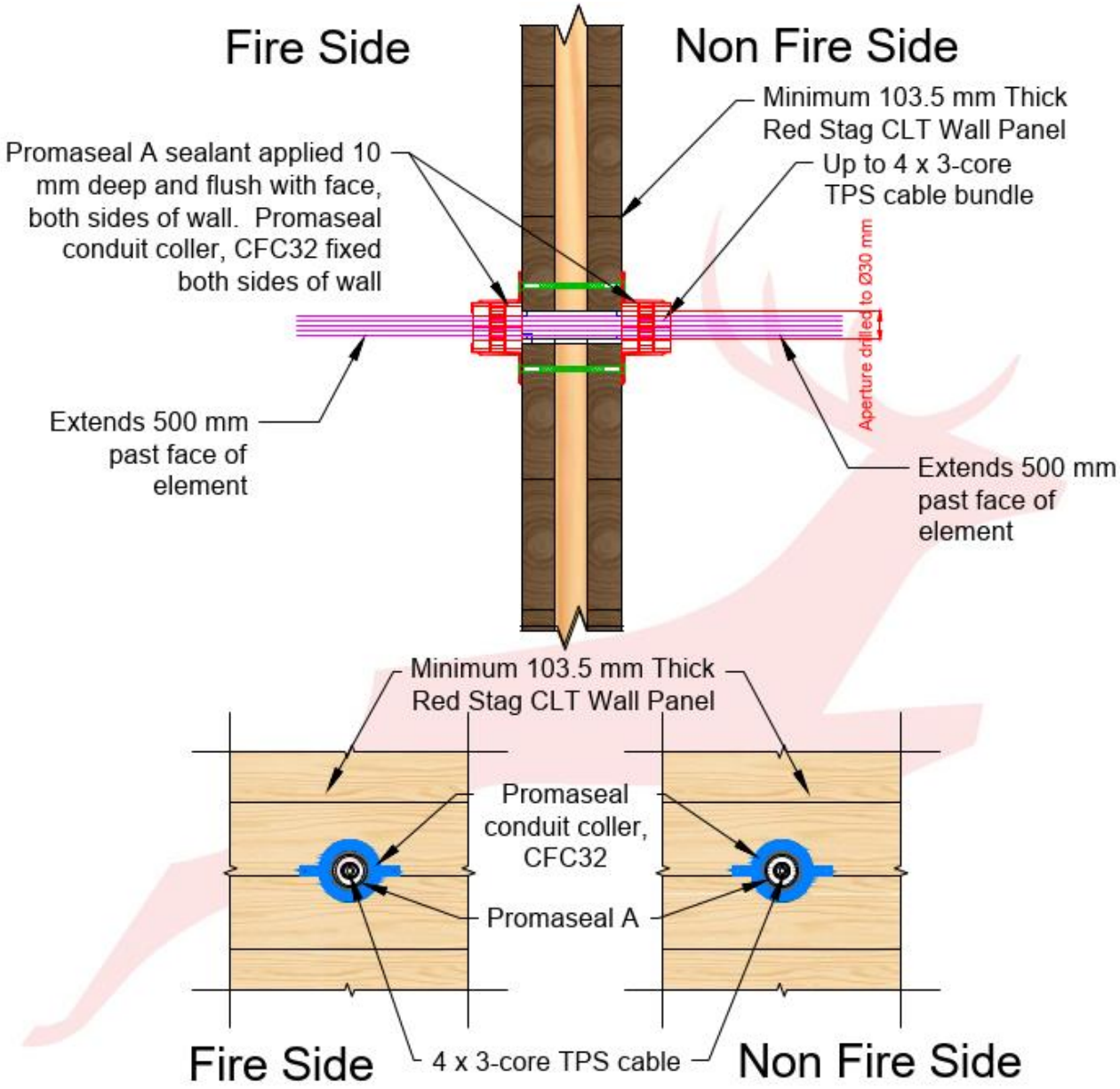

Figure 28 Elevation and plan view of four 3-core TPS Cables protected by Promaseal CFC32 in Red Stag CLT wall

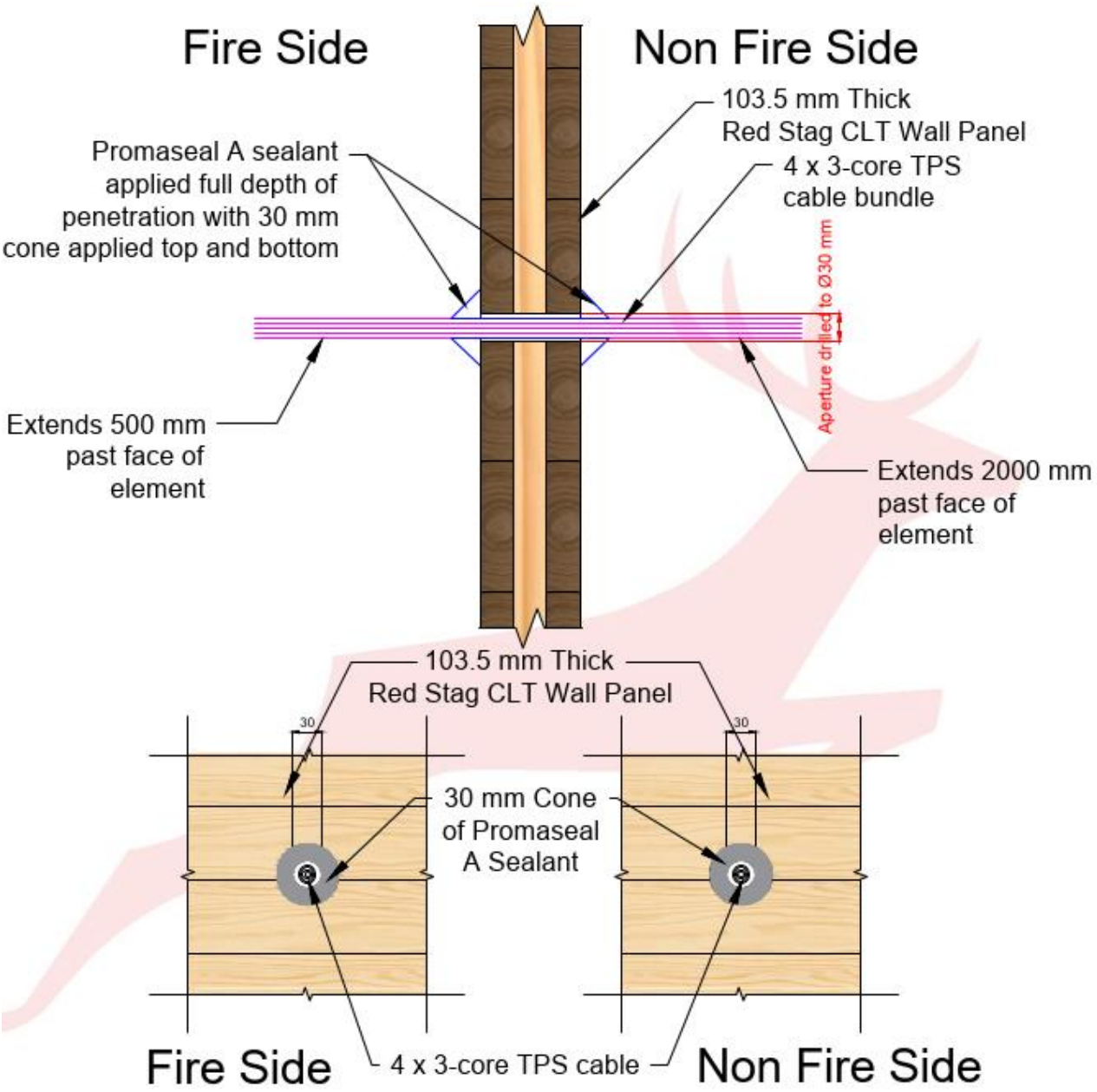

Figure 29 **Elevation and plan view of four 3-core TPS Cables in Red Stag CLT wall**

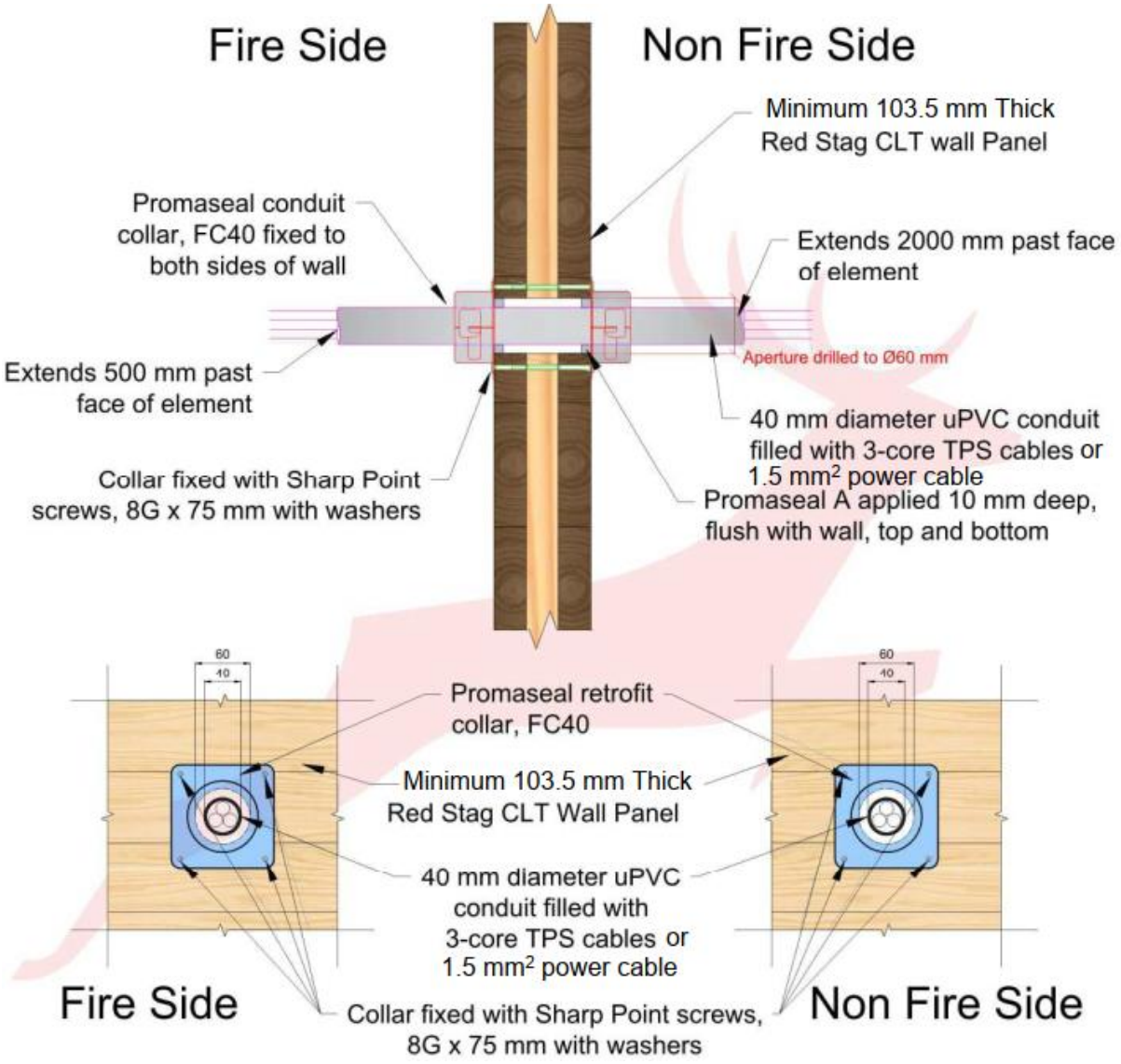

Figure 30 Elevation and plan view of 40 mm diameter uPVC conduit – filled with 3 core TPS cables or 1.5 mm^2 power cable in Red Stag CLT wall

