



# Regulatory information report

## Assessment of Hilti CFS-TTS Firestop top track seal

Client: Hilti (Australia) Pty Ltd

Product: Hilti CFS-TTS Firestop top track seal




Report number: FAS200132

Revision: RIR 1.4

Issue date: 23 June 2021

Expiry date: 31 May 2025

## Amendment schedule

Version*	Date	Information relating to report			
RIR1.2	Issue: 14/08/2020	Reason for issue	Issued in conjunction with FAS200132 R1.2.		
			Prepared by	Reviewed by	Approved by
	Expiry: 31/05/2025	Name	Alim Rasel	Omar Saad	Omar Saad
RIR1.4	Issue: 23/06/2021	Reason for issue	Revised with the inclusion of penetration services passing through the Hilti CFS-TTS.		
			Prepared by	Reviewed by	Approved by
	Expiry: 31/05/2025	Name	Alim Rasel	Omar Saad	Omar Saad
		Signature			

\*RIR 1.0, RIR1.1 and R1.3 numberings are skipped to maintain consistency with the original assessment report.

## Contact information

Warringtonfire Australia Pty Ltd – ABN 81 050 241 524

### **Melbourne – NATA registered laboratory**

Unit 2, 409-411 Hammond Road  
Dandenong South, VIC 3175  
Australia

T: +61 3 9767 1000

### **Brisbane**

Suite 6, Level 12  
133 Mary Street  
Brisbane, QLD 4000  
Australia

T: +61 7 3238 1700

### **Perth**

Unit 22, 22 Railway Road  
Subiaco, WA 6008  
Australia

T: +61 8 9382 3844

### **Sydney**

Suite 802, Level 8  
383 Kent Street  
Sydney, NSW 2000  
Australia

T: +61 2 9211 4333

### **Canberra**

Unit 2, 11 Murray Crescent  
Griffith, ACT 2603  
Australia

T: +61 2 6260 8488

## General conditions of use

The data, methodologies, calculations and results documented in this report specifically relate to the tested/assessed specimen/s and must not be used for any other purpose.

This report may only be reproduced in full. Extracts or abridgements must not be published without permission from Warringtonfire Australia.

All work and services carried out by Warringtonfire Australia are subject to and conducted in accordance with our standard terms and conditions. These are available on request and at <https://www.element.com/terms/terms-and-conditions>.

## Executive summary

This report contains the minimum information required for regulatory compliance and refers to the Assessment report FAS200132 R1.4. Summaries of the test data on which this assessment is based are provided in the appendices which are only available in the full report.

The analysis conducted in the referenced assessment report outlines the findings of the assessment undertaken to determine the expected fire resistance level (FRL) of Hilti CFS-TTS Firestop top track seal if tested in accordance with AS 1530.4:2014 and assessed in compliance with AS 4072.1:2005.

It has been concluded that the proposed variations are expected to achieve the following FRLs as shown in Table 1 to Table 7 if tested in accordance with AS 1530.4:2014 and assessed in compliance with AS 4072.1:2005.

**Table 1 Hilti TTS protecting top tracks in flexible wall construction**

Hilti TTS top track seal	Track size	Maximum joint height	Fasteners	Joint construction	Separating element (minimum thickness)	FRL
Firestop top track seal CFS-TTS E6	64-65 mm	20 mm	X-C 20 MX, X-C 22 P8 S15-TH, X-C 20 B3, X-C 20 B3 MX, X-P 17 B3 MX, X-P 20 B3 MX, X-P 24 B3 MX, X-P 17 G3, X-P 17 G3 MX, X-P 20 G3 MX, X-GN 20 MX, X-GHP 18 MX, HUS3-P 6 × 40/5, HUS 6 × 35, HUS-H/P 6 × 40, HUS-H 6 × 45, HUS3-PS (Range), HUS-H/P 6 × 60, HUS3-H 10 (Range), HUS3-H 8 (Range), DBZ 6/4.5, HFB 6 × 35.	Horizontal, corners, T-joints, vertical	90 mm (1 × 13 mm) plasterboard wall or 103 mm (1 × 13 mm on one side, 2 × 13 mm on the other) plasterboard wall	-/60/60 (any CFS-TTS type)
Firestop top track seal CFS-TTS E7	71-77 mm				96 mm (1 × 16 mm) plasterboard wall	-/90/90 (any CFS-TTS type)
Firestop top track seal CFS-TTS E9	92-98 mm				116 mm (2 × 13 mm) or 128 mm (2 × 16 mm) plasterboard wall	-/120/120 (any CFS-TTS type)
Firestop top track seal CFS-TTS ES	≥ 92 mm single stud walls or double stud walls with total track width ≥ 92mm					

**Table 2 Hilti TTS protecting top tracks in flexible walls with metal decking**

Hilti TTS top track seal	Track size	Maximum joint height	Metal deck dimension	Metal deck sealing	Separating element (minimum thickness)	FRL*	
Firestop top track seal CFS-TTS E6	64-65 mm	20 mm	Maximum height 65 mm. Overall area restricted to 0.00957 m <sup>2</sup> for each profile	Hilti CP606 ,10 mm deep on both sides. Cavity backfilled with mineral rockwool insulation (density 100 kg/m <sup>3</sup> )	90 mm (1 × 13 mm) plasterboard wall or 103 mm (1 × 13 mm on one side, 2 × 13 mm on the other) plasterboard wall	-/60/60 (any CFS-TTS type)	
Firestop top track seal CFS-TTS E7	71-77 mm						
Firestop top track seal CFS-TTS E9	92-98 mm						
Firestop top track seal CFS-TTS ES	≥ 92 mm single stud walls or double stud walls with total track width ≥ 92 mm						
Firestop top track seal CFS-TTS E6	64-65 mm	20 mm		Maximum height 65 mm. Overall area restricted to 0.00957 m <sup>2</sup> for each profile	Hilti CP606 ,10 mm deep on both sides. Cavity backfilled with mineral rockwool insulation (density 100 kg/m <sup>3</sup> )	96 mm (1 × 16 mm) or 116 mm (2 × 13 mm) plasterboard wall	-/60/60
Firestop top track seal CFS-TTS E7	71-77 mm						-/90/90
Firestop top track seal CFS-TTS E9	92-98 mm						-/90/90
Firestop top track seal CFS-TTS ES	≥ 92 mm single stud walls or double stud walls with total track width ≥ 92 mm						-/90/90
<p>*This table is applicable if the wall is perpendicular to the metal decking. If the wall is parallel to the decking, listed FRLs are applicable without the necessity of “Metal deck profile sealing”. The width between the decking (indicated as C in Figure 7) must be higher than the thickness of the wall. The wall must be installed in between the decking profile. The head track and the TTS must not be exposed to the metal decking profile cavity.</p>							

**Table 3 Hilti TTS protecting uneven overhead horizontal surfaces**

Hilti TTS top track seal	Track size	Maximum allowable overhead gap	Sealing system	Separating element (minimum thickness)	FRL
Firestop top track seal CFS-TTS E6	64-65 mm	30 mm	Hilti CP606 25 mm deep. The cavity backfilled with mineral rockwool insulation (density 100 kg/m <sup>3</sup> )	90 mm (1 × 13 mm) plasterboard wall or 103 mm (1 × 13 mm on one side, 2 × 13 mm on the other) plasterboard wall	-/60/60 (any CFS-TTS type)
Firestop top track seal CFS-TTS E7	71-77 mm			96 mm (1 × 16 mm) plasterboard wall	-/90/90 (any CFS-TTS type)
Firestop top track seal CFS-TTS E9	92-98 mm			116 mm (2 × 13 mm) plasterboard wall	-/120/120 (any CFS-TTS type)
Firestop top track seal CFS-TTS ES	≥ 92 mm single stud walls or double stud walls with total track width ≥ 92 mm				

**Table 4 Metal pipes passing through the Hilti CFS-TTS**

Service	Wall thickness	Aperture and annular gap	Sealant	Hilti CFS-TTS top track seal	Insulation	Separating element	FRL
Up to 40 mm steel pipe	Minimum 4 mm	Maximum aperture 64 mm. Annular gap must not exceed 12 mm.	CP 606 to seal the annular gap as illustrated Figure 9.	As listed in Table 12.	38 mm thick mineral insulation up to 300 mm on each side (minimum nominal density 100 kg/m <sup>3</sup> )	Min 90 mm (1 × 13 mm) plasterboard wall or 103 mm (1 × 13 mm on one side, 2 × 13 mm on the other) plasterboard wall	-/60/60
			CP 606 to seal the annular gap and application of 50 mm × 50 mm CP 606 in cone configuration around the service. The sealing details are illustrated in Figure 10.			Min 96 mm (1 × 16 mm) plasterboard wall	-/90/90*
						Min 116 mm (2 × 13 mm) plasterboard wall	-/120/120*
Up to 20 mm copper pipe	Minimum 1.63 mm	Maximum aperture 48 mm. Annular gap must not exceed 14 mm.	CP 606 to seal the annular gap as illustrated Figure 9.		38 mm thick mineral insulation up to 300 mm on each side (min density 100 kg/m <sup>3</sup> )	Min 90 mm (1 × 13 mm) plasterboard wall or 103 mm (1 × 13 mm on one side, 2 × 13 mm on the other) plasterboard wall	-/60/60
			CP 606 to seal the annular gap and application of 50 mm × 50 mm CP 606 in cone configuration around the service. The sealing details are illustrated in Figure 10.			Min 96 mm (1 × 16 mm) plasterboard wall	-/90/90*
						Min 116 mm (2 × 13 mm) plasterboard wall	-/120/90*

\*Sealant coning is only required when 90 minutes and 120 minutes of insulation performance is required.

