

FIRE ASSESSMENT REPORT

FC12925-001 ISSUE 7

FIRE RESISTANCE OF BOSS FIRE® TRANSIT BOX PENETRATION SYSTEMS

CLIENT
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ASSESSMENT OBJECTIVE

To assess the fire resistance of the BOSS Fire® Transit Box and penetrations in accordance with AS 1530.4:2014 and AS 4072.1-2005 as appropriate, with reference to AS 4072.1-2005.

The assessment is to consider the following:

1. Range of penetration services with or without wrap.
2. Allow a variation in BOSS Fire® Transit Box size.
3. Installation in the following elements with established FRL/FRR:
4. Steel or timber framed plasterboard lined walls, or
5. Blank infill panel of BOSS Batts, or
6. other walls such as AFS, Barrierline, Dincel, Hebel, IntRwall, Korok, Pronto Panel, Shaftliner/Shaftwall, Speedpanel, Supapanel, Partiwall/Party Wall, INEX wall systems, AlphaPanel systems, concrete walls, solid or hollow masonry/block walls, AAC walls, or
7. Concrete floors at least 70 mm thick with P40 Mak-Wrap above the slab, or
8. Concrete floors at least 110 mm thick, or
9. Fire rated ceiling and ceiling/floors.

CONCLUSION

It is considered that the penetrations listed in the table below, included in the BOSS Fire® Transit Box specimens tested in Exova Warringtonfire fire resistance tests EWFA No. 45917000.1, FRT 180473 and CSIRO test FSP 2091 mounted in steel or timber framed plasterboard lined walls, blank infill panel of BOSS Batts, AAC, normal weight concrete, solid or hollow masonry walls or other walls such as AFS, Barrierline, Dincel, Hebel, IntRwall, Korok, Pronto Panel, Shaftliner/Shaftwall, Speedpanel, Supapanel, Partiwall/Party Wall, INEX wall systems, AlphaPanel systems, or concrete floors at least 70 mm thick and fire rated ceiling or ceiling/floors as tested in FRT 180474, would achieve an FRL, in accordance with AS 1530.4:2014, with reference to AS 4072.1-2005, or the lesser of that stated in the following table or the FRL of the wall, ceiling or floor/ceiling. All floor/ceiling installations must include MAK Wrap P40 insulation on the unexposed face. The table identifies the applicability of systems to walls or floors as appropriate. All floor systems include P40-MAK Wrap.

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FRL of BOSS Fire® Transit Box penetrations