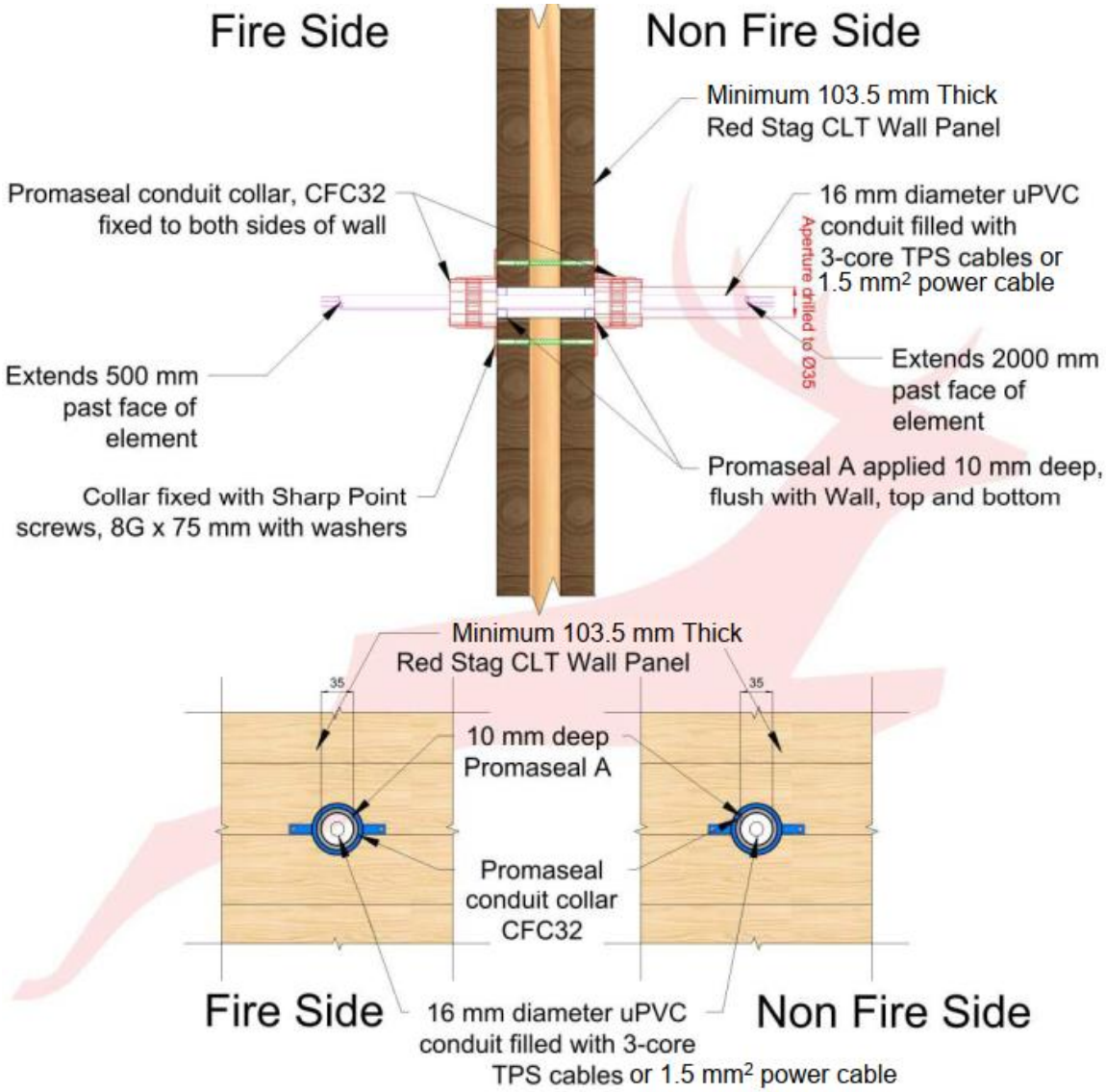

Figure 31 Elevation and plan view of 16 mm diameter uPVC conduit – filled with 3 core TPS cables 1.5 mm² power cable in Red Stag CLT wall

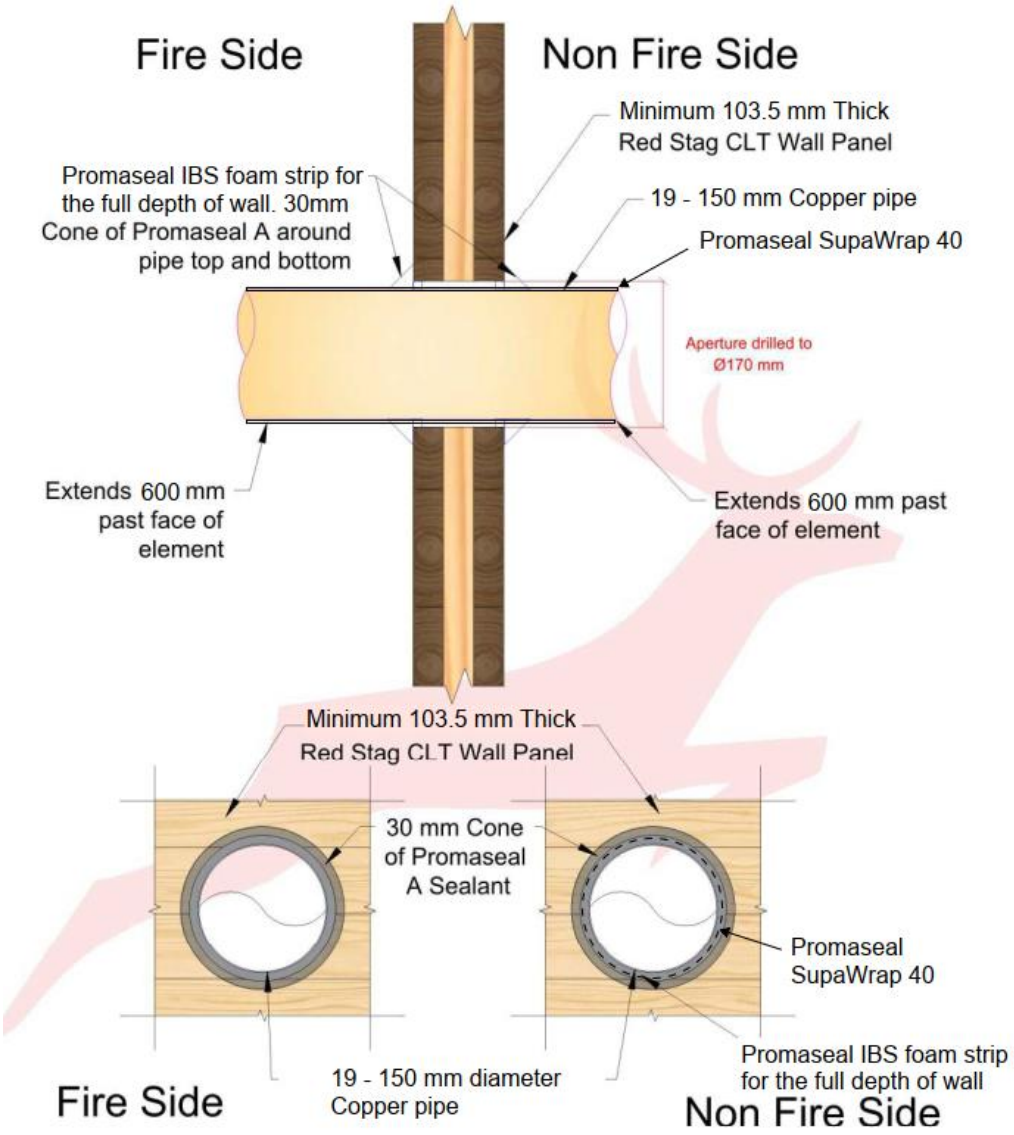

Figure 32 Elevation and plan view of 19 – 150 mm diameter copper pipe wrapped with Promaseal SupaWrap 40 in Red Stag CLT wall