**Table 5 Plastic pipes passing through the Hilti CFS-TTS**

Service*	Wall thickness	Aperture and annular gap	Sealant	Hilti CFS-TTS top track seal	Separating element	FRL
16 mm Pex-a	Maximum 2.3 mm	Maximum aperture 38 mm. Maximum annular gap must not exceed 9 mm.	CP 611a to seal the annular gap as illustrated Figure 11.	As listed in Table 12.	Min 90 mm (1 × 13 mm) plasterboard wall or 103 mm (1 × 13 mm on one side, 2 × 13 mm on the other) plasterboard wall	-/60/60
20 mm Pex-a						
16 mm Pex-b						
20 mm Pex-b						
16 mm Pex-a/Al/Pex-a	Maximum 2.0 mm				Min 96 mm (1 × 16 mm) plasterboard wall	-/90/60
20 mm Pex-a/Al/Pex-a						
16 mm Pex-b/Al/Pex-b						
20 mm Pex-b/Al/Pex-b						
*Services can be optionally positioned 5 mm or 0 mm from the seal edge.						



**Table 6 Cable or cable bundle passing through the Hilti CFS-TTS**

Cables*	Configuration	Sealant	Aperture and annular gap	Cable details	Hilti CFS-TTS top track seal	Separating element	FRL	
Electrical and communication cables including but not limited to circular submains, flat TPS, RG6 Quad Shield coax cables, data cables (CAT 5, 6, 7, 8), fire rated cables*	Single cable or cable bundle	CP 611a as illustrated in Figure 12.	Maximum Aperture 38 mm. Maximum annular gap must not exceed 14 mm.	1.5 mm fire rated cable, 3 × CAT6 and 3 × RG6 cable bundle, 4 × 2.5 mm TPS cable bundle, 3 × 2.5 mm fire rated cable bundle or any other cable or cable bundle with maximum 30 mm <sup>2</sup> conductor area (applicable to both single and multi-core cables)	As listed in Table 12.	Min 90 mm (1 × 13 mm) plasterboard wall or 103 mm (1 × 13 mm on one side, 2 × 13 mm on the other) plasterboard wall	-/60/60	
		CP 611a to seal the annular gap. Additionally, CP 611a in 50 mm × 50 mm cone configuration around the service. The sealing details are illustrated in Figure 13.				Min 96 mm (1 × 16 mm) plasterboard wall	-/90/90**	
		CP 606 as illustrated in Figure 12.				Min 116 mm (2 × 13 mm) plasterboard wall	-/120/90**	
			CP 606 as illustrated in Figure 12.	Maximum aperture 16 mm. Maximum annular gap must not exceed 3.5 mm.	3 × CAT6 cable bundle, 2 × 1.5 mm TPS cable bundle, 2 × RG6 cable bundle or any other cable or cable bundle with maximum 9 mm <sup>2</sup> conductor area (applicable to both single and multi-core cables)		Min 90 mm (1 × 13 mm) plasterboard wall or 103 mm (1 × 13 mm on one side, 2 × 13 mm on the other) plasterboard wall	-/60/60
							Min 96 mm (1 × 16 mm) plasterboard wall	-/90/90
							Min 116 mm (2 × 13 mm) plasterboard wall	-/120/120
<p>*The cables could consist of copper conductors sheathed with PVC (if any) and insulated with either PVC or XLPE. The cable or cable bundle will be optionally positioned 0 mm from the seal edge.</p> <p>**Sealant coning is only required when 90 minutes and 120 minutes of insulation performance is required.</p>								

**Table 7 Conduits passing through the TTS**

Services	Aperture and annular gap	Conduit type	Cables*	Sealant	Hilti CFS-TTS top track seal	Separating element	FRL
16 mm or 25 mm uPVC conduit	Maximum aperture 38 mm. Annular gap must not exceed 6.5 mm.	Flexible or rigid	With or without cables. Cables could be 3 × CAT6 and 3 × RG6 cable bundle or any other cable or cable bundle with maximum conductor area of 2.4 mm <sup>2</sup> (applicable to both single and multi-core cables).	CP 611a to seal the annular gap as illustrated in Figure 14.	As listed in Table 12.	Min 90 mm (1 × 13 mm) plasterboard wall or 103 mm (1 × 13 mm on one side, 2 × 13 mm on the other) plasterboard wall	-/60/60
				CP 611a to seal the annular gap. Additionally, CP 611a in 50 mm × 50 mm cone configuration around the service. The sealing details are illustrated in Figure 15.		Min 96 mm (1 × 16 mm) plasterboard wall	-/90/90**
						Min 116 mm (2 × 13 mm) plasterboard wall	-/120/120**
<p>*The cables could be but not limited to circular submains, flat TPS, RG6 Quad Shield coax cables, data cables (CAT 5, 6, 7, 8), fire rated cables. The cables could consist of copper conductors sheathed with PVC (if any) and insulated with either PVC or XLPE.</p> <p>**Sealant coning is only required when 90 minutes and 120 minutes of insulation performance is required.</p>							

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 31 May 2025.

## Contents

Amendment schedule .....	2
Contact information .....	3
General conditions of use .....	3
Executive summary .....	4
Contents.....	11
1. Introduction .....	12
2. Framework for the assessment.....	12
2.1 Compliance with the National Construction Code .....	13
2.2 Declaration .....	13
3. Limitations of this assessment.....	13
4. Description of the specimen and variations.....	14
4.1 System description.....	14
4.2 Referenced test data.....	14
4.3 Variations to tested systems.....	14
4.4 Purpose of the test.....	16
4.5 Schedule of components .....	16
4.5.1 Unpenetrated CFS-TTS system.....	16
4.5.2 Penetrated CFS-TTS system .....	22
5. Assessment outcome .....	27
6. Validity .....	34

## 1. Introduction

This report contains the minimum information sufficient for regulatory compliance and refers to the Assessment report FAS200132 R1.4.

The analysis conducted in the referenced assessment report documents the findings of the assessment undertaken to determine the expected fire resistance level (FRL) of Hilti CFS-TTS Firestop top track seal if tested in accordance with AS 1530.4:2014<sup>1</sup> and assessed in compliance with AS 4072.1:2005<sup>2</sup>. This assessment was carried out at the request of Hilti Australia Pty Ltd. The sponsor details are included in Table 8.

**Table 8 Sponsor details**

Sponsor	Address
Hilti (Australia) Pty Ltd	1G Homebush Bay Dr Rhodes NSW 2138 Australia

## 2. Framework for the assessment

An assessment is an opinion about the likely performance of a component or element of structure if it was subject to a fire test.

The assessed performance of the system variations documented within this assessment report has been determined by assessing the performance of the tested systems against the expected impact of each variation. The system details tested in accordance with AS 1530.4:2014, are generally considered to be representative of a more onerous or comparable condition than the listed system variations which are generally expected to yield a performance equivalent to the tested systems.

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<sup>3</sup>.

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 resistance performance if the elements were to be tested in accordance with AS 1530.4:2014.

<sup>1</sup> 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.

<sup>2</sup> 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.

<sup>3</sup> 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.

## 2.1 Compliance with the National Construction Code

This assessment report has been prepared to meet the evidence of suitability requirements of the National Construction Code Volumes One and Two – Building Code of Australia (NCC) 2019 including Amendments<sup>4</sup> under A5.2 (1) (d).

This assessment has been written in accordance with the general principles outlined in EN 15725:2010<sup>5</sup> 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) provisions of the NCC under A5.5 for reaction to fire 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<sup>6</sup>.

## 2.2 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 12 February 2021, Hilti Australia Pty Ltd 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.
- The results of this assessment are applicable to fire exposure from either side.
- 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 assessment report FAS200132 R1.4.

<sup>4</sup> National Construction Code Volumes One and Two - Building Code of Australia 2019 including Amendments, Australian Building Codes Board, Australia.

<sup>5</sup> 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.

<sup>6</sup> 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

Hilti CFS-TTS FIRESTOP seal protecting top tracks was tested in accordance with AS 1530.4:2014. This report further analyses the test results and explores the applicability of the test outcome in various constructions.

### 4.2 Referenced test data

The assessment of the variation to the tested system and the determination of the likely performance is based on the results of the fire tests documented in the reports summarised in Table 9. Further details of the tested system are described in the original assessment report FAS200132 R1.4.

**Table 9** Referenced test data

Report number	Test sponsor	Test date	Testing authority
WARRES 71151A	Hilti EntwicklungsgesellschaftmbH	25 April 1997	Warringtonfire UK
EWFA 55905400.1	Hilti (Australia) Pty Ltd	24 July 2018	Warringtonfire Australia
19376E	Hilti AG	30 October 2018	WFRGENT NV
FRT180051.2	Hilti (Australia) Pty Ltd	06 January 2019	Warringtonfire Australia
WF415429	Hilti EntwicklungsgesellschaftmbH	07 September 2019	Warringtonfire UK
WF415430	Hilti EntwicklungsgesellschaftmbH	07 September 2019	Warringtonfire UK
FRT 190406	Hilti (Australia) Pty Ltd	21 November 2019	Warringtonfire Australia
FRT 190438	Hilti (Australia) Pty Ltd	03 December 2019	Warringtonfire Australia
FRT 200025	Hilti (Australia) Pty Ltd	11 February 2020	Warringtonfire Australia
FRT200338	Hilti (Australia) Pty Ltd	25 November 2020	Warringtonfire Australia
FRT190338	Hilti (Australia) Pty Ltd	31 December 2020	Warringtonfire Australia

### 4.3 Variations to tested systems

An identical system has not been subjected to a fire test. We have therefore assessed the product using baseline test information for similar systems. The variations to the tested systems together with the referenced baseline fire tests – are described in Table 10.

