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Fire assessment report

A1 COREX shaft wall systems in accordance with AS 1530.4:2014

Sponsor: Trafalgar Group

Report number: FAS210132 Revision: R1.1

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Quality management

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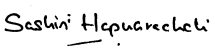
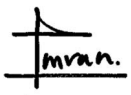
R1.0	Issue: 9/11/2021	Reason for issue	Initial issue		
		Name	Prepared by: Sashini Sue Hapuarachchi	Reviewed by: Imran Ahamed	Authorised by: Omar Saad
R1.1	Issue: 23/11/2021	Reason for issue	Revised to address minor comments from client		
	Expiry: 30/11/2026	Name	Prepared by: Sashini Sue Hapuarachchi	Reviewed by: Imran Ahamed	Authorised by: Imran Ahamed
		Signature			

Executive summary

This report documents the findings of the assessment undertaken to determine the expected fire resistance level (FRL) of A1 COREX shaft wall systems if tested in accordance with AS 1530.4:2014.

The analysis in section 5 to of this report found that the proposed systems, together with the described variations, are expected to achieve FRLs as shown in Table 1, if tested in accordance with AS 1530.4:2014.

Table 1 Assessment outcome

Shaft wall system	FRL
2 × A1 COREX 15 mm plasterboards on one of the sides of the steel framework	-/60/60
2 × A1 COREX 20 mm plasterboards on one of the sides of the steel framework	-/90/90
2 × A1 COREX 25 mm plasterboards on one of the sides of the steel framework	-/120/120
Notes: The construction details of the wall systems must be as shown in Table 5 and Figure 1 to Figure 8.	

The variations and outcome of this assessment 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 30 November 2026.

Contents

1. Introduction

This report documents the findings of the assessment undertaken to determine the expected fire resistance level (FRL) of A1 COREX shaft wall systems – if tested in accordance with AS 1530.4:2014[1].

This report may be used as 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 this assessment report. It also references test evidence for meeting deemed to satisfy (DTS) provisions of the NCC as applicable to the assessed systems.

This assessment was carried out at the request of Trafalgar Group.

The sponsor details are included in Table 2.

Table 2 Sponsor details

Sponsor	Address
Trafalgar Group	26a Ferndell Street South Granville 2142 NSW Australia

2. Framework for the assessment

2.1 Assessment approach

An assessment is an opinion 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 exists 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 2019[2].

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.

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.

This 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 hazard properties if the elements were to be tested in accordance with AS 1530.4:2014.

[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] Passive Fire Protection Forum (PFPF), 2019, Guide to undertaking technical assessments of the fire performance of construction products based on fire test evidence, Passive Fire Protection Forum (PFPF), UK.

This 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

This assessment report has been prepared to meet the Evidence of Suitability requirements of the NCC 2019 including amendments[3] under A5.2 (1) (d).

This assessment has been written in accordance with the general principles outlined in EN 15725:2010[4] 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.

This assessment report may also be used to demonstrate compliance with the requirements for Evidence of Suitability under NCC 2016 including amendments[5].

2.3 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 5 October 2021, Trafalgar Group confirmed that:

- To their knowledge the component or element of structure, which is the subject of this assessment, has not been subjected to a fire test to the standard against which this assessment is being made.
- They agree to withdraw this 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 this assessment is being made and the results are not in agreement with this assessment.
- They are not aware of any information that could adversely affect the conclusions of this 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 this assessment

- The scope of this report is limited to an assessment of the variations to the tested systems described in section 4.3.
- This 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.
- This assessment is applicable to 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.
- This report is only valid for the assessed systems 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 this report – may invalidate the findings of this assessment. If there are changes to the system, a reassessment will need to be done by an Accredited Testing Laboratory (ATL).
- The documentation that forms the basis for this report is listed in Appendix A and Appendix B.
- The wall height between floors (or lateral supports) must not exceed 4 m.

[3] National Construction Code Volumes One and Two - Building Code of Australia 2019 including Amendments, Australian Building Codes Board, Australia
[4] 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.
[5] National Construction Code Volumes One and Two - Building Code of Australia 2016 including Amendments, Australian Building Codes Board, Australia

- This 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 this report as a result.
- This assessment is based on the proposed systems being constructed under comprehensive quality control practices and following appropriate industry regulations and Australian Standards on quality of materials, design of structures, guidance on workmanship and the expert handling, placing and finishing of the products on site. These variables are beyond the control and consideration of this report.

4. Description of the specimen and variations

4.1 System description

The tested shaft wall systems consist of 2 × 15 mm, 2 × 20 mm or 2 × 25 mm A1 COREX plasterboards mounted on one face of a steel framework tested in accordance with EN 1364-1:2015[6]. The wall systems were 3 m in height. One vertical edge was mounted as in practise and the other vertical edge was constructed as a free edge.

4.2 Referenced test data

The assessment of the variation to the tested system and the determination of the expected performance is based on the results of the fire tests documented in the reports summarised in Table 3. Further details of the tested system are included in Appendix B. DALSAN ALÇI SAN. VE TİC. A.Ş. has given permission to use their test reports for this assessment.

Table 3 Referenced test data

Report number	Test sponsor	Test date	Testing authority
RFTR21184	DALSAN ALÇI SAN. VE TİC. A.Ş.	17 August 2021	Efectis
RFTR21185	DALSAN ALÇI SAN. VE TİC. A.Ş.	17 August 2021	Efectis
RFTR21186	DALSAN ALÇI SAN. VE TİC. A.Ş.	18 August 2021	Efectis
RFTR21187	DALSAN ALÇI SAN. VE TİC. A.Ş.	19 August 2021	Efectis
RFTR21188	DALSAN ALÇI SAN. VE TİC. A.Ş.	19 August 2021	Efectis
RFTR21189	DALSAN ALÇI SAN. VE TİC. A.Ş.	20 August 2021	Efectis
NI1189	Wormald International/Boral Australian Gypsum/CSR	15 March 1989	Fire Research Laboratories
FSV2163	Trafalgar Group Pty Ltd	8 December 2020	CSIRO

4.3 Variations to the tested systems

An identical system has not been subject to a standard fire test. We have therefore assessed the system using baseline test information for similar systems. The variations to the tested systems – together with the referenced standard fire tests – are described in Table 4.

Table 4 Variations to tested systems

Item	Reference test	Description	Variations
A1 COREX shaft wall systems	RFTR21188	The tested specimen included a shaft wall system consisting of double layer A1 COREX 15 mm plasterboards mounted on the fire exposed side of a steel framework tested in accordance with EN 1364-1:2015.	The proposed variations to the tested systems are as follow: • Two way FRL for the shaft wall systems with 2 × 15 mm,

[6] European Committee for Standardization, BS EN 1364-1:2015, Fire resistance tests for tests for non-load bearing elements – Part 1: Walls. European Committee for Standardization, Brussels, Belgium.

Item	Reference test	Description	Variations
	RFTR21189	The tested specimen included a shaft wall system consisting of double layer A1 COREX 15 mm plasterboards mounted on the unexposed side of a steel framework tested in accordance with EN 1364-1:2015.	2 × 20 mm and 2 × 25 mm A1 COREX boards mounted on one of the sides of the steel framework in accordance with AS 1530.4:2014. • Wall heights up to 4 m • Steel studs of 64 mm or deeper with 0.6 mm or thicker steel • Wall construction details as shown in Figure 3 to Figure 8.
	RFTR21186	The tested specimen included a shaft wall system consisting of double layer A1 COREX 20 mm plasterboards mounted on the exposed side of a steel framework tested in accordance with EN 1364-1:2015.	
	RFTR21187	The tested specimen included a shaft wall system consisting of double layer A1 COREX 20 mm plasterboards mounted on the unexposed side of a steel framework tested in accordance with EN 1364-1:2015.	
	RFTR21184	The tested specimen included a shaft wall system consisting of double layer A1 COREX 25 mm plasterboards mounted on the exposed side of a steel framework tested in accordance with EN 1364-1:2015.	
	RFTR21185	The tested specimen included a shaft wall system consisting of double layer A1 COREX 25 mm plasterboards mounted on the unexposed side of a steel framework tested in accordance with EN 1364-1:2015.	