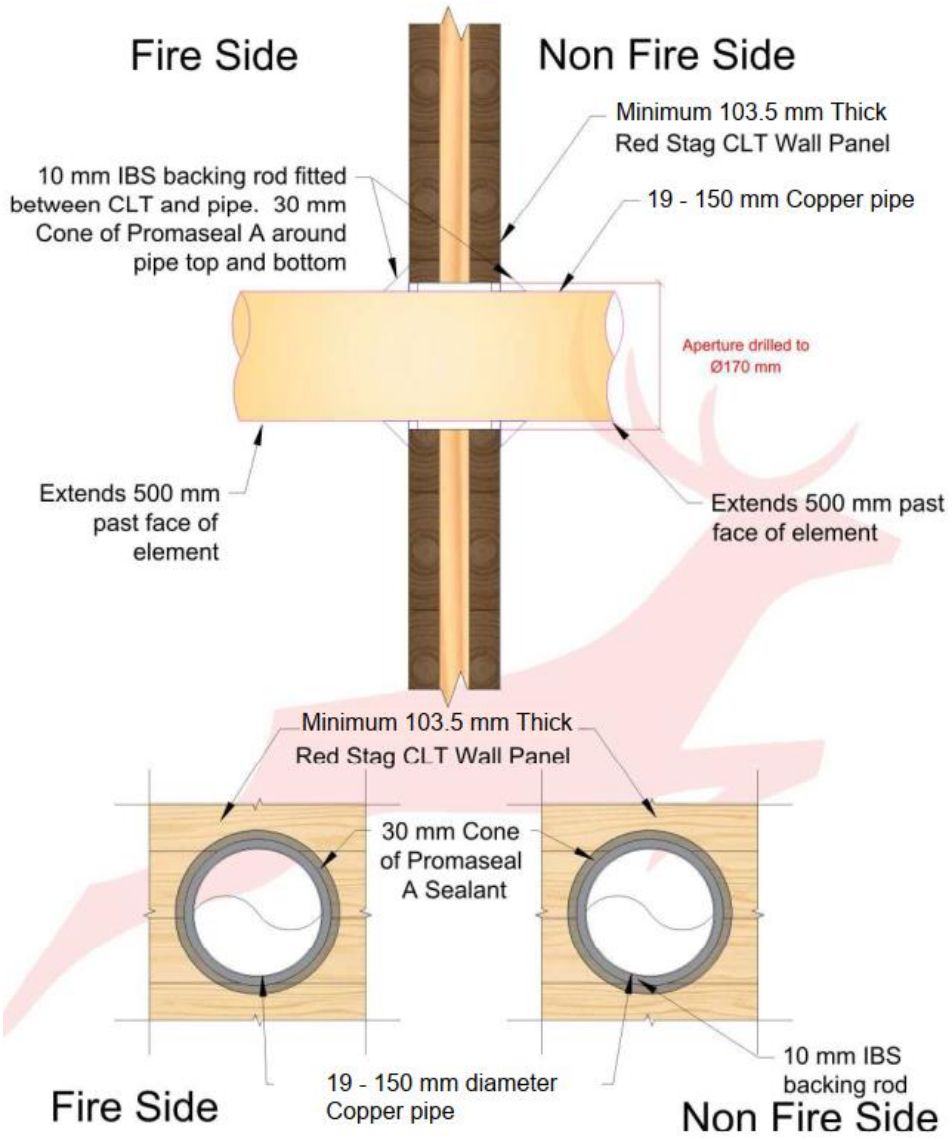

Figure 33 Elevation and plan view of 19 – 150 mm diameter copper pipe in Red Stag CLT wall

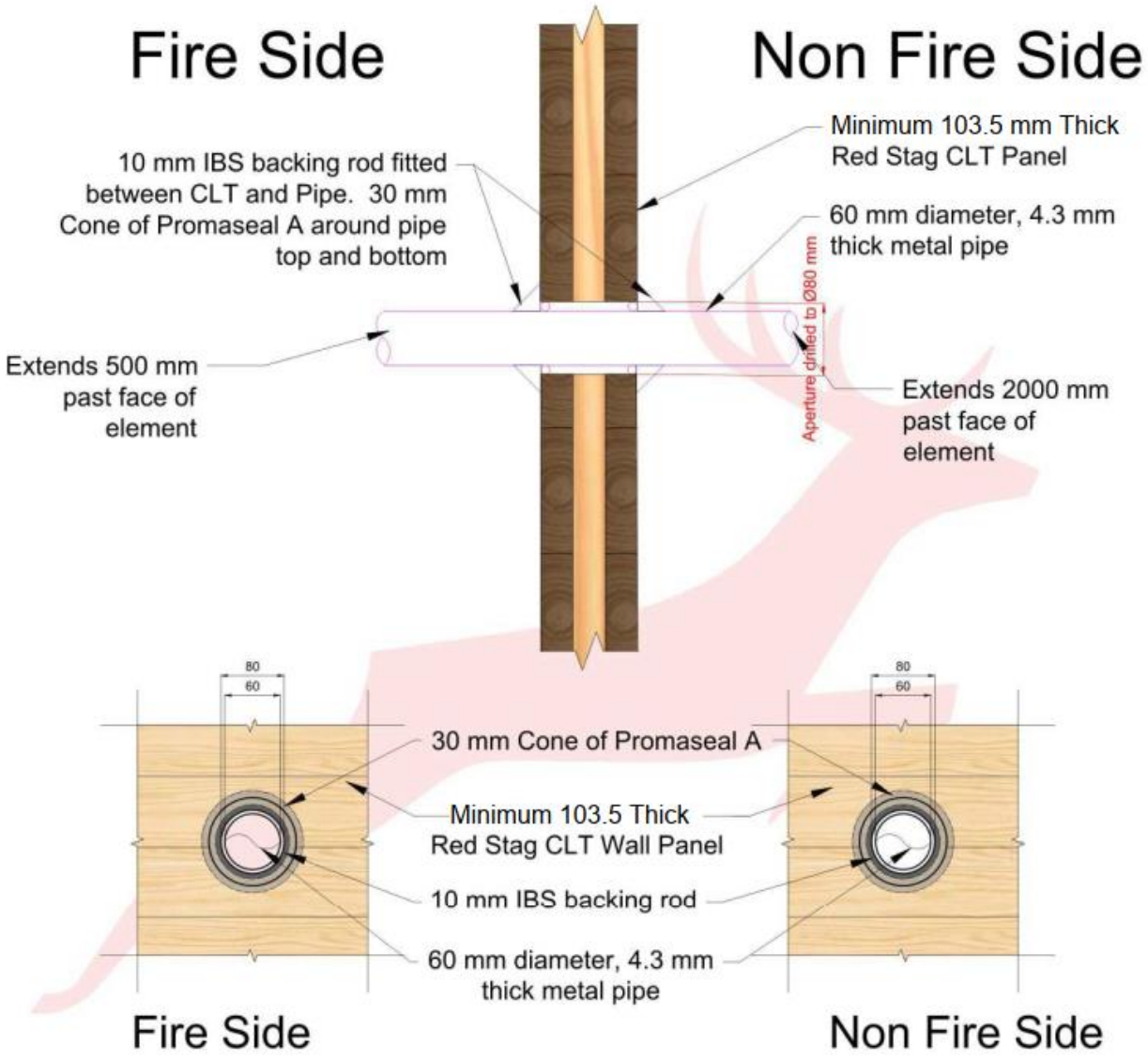

Figure 34 Elevation and plan view of 60 mm diameter, 4.3BMT metal pipe in Red Stag CLT wall

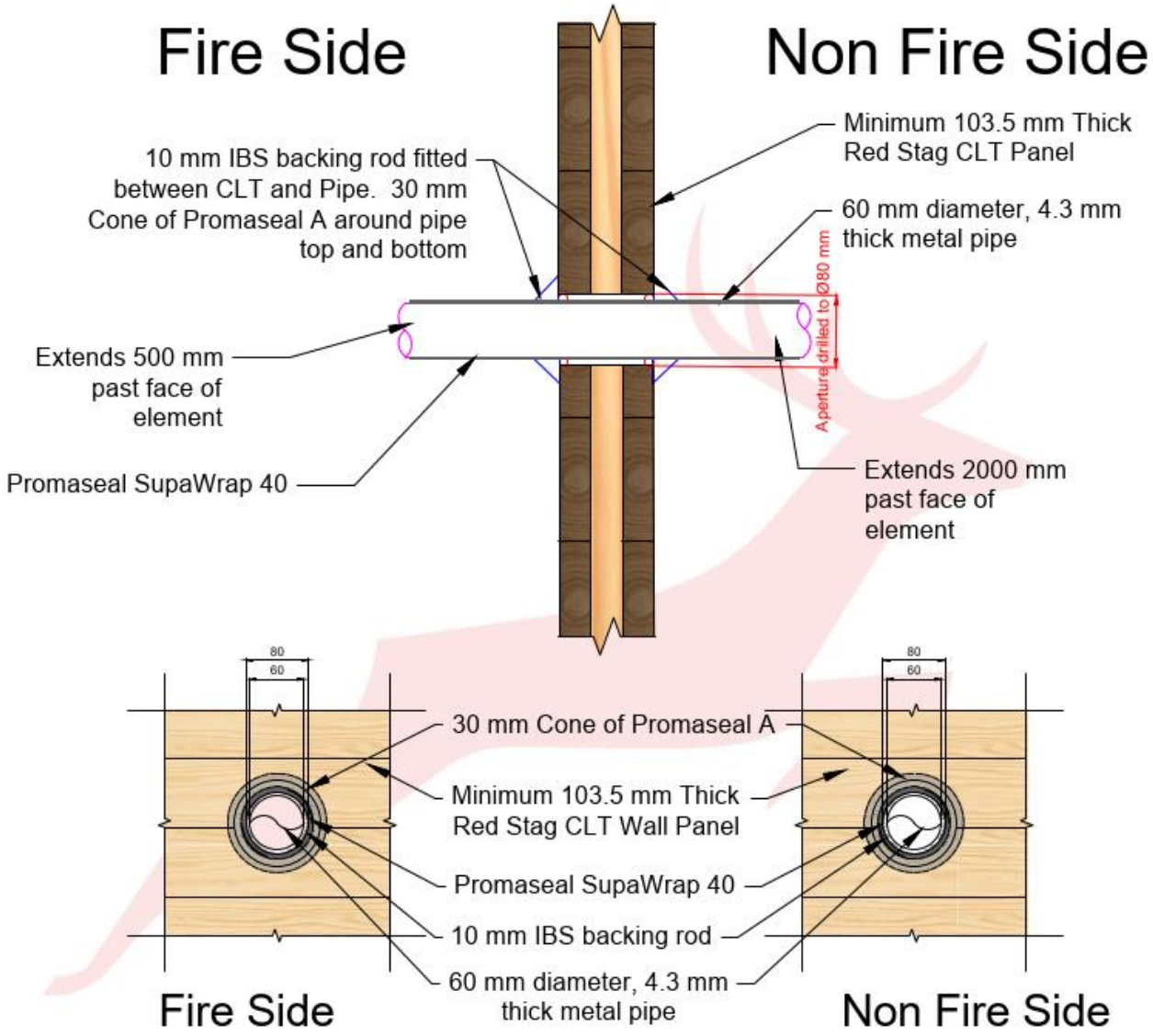

Figure 35 Elevation and plan view of 60 mm diameter, 4.3BMT metal pipe protected by Promaseal SupaWrap 40 in Red Stag CLT wall