**Table 10** Variation to tested systems

Item	Reference test	Description	Variations
Hilti CFS-TTS Firestop top track seal	FRT 190406, FRT 190438, FRT 200025	The tested system consisted of Hilti CFS-TTS E6	Firestop top track seal CFS-TTS E7
			Firestop top track seal CFS-TTS E9
			Firestop top track seal CFS-TTS ES

Item	Reference test	Description	Variations
Plasterboard construction	FRT 190406, FRT 190438, FRT 200025	<p>Tested framed wall construction included the following:</p> <p>FRL -/120/120: 2 × 13 mm plasterboard wall construction (both sides)</p> <p>FRL -/60/60: 1 × 13 mm plasterboard wall construction (both sides)</p>	<p>FRL -/120/120: 2 × 16 mm Plasterboard wall construction (both sides)</p> <p>FRL -/90/90: 1 × 16 mm plasterboard wall construction (both sides)</p> <p>FRL -/60/60: 1 × 13 mm of plasterboard one side and 2 × 13 mm on the opposite side.</p> <p>Both single and double stud walls that achieve FRL-/60/60, FRL -/90/90 and FRL -/120/120 are covered under this variation.</p>
Applicable fasteners (Track to concrete)	EWFA 55905400.1	The fasteners included in the tested systems were recorded as Hilti HUS3-P 6 × 40/5 and Hilti X-C 20 b3 MX.	The fasteners can be varied to include, X-C 20 MX, X-C 22 P8 S15-TH, X-C 20 B3, X-C 20 B3 MX, X-P 17 B3 MX, X-P 20 B3 MX, X-P 24 B3 MX, X-P 17 G3, X-P 17 G3 MX, X-P 20 G3 MX, X-GN 20 MX, X-GHP 18 MX, HUS3-P 6 × 40/5, HUS 6 × 35, HUS-H/P 6 × 40, HUS-H 6 × 45, HUS3-PS (Range), HUS-H/P 6 × 60, HUS3-H 10 (Range), HUS3-H 8 (Range), DBZ 6/4.5, HFB 6 × 35.
Joint construction	FRT 190406, FRT 190438, FRT 200025	The Hilti CFS-TTS were applied in horizontal top tracks in the tested system	The fire resistance achieved can be extended to include corners, T-joints and vertical configurations.
Wall frame	FRT 190406, FRT 190438, FRT 200025, 19376E	The tested systems consisted of steel stud frames	The wall framing shall be varied to include timber studs.
Metal Decking	WF415429, WF415430, WARRES 71151A	The tested system included flexible wall perpendicular to metal decking. The decking profile was sealed with CFS-HFF and CFS-F FX.	The wall construction shall be parallel to the metal decking. The decking profile will be sealed with CP 606 and cavity insulation.
Sealing of uneven horizontal surfaces	WARRES 71151A	Hilti CP 606 in conjunction with mineral wool cavity insulation was used to seal metal decking profile.	Hilti CP 606 and cavity insulation must be used to seal overhead gaps caused by uneven horizontal surfaces.
Metal pipes	FRT200338	Ø 40 mm steel and Ø 20 mm copper pipes were tested.	It is proposed that the steel pipes will be up to Ø 40 mm and the copper pipes will be up to Ø 20 mm.
Pex-a and Pex-a/Al/Pex-a		Tested pipe were Pex-b and Pex-b/Al-Pex-b	It is proposed that Pex-a and Pex-a/Al/Pex-a will be optionally installed instead of Pex-b and Pex-b/Al-Pex-b.
Pex pipe sizes		Tested pipes were nominally Ø20 mm.	It is proposed that pipe sizes will be decreased to Ø16 mm.
Conduits		uPVC conduit filled with cables was tested.	It is proposed conduits will be with or without cables.
Conduit size		Tested conduit was nominally Ø25 mm.	It is proposed that the conduit size will be decreased to Ø 16 mm.

Item	Reference test	Description	Variations
Tested cables		A series of electrical and communication cables were tested.	It is proposed that the cables would be but not limited to circular submains, flat TPS, RG6 Quad Shield coax cables, data cables (CAT 5, 6, 7, 8), fire rated cables. The cable would consist of copper conductors sheathed with PVC (if any) and insulated with either PVC or XLPE.

## 4.4 Purpose of the test

AS 1530.4:2014 sets out method for fire tests on building materials, components and structures and other elements of construction.

AS 1530.4:2014, section 10, further stipulates the testing procedure of service penetrations and control joints

## 4.5 Schedule of components

### 4.5.1 Unpenetrated CFS-TTS system

Table 11 outlines the schedule of components for the assessed systems subject to a fire test, as referenced in Appendix A of the referenced report.

**Table 11 Schedule of component of assessed system**

Item	Description	
<b>Separating element</b>		
1	Item name	Fire-rated plasterboard panel
	Construction	FRL -/120/120: The wall must have a minimum thickness of 116 mm and consisted of steel stud/timber framing (minimum 64 mm for steel, 70 mm for timber) lined on both faces with minimum of two layers of 13 mm or 16 mm thick fire grade plasterboard and must be tested to achieve an FRL of -/120/120 or 120/120/120.  FRL -/90/90: The wall must have a minimum thickness of 96 mm and consisted of steel stud framing (minimum 64 mm) lined on both faces with minimum of 1 layer of 16 mm thick fire grade plasterboard and must be tested to achieve an FRL of -/90/90 or 90/90/90.  FRL -/60/60: The wall must have a minimum thickness of 90 mm and consisted of steel stud framing (minimum 64 mm) lined on both faces with minimum of 1 layer of 13 mm thick fire grade plasterboard and must be tested to achieve an FRL of -/60/60 or 60/60/60. The plasterboard construction can occasionally include 2 layers of 13 mm thick fire grade plasterboard in one of the faces.
	Product name	USG Boral Firestop, CSR Gyprock Fyrchek, Knauf Fireshield, GIB Fyreline, BGC Fireboard / GTEK Fire, Elephant Plasterboard and Midland Fire-Resistant Plasterboard.
	Density	788 kg/m <sup>3</sup> (measured)
2	Item name	Head Track
	Size	64-65 mm, 71-77 mm, 92-98 mm, and ≥ 92 mm (single or double stud wall) (as appropriate)
3	Item name	Stud
	Size	Steel studs: 64-65 mm, 71-77 mm, 92-98 mm, and ≥ 92 mm (single or double stud wall) (as appropriate)



Item	Description		
		Timber stud: Minimum thickness 70 mm (2 × 13 mm plasterboard wall construction).	
4	Item name	Bottom Track	
	Size	64-65 mm, 71-77 mm, 92-98 mm, and ≥ 92 mm (single or double stud wall) (as appropriate)	
5	Item name	Fasteners	
	Product name	X-C 20 MX, X-C 22 P8 S15-TH, X-C 20 B3, X-C 20 B3 MX, X-P 17 B3 MX, X-P 20 B3 MX, X-P 24 B3 MX, X-P 17 G3, X-P 17 G3 MX, X-P 20 G3 MX, X-GN 20 MX, X-GHP 18 MX, HUS3-P 6 × 40/5, HUS 6 × 35, HUS-H/P 6 × 40, HUS-H 6 × 45, HUS3-PS (Range), HUS-H/P 6 × 60, HUS3-H 10 (Range), HUS3-H 8 (Range), DBZ 6/4.5, HFB 6 × 35	
	Size	As applicable	
6	Item name	Hilti sealant CP 606	
	Product name	Hilti Firestop Acrylic Sealant CP 606	
	Density	1868 kg/m <sup>3</sup> (measured)	
7	Item name	Plasterboard screw	
	Product name	Hilti S-DS01B 3.5 × 25/41	
	Size	Ø3.5 mm × 25/41 mm long	
8	Item name	Wall cavity insulation	
	Product name	Bradford Acoustigard, GreenStuf, Pink Batts, Earthwool or similar insulation with same thickness, density and R value as stipulated below.	
	Thickness	50 mm	
	Density	11 kg/m <sup>3</sup> (measured)	
	R value	R1.2 or higher	
9	Item name	Jointing Compound	
	Product	USG Boral BaseCote™ 45- and 50-mm paper tape	
	Installation	Applied onto the plasterboard joints and screw fixings on the plasterboard.	
<b>Fire-stopping protections</b>			
<b>Seal</b>			
10	Product name	Hilti CFS-TTS FIRESTOP Top Track Seal	
	Size	Firestop top track seal CFS-TTS E6	64-65 mm
		Firestop top track seal CFS-TTS E7	71-77 mm
		Firestop top track seal CFS-TTS E9	92-98 mm
		Firestop top track seal CFS-TTS ES	≥ 92 mm single stud walls or double stud walls with total track width ≥ 92 mm
	Installation	Installed to protect horizontal gaps as tested in FRT190406, FRT190438 or FRT200025 or corners, T-joints or installed vertically as illustrated in Figure 4, Figure 5 and Figure 6.	
<b>Control joint A</b>			
A	Service	Wall top detail protection	
	Size	Maximum height 20 mm	

Item	Description	
	Local fire-stopping protection	
	Protection	Hilti CFS-TTS FIRESTOP Top Track Seal (item 10)
	Installation	2 pcs of CFS-TTS installed between the head track and the concrete. The CFS-TTS must be visible from both the unexposed and exposed sides. A 15 mm overlap that is compressed between the 2 pcs of CFS-TTS.