4.4 Schedule of components

Table 5 outlines the schedule of components for the assessed systems subject to a fire test, as referenced in Appendix B. Figure 1 to Figure 8 show the assessed systems.

Table 5 Schedule of components of assessed systems

Item	Description	
1	Name	Top and bottom profile in steel framework
	Type	Galvanized steel
	Dimensions	As appropriate with the steel stud size
	Fixings	Steel dowels (M6) and steel screws 6 × 45 mm (Ø × l) fixed at 500 mm centres
2	Name	Steel studs
	Type	Galvanized steel
	Dimensions	Thickness – minimum 0.6 mm Depth – minimum 64 mm
	Fixings	Steel dowels (M6) and steel screws 6 × 45 mm (Ø × l) fixed to the frame at minimum 500 mm centres. A 10 mm gap is to be left at the top of the stud to allow free expansion for a wall height of 3 m. For wall heights of more than 3 m, the expansion allowance must be increased as appropriate. Maximum distance between studs to be 600 mm.
3	Name	Joint tape
	Location	Between top and bottom profiles and the supporting construction applied along profile widths.
4	Name	A1 COREX plasterboards
	Thickness	2 × 15 mm, 2 × 20 mm, 2 × 25 mm

Item	Description	
	Nominal density	900 ± 135 kg/m^3
	Coating	Both faces must be covered with fibreglass mattress. Unit area weight of fibreglass mattress on one face of the plasterboard is 205 g/m^2
	Fixings	Type: Steel drywall screws Dimensions: • 8 g × 45 mm– for first layer • 8 g × 75 mm– for second layer Location: Fixing plasterboards to steel studs and top and bottom steel profiles. Centre to centre distance of fixings on first layer and second layer must be 400 mm and 300 mm, respectively. The horizontal or vertical joints of layer 1 and layer 2 of A1 COREX boards should not be overlapped with each other during installation.
	Filler	Jointing compound: DERZTEK EN13963; Type 3B joint plater must be used for filling and finish. DALSAN fibreglass joint tape (65 g/m^2 unit area weight) must be used on joints of plasterboard and screwing points for both faces.
5	Sealant	FyreFLEX
	Location	Head of wall construction detail as shown in Figure 4

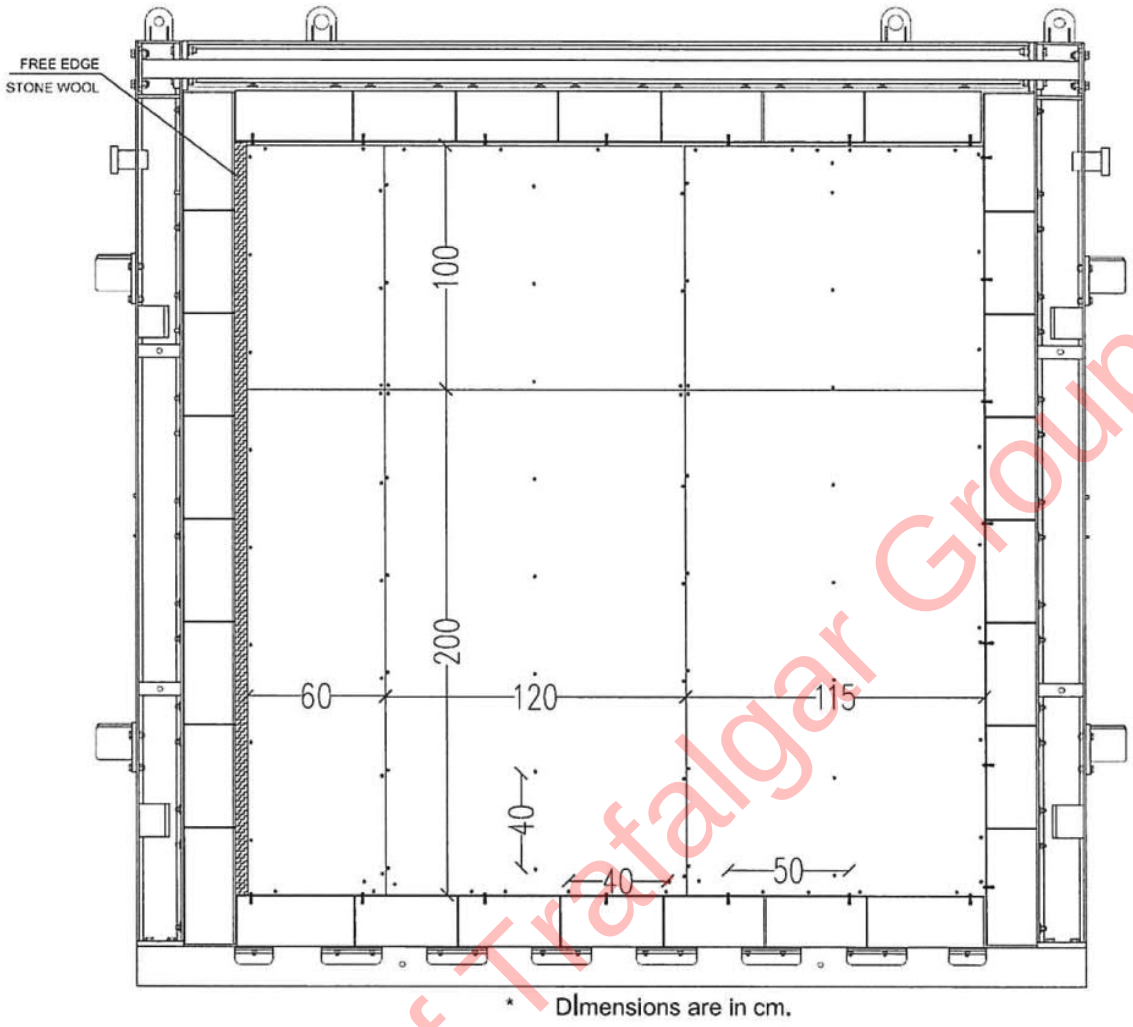


Figure 1 1st layer view of the exposed side of the specimen – extracted from test report