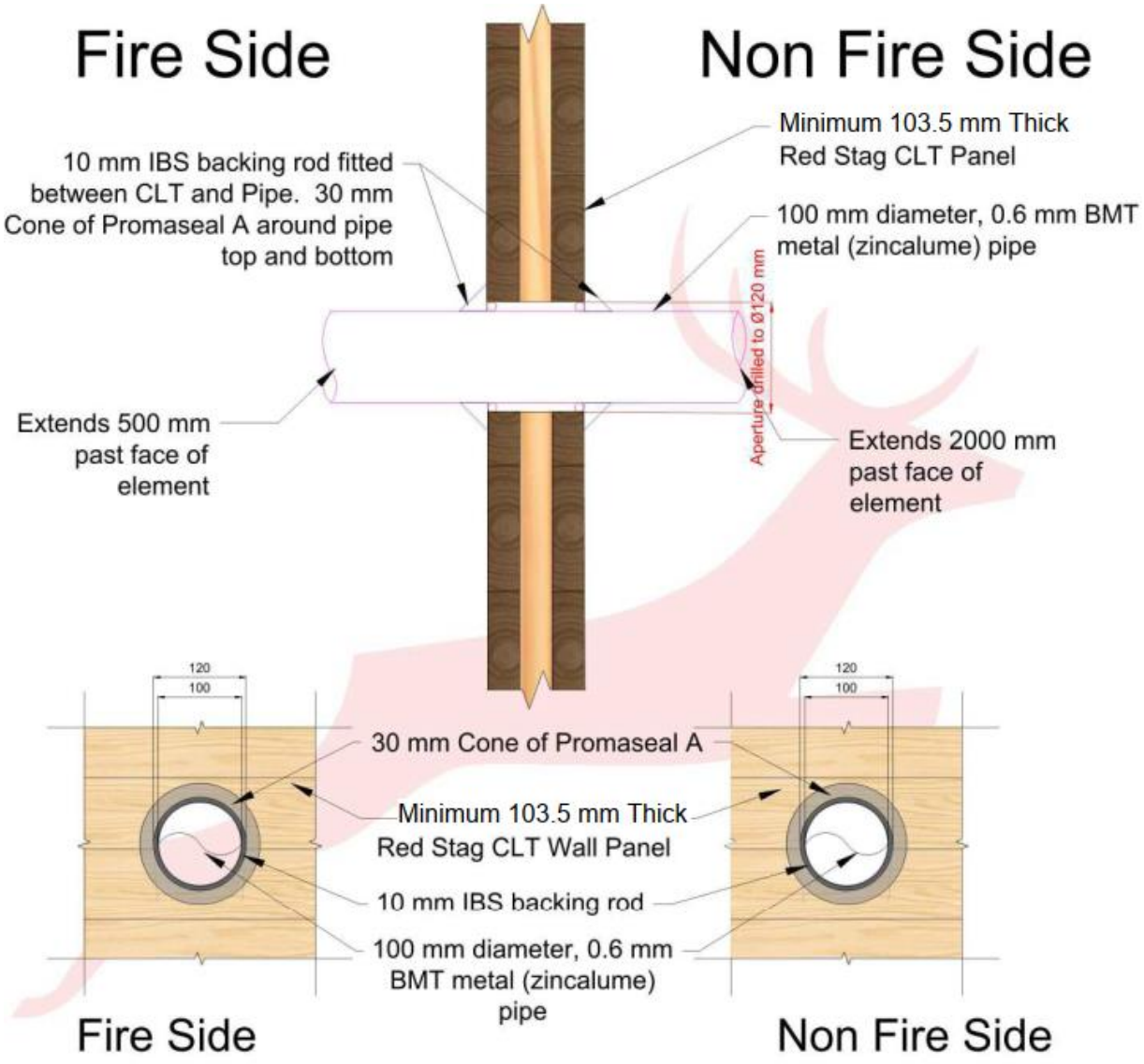

Figure 36 Elevation and plan view of 100 mm diameter, 0.6BMT metal (Zincalume) down pipe in Red Stag CLT wall

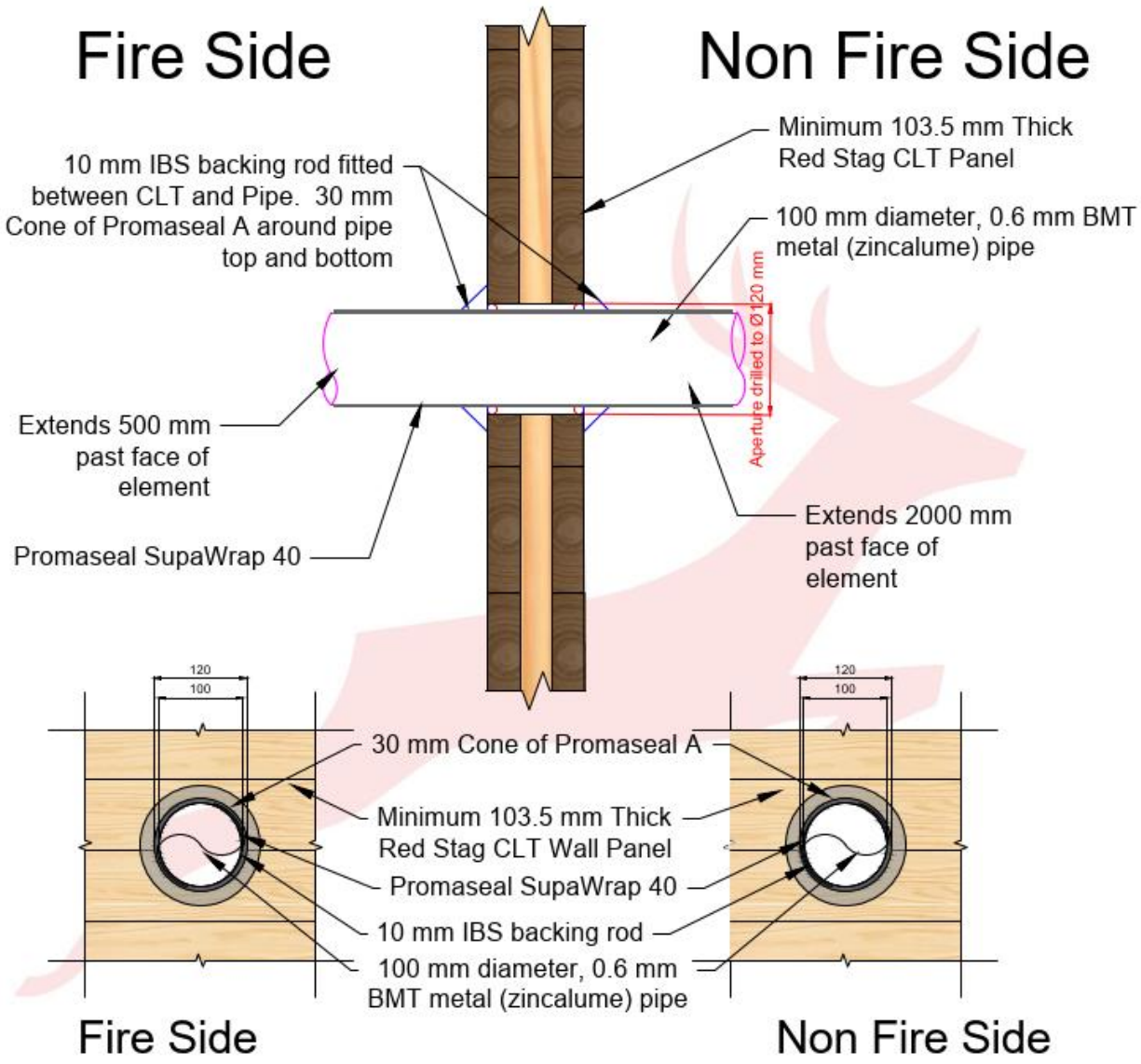

Figure 37 Elevation and plan view of 100 mm diameter, 0.6BMT metal (Zincalume) down pipe protected by Promaseal SupaWrap 40 in Red Stag CLT wall

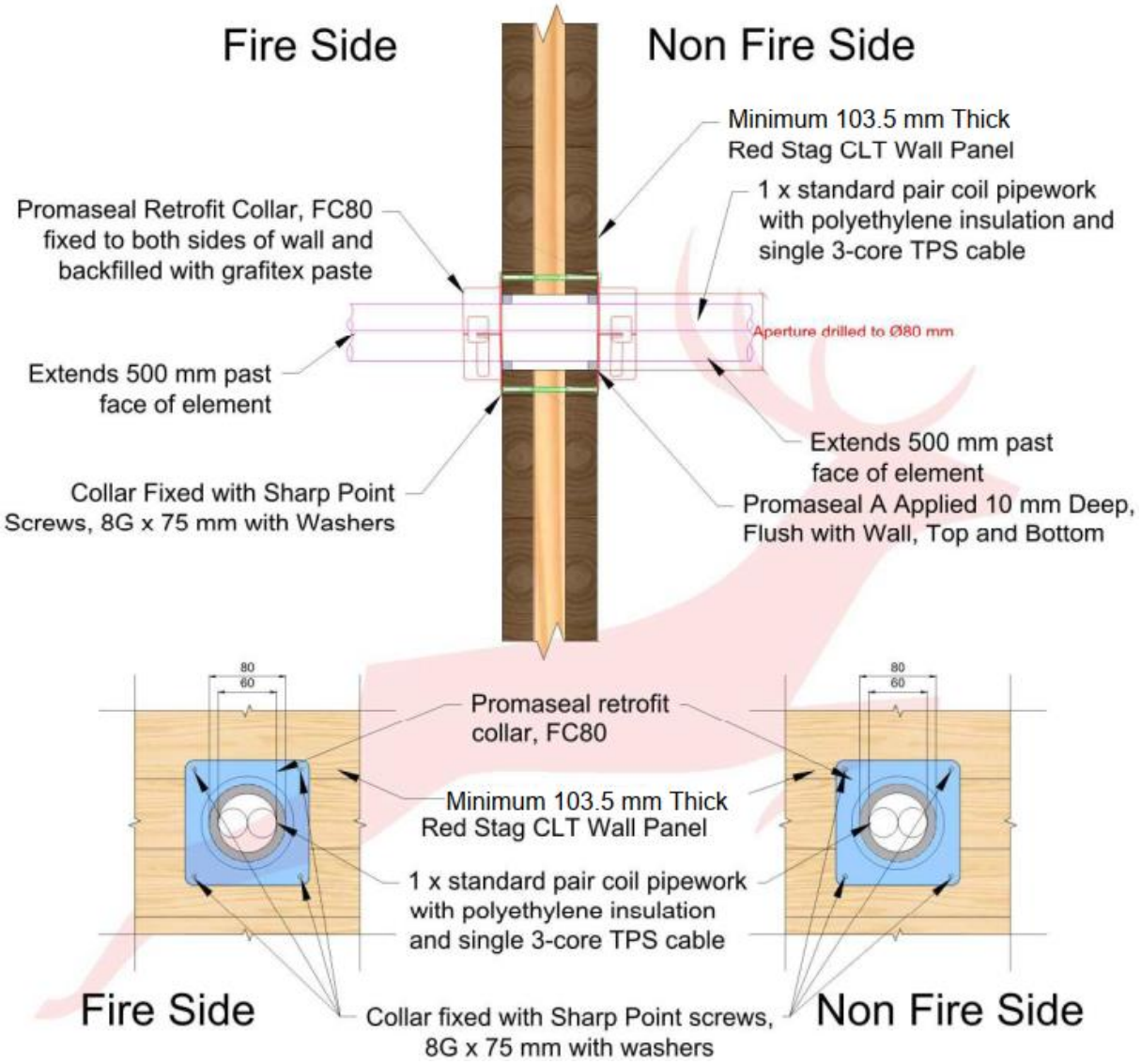

Figure 38 Elevation and plan view of 1 × Standard pair coil pipework with polyethylene insulation and single 3-core TPS cable in Red Stag CLT wall