Penetration	FRL With P40-MAK	FRL No Wrap
Blank Seals		
BOSS Fire® Transit Box 150 mm x 150 mm maximum (or <22,500 mm² opening size) in minimum 100 mm thick walls.	-/120/120	-/120/120
BOSS Fire® Transit Box in minimum 100 mm thick walls filled with BOSS Batt, FR Foam Block or BOSS FirePillows-240.	-/120/120	-/120/120
BOSS Fire® Transit Box in concrete floor slabs minimum 70 mm thick filled with BOSS Batt, FR Foam Block or BOSS FirePillows-240. Wrap above slab only	-/120/120	N/A
BOSS Fire® Transit Box in concrete floor slabs minimum 110 mm thick filled with BOSS Batt, FR Foam Block or BOSS FirePillows-240.	-/120/120	-/120/120
BOSS Fire® Transit Box without services in ceiling or ceiling floor systems filled with BOSS Batt, FR Foam Block or BOSS FirePillows-240.	-/120/120	-/120/120
Metal Pipes		
Paircoil up to 13/19 mm insulated copper pipes	-/120/120	-/120/90
Copper Pipe up to 25 mm OD with minimum 13 mm thick non-combustible lagging to AS1530.1 or Armaflex FRV, K-Flex lagging or Thermobreak lagging or similar elastomeric foam rubber such as nitrile, Neoprene, or cross-linked polyolefin with density from 25 kg/m³ to 75 kg/m³ and complying with AS 1530.3, SFI=0 and SDI≤5.	-/120/120	-/120/60
Copper Pipe up to 32 mm OD with minimum 19 mm thick continuous Armaflex FRV, K-Flex lagging or Thermobreak lagging Armaflex FRV, K-Flex lagging or Thermobreak lagging or similar elastomeric foam rubber such as nitrile, Neoprene, or cross-linked polyolefin with density from 25 kg/m³ to 75 kg/m³ and complying with AS 1530.3, SFI=0 and SDI≤5..	-/120/120	-/120/120
Copper Pipe up to 50.8 mm OD with minimum 25 mm thick FR lagging	-/120/120	-/120/60
Copper Pipe up to 50.8 mm OD uninsulated	-/120/120	-/120/-
Steel Sprinkler Pipe up to 60.3 mm OD	-/120/120	-/120/120
Plastic Pipes walls		
PEX & PEX-AL-PEX Pipes up to 25 mm OD with or without lagging	-/120/120	-/120/90
uPVC Pipe & Conduit up to 55.8 mm OD	-/120/120	-/120/120
cPVC Pipe up to 60.3 mm OD	-/120/120	-/120/120
PE-RT Pipe or PE-RT Kelox pipe up to 32 mm OD with or without lagging	-/120/120	-/120/-
Plastic Pipes concrete floor slab		
uPVC Pipe & Conduit up to 25 mm OD	-/120/120	N/A
Plastic Pipes floor/ceiling		
uPVC Pipe & Conduit up to 25 mm OD	-/90/90	N/A
Electrical Cables		
Appendix D1 Power Cables (except 630 mm²)	-/120/120	-/120/60
Multi Core Power Cables: Individual conductor size up to 16 mm². Total Maximum cross sectional area not greater than 48 mm² per cable.	-/120/120	-/120/90
Appendix D2 Data / Comms Cables also including: CAT5, CAT5E, CAT6, CAT7, COAX, MATV, SMATV, CATV, Fig 8, Fire Alarm, EWIS, LAN, Security, NBN, Fibre Optic & Speaker cables.	-/120/120	-/120/90
Cables with Aluminium core 185 mm² or less	-/120/120	-/120/30

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It is considered that:

1. The FRL given above is the maximum and will be subject to the FRL of the wall, floor or ceiling/floor in which the BOSS Fire® Transit Box is installed. The FRL will be the lesser of the building element or the FRL as given above.
2. The wall thickness must be at least 100 mm and the BOSS Fire® Transit Box sealed with at least 15 mm x 15 mm fillet of BOSS FireMastic-300. Where the wall thickness is less than 100 mm it may be increased by locally applied lining such as fire rated plasterboard, Boss Batts, P40 Mak wrap or FireMastic-300 or any fire rated sealant approved in accordance with AS 1530.4:2014 for use against a metal element.
3. In all cases the P40-MAK Wrap is 300 mm wide**.**
4. The BOSS Fire® Transit Box, without any wrap, must be filled with service penetrations as follows:
    a. For 150x150mm fire box (or 22,500mm² open face) or smaller – no minimum fill requirement
    b. For greater than 150x150mm (or >22,500mm²) larger boxes, minimum 14% fill requirement.
5. The BOSS Fire® Transit Box may be reduced in height and/or increased in width up to a maximum of 900 mm provided that the box includes a dual or single BOSS Intumescent Sash Inlay around the full internal perimeter together with two pairs of 9 mm deep BOSS FR BRUSH SEAL nylon brush smoke barrier at the top and bottom of the box for the full height and full width. For widths greater than 450 mm additional fixings at 200 mm centres or a minimum 20 mm x 20 mm flanged bracket is used around the perimeter to hold the BOSS Fire® Transit Box in place on one side of the wall, floor or ceiling. If using a bracket fixing method for under soffit applications, the flanged bracket shell be required on three sides only.
6. Where the Fire Transit Box is to be installed in a wall, the box manufacturer may supply a box with a reduced depth of minimum 100mm, as 100 mm is the minimum box depth that had been tested and considered in this report. When a thermal wrap is required, as specified in this report, the wrap over the penetrations must be maintained at a minimum of 270mm.
7. The BOSS Fire® Transit Box can be installed into a fire rated element of a single 50 mm BOSS Batt for 60 minutes (with and addition patch of 50 mm BOSS Batt extending 100 mm around the BOSS Fire® Transit Box), or a double layer of 50 mm BOSS Batts for 90 minutes or 120 minutes.
8. On steel or timber framed lined walls, the fire resistance of the BOSS Fire® Transit Box and penetrations is conditional upon established framing requirements of the plasterboard wall system, including the position of studs and noggins within the wall system. Notwithstanding that, the BOSS Fire® Transit Box must be located no more than 35mm from the nearest stud and no more than 120mm from the nearest noggin. For mid-wall mounting applications, the BOSS Fire® Transit Box may be affixed to a noggin from below, or alternatively be positioned to the top of a noggin.