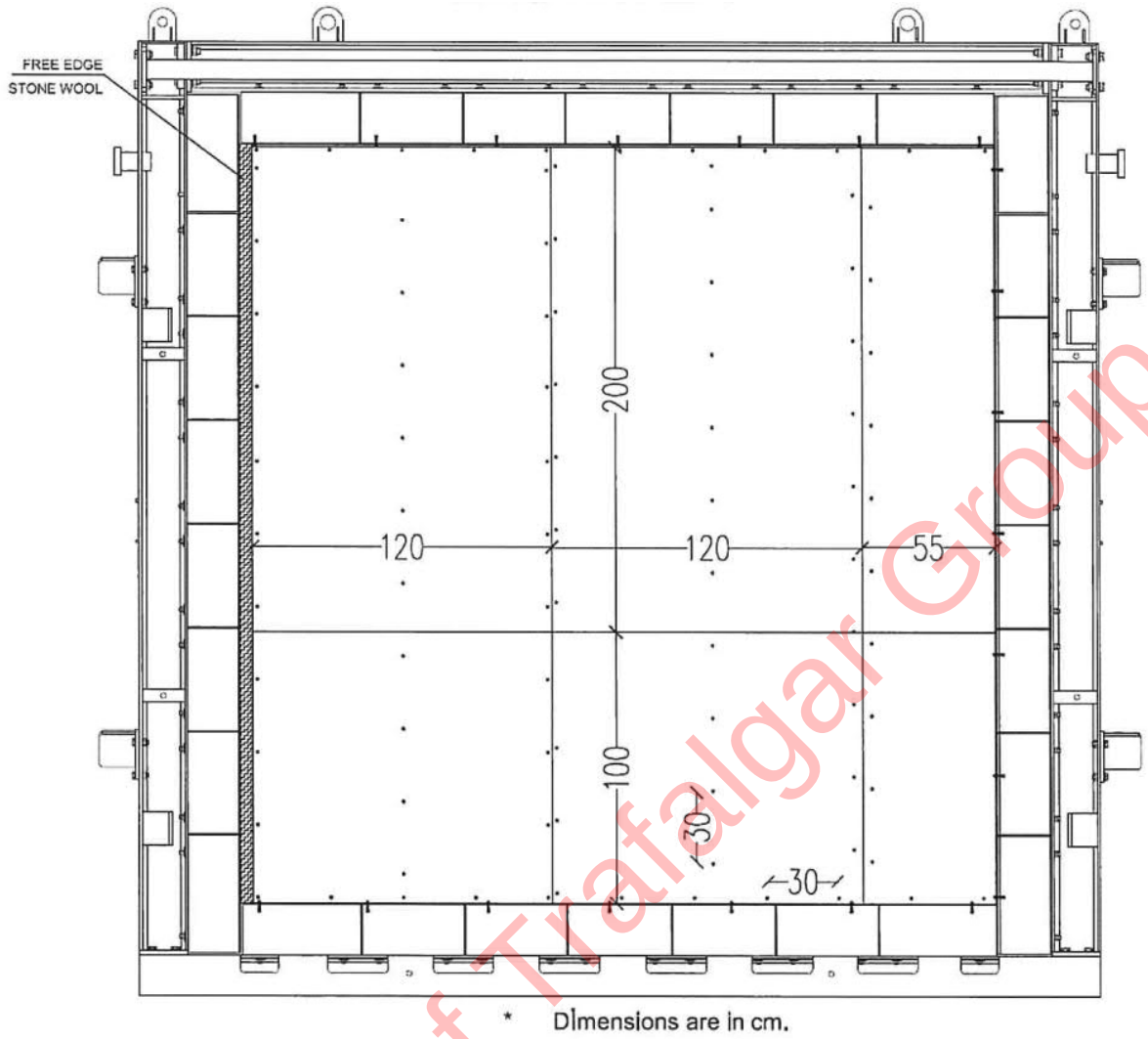


Figure 2 **2nd layer view of the exposed side of the specimen – extracted from test report**