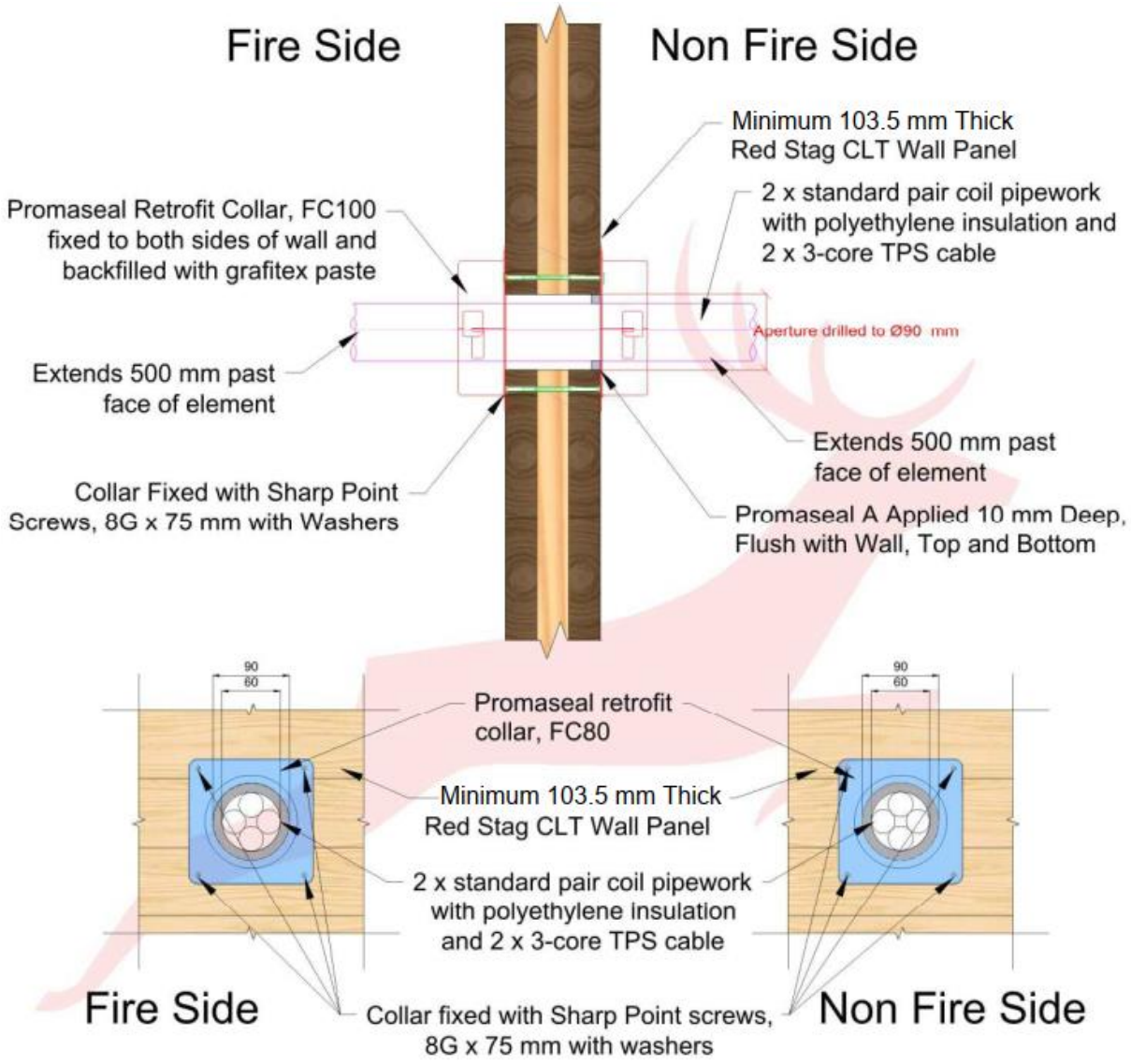

Figure 39 Elevation and plan view of 2 × Standard pair coil pipework with polyethylene insulation and 2 × 3-core TPS cable in Red Stag CLT wall

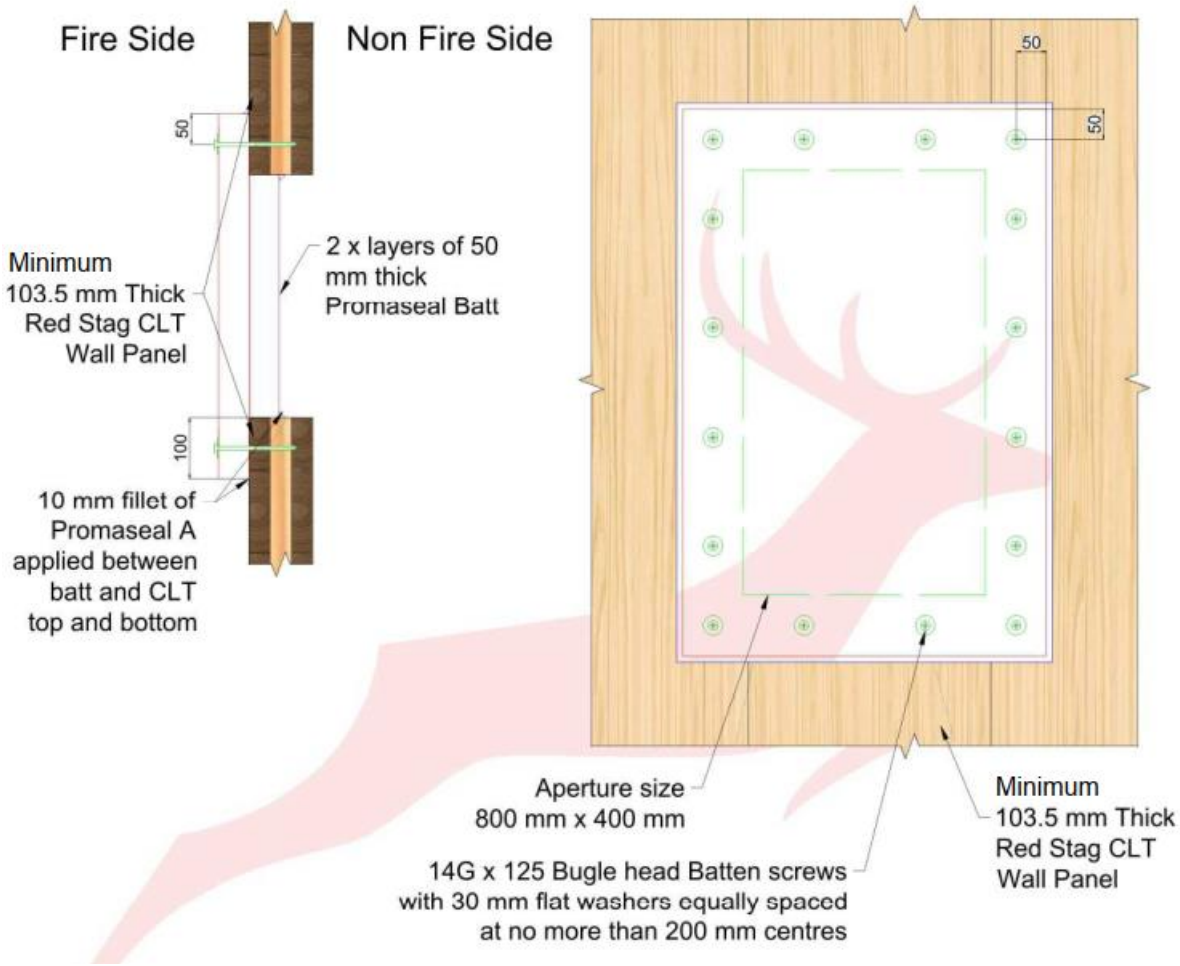

Figure 40 Elevation and plan view of blank Promaseal batt system in opening 800 mm × 400 mm in Red Stag CLT wall

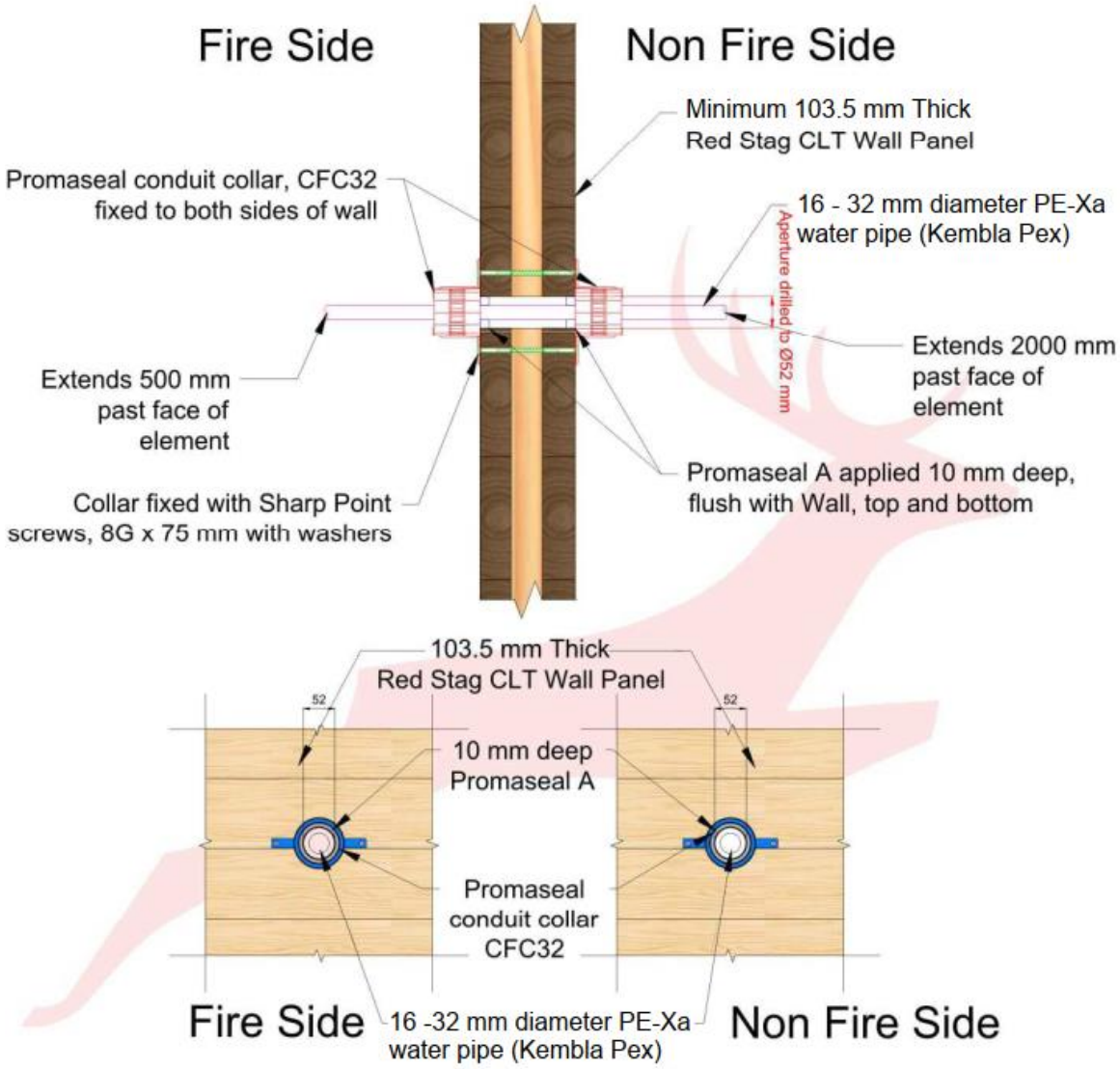

Figure 41 Elevation and plan view of 16 – 32 mm diameter PE-Xa water pipe (Kembla Pex) in Red Stag CLT wall