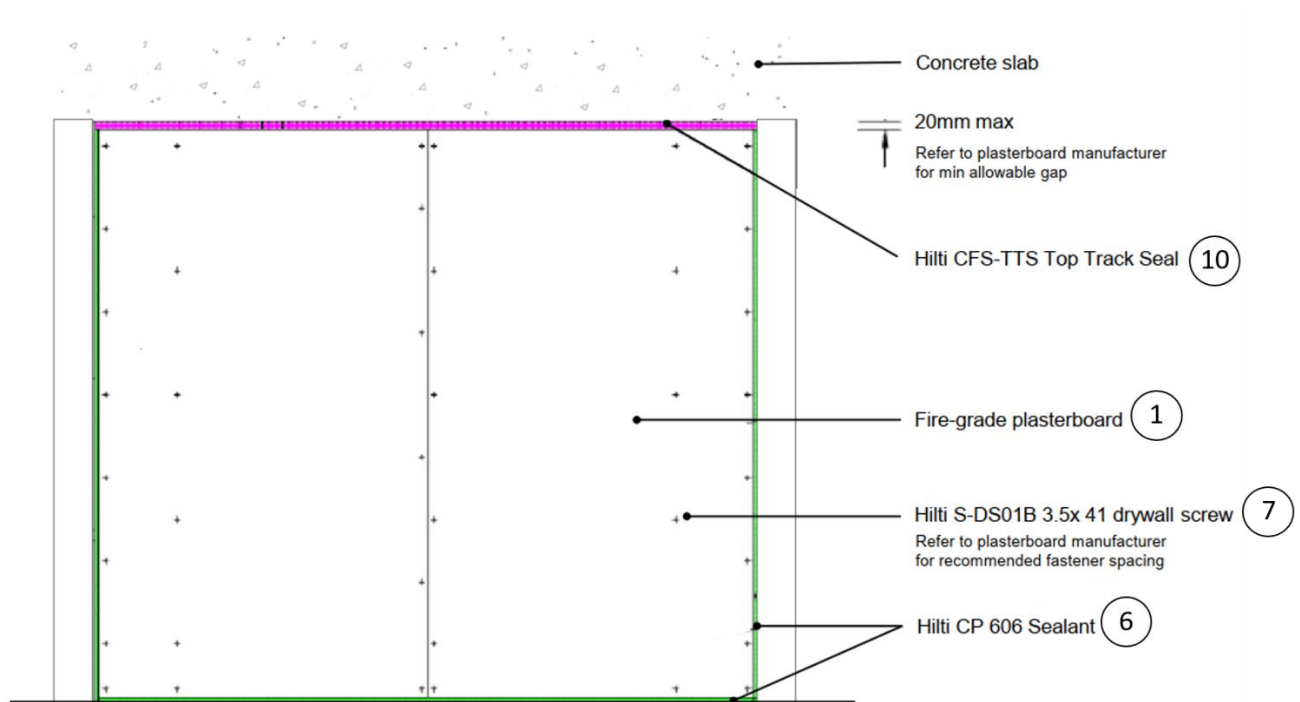


Figure 1 Hilti TTS protecting top track (Elevation view)

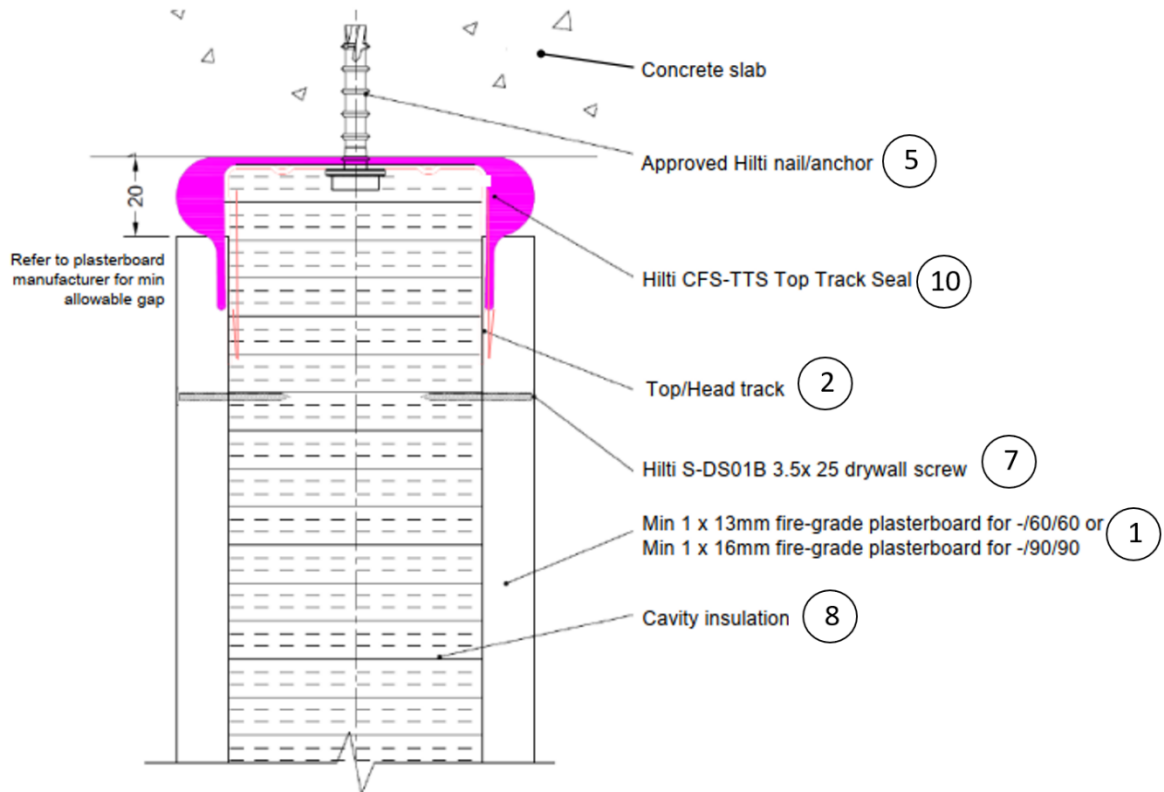


Figure 2 Hilti TTS protecting top tracks- 60- and 90-min system (cross section)

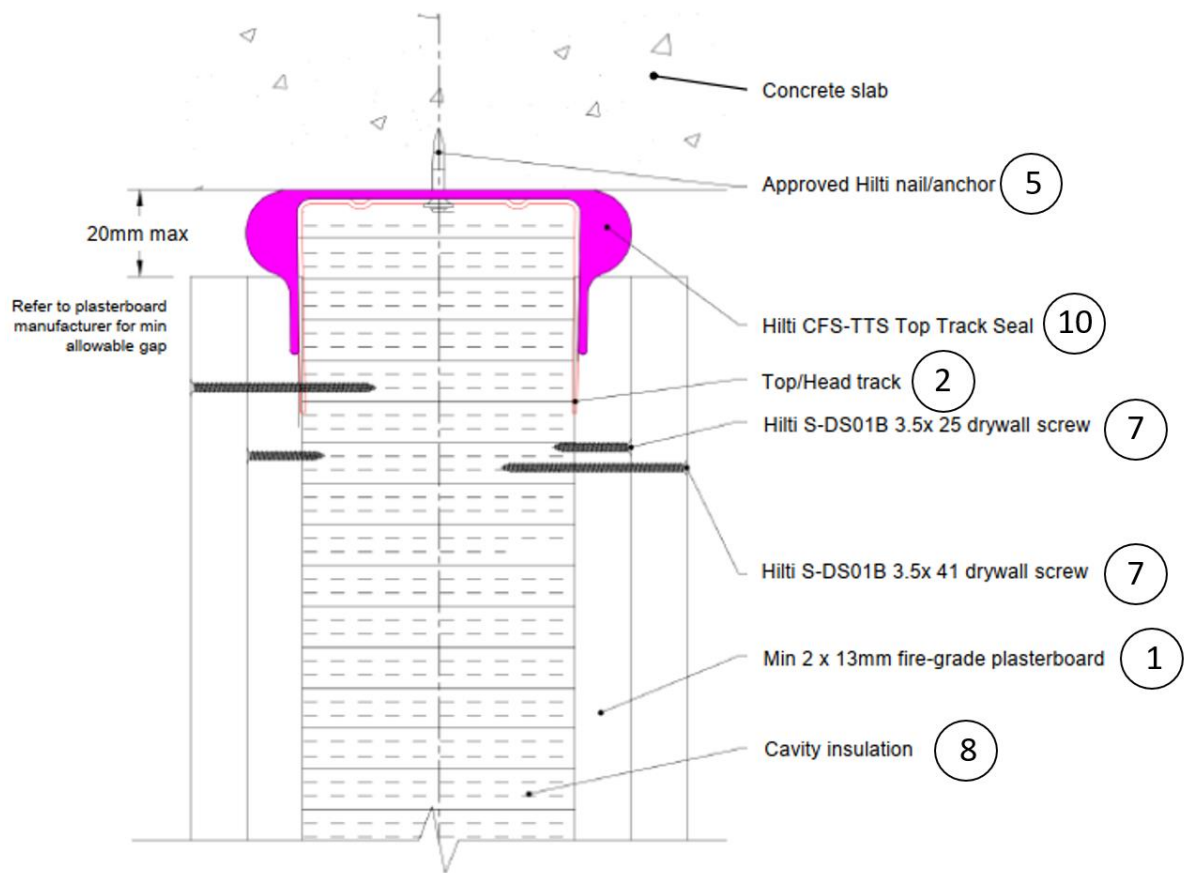


Figure 3 Hilti TTS protecting top tracks- 120-min system (cross section)