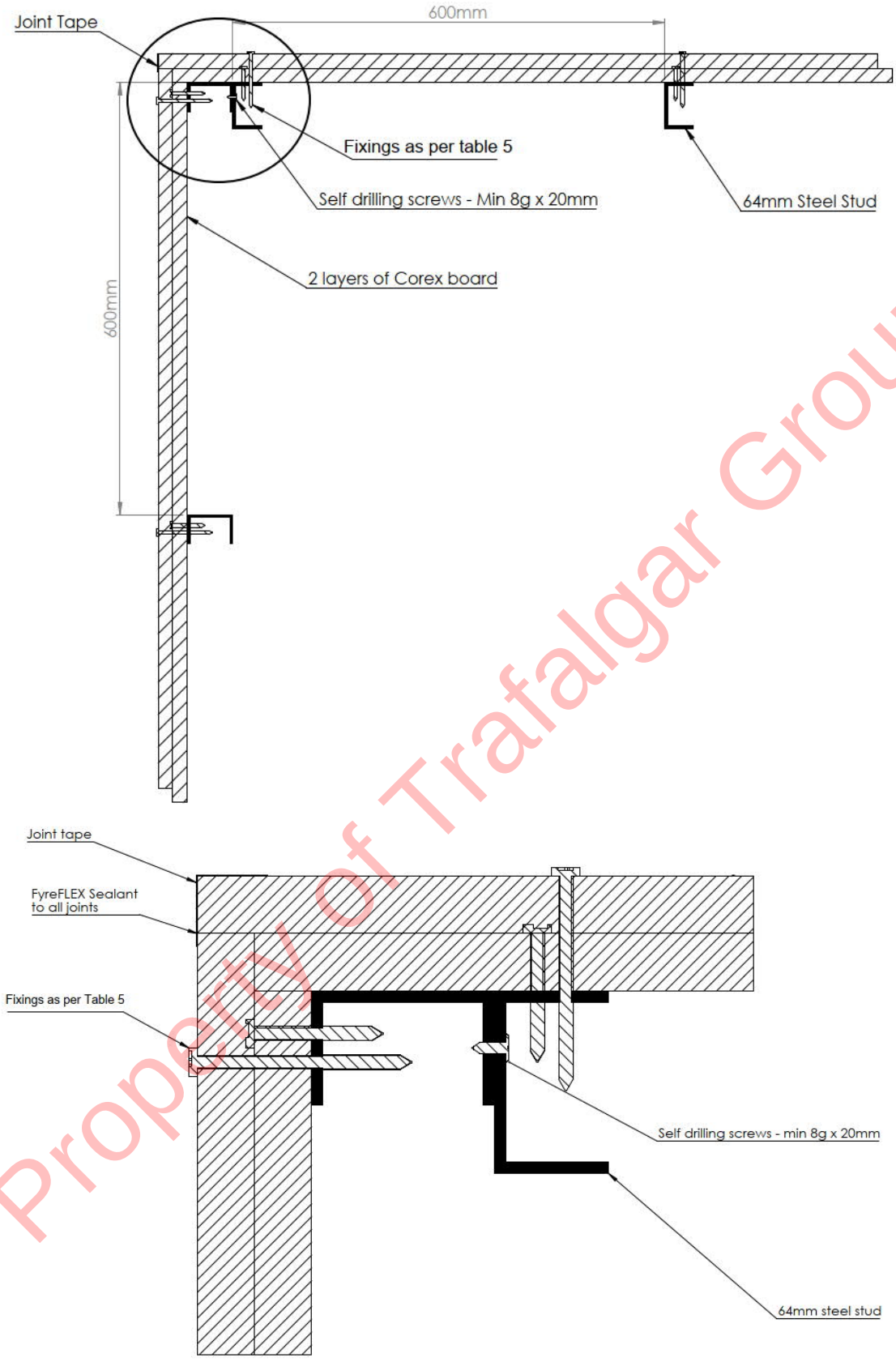


Figure 3 Corner joint detail

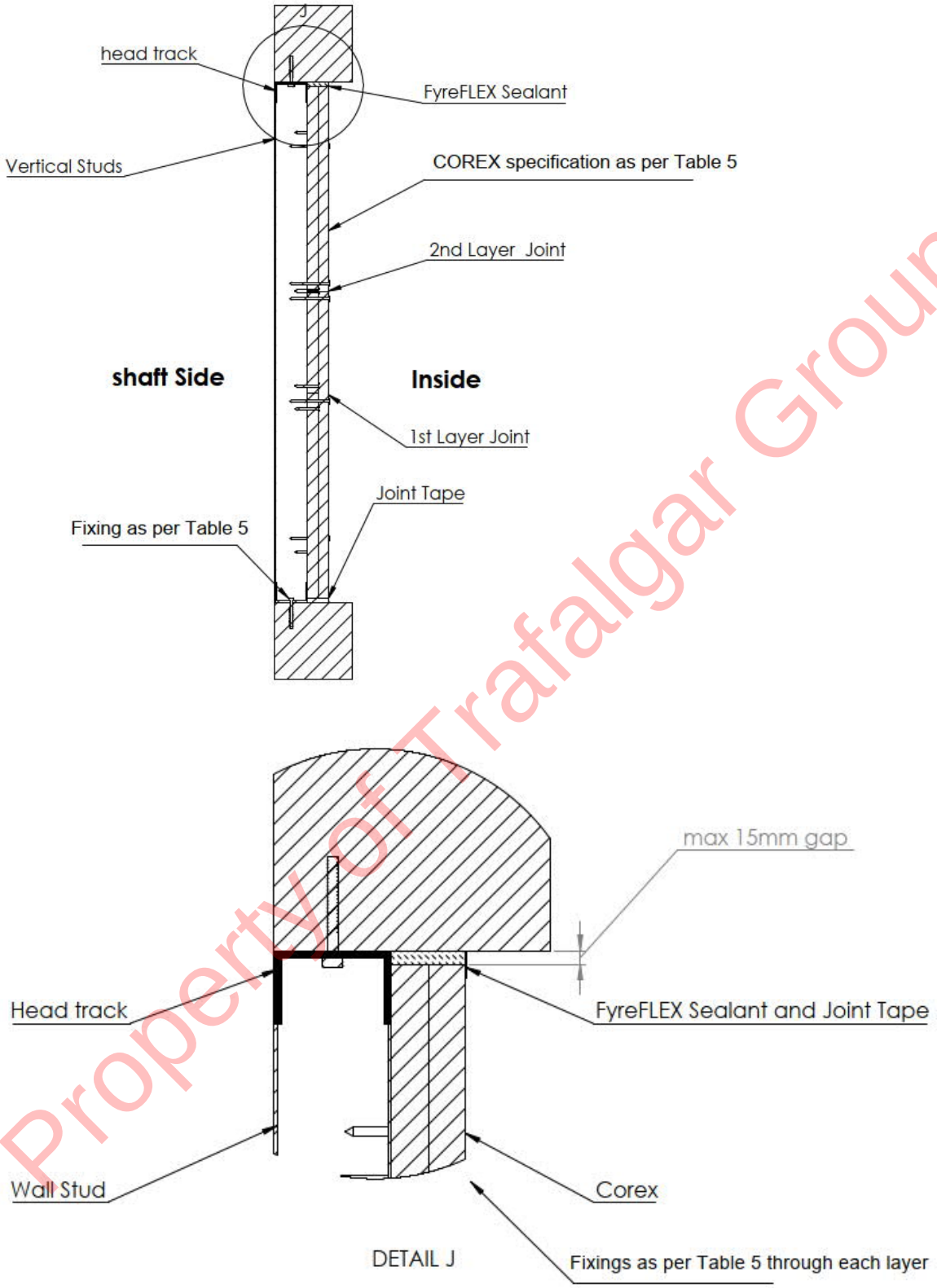


Figure 4 Stud fixing and head of wall detail

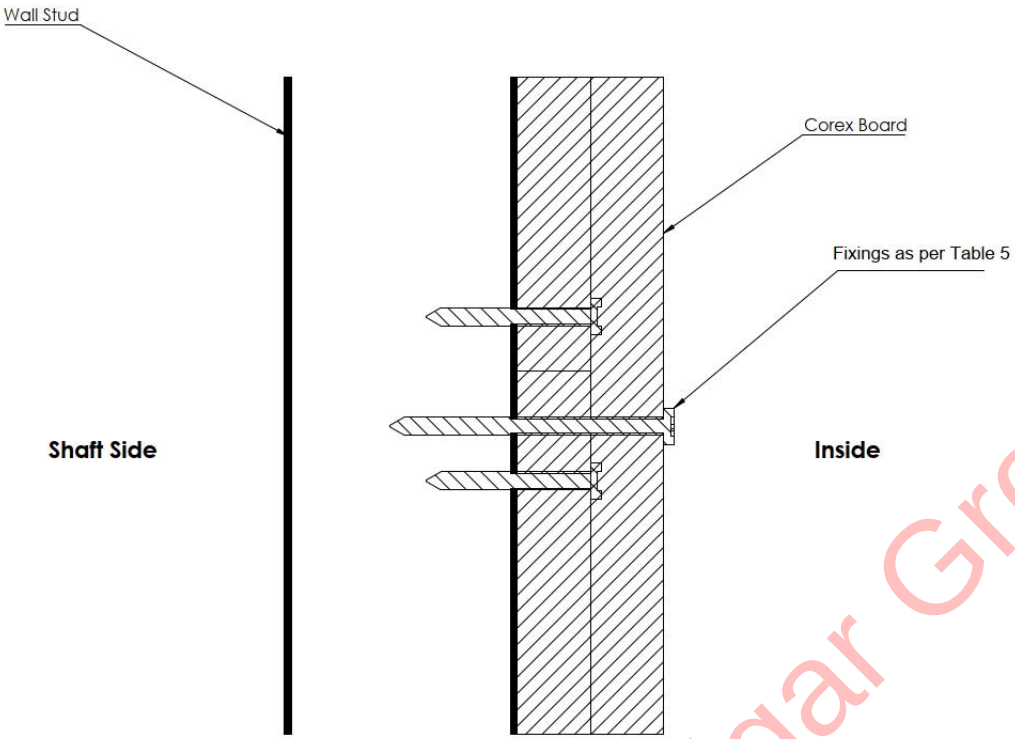


Figure 5 First layer joint

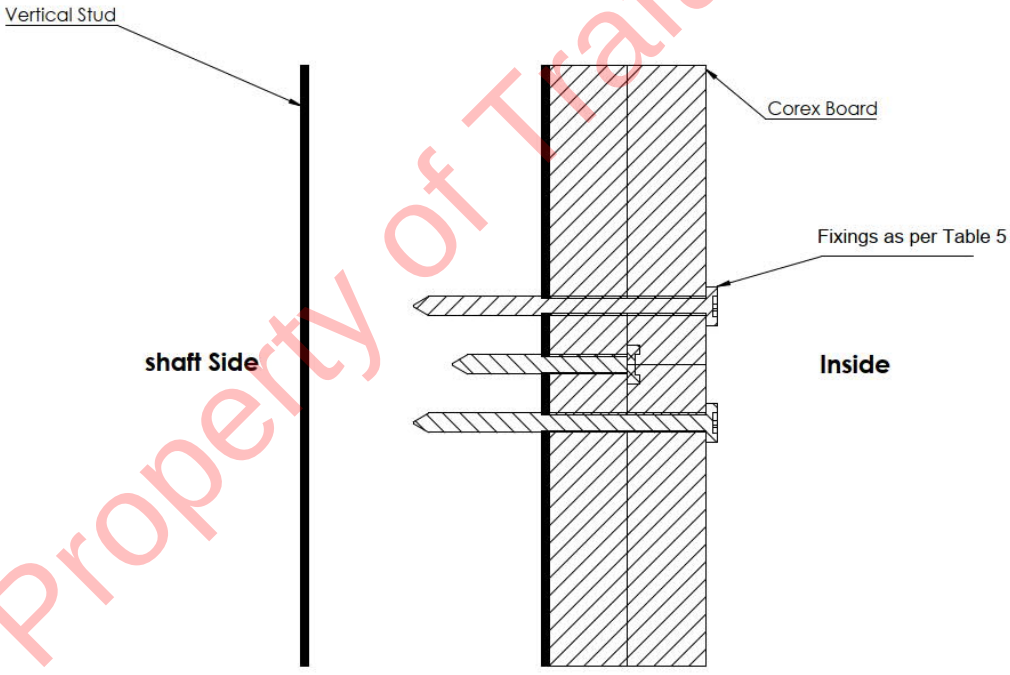


Figure 6 Second layer joint

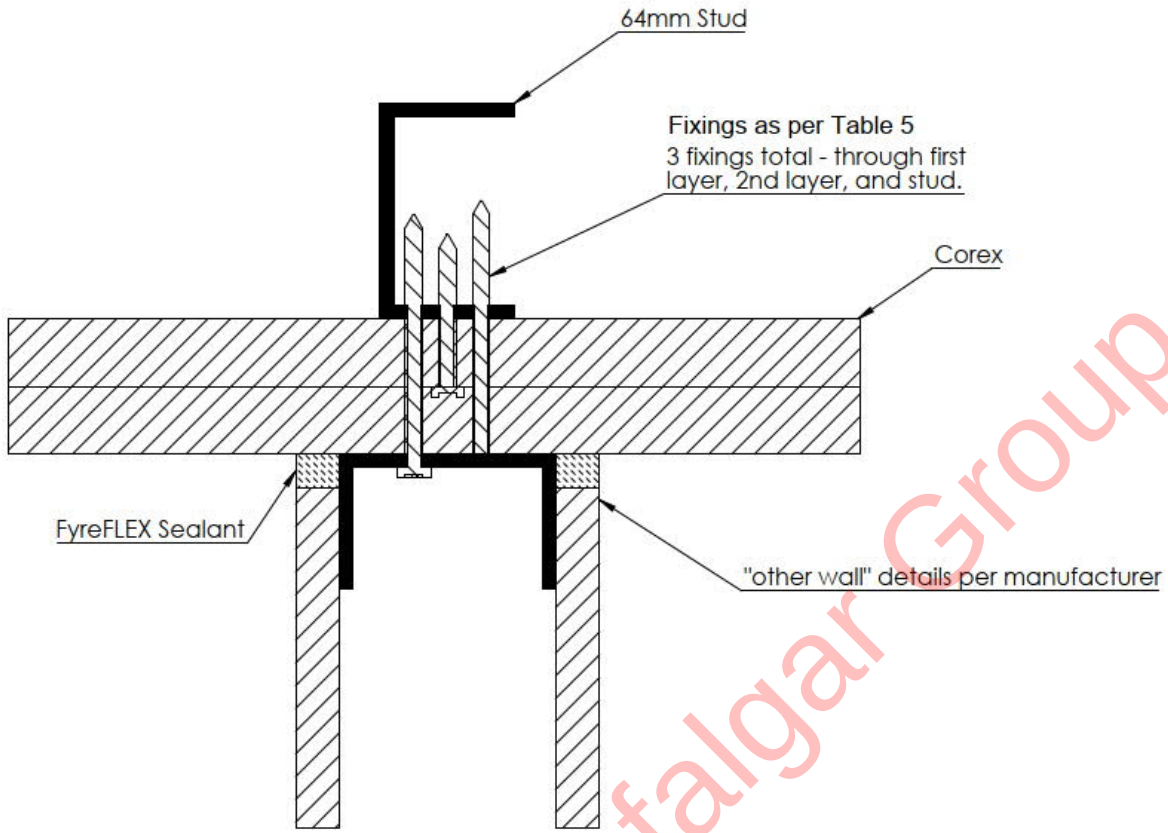


Figure 7 T junction with other walls

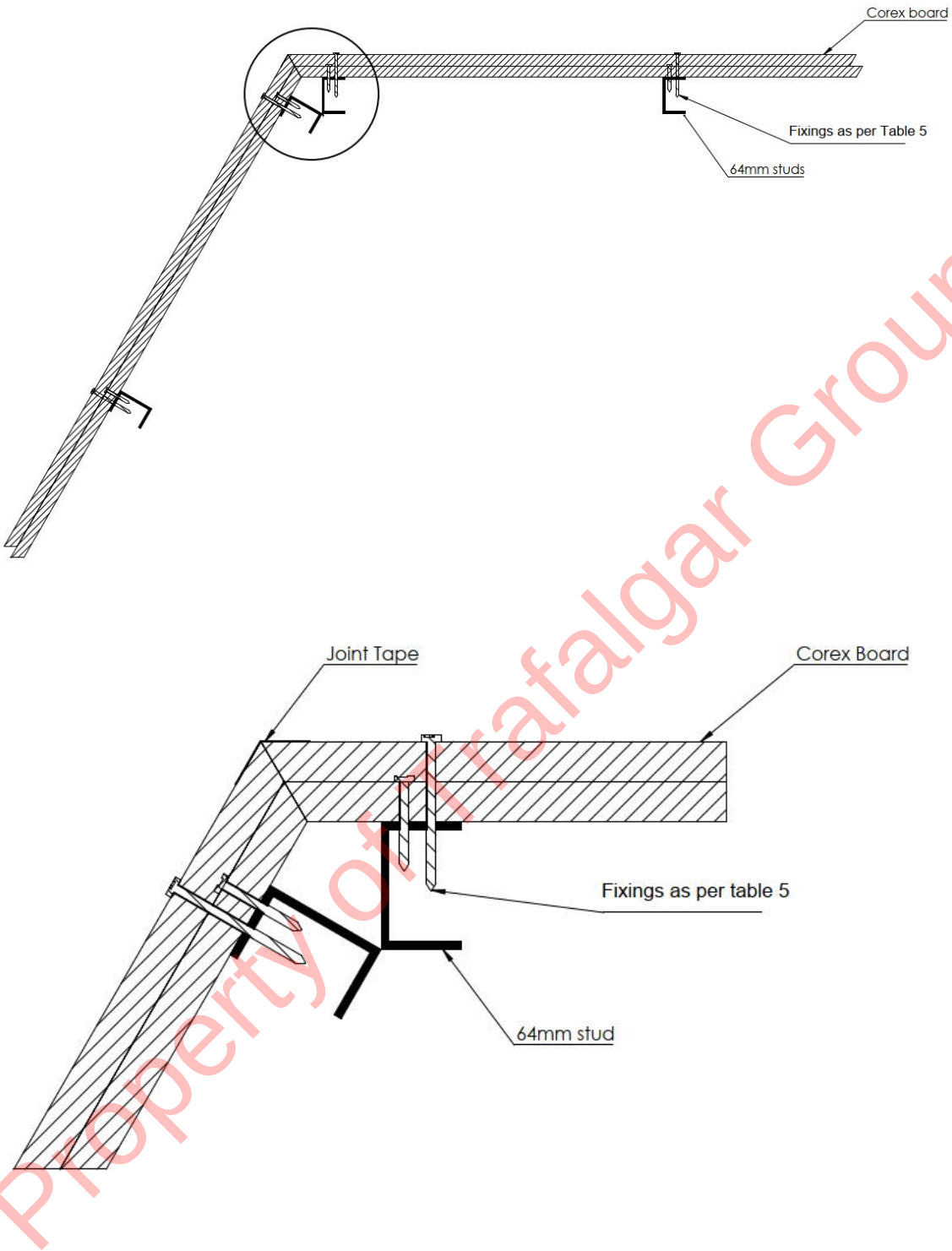


Figure 8 Angle intersections

5. Assessment of A1 COREX shaft wall systems

5.1 Description of variation

The wall systems consist of 2 × 15 mm, 2 × 20 mm or 2 × 25 mm A1 COREX plasterboards mounted on one face of a steel framework tested in accordance with EN 1364-1:2015 with exposure to fire from either side. It is proposed to assess the performance of the tested wall systems in accordance with AS 1530.4:2014 with additional variations as follows:

- Two way FRL for the shaft wall systems with 2 × 15 mm, 2 × 20 mm and 2 × 25 mm A1 COREX boards mounted on one of the sides of the steel framework in accordance with AS 1530.4:2014.
- Increase in wall height up to 4 m
- Variation in depth and increase in thickness of steel studs
- Wall construction details as shown in Figure 3 to Figure 8

5.2 Methodology

The method of assessment used is summarised in Table 6.