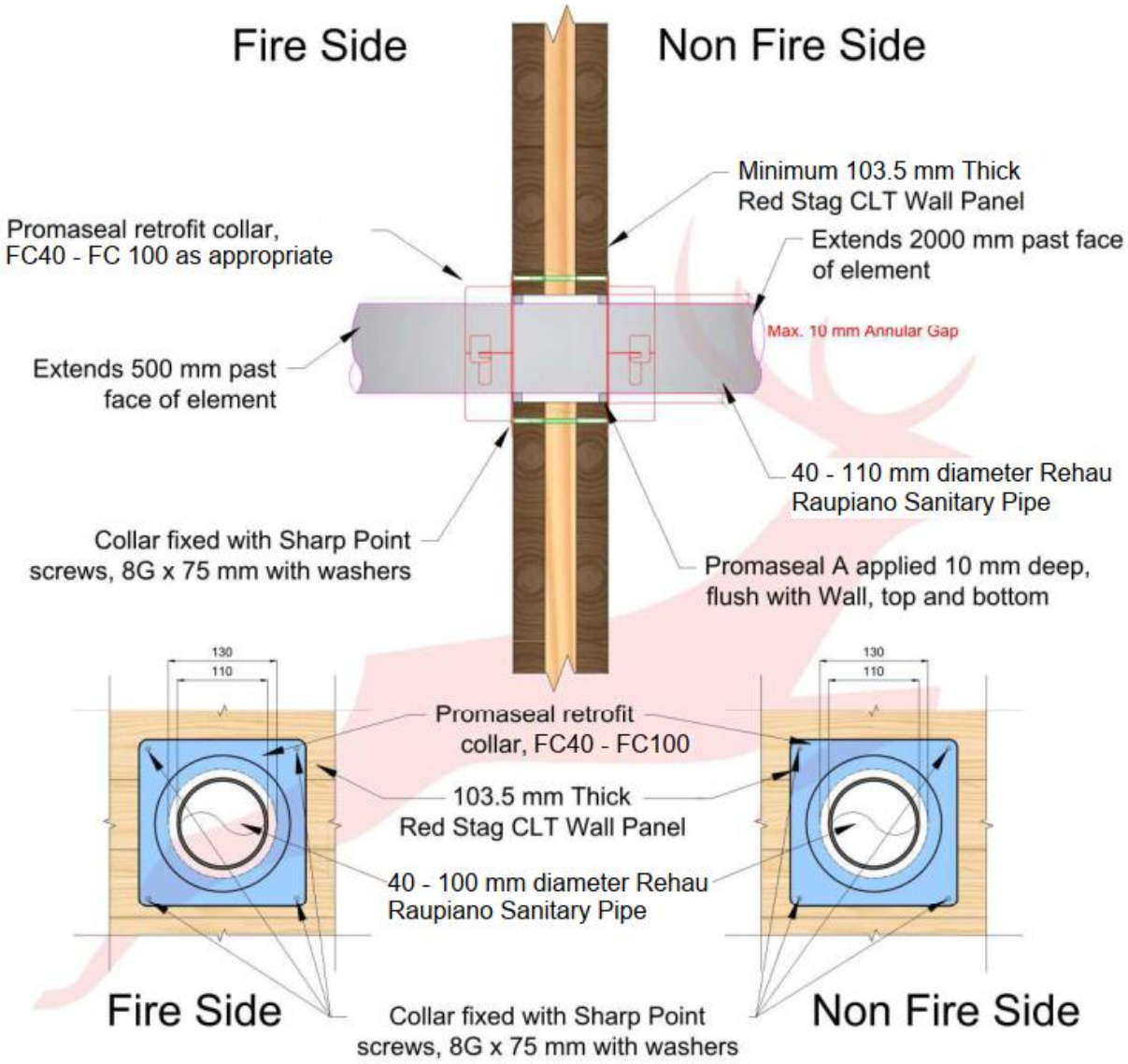

Figure 42 Elevation and plan view of 40 - 110 mm diameter Rehau Raupiano sanitary pipe in Red Stag CLT wall

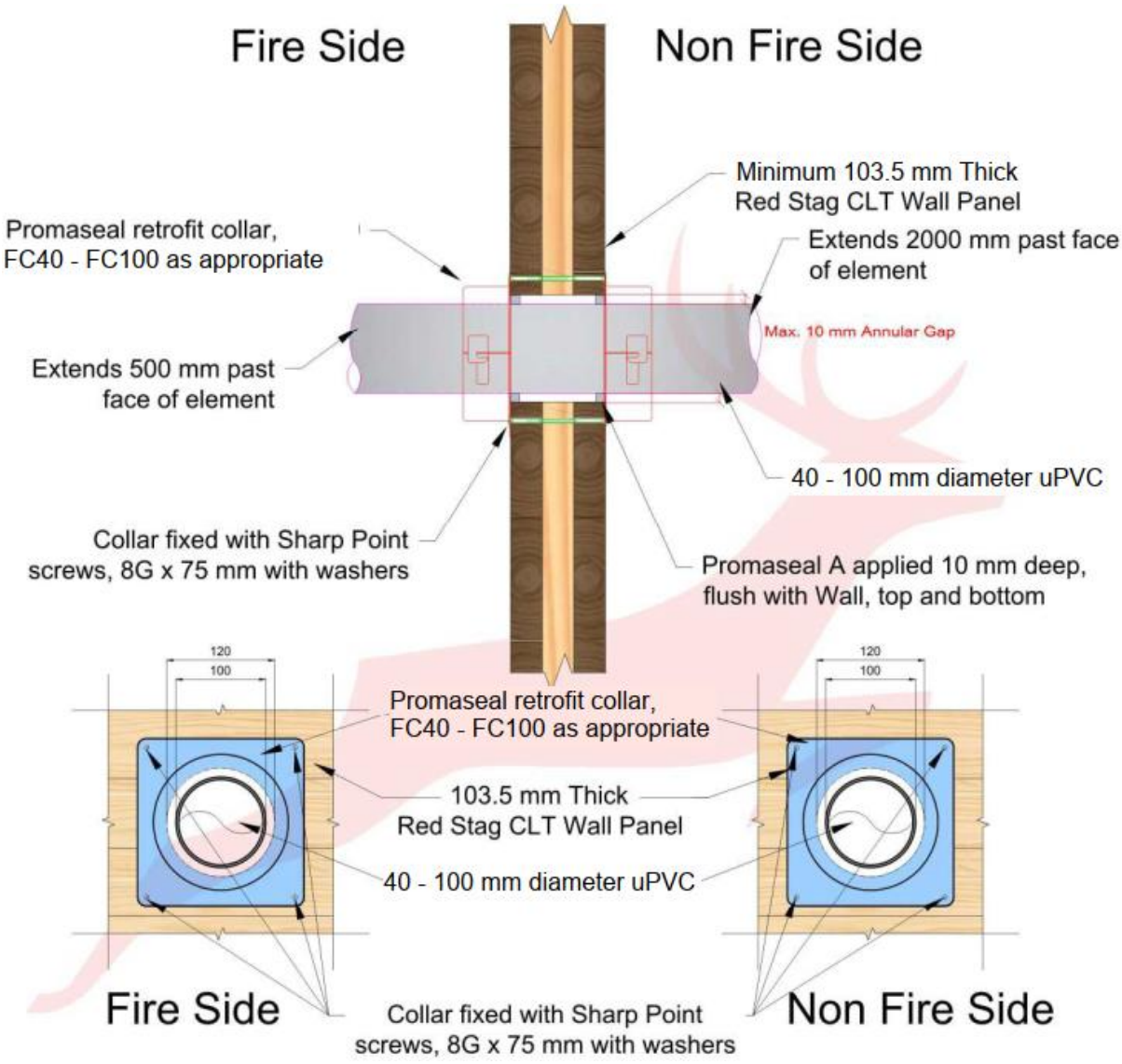

Figure 43 Elevation and plan view of 40 – 100mm WT uPVC pipe in Red Stag CLT wall