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9. The maximum perimeter gap between the BOSS Fire® Transit Box and the wall lining is up to 20 mm. The gap is to be filled with BOSS FireMastic-300 sealant or any of the fire rated sealants listed below and approved in accordance with AS1530.4:2014 for use against a metal element, to the full depth of the plasterboard lining. Sealants which are applicable are:

    - Knauf Bindex Fire Sealant
    - CSR Fire Seal
    - Hilti CP606
    - HB Fuller Firesound
    - Sika Flex-400 fire sealant

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LIMITATION

This report is subject to the accuracy and completeness of the information supplied. BRANZ reserves the right to amend or withdraw this assessment if information becomes available which indicates the stated fire performance may not be achieved. This assessment report may only be quoted or reproduced in full.

TERMS AND CONDITIONS

This report is issued in accordance with the Terms and Conditions as detailed and agreed in the BRANZ Services Agreement for this work.

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DOCUMENT REVISION STATUS

ISSUE NO.	DATE ISSUED	REVIEW DATE	DESCRIPTION
1	7 July 2020		Initial Issue
2	17 July 2020		Clarification of specification for power cables.
3	23 December 2020		Changes to blank BOSS Fire® Transit Boxes systems. Specification of minimum wall thickness and fill of the BOSS Fire® Transit Boxes.
4	22 April 2021		Modifications to Figure titles and inclusion of INEX wall systems.
5	16 July 2021		Additional details for drawings. Revision of drawings. Clarification of plastic pipes FRL Changes to the list of penetration systems
6	19 July 2021	19 July 2031	Correction of typo. Add reference to AS 4072.1-2005 Include 10 year review date.
7	22 March 2022	22 March 2032	Clarification of plastic pipes in floors, percentage fill of BOSS Fire® Transit Boxes, elastomeric lagging. Addition of empty 150 mm x 150 mm BOSS Fire® Transit Boxes and AlphaPanel systems.

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1. INTRODUCTION

This report gives BRANZ's assessment of the fire resistance of the BOSS Fire® Transit Box and penetrations in accordance with AS 1530.4:2014 and AS 4072.1-2005 as appropriate, with reference to AS 4072.1-2005.

The assessment is to consider the following:

1. Range of penetration services with or without wrap.
2. Allow a variation in BOSS Fire® Transit Box size.
3. Installation in the following elements with established FRL/FRR:
4. Steel or timber framed plasterboard lined walls, or
5. Blank infill panel of BOSS Batts, or
6. other walls such as AFS, Barrierline, Dincel, Hebel, IntRwall, Korok, Pronto Panel, Shaftliner/Shaftwall, Speedpanel, Supapanel, Partiwall/Party Wall, INEX wall systems, AlphaPanel systems, concrete walls, solid or hollow masonry/block walls, AAC, or
7. Concrete floors at least 70 mm thick with P40 Mak-Wrap above the slab, or
8. Concrete floors at least 110 mm thick, or
9. Fire rated ceiling and ceiling/floors.