Table 6 Method of assessment

Assessment method	
Level of complexity	Intermediate assessment
Type of assessment	Quantitative and comparative

5.3 Relevance of EN test data with respect to AS 1530.4:2014

5.3.1 General

The referenced fire test reports were conducted in accordance with EN 1363-1:2020[7]., EN 1363-2:1999[8] and EN 1364-1:2015. These standards differ from AS 1530.4:2014 and their effect on the fire resistance performance of test specimens are discussed below.

5.3.2 Test specimen construction

The specimen restraint requirements for AS 1530.4:2014 are that the panels to be restrained at the perimeter in a manner representative of the practical installation. For applications where the non-load bearing walls are to be longer than the tested specimen, a vertical free edge is specified.

The test specimens in the referenced fire test reports were fixed on one vertical edge to simulate a wider wall construction in practise as required by AS 1530.4:2014.

5.3.3 Furnace temperature regime

The furnace temperature regime for fire resistance tests conducted in accordance with AS 1530.4:2014 follows a similar trend to EN 1363-1:2020 In addition, the parameters outlining the accuracy of control of the furnace temperature in AS 1530.4:2014 and EN 1363-1:2020 are not appreciably different.

[7] European Committee for Standardization, BS EN1363-1:2020: Fire resistance tests. General requirements, European Committee for Standardization, Brussels, Belgium.

[8] European Committee for Standardization, 1999, Fire resistance tests – Alternative and additional procedures, BS EN 1363-2:1999, European Committee for Standardization, Brussels, Belgium.

5.3.4 Furnace thermocouples

The furnace thermocouples specified in AS 1530.4:2014 are type K, mineral insulated metal sheathed (MIMS) with a stainless steel sheath having a wire of diameter of less than 1.0 mm and an overall diameter of 3 mm. The measuring junction protrudes at least 25 mm from the supporting heat resistant tube.

The furnace thermocouple specified in EN 1363.1:2020 is made from folded nickel alloy plate that faces the furnace chamber. A thermocouple is fixed to the side of the plate facing the specimen with the thermocouple hot junction protected by a pad of insulating material. The plate part is to be constructed from 150 ± 1 mm long by 100 ± 1 mm wide by 0.7 ± 0.1 mm thick nickel alloy sheet strips. The measuring junction is to consist of nickel chromium/nickel aluminium (Type K) wire as defined in EN60584-1, contained within mineral insulation in a heat-resisting steel alloy sheath of nominal diameter range of 1 mm to 3 mm, the hot junctions being electrically insulated from the sheath.

The thermocouple hot junction is to be fixed to the geometric centre of the plate, by a small steel strip made from the same material as the plate. The steel strip can be welded to the plate or may be screwed to it to facilitate replacement of the thermocouple. The strip should be approximately 18 mm by 6 mm if it is spot-welded to the plate, and nominally 25 mm by 6 mm if it is to be screwed to the plate. The screw is to be 2 mm in diameter.

The assembly of plate and thermocouple should be fitted with a pad of inorganic insulation material 97 ± 1 mm by 97 ± 1 mm by 10 ± 1 mm thick with a density of 280 ± 30 kg/m³. The relative location of the furnace thermocouples for the exposed face of the specimen, for AS 1530.4:2014 and EN 1363.1:2020, is 100 mm + 10 mm and 100 mm + 50 mm respectively.

The furnace control thermocouples required by EN 1363.1:2020 are less responsive than those specified by AS 1530.4:2014. This variation in sensitivity can produce a potentially more onerous heating condition for specimens tested to EN 1363.1:2020, particularly when the furnace temperature is changing quickly in the early stages of the test.

5.3.5 Furnace pressure

AS 1530.4:2014 and EN 1363-1:2020 specify that the neutral axis must be established at 500 mm from the base and a pressure of 20 Pa is expected at the top of the 3 m high wall specimen. In addition, the parameters outlining the accuracy of control and location of zero-gauge furnace pressure in AS 1530.4:2014 and EN 1363-1:2020 are not appreciably different.

5.3.6 Specimen temperature measurement

The specimen thermocouple specification is generally the same for AS 1530.4:2014 and EN 1364-1:2015. Both standards prescribe the same locations for measuring specimen average temperature, being at the centre and four quarter points.

For non-loadbearing panel walls with joints, AS 1530.4:2014 specifies maximum temperature thermocouple locations as -

- at the head of the specimen at mid-width.
- at the head of the specimen in line with a stud
- at the junction of a horizontal and vertical joint.
- at the mid-height of one fixed edge.
- at the mid-height of one free edge – 100 mm from the edge.
- at mid-width, where possible, with the centre of the pad 15 mm from the edge of a horizontal joint – positive pressure zone.
- at mid-height, where possible, with the centre of the pad 15 mm from the edge of a vertical joint – positive pressure zone.

The referenced test reports confirm that thermocouples for measuring maximum temperature were more or less similar to the requirements of AS 1530.4:2014.

5.3.7 Performance criteria

AS 1530.4:2014 specifies the following performance criteria for building materials and structures:

- Structural adequacy – (not relevant to the referenced tests)
- Integrity
- Insulation

Integrity

The integrity criteria for AS 1530.4:2014 and EN 1363-1:2020 are not appreciably different.

Insulation

The insulation criteria for AS 1530.4:2014 and EN 1363-1:2020 are not appreciably different.

5.3.8 Application of referenced test data to AS 1530.4:2014.

The variations in furnace heating regimes, furnace pressure conditions, furnace thermocouples and the responses of the different thermocouple types to the furnace conditions are not expected to have an overall significant effect on the outcome of the referenced fire resistance test.

Based on the above discussion, it is considered that the results relating to the integrity and insulation performance of the referenced tests can be used as a basis to assess the FRL of the wall systems – if tested in accordance with AS 1530.4:2014.

5.4 Assessment of shaft wall systems with A1 COREX boards

5.4.1 Performance of wall systems with A1 COREX boards

The referenced tests include 2 × 15 mm, 2 × 20 mm and 2 × 25 mm A1 COREX boards mounted on a steel framework tested in accordance with EN 1363-1:2020, EN 1363-2:1999 and EN 1364-1:2015. As discussed in section 5.3, the results relating to the integrity and insulation performance of the referenced tests can be used as a basis to assess the FRL of the wall systems if tested in accordance with AS 1530.4:2014.

The wall system with 2 × 15 mm A1 COREX boards mounted on one side of the steel framework was tested in RFTR21188 and RFTR21189 with the A1 COREX boards on the exposed and unexposed side of the steel frame, respectively. Both systems maintained the integrity and insulation criteria for at least 60 minutes. It is therefore reasonable to assess the performance of the wall system with 2 × 15 mm A1 COREX boards mounted on one of the sides of the steel framework to an FRL of -/60/60 when exposed to fire from either side, but not simultaneously.