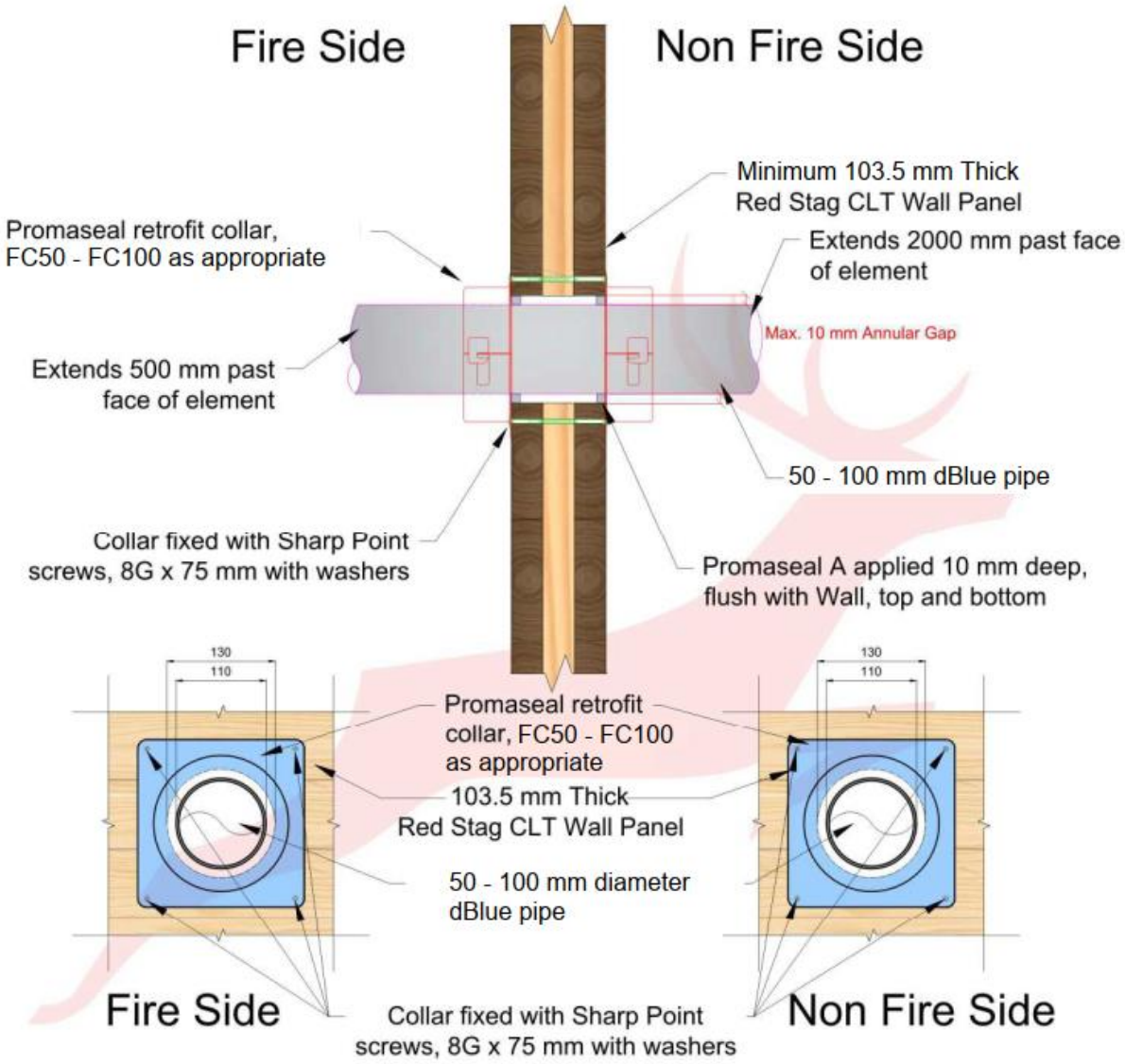

Figure 44 Elevation and plan view of 50 - 110 mm diameter dBlue PP/PP- MD/PP Pipe in Red Stag CLT wall

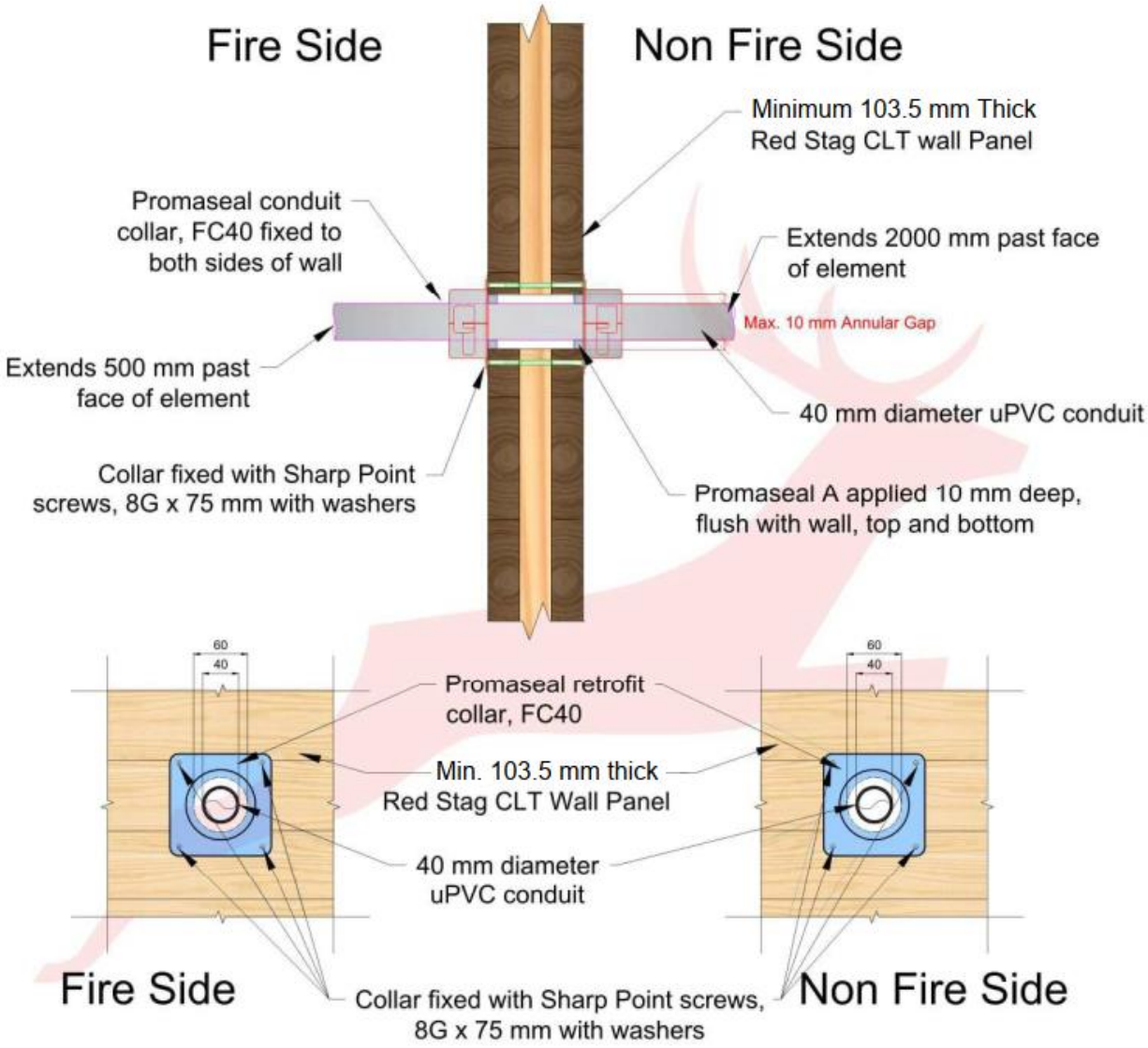

Figure 45 Elevation and plan view of 40 mm diameter conduit in Red Stag CLT wall

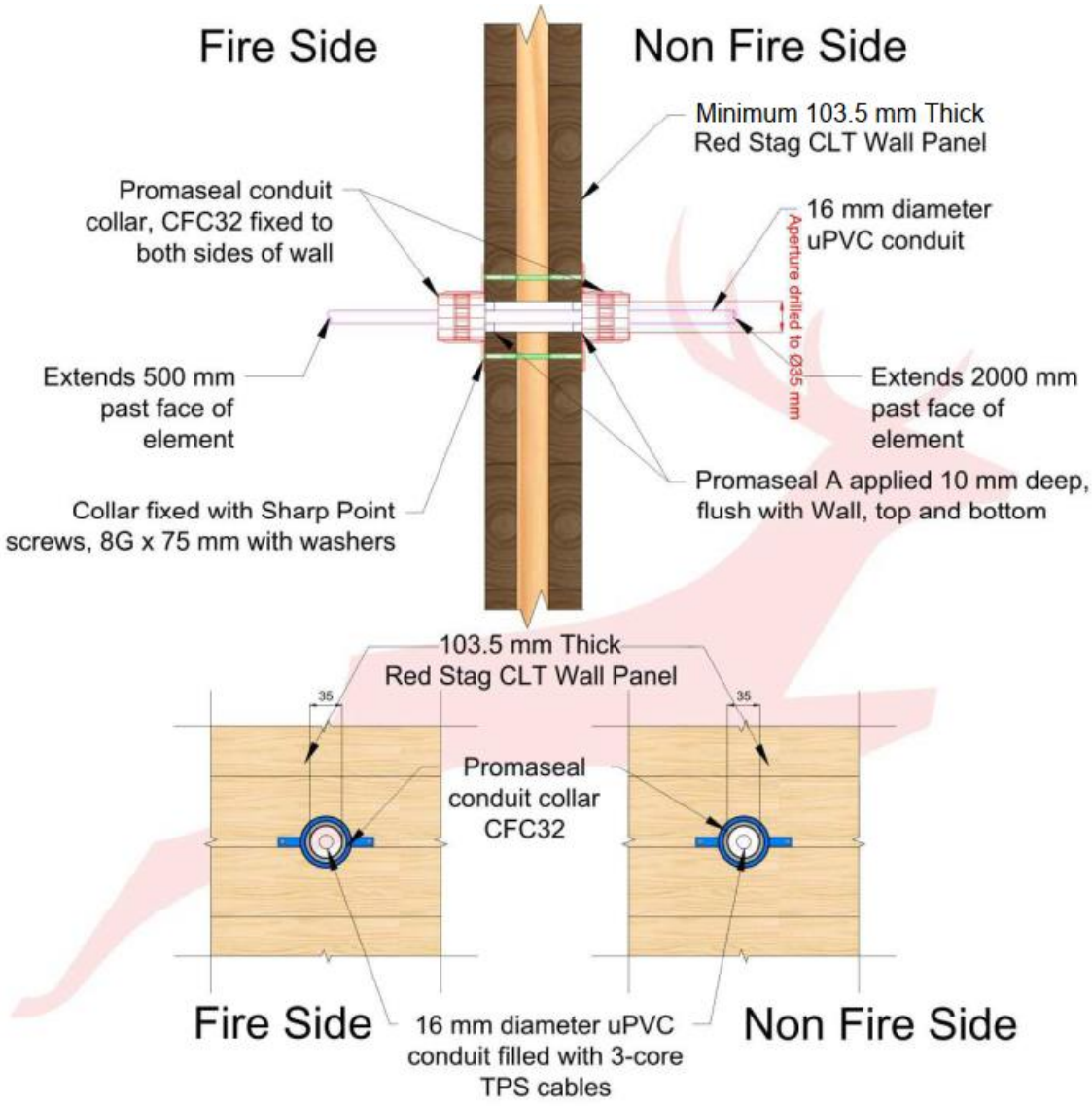

Figure 46 Elevation and plan view of 16 mm diameter conduit in Red Stag CLT wall

5. Assessment outcome

The referenced assessment demonstrates that the assessed penetration systems are expected to achieve FRLs as summarised in Table 7 and Table 8 if they were tested in accordance with AS 1530.4:2014.