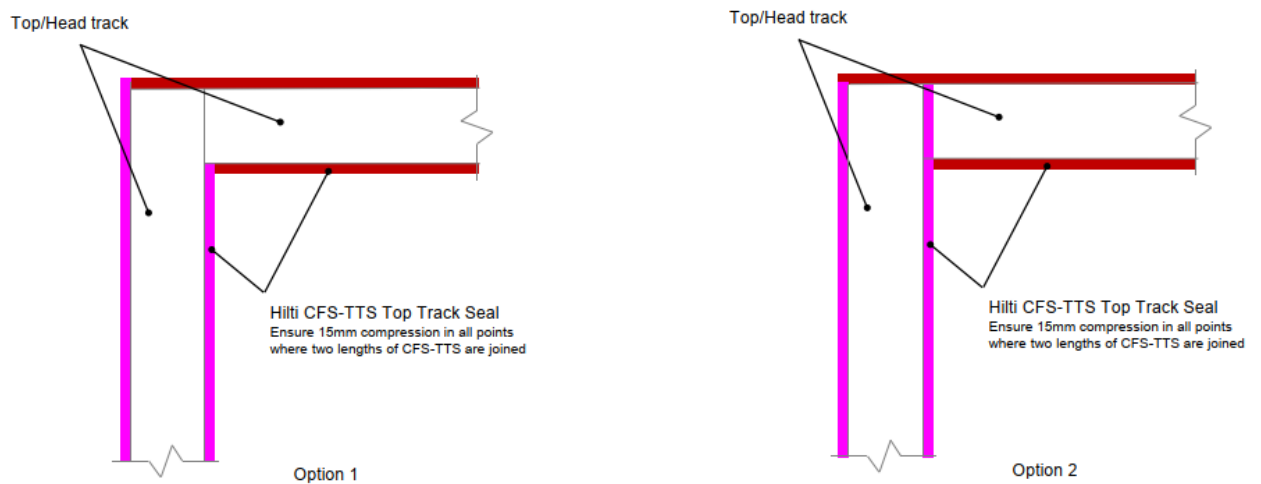


Figure 4 TTS corner details

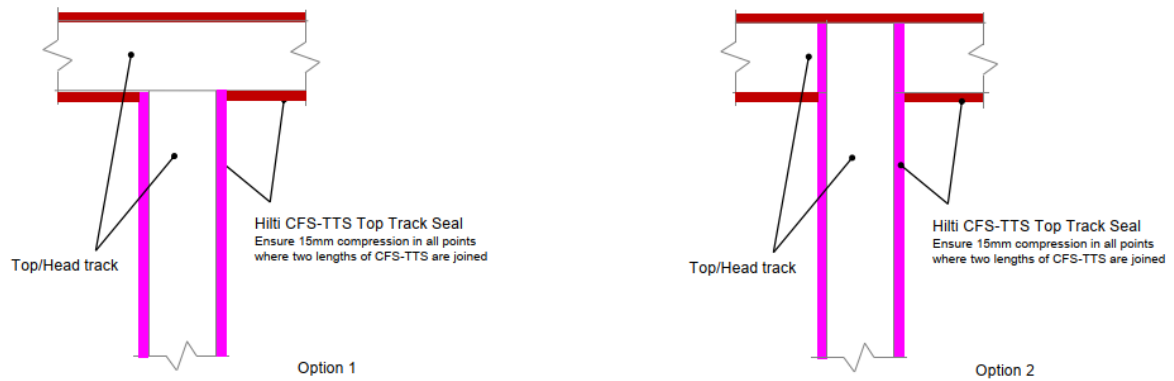


Figure 5 TTS T-joint details

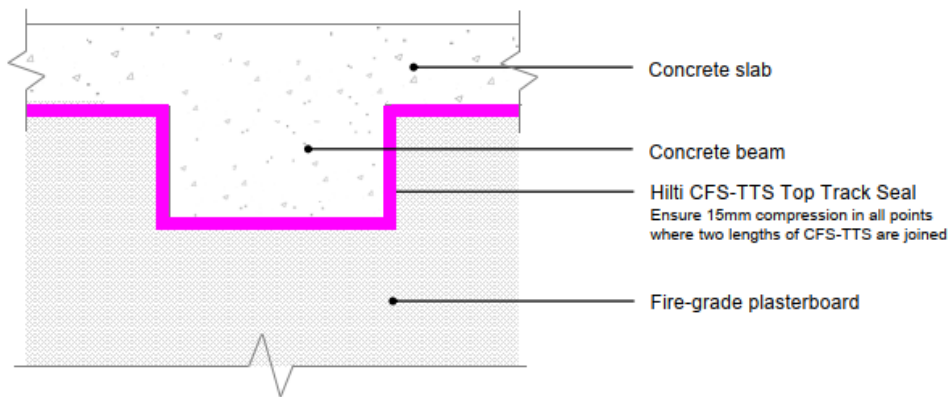


Figure 6 TTS vertical installation

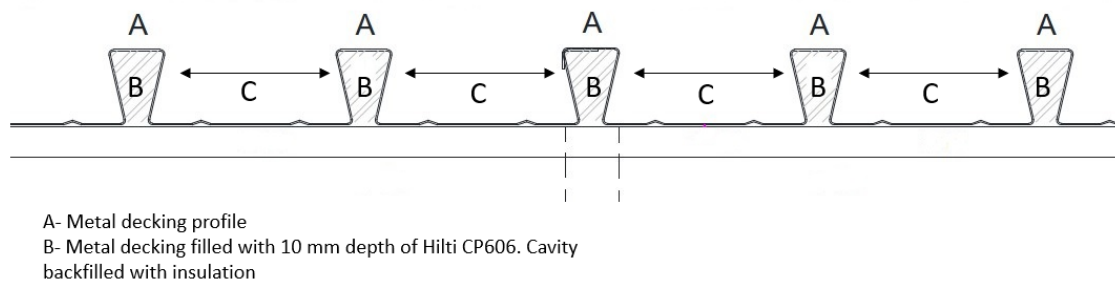


Figure 7 Metal decking sealing system

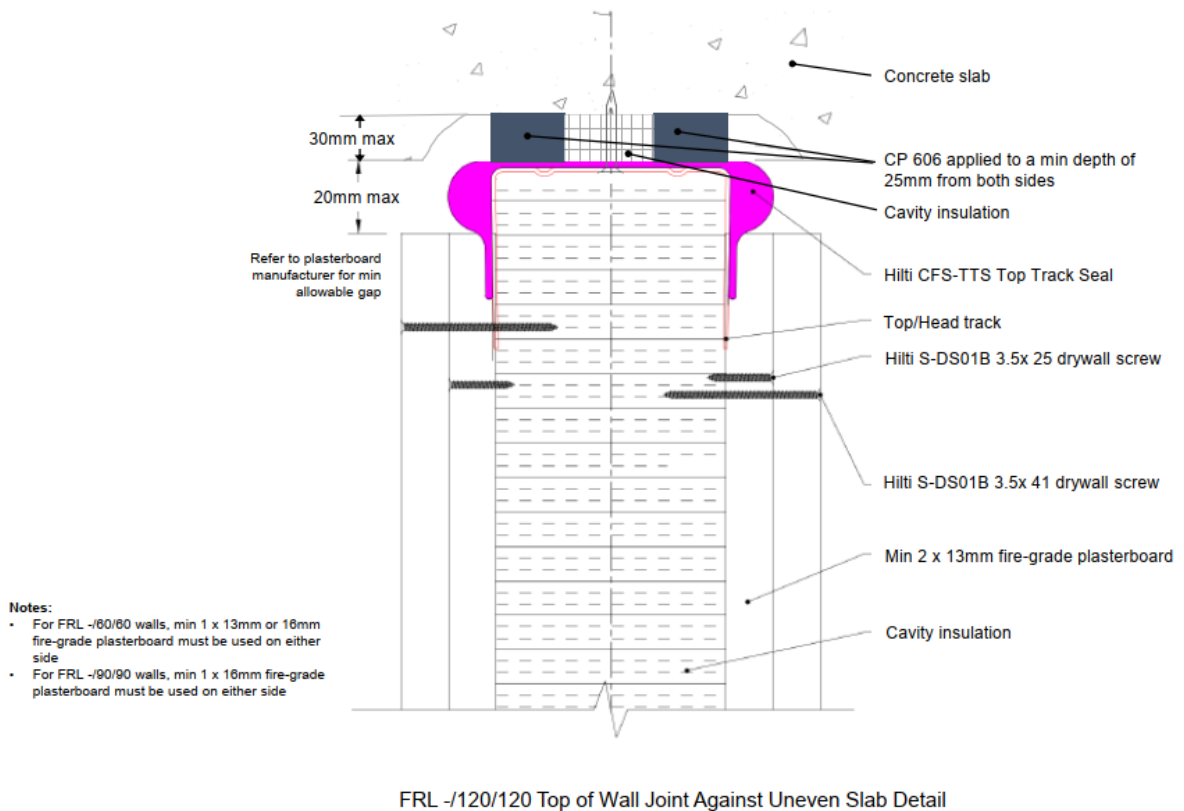


Figure 8 Sealing of uneven slab

### 4.5.2 Penetrated CFS-TTS system

Table 12 outlines the schedule of components for the assessed systems subject to a fire test, as referenced in Appendix A of the referenced report.