The wall system with 2 × 20 mm A1 COREX boards mounted on one side of the steel framework was tested in RFTR21186 and RFTR21187 with the A1 COREX boards on the exposed and unexposed side of the steel frame, respectively. Both systems maintained the integrity and insulation criteria for at least 90 minutes. It is therefore reasonable to assess the performance of the wall system with 2 × 20 mm A1 COREX boards mounted on one of the sides of the steel framework to an FRL of -/90/90 when exposed to fire from either side, but not simultaneously.

The wall system with 2 × 25 mm A1 COREX boards mounted on one side of the steel framework was tested in RFTR21184 and RFTR21185 with the A1 COREX boards on the exposed and unexposed side of the steel frame, respectively. Both systems maintained the integrity and insulation criteria for at least 120 minutes. It is therefore, reasonable to assess the performance of the wall system with 2 × 25 mm A1 COREX boards mounted on one of the sides of the steel framework to an FRL of -/120/120 when exposed to fire from either side, but not simultaneously.

5.4.2 Increase in wall height

The tested systems in the referenced test were 3 m in height. It is proposed to assess the performance of wall systems with an increased height up to 4 m. EN 1364-1:2015 standard states that the height of a wall construction may be increased by 1.0 m provided that the following criteria are satisfied:

- Minimum tested height is 3 m when tested without a supporting construction or 2.8 when tested with a supporting construction
- The maximum deflection of the test specimen was not in excess of 100 mm
- The expansion allowances are increased pro-rata

All the tested specimens were 3 m in height and the maximum deflection of any of the tested specimens did not exceed 100 mm. With the confidence given by the tested specimens meeting the extension of height criteria specified in EN 1364-1:2015, an increase in height of the proposed wall systems up to 4 m is positively assessed in this assessment provided that the expansion allowance for the proposed wall system is increased pro-rata.

5.4.3 Increase in depth and thickness of steel studs

The tested wall systems were supported by 74 mm deep steel studs with a thickness of 0.6 mm. It is proposed to support the wall systems using 64 mm or deeper studs. This variation is not considered to be detrimental to the system as the A1 COREX boards on the exposed side will be directly exposed to fire in both the scenarios of the studs being on the exposed or unexposed side. Therefore, the proposed change in the depth and increase in thickness of the studs are positively assessed in this assessment.

5.4.4 Wall construction details

Corner joints and angled intersections

The proposed corner construction detail where two walls meet are shown in Figure 3. The two walls are bonded together using a joint tape on the outside of the two walls. Furthermore, the edge studs of the two wall systems are fixed together by a screw which forms a rigid connection, thereby limiting the ability of any gap opening in the wall system. Therefore, this corner construction detail is unlikely to cause any detrimental effect to the performance of the wall system.

The construction detail at an angled intersection is shown in Figure 8. Similar to the corner construction detail a rigid connection is formed between the two wall systems using a joint tape on the outside of the two walls. Therefore, in the event of a fire it can be reasonably expected that there will be no additional deflection caused by the proposed construction detail.

Based on the above discussion, the proposed corner detail as shown in Figure 3 and angled intersection detail as shown Figure 8 in are positively assessed in this assessment.

Head wall detail with FyreFLEX sealant

It is proposed to use FyreFLEX sealant to seal the gap at the head of the proposed wall system as shown in Figure 4. The maximum gap allowed between the head of the wall and the plasterboards is proposed to be 15 mm, whereas the sealant is proposed to be filled to the full depth of the plasterboards in the wall system i.e. either. 2 × 15 mm, 2 × 20 mm or 2 × 25 mm.

Test report NI1189 provides evidence for the performance of a deflection head detail protected by the proposed FyreFLEX sealant. A gap of 30 mm at the head of the plasterboard wall was filled to a depth of 16 mm in the referenced test. The tested deflection head detail did not fail integrity or insulation for 120 minutes thereby, providing evidence of the performance of the proposed FyreFLEX sealant at the wall head detail. Additionally, FSV 2163 demonstrates the performance of the FyreFLEX sealant protecting a 7 mm gap at the head of the wall when applied to a depth of 26 mm of the plasterboard lining. The head detail was protected with the FyreFLEX sealant showing no failure in integrity or insulation throughout the duration of the test for 121 minutes, thereby, achieving an FRL of -/120/120.

The maximum gap in the proposed wall systems is 15 mm, whereas the depth can be either 30 mm, 40 mm or 50 mm depending on the thickness of the A1COREX boards used. It is to be noted that the proposed gap at the head detail is lower than the tested head detail gap in NI1189 and the proposed minimum depth of the sealant is larger than the tested depth of sealant in both NI1189 and FSV2163. Therefore, the proposed head construction detail using FyreFLEX as shown in Figure 4 is positively assessed for the assessed FRLs of the wall systems.

T-Junction with other wall systems

The proposed T-Junction detail is shown in Figure 7. The figure refers to a junction where the proposed A1 COREX shaft wall system meets another type of wall and forms a T-Junction. The two wall systems are connected using a screw fixing and FyreFLEX sealant. The stud-to-stud connection by the screw fixing forms a rigid connection between the two walls which is expected to limit the deflection of the wall system in the event of a fire. Therefore, this proposed construction detail is also positively assessed in this assessment.

5.5 Conclusion

This assessment demonstrates that the proposed shaft wall systems are expected to achieve FRLs as shown in Table 7 – if they were tested in accordance with AS 1530.4:2014.

Table 7 Conclusion of assessment

Wall system	FRL
2 × A1 COREX 15 mm plasterboards on one of the sides of the steel framework	-/60/60
2 × A1 COREX 20 mm plasterboards on one of the sides of the steel framework	-/90/90
2 × A1 COREX 25 mm plasterboards on one of the sides of the steel framework	-/120/120
Notes: The construction details of the wall systems must be as shown in Table 5 and Figure 1 to Figure 8.	

6. Validity

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

This assessment is based on information and experience available at the time of preparation. 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 this report be reviewed on, or before, the stated expiry date.

This 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 this report.

This assessment is provided to Trafalgar Group for their own specific purposes. This report may be used as Evidence of Suitability in accordance the requirements of the relevant National Construction Code. Building certifiers and other third parties must determine the suitability of the systems described in this report for a specific installation.

Appendix A Drawings and additional information

Table 8 Details of drawings

Drawing title	Dwg no	Date	Provided by
Corex Wall Approvals DWG	Drawing no 1 to 9	21 October 2021	Trafalgar Group

Table 9 Additional information

Other information	Date	Provided by
Figure 1 and Figure 2	20 September 2021	Extracted from test report RFTR21188

Appendix B Summary of supporting test data

B.1 Test report – RFTR21184

Table 10 Information about test report

Item	Information about test report
Report sponsor	DALSAN ALÇI SAN. VE TİC. A.Ş.
Test laboratory	Efectis Dilovasi OSB, 5. Kisim, Firat Cad. No 18, 41455 Dilovasi, Kocaeli/Turkey.
Test date	The fire resistance test was done on 17 August 2021.
Test standards	The test was done in accordance with EN 1364-1:2015.
Variation to test standards	None
General description of tested specimen	The tested specimen includes a shaft wall system consisting of double layer A1 COREX 25 mm plasterboards mounted on the exposed side of a steel framework. Total thickness of the partition is 125 mm.
Instrumentation	The test report states that the instrumentation was in accordance with EN 1364-1:2015, EN 1363-1:2020 and EN 1363-2:1999.

The test specimen achieved the following results.