Table 7 Summary of the assessment outcome for penetrations through Red Stag CLT floor/ceiling systems

Service penetration type	Description	Fire stopping system	FRL	Report reference	Reference figure
Electrical and communication cables	Up to four 3-core TPS cables	Promaseal-A sealant	-/60/60	FP13961-002	Figure 1
	40 mm diameter uPVC conduit – filled with 3-core TPS cable or 1.5 mm^2 power cable	Promaseal FC40 collar and Promaseal-A sealant	-/60/60	FP13961-002	Figure 2
	16 mm diameter uPVC conduit – filled with 3-core TPS cable or 1.5 mm^2 power cable	Promaseal CFC32 collar and Promaseal-A sealant	-/60/60	FP13961-002	Figure 3
	D1 cable configuration as per AS 1530.4:2014	2 layers of 50 mm Promaseal batts (maximum 800 mm × 400 mm), Promashield® 100 and Promaseal A acrylic sealant	-/60/60	FP13961-001 A-18-029	Figure 4
	D1 cable configuration as per AS 1530.4:2014	2 layers of 50 mm Promaseal batts (maximum 800 mm × 400 mm) and Promaseal A acrylic sealant	-/60/30	PF20012	Figure 5
	D2 cable configuration as per AS 1530.4:2014	2 layers of 50 mm Promaseal batts, (maximum 800 mm × 400 mm), Promashield® 100 and Promaseal A acrylic sealant	-/60/60	FP13961-001 A-18-030	Figure 6
	D2 cable configuration as per AS 1530.4:2014	2 layers of 50 mm Promaseal batts (maximum 800 mm × 400 mm) and Promaseal A acrylic sealant	-/60/30	PF20008	Figure 7
Metal pipes	19 – 50 mm diameter copper pipes	Promaseal A acrylic sealant, 10 mm IBS backing rod and Promat SupaWrap 40 for a length of 300 mm on the unexposed side	-/60/60	PF20012	Figure 8
	50 – 150 diameter copper pipes	Promaseal A acrylic sealant, Promaseal IBS foam strip for the full depth of the floor and Promat SupaWrap for a length of 600 mm on the unexposed side	-/60/60	FP13961-001	Figure 9

Service penetration type	Description	Fire stopping system	FRL	Report reference	Reference figure
	19 – 50 mm diameter copper pipes	Promaseal A acrylic sealant and 10 mm IBS backing rod	-/60/-	PF20012	Figure 10
	50 – 150 diameter copper pipes	Promaseal A acrylic sealant and Promaseal IBS form strip for the full depth of the floor	-/60/-	FP13961-001	Figure 11
	60 mm diameter, 4.3BMT metal pipe	Promaseal-A and 10 mm IBS Backing rod	-/60/30	FP13961-002	Figure 12
	60 – 100 mm diameter, 0.6BMT metal (Zincalume) down pipe	Promaseal-A and 10 mm IBS Backing rod	-/60/-	FP13961-002	Figure 13
	32 - 100 mm steel sprinkler pipes	Promaseal A acrylic sealant and 10 mm IBS backing rod	-/60/-	PF20012 and FP13961-001	Figure 14
Metal pipes and electrical and communication cables	1 × standard pair coil pipework with polyethylene insulation and 3-core TPS cable	Promaseal FC80 collar backfilled with Grafitex	-/30/30	FP13961-002	Figure 15
	2 × standard pair coil pipework with polyethylene insulation and 3-core TPS cable	Promaseal FC100 collar backfilled with Grafitex	-/30/30	FP13961-002	Figure 16
Miscellaneous Services	Blank seal of up to 800 mm × 400 mm in size	2 layers of 50 mm Promaseal batt	-/60/60	FP13961-001	Figure 17
Plastic pipes	16 mm diameter PE-Xa water pipes (Kembla Pex)	Promaseal CFC32 collar and Promaseal-A sealant	-/60/60	FP13961-002	Figure 18
	25 mm diameter PE-Xa water pipes (Kembla Pex)	Promaseal CFC32 collar and Promaseal-A sealant	-/60/30	FP13961-002	Figure 19
	32 mm diameter PE-Xa water pipes (Kembla Pex)	Promaseal CFC32 collar and Promaseal-A sealant	-/30/30	FP13961-002	Figure 20
	40 – 110 mm diameter Rehau Raupiano sanitary pipes	Promaseal A acrylic sealant and Promaseal Fire collars FC40 – FC100 as appropriate	-/60/60	FP13961-001	Figure 21
	40 – 100 uPVC pipes	Promaseal A acrylic sealant and Promaseal Fire collars FC40 – FC100 as appropriate	-/60/60	PF20008	Figure 22
	100 mm uPVC floor waste assembly with grate	SNAP Fire Collar - LP100R and Boss Firemastic 300 sealant	-/60/60	PF20012	Figure 23

Service penetration type	Description	Fire stopping system	FRL	Report reference	Reference figure
	50 – 110 dBlue PP/PP- MD/PP pipes	Boss Firemastic 300 sealant and Boss maxi collar 50 – 110 mm as appropriate	-/60/60	PF20012	Figure 24
	40 mm diameter uPVC conduit – empty	Promaseal FC40 collar and Promaseal-A sealant	-/60/60	FP13961-002	Figure 25
	16 mm diameter uPVC conduit – empty	Promaseal CFC32 collar and Promaseal-A sealant	-/60/60	FP13961-002	Figure 26

Table 8 Summary of the assessment outcome for penetrations through Red Stag CLT wall systems

Service penetration type	Description	Fire stopping system	FRL	Report reference	Reference figure
Electrical and communication cables	Single 3-core TPS cables	Promaseal-A sealant	-/60/60	FP13961-003	Figure 27
	Up to four 3-core TPS cables	Promaseal-A sealant and Promaseal CFC32 collar on both sides of the wall	-/60/60	FP13961-003	Figure 28
	Up to four 3-core TPS cables	Promaseal-A sealant	-/60/60	FP13961-007	Figure 29
	40 mm diameter uPVC conduit – filled with 3-core TPS cables or 1.5 mm^2 power cable	Promaseal-A sealant and Promaseal FC40 collar on both sides of the wall	-/60/60	FP13961-004	Figure 30
	16 mm diameter uPVC conduit – filled with 3-core TPS cables or 1.5 mm^2 power cable	Promaseal-A sealant and Promaseal CFC32 collar on both sides of the wall	-/60/60	FP13961-004	Figure 31
Metal pipes	19 – 150 mm diameter copper pipe	Promaseal A sealant, Promaseal IBS foam strip for the full depth of the floor and Promat SupaWrap for a length of 600 mm on both sides of the wall	-/60/60	PF20012	Figure 32
	19 – 150 mm diameter copper pipe	Promaseal-A and 10 mm IBS backing rod	-/60/-	FP13961-005	Figure 33
	60 mm diameter, 4.3BMT metal pipe	Promaseal-A and 10 mm IBS backing rod	-/60/30	FP13961-004	Figure 34
	60 mm diameter, 4.3BMT metal pipe	Promaseal-A, 10 mm IBS backing rod and Promat SupaWrap for a length of 300 mm on both sides of the wall	-/60/60	FP13961-004	Figure 35

Service penetration type	Description	Fire stopping system	FRL	Report reference	Reference figure
	100 mm diameter, 0.6BMT metal (Zincalume) down pipe	Promaseal-A and 10 mm IBS backing rod	-/60/-	FP13961-004	Figure 36
	100 mm diameter, 0.6BMT metal (Zincalume) down pipe	Promaseal-A, 10 mm IBS backing rod and Promat SupaWrap for a length of 300 mm on both sides of the wall	-/60/60	FP13961-004	Figure 37
	32 - 100 mm steel sprinkler pipes	Promaseal-A and 10 mm IBS backing rod	-/60/-	FP13961-005	Figure 36
Metal pipes and electrical and communication cables	1 x Standard pair coil pipework with polyethylene insulation and 3-core TPS cable	Promaseal FC80 collar backfilled with Grafitex	-/60/60	FP13961-005	Figure 38
	2 x Standard pair coil pipework with polyethylene insulation and 3-core TPS cable	Promaseal FC100 collar backfilled with Grafitex	-/60/30	FP13961-005	Figure 39
Miscellaneous Services	Blank Promaseal batt system in an 800 mm × 400 mm opening	2 layers of 50 mm Promaseal batt	-/60/60	FP13961-006	Figure 40
Plastic pipes	16 – 32 mm diameter PE-Xa water pipe (Kembla Pex)	Promaseal-A sealant and Promaseal CFC32 collar on both sides of the wall	-/60/60	FP13961-004	Figure 41
	40 - 110 mm diameter Rehau Raupiano sanitary pipe	Promaseal-A sealant and Promaseal fire collars FC40 - FC100 on both sides of the wall as appropriate	-/60/60	FP13961-003	Figure 42
	40 – 100mm WT PVC-U pipe	Promaseal-A sealant and Promaseal fire collars FC40 - FC100 on both sides of the wall as appropriate	-/60/60	FP13961-003	Figure 43
	50 - 110DN dBlue PP/PP- MD/PP Pipe	Promaseal-A sealant and Promaseal fire collars FC50 - FC100 on both sides of the wall as appropriate	-/60/60	FP13961-004	Figure 44
	40 mm diameter conduit – empty	Promaseal-A sealant and Promaseal FC40 collar on both sides of the wall	-/60/60	FP13961-003	Figure 45
	16 mm diameter conduit – empty	Promaseal-A sealant and Promaseal CFC32 collar on both sides of the wall	-/60/60	FP13961-003	Figure 46

6. Validity

Warringtonfire Australia does not endorse the tested or assessed product in any way. The conclusions of the referenced assessment may be used to directly assess fire resistance, but it should be recognised that a single test method will not provide a full assessment of fire resistance under all conditions.

Due to the nature of fire testing and the consequent difficulty in quantifying the uncertainty of measurement, it is not possible to provide a stated degree of accuracy. The inherent variability in test procedures, materials and methods of construction, and installation may lead to variations in performance between elements of similar construction.

The referenced assessment is based on test data, information and experience available at the time of preparation. If contradictory evidence becomes available to the assessing authority, the assessment will be unconditionally withdrawn, and the report sponsor will be notified in writing. Similarly, the assessment should be re-evaluated, if the assessed construction is subsequently tested since actual test data is deemed to take precedence.

The published procedures for the conduct of tests and the assessment of test results are subject to constant review and improvement. It is therefore recommended that the referenced assessment report be reviewed on, or before, the stated expiry date.

The referenced assessment represents our opinion about the performance of the proposed systems expected to be demonstrated on a test in accordance with AS 1530.4:2014, based on the evidence referred to in the referenced assessment report.

The referenced assessment is provided to Red Stag Wood Solutions Limited for their own specific purposes. The referenced assessment report may be used as evidence of suitability in accordance with the requirements of the relevant National Construction Code. Building certifiers and other third parties must determine the suitability of the systems described in the referenced assessment report for a specific installation.

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