Table 12 Schedule of component of assessed system with penetrated TTS

Description		
<b>Separating element (SE)</b>		
1.	Item name	Fire rated plasterboard panel
	Construction	<p>FRL -/120/120: The wall must have a minimum thickness of 116 mm and consisted of steel stud/timber framing (minimum 64 mm for steel, 70 mm for timber) lined on both faces with minimum of two layers of 13 mm or 16 mm thick fire grade plasterboard and must be tested to achieve an FRL of -/120/120 or 120/120/120.</p> <p>FRL -/90/90: The wall must have a minimum thickness of 96 mm and consisted of steel stud framing (minimum 64 mm) lined on both faces with minimum of 1 layer of 16 mm thick fire grade plasterboard and must be tested to achieve an FRL of -/90/90 or 90/90/90.</p> <p>FRL -/60/60: The wall must have a minimum thickness of 90 mm and consisted of steel stud framing (minimum 64 mm) lined on both faces with minimum of 1 layer of 13 mm thick fire grade plasterboard and must be tested to achieve an FRL of -/60/60 or 60/60/60. The plasterboard construction can occasionally include 2 layers of 13 mm thick fire grade plasterboard in one of the faces and single layer on the other side.</p> <p>Cavity insulation: The wall can be constructed with or without cavity insulation.</p>

Description			
	Product name	Inclusive but not limited to USG Boral Firestop, CSR Gyprock Fyrechek, Knauf Fireshield, GIB Fyrelite, BGC Fibreboard/GTEK Fire, Elephant plasterboard and Midland FR plasterboard	
	Density	788 kg/m <sup>3</sup>	
2.	Item name	Deflection head track	
	Size	64-65 mm, 71-77 mm, 92-98 mm, and ≥ 92 mm (single or double stud wall) (as appropriate)	
3	Item name	Stud	
	Size	Steel studs: 64-65 mm, 71-77 mm, 92-98 mm, and ≥ 92 mm (single or double stud wall) (as appropriate) Timber stud: Minimum thickness 70 mm (2 × 13 mm plasterboard wall construction). Minimum distance of 100 mm from the seal to any stud.	
4	Item name	Bottom Track	
	Size	64-65 mm, 71-77 mm, 92-98 mm, and ≥ 92 mm (single or double stud wall) (as appropriate)	
5	Item name	Concrete lintel	
6	Item name	Fasteners	
	Product name	X-C 20 MX, X-C 22 P8 S15-TH, X-C 20 B3, X-C 20 B3 MX, X-P 17 B3 MX, X-P 20 B3 MX, X-P 24 B3 MX, X-P 17 G3, X-P 17 G3 MX, X-P 20 G3 MX, X-GN 20 MX, X-GHP 18 MX, HUS3-P 6 × 40/5, HUS 6 × 35, HUS-H/P 6 × 40, HUS-H 6 × 45, HUS3-PS (Range), HUS-H/P 6 × 60, HUS3-H 10 (Range), HUS3-H 8 (Range), DBZ 6/4.5, HFB 6 × 35	
	Size	As appropriate	
7	Item name	Plasterboard screw	
	Product name	Hilti S-DS01B 3.5 × 25	
8	Item name	Hilti CFS-TTS FIRESTOP Top Track Seal	
	Size	<b>Hilti CFS-TTS top track seal</b> <b>Track size</b>	
		Firestop top track seal CFS-TTS E6	64-65 mm
		Firestop top track seal CFS-TTS E7	71-77 mm
		Firestop top track seal CFS-TTS E9	92-98 mm
Firestop top track seal CFS-TTS ES	≥ 92 mm single stud walls or double stud walls with total track width ≥ 92 mm		
9	Item name	Jointing compound	
	Product	USG Boral All purpose premix compound	
	Installation	Applied on top of the screw fixing on the plasterboard on both the exposed and the unexposed sides.	
<b>Fire-stopping protections</b>			
<b>Sealant</b>			
10	Item name	CP 606	
	Product name	Hilti Firestop acrylic sealant CP 606	
	Density	1868 kg/m <sup>3</sup>	
11	Item name	CP 611a	
	Product name	Hilti Firestop intumescent sealant CP 611a	

Description		
	Density	1400 kg/m <sup>3</sup>
<b>Pipe insulation</b>		
12	Item name	Pipe insulation
	Product	Mineral wool insulation
	Density of mineral wool	Nominal 100 kg/m <sup>3</sup>
<b>Services</b>		
13	Item name	Metal pipes
	Material	Steel and copper
	Size	As listed in Table 4.
14	Item name	Plastic pipes
	Product name	Pex-a, Pex-b, Pex-a/Al/Pex-a and Pex-b/Al/Pex-b pipes
	Size	As listed in Table 5.
<b>Cables</b>		
15	Item name	Cable and cable bundle
	Product name	Electrical and communication cables including but not limited to circular submains, flat TPS, RG6 Quad Shield coax cables, data cables (CAT 5, 6, 7, 8), fire rated cables
	Construction	The cables could consist of copper conductors sheathed with PVC (if any) and insulated with either PVC or XLPE.
	Conductor size	As listed in Table 6.
16	Item name	Rigid and flexible conduit
	Material	uPVC
	Size	As listed in Table 7.
Minimum 40 mm distance between services needs to be maintained.		

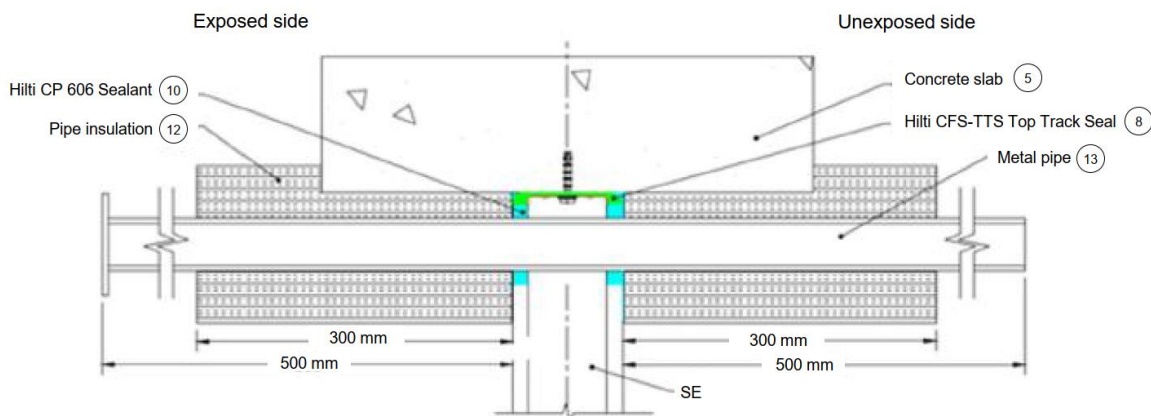
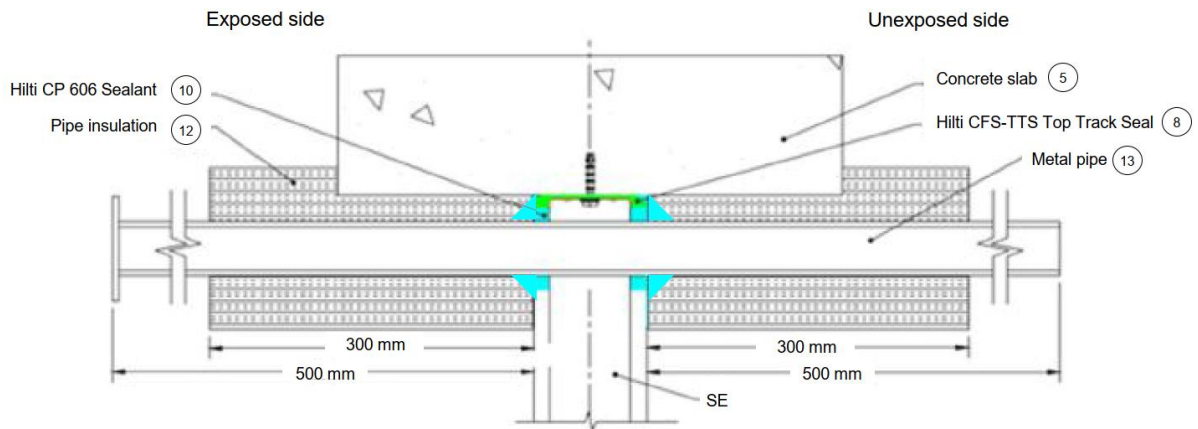
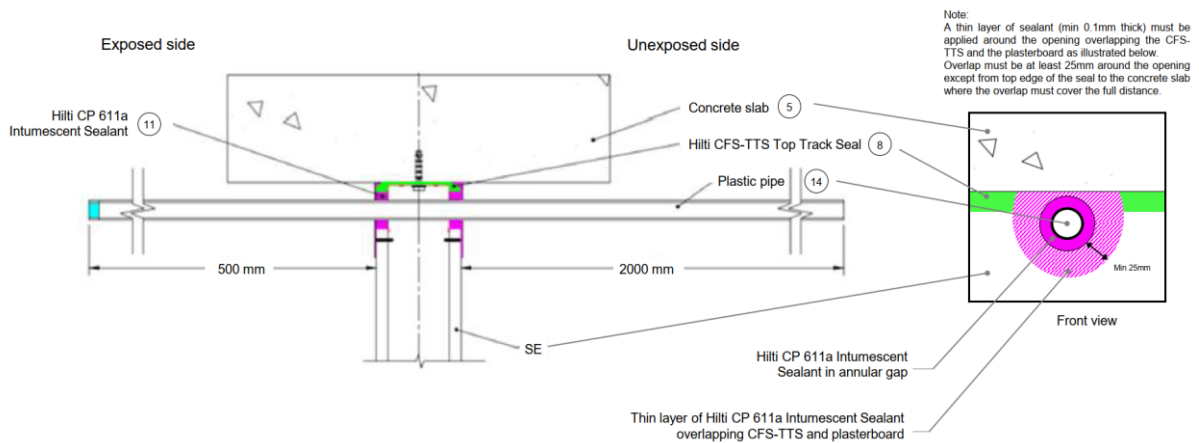


Figure 9 Metal pipes passing through CFS-TTS without sealant coning.