Figure 1 to Figure 31 show construction details for the BOSS Fire® Transit Box systems in various applications. Where there is a conflict between the text and figures, the text shall take precedence.

2. BACKGROUND

2.1 Exova Warringtonfire fire resistance test EWFA No. 45917000

In Exova Warringtonfire fire resistance test EWFA No. 45917000 the specimen was a 1,200 mm high x 945 mm wide x 124 mm thick CSR Gyprock wall comprising one layer of 16 mm Fyrchek each side of 92 mm deep Rondo Quiet Studs penetrated by service bundles comprising various pipes and cables. The cavity of the wall system was filled with Pink Partition 24 R2.5 insulation wool. The wall system was penetrated in three locations by various pipes and cables which were protected with two BOSS Fire® Transit Box-300 and a BOSS Fire® Transit Box-150. The various pipes and cables and their protection systems were tested in accordance with AS 1530.4:2014 for a duration of 121 minutes. All penetrations achieved an FRL of -/120/120.

2.1.1 Specimen A, BOSS Fire® Transit Box-150

The BOSS Fire® Transit Box-150 consisted of a rectangular steel box 150 mm wide x 270 mm deep x 150 mm high x 1.0 mm thick and enclosed eight 150 mm long HPE Sachet (BOSS FireMastic-HPE). Two HPE Sachets were installed on each of the top and bottom cover and two each on the left and right wall. Four 145 mm wide x 109 mm high x 9 mm deep BOSS FR BRUSH SEAL nylon brush smoke barrier were provided at the openings (two of the brush on the top cover and the other two located on the bottom cover). A 25 mm x 25 mm fillet of FireMastic-300 was provided around the BOSS Fire® Transit Box at the interface between the wall and the Fire® Transit Box and in the gap between the BOSS Fire® Transit Box and the wall aperture. Beyond the fillet the BOSS Fire® Transit Box was exposed without any cladding.

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The pipe and cable penetrations beyond the BOSS Fire® Transit Box were wrapped with a 300 mm wide x 38 mm thick lagging of BOSS P40 MAK-Wrap which consisted of an aluminium foil on the outer layer and low density mineral fibre on the inner layer.

2.1.2 Specimen B, BOSS Fire® Transit Box-300

The BOSS Fire® Transit Box-300 consisted of a rectangular steel box 300 mm wide x 270 mm deep x 150 mm high x 1.0 mm thick and enclosed four 300 mm long x 85 mm wide HPE Sachet (BOSS FireMastic-HPE), two on the top cover and the other two on the bottom cover. Four 150 mm long HPE Sachet were installed two on each side of the BOSS Fire® Transit Box (left and right wall). Four 296 mm wide x 109 mm high x 9 mm deep BOSS FR BRUSH SEAL nylon brush smoke barrier were provided at the openings (two of the brushes on the top cover and the other two located on the bottom cover). A service support trapeze comprising two 6 mm diameter x 128 mm long screws and a 10 mm diameter x 280 mm long metal bar was provided at the mid depth of the BOSS Fire® Transit Box. The BOSS Fire® Transit Box was fixed to the concrete lintel with two masonry anchors before the plasterboard was installed. FireMastic-300 was provided around the perimeter and down the centre on the interface between the BOSS Fire® Transit Box-300 top cover and concrete lintel and in the gap between the BOSS Fire® Transit Box and the wall aperture.

Mineral wool insulation consisting of 400 mm x 200 mm x 50 mm thick BOSS Bulkhead Batt (high density mineral fibre, stated density 160 kg/m^3) was placed on the plasterboard wall lining around the BOSS Fire® Transit Box on the side and along the bottom on both exposed and unexposed faces of the wall. The batts were screw fixed to the wall system. BOSS P40 MAK-Wrap was wrapped around the whole penetration service twice. The BOSS P40 MAK-Wrap extended 290 mm from the Bulkhead Batt on both sides of the wall and was secured with cable ties. Aluminium tape was used to cover exposed mineral fibres at the open end of the wrap.