Table 11 Results summary for this test report

Performance criteria	Result
Integrity (E)	No failure at 131 minutes
Insulation (I)	Failure at 130 minutes

B.2 Test report – RFTR21185

Table 12 Information about test report

Item	Information about test report
Report sponsor	DALSAN ALÇI SAN. VE TİC. A.Ş.
Test laboratory	Efectis Dilovasi OSB, 5. Kisim, Firat Cad. No 18, 41455 Dilovasi, Kocaeli/Turkey.
Test date	The fire resistance test was done on 17 August 2021.
Test standards	The test was done in accordance with EN 1364-1:2015.
Variation to test standards	None
General description of tested specimen	The tested specimen includes a shaft wall system consisting of double layer A1 COREX 25 mm plasterboards mounted on the unexposed side of a steel framework. Total thickness of the partition is 125 mm.
Instrumentation	The test report states that the instrumentation was in accordance with EN 1364-1:2015, EN 1363-1:2020 and EN 1363-2:1999.

The test specimen achieved the following results.

Table 13 Results summary for this test report

Performance criteria	Result
Integrity (E)	No failure at 129 minutes
Insulation (I)	Failure at 128 minutes

B.3 Test report – RFTR21186

Table 14 Information about test report

Item	Information about test report
Report sponsor	DALSAN ALÇI SAN. VE TİC. A.Ş.
Test laboratory	Efectis Dilovasi OSB, 5. Kisim, Firat Cad. No 18, 41455 Dilovasi, Kocaeli/Turkey.
Test date	The fire resistance test was done on 18 August 2021.
Test standards	The test was done in accordance with EN 1364-1:2015.
Variation to test standards	None
General description of tested specimen	The tested specimen includes a shaft wall system consisting of double layer A1 COREX 20 mm plasterboards mounted on the exposed side of a steel framework. Total thickness of the partition is 115 mm.
Instrumentation	The test report states that the instrumentation was in accordance with EN 1364-1:2015, EN 1363-1:2020 and EN 1363-2:1999.

The test specimen achieved the following results.

Table 15 Results summary for this test report

Performance criteria	Result
Integrity (E)	No failure at 94 minutes
Insulation (I)	Failure at 93 minutes

B.4 Test report – RFTR21187

Table 16 Information about test report

Item	Information about test report
Report sponsor	DALSAN ALÇI SAN. VE TİC. A.Ş.
Test laboratory	Efectis Dilovasi OSB, 5. Kisim, Firat Cad. No 18, 41455 Dilovasi, Kocaeli/Turkey.
Test date	The fire resistance test was done on 19 August 2021.
Test standards	The test was done in accordance with EN 1364-1:2015.
Variation to test standards	None
General description of tested specimen	The tested specimen includes a shaft wall system consisting of double layer A1 COREX 20 mm plasterboards mounted on the unexposed side of a steel framework. Total thickness of the partition is 115 mm.
Instrumentation	The test report states that the instrumentation was in accordance with EN 1364-1:2015, EN 1363-1:2020 and EN 1363-2:1999.

The test specimen achieved the following results.

Table 17 Results summary for this test report

Performance criteria	Result
Integrity (E)	No failure at 92 minutes
Insulation (I)	Failure at 91 minutes

B.5 Test report – RFTR21188

Table 18 Information about test report

Item	Information about test report
Report sponsor	DALSAN ALÇI SAN. VE TİC. A.Ş.
Test laboratory	Efectis Dilovasi OSB, 5. Kisim, Firat Cad. No 18, 41455 Dilovasi, Kocaeli/Turkey.
Test date	The fire resistance test was done on 19 August 2021.
Test standards	The test was done in accordance with EN 1364-1:2015.
Variation to test standards	None
General description of tested specimen	The tested specimen includes a shaft wall system consisting of double layer A1 COREX 15 mm plasterboards mounted on the fire exposed side of a steel framework. Total thickness of the partition is 105 mm.
Instrumentation	The test report states that the instrumentation was in accordance with EN 1364-1:2015, EN 1363-1:2020 and EN 1363-2:1999.

The test specimen achieved the following results.

Table 19 Results summary for this test report

Performance criteria	Result
Integrity (E)	No failure at 64 minutes
Insulation (I)	Temperature measured with a roving thermocouple at horizontal contact point of panels exceeded 180℃ at 63 minutes

B.6 Test report – RFTR21189

Table 20 Information about test report

Item	Information about test report
Report sponsor	DALSAN ALÇI SAN. VE TİC. A.Ş.
Test laboratory	Efectis Dilovasi OSB, 5. Kisim, Firat Cad. No 18, 41455 Dilovasi, Kocaeli/Turkey.
Test date	The fire resistance test was done on 20 August 2021.
Test standards	The test was done in accordance with EN 1364-1:2015.
Variation to test standards	None
General description of tested specimen	The tested specimen includes a shaft wall system consisting of double layer A1 COREX 15 mm plasterboards mounted on the unexposed side of a steel framework. Total thickness of the partition is 105 mm.
Instrumentation	The test report states that the instrumentation was in accordance with EN 1364-1:2015, EN 1363-1:2020 and EN 1363-2:1999.

The test specimen achieved the following results.

Table 21 Results summary for this test report

Performance criteria	Result
Integrity (E)	No failure at 66 minutes
Insulation (I)	Failure at 65 minutes

B.7 Test report – NI1189

Table 22 Information about test report

Item	Information about test report
Report sponsor	Wormald International/Boral Australian Gypsum/CSR
Test laboratory	Fire Research Laboratories 59, Normanby Road, Nottinghill, Victoria, 3168 Australia.
Test date	The fire resistance test was done on 15 March 1989.
Test standards	The test was done in accordance with AS 1530.4:1985, Fire research Standard FR288:1988, ISO 834:1975 and BS 476-20:1987.
Variation to test standards	None
General description of tested specimen	The tested specimen consisted of a 128 mm thick two-hour fire rated plasterboard partition 2540 high × 1930 wide. A deflection head detail was provided at the head of the partition; the plasterboard sheets being terminated 30 mm below the head. The deflection head was fire stopped with FyreFLEX applied to a thickness of 16 mm on both faces of the partition. Only the results of the deflection head control joint are relevant to this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:1985, Fire research Standard FR288:1988, ISO 834:1975 and BS476-20:1987.

The test specimen achieved the following results.

Table 23 Results summary for this test report

Item	Performance criteria	Result
Deflection head control joint	Integrity	No failure at 120 minutes
	Insulation	No failure at 120 minutes

B.8 Test report – FSV2163

Table 24 Information about test report

Item	Information about test report
Report sponsor	Trafalgar Group Pty Ltd
Test laboratory	CSIRO 14, Julius Avenue North Ryde NSW 2113, Australia.
Test date	The fire resistance test was done on 8 December 2020.
Test standards	The test was done in accordance with AS 1530.4:2014.
Variation to test standards	The furnace pressure was in excess of the requirements of AS 1530.4:2014 during the test for the periods of time shown in figure 3 in the test report. The test laboratory confirms that h minor departure in furnace pressure measured between 5 and 17 minutes would not have significantly affected the results of the test.
General description of tested specimen	The specimen layout consisted of a 3000 mm wide 2770 mm high 116 mm thick plasterboard wall with a 225 mm high 165 mm thick concrete lintel located above the head of the wall. The wall incorporated four access panels, ten service penetrations and two wall system perimeter joints (located along the head) protected with various fire stopping systems. Only the results of the head of wall detail are relevant to this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2014.

The test specimen achieved the following results.

Table 25 Results summary for this test report

Item	Performance criteria	Result
Head of wall detail	Integrity	No failure at 121 minutes
	Insulation	No failure at 121 minutes

warringtonfire

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