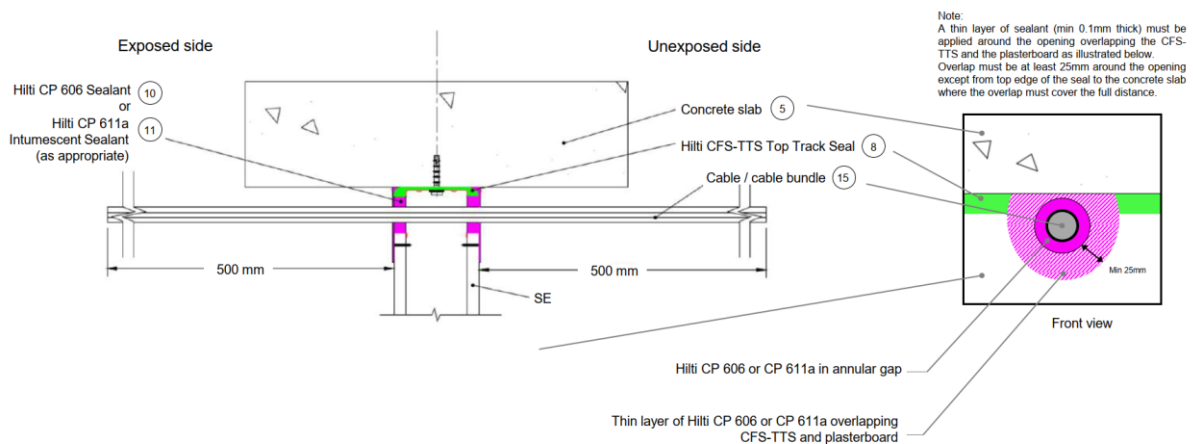




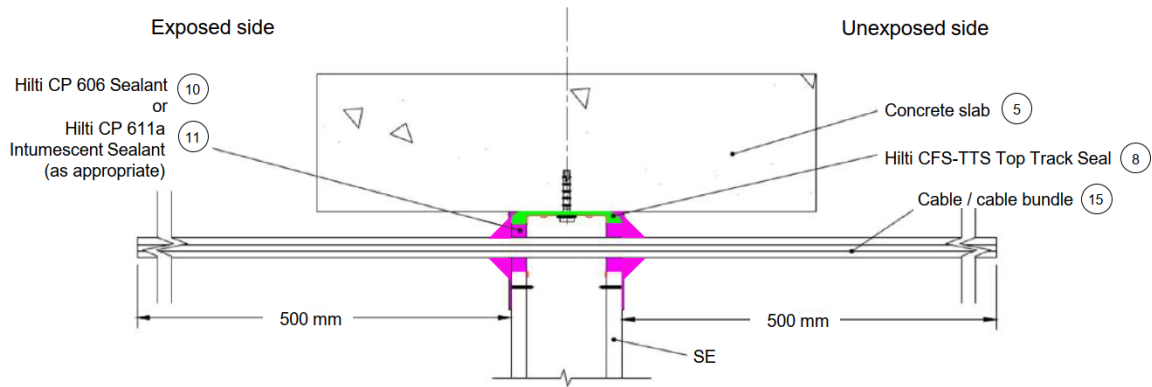
**Figure 10** Metal pipes passing through CFS-TTS with 50 mm × 50 mm CP 606 sealant coning for 90 and 120 minutes (as applicable) insulation performance



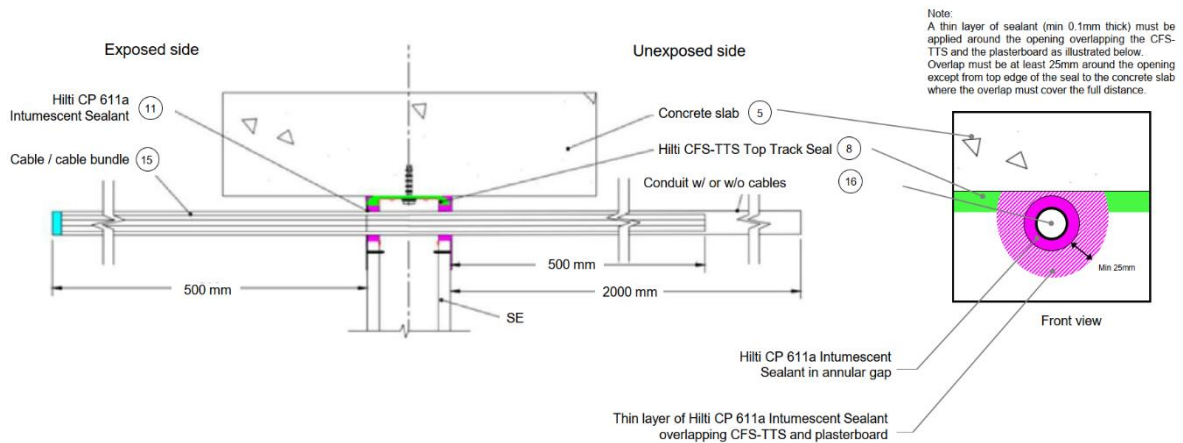
**Figure 11** Plastic pipes passing through CFS-TTS



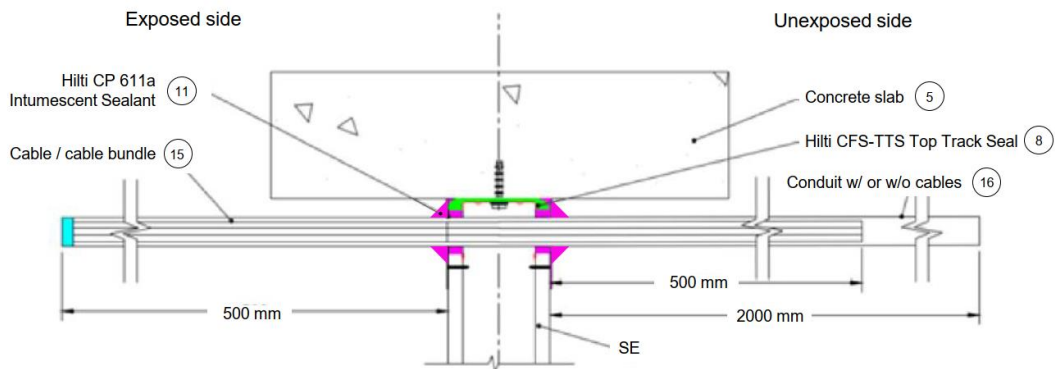
**Figure 12** Single cable or cable bundle passing through CFS-TTS without sealant coning.



**Figure 13** Single cable or cable bundle passing through CFS-TTS with CP 606 and CP 611a (as appropriate) with 50 mm × 50 mm coning for 90 minutes and 120 minutes (as appropriate) insulation performance



**Figure 14** Conduits with or without cable infill passing through CFS-TTS without sealant coning



**Figure 15** Conduits with or without cable infill passing through CFS-TTS with CP 611a sealant in 50 mm × 50 mm coning for 90 and 120 minutes (as applicable) insulation performance

## 5. Assessment outcome

Details of the assessment and discussion are only available in the referenced main assessment report FAS200132 R1.4. It has been concluded that, Hilti CFS-TTS top track seal in conjunction with the proposed variations are expected to achieve the FRLs as shown below, if tested in accordance with AS 1530.4:2014 and assessed in compliance with AS 4072.1:2005. A summary of the assessment outcome is outlined in Table 13 to Table 19. Table 15

**Table 13 Hilti TTS protecting top tracks in flexible wall construction**

Hilti TTS top track seal	Track size	Maximum joint height	Fasteners	Joint construction	Separating element (minimum thickness)	FRL
Firestop top track seal CFS-TTS E6	64-65 mm	20 mm	X-C 20 MX, X-C 22 P8 S15-TH, X-C 20 B3, X-C 20 B3 MX, X-P 17 B3 MX, X-P 20 B3 MX, X-P 24 B3 MX, X-P 17 G3, X-P 17 G3 MX, X-P 20 G3 MX, X-GN 20 MX, X-GHP 18 MX, HUS3-P 6 × 40/5, HUS 6 × 35, HUS-H/P 6 × 40, HUS-H 6 × 45, HUS3-PS (Range), HUS-H/P 6 × 60, HUS3-H 10 (Range), HUS3-H 8 (Range), DBZ 6/4.5, HFB 6 × 35.	Horizontal, corners, T-joints, vertical	90 mm (1 × 13 mm) plasterboard wall or 103 mm (1 × 13 mm on one side, 2 × 13 mm on the other) plasterboard wall	-/60/60 (any CFS-TTS type)
Firestop top track seal CFS-TTS E7	71-77 mm				96 mm (1 × 16 mm) plasterboard wall	-/90/90 (any CFS-TTS type)
Firestop top track seal CFS-TTS E9	92-98 mm				116 mm (2 × 13 mm) or 128 mm (2 × 16 mm) plasterboard wall	-/120/120 (any CFS-TTS type)
Firestop top track seal CFS-TTS ES	≥ 92 mm single stud walls or double stud walls with total track width ≥ 92mm					

**Table 14 Hilti TTS protecting top tracks in flexible walls with metal decking**

Hilti TTS top track seal	Track size	Maximum joint height	Metal deck dimension	Metal deck sealing	Separating element (minimum thickness)	FRL*
Firestop top track seal CFS-TTS E6	64-65 mm	20 mm	Maximum height 65 mm. Overall area restricted to 0.00957 m <sup>2</sup> for each profile	Hilti CP606 ,10 mm deep on both sides. Cavity backfilled with mineral rockwool insulation (density 100 kg/m <sup>3</sup> )	90 mm (1 × 13 mm) plasterboard wall or 103 mm (1 × 13 mm on one side, 2 × 13 mm on the other) plasterboard wall	-/60/60 (any CFS-TTS type)
Firestop top track seal CFS-TTS E7	71-77 mm					
Firestop top track seal CFS-TTS E9	92-98 mm					
Firestop top track seal CFS-TTS ES	≥ 92 mm single stud walls or double stud walls with total track width ≥ 92 mm					
Firestop top track seal CFS-TTS E6	64-65 mm	20 mm		Hilti CP606 ,10 mm deep on both sides. Cavity backfilled with mineral rockwool insulation (density 100 kg/m <sup>3</sup> )	96 mm (1 × 16 mm) or 116 mm (2 × 13 mm) plasterboard wall	-/60/60
Firestop top track seal CFS-TTS E7	71-77 mm					-/90/90
Firestop top track seal CFS-TTS E9	92-98 mm					-/90/90
Firestop top track seal CFS-TTS ES	≥ 92 mm single stud walls or double stud walls with total track width ≥ 92 mm					-/90/90
<p>*This table is applicable if the wall is perpendicular to the metal decking. If the wall is parallel to the decking, listed FRLs are applicable without the necessity of “Metal deck profile sealing”. The width between the decking (indicated as C in Figure 7) must be higher than the thickness of the wall. The wall must be installed in between the decking profile (within C section) and the head track and the TTS must not be exposed to the metal decking profile cavity.</p>						

**Table 15 Hilti TTS protecting uneven overhead horizontal surfaces**

Hilti TTS top track seal	Track size	Maximum allowable overhead gap	Sealing system	Separating element (minimum thickness)	FRL
Firestop top track seal CFS-TTS E6	64-65 mm	30 mm	Hilti CP606 25 mm deep. The cavity backfilled with mineral rockwool insulation (density 100 kg/m <sup>3</sup> )	90 mm (1 × 13 mm) plasterboard wall or 103 mm (1 × 13 mm on one side, 2 × 13 mm on the other) plasterboard wall	-/60/60 (any CFS-TTS type)
Firestop top track seal CFS-TTS E7	71-77 mm			96 mm (1 × 16 mm) plasterboard wall	-/90/90 (any CFS-TTS type)
Firestop top track seal CFS-TTS E9	92-98 mm			116 mm (2 × 13 mm) plasterboard wall	-/120/120 (any CFS-TTS type)
Firestop top track seal CFS-TTS ES	≥ 92 mm single stud walls or double stud walls with total track width ≥ 92 mm				

**Table 16 Metal pipes passing through the Hilti CFS-TTS**

Service	Wall thickness	Aperture and annular gap	Sealant	Hilti CFS-TTS top track seal	Insulation	Separating element	FRL
Up to 40 mm steel pipe	Minimum 4 mm	Maximum aperture 64 mm. Annular gap must not exceed 12 mm.	CP 606 to seal the annular gap as illustrated Figure 9.	As listed in Table 12.	38 mm thick mineral insulation up to 300 mm on each side (minimum nominal density 100 kg/m <sup>3</sup> )	Min 90 mm (1 × 13 mm) plasterboard wall or 103 mm (1 × 13 mm on one side, 2 × 13 mm on the other) plasterboard wall	-/60/60
			CP 606 to seal the annular gap and application of 50 mm × 50 mm CP 606 in cone configuration around the service. The sealing details are illustrated in Figure 10			Min 96 mm (1 × 16 mm) plasterboard wall	-/90/90*
						Min 116 mm (2 × 13 mm) plasterboard wall	-/120/120*
Up to 20 mm copper pipe	Minimum 1.63 mm	Maximum aperture 48 mm. Annular gap must not exceed 14 mm.	CP 606 to seal the annular gap as illustrated Figure 9.	As listed in Table 12.	38 mm thick mineral insulation up to 300 mm on each side (min density 100 kg/m <sup>3</sup> )	Min 90 mm (1 × 13 mm) plasterboard wall or 103 mm (1 × 13 mm on one side, 2 × 13 mm on the other) plasterboard wall	-/60/60
			CP 606 to seal the annular gap and application of 50 mm × 50 mm CP 606 in cone configuration around the service. The sealing details are illustrated in Figure 10.			Min 96 mm (1 × 16 mm) plasterboard wall	-/90/90*
						Min 116 mm (2 × 13 mm) plasterboard wall	-/120/90*

\*Sealant coning is only required when 90 minutes and 120 minutes of insulation performance is required.

**Table 17 Plastic pipes passing through the Hilti CFS-TTS**

Service*	Wall thickness	Aperture and annular gap	Sealant	Hilti CFS-TTS top track seal	Separating element	FRL
16 mm Pex-a	Maximum 2.3 mm	Maximum aperture 38 mm. Maximum annular gap must not exceed 9 mm.	CP 611a to seal the annular gap as illustrated Figure 11.	As listed in Table 12.	Min 90 mm (1 × 13 mm) plasterboard wall or 103 mm (1 × 13 mm on one side, 2 × 13 mm on the other) plasterboard wall	-/60/60
20 mm Pex-a						
16 mm Pex-b						
20 mm Pex-b						
16 mm Pex-a/Al/Pex-a	Maximum 2.0 mm				Min 96 mm (1 × 16 mm) plasterboard wall	-/90/60
20 mm Pex-a/Al/Pex-a						
16 mm Pex-b/Al/Pex-b						
20 mm Pex-b/Al/Pex-b						
*Services can be optionally positioned 5 mm or 0 mm from the seal edge.						

**Table 18 Cable or cable bundle passing through the Hilti CFS-TTS**

Cables*	Configuration	Sealant	Aperture and annular gap	Cable details	Hilti CFS-TTS top track seal	Separating element	FRL	
Electrical and communication cables including but not limited to circular submains, flat TPS, RG6 Quad Shield coax cables, data cables (CAT 5, 6, 7, 8), fire rated cables*	Single cable or cable bundle	CP 611a as illustrated in Figure 12.	Maximum Aperture 38 mm. Maximum annular gap must not exceed 14 mm.	1.5 mm fire rated cable, 3 × CAT6 and 3 × RG6 cable bundle, 4 × 2.5 mm TPS cable bundle, 3 × 2.5 mm fire rated cable bundle or any other cable or cable bundle with maximum 30 mm <sup>2</sup> conductor area (applicable to both single and multi-core cables)	As listed in Table 12.	Min 90 mm (1 × 13 mm) plasterboard wall or 103 mm (1 × 13 mm on one side, 2 × 13 mm on the other) plasterboard wall	-/60/60	
		CP 611a to seal the annular gap. Additionally, CP 611a in 50 mm × 50 mm cone configuration around the service. The sealing details are illustrated in Figure 13.				Min 96 mm (1 × 16 mm) plasterboard wall	-/90/90**	
		CP 606 as illustrated in Figure 12.	Maximum aperture 16 mm. Maximum annular gap must not exceed 3.5 mm.			3 × CAT6 cable bundle, 2 × 1.5 mm TPS cable bundle, 2 × RG6 cable bundle or any other cable or cable bundle with maximum 9 mm <sup>2</sup> conductor area (applicable to both single and multi-core cables)	Min 116 mm (2 × 13 mm) plasterboard wall	-/120/90**
		CP 606 as illustrated in Figure 12.					Min 90 mm (1 × 13 mm) plasterboard wall or 103 mm (1 × 13 mm on one side, 2 × 13 mm on the other) plasterboard wall	-/60/60
							Min 96 mm (1 × 16 mm) plasterboard wall	-/90/90
							Min 116 mm (2 × 13 mm) plasterboard wall	-/120/120

\*The cables could consist of copper conductors sheathed with PVC (if any) and insulated with either PVC or XLPE. The cable or cable bundle will be optionally positioned 0 mm from the seal edge.

\*\*Sealant coning is only required when 90 minutes and 120 minutes of insulation performance is required.



**Table 19 Conduits passing through the TTS**

Services	Aperture and annular gap	Conduit type	Cables*	Sealant	Hilti CFS-TTS top track seal	Separating element	FRL
16 mm or 25 mm uPVC conduit	Maximum aperture 38 mm. Annular gap must not exceed 6.5 mm.	Flexible or rigid	With or without cables. Cables could be 3 × CAT6 and 3 × RG6 cable bundle or any other cable or cable bundle with maximum conductor area of 2.4 mm <sup>2</sup> (applicable to both single and multi-core cables).	CP 611a to seal the annular gap as illustrated in Figure 14.	As listed in Table 12.	Min 90 mm (1 × 13 mm) plasterboard wall or 103 mm (1 × 13 mm on one side, 2 × 13 mm on the other) plasterboard wall	-/60/60
				CP 611a to seal the annular gap. Additionally, CP 611a in 50 mm × 50 mm cone configuration around the service. The sealing details are illustrated in Figure 15.		Min 96 mm (1 × 16 mm) plasterboard wall	-/90/90**
				Min 116 mm (2 × 13 mm) plasterboard wall		-/120/120**	
<p>*The cables could be but not limited to circular submains, flat TPS, RG6 Quad Shield coax cables, data cables (CAT 5, 6, 7, 8), fire rated cables. The cables could consist of copper conductors sheathed with PVC (if any) and insulated with either PVC or XLPE.</p> <p>**Sealant coning is only required when 90 minutes and 120 minutes of insulation performance is required.</p>							

## 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 likely 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 the Hilti Australia Pty Ltd for its own purposes and we cannot express an opinion on whether it will be accepted by building certifiers or any other third parties for any purpose.