2.1.3 Specimen C, BOSS Fire® Transit Box-300

The BOSS Fire® Transit Box-300 consisted of a rectangular steel box 300 mm wide x 270 mm deep x 150 mm high x 1.0 mm thick and enclosed four 300 mm long x 85 mm wide HPE Sachet (BOSS FireMastic-HPE), two on the top cover and the other two on the bottom cover. Four 150 mm long HPE Sachet HPE Sachet were installed two on each side of the BOSS Fire® Transit Box (left and right wall). Four 296 mm wide x 109 mm high x 9 mm deep BOSS FR BRUSH SEAL nylon brush smoke barrier were provided at the openings (two of the brushes on the top cover and the other two located on the bottom cover). Carinya 20 mm x 20 mm x 1 mm angle was cut and bent and installed around the BOSS Fire® Transit Box-300 on both sides of the wall, screwed to the wall to secure the BOSS Transit Box in position. FireMastic-300 was applied in the gap between the BOSS Transit Box and the wall aperture.

BOSS P40 MAK-Wrap was wrapped around the whole penetration system, including the BOSS Fire® Transit Box protruding past the wall, with a ninety degree overlap. The BOSS P40 MAK-Wrap extended 300 mm from the wall on both sides of the wall and was secured with cable ties. Aluminium tape was used to cover exposed mineral fibres at the open end of the wrap.

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The BOSS Fire® Transit Box specimens tested in fire resistance test EWFA No. 45917000 contained the following penetrating services:

- Two 20 mm PEX pipes
- 20 mm PEX/AL/PEX pipe
- Paircoil 10/15 mm insulated copper pipe
- Prysmian L electrical cable 2Core + E 2.5 mm^2 Cu.
- Prysmian L electrical cable 2Core 2.5 mm^2 Cu.
- Garland data cable LSZH CAT5E
- Jonsa coax cable CRG6UBQ 75 ohm
- Garland Work Series 6C security cable
- 32 mm NB medium galvanised pipe
- DN25 Type B copper pipe
- 20 mm uPVC conduit
- WW electric cable 2Core + E 10 mm^2 Cu
- Firesense cable IPSLD 0.75-2C Fire Alarm System-Light-Duty
- Grove communications data cable E225668 CAT6

The three penetration systems achieved an FRL of -/120/120.

2.2 CSIRO fire resistance test FSP 2091

In CSIRO fire resistance test FSP 2091 the specimens tested comprised two BOSS Fire® Transit Boxes, nominally 300 mm wide x 150 mm high x 270 mm deep without wrap, containing a number of services penetrating through and installed in a steel framed plasterboard lined wall comprising a single layer of 13 mm thick fire rated plasterboard each face of the frame for a nominal thickness of 118 mm. One box was soffit mounted and the other was mounted mid wall of the 1,000 mm x 1,000 mm wall. The 10 mm annular gap between the fire box and the surrounding plasterboard was filled with BOSS FireMastic-300 to a depth of 13 mm. A 15 mm x 15 mm fillet of BOSS FireMastic-300 was applied to the surrounding sides of the fire box on both faces of the plasterboard wall. Each transit box included a number of pipe and cable penetrations including:

- 16 mm^2 2C & E power cable with 18.1 mm OD
- 16mm x PEX pipe with 12.5mm thick pipe lagging
- 20mm PEX and PEX-AL pipes
- 25mm x PEX-AL pipe
- 40mm Steel Sprinkler Pipe
- RG6 MATV and CAT5 data cables
- 2.5mm twin FR cable
- 20mm NBN conduit with NBN cables inside
- Pair of 32mm OD copper pipes with 25mm thick lagging
- 38mm dia. copper pipe with 25mm thick lagging

The specimens were tested in accordance with AS 1530.4:2014 for a duration of 91 minutes and achieved Integrity and Insulation of 91 minutes without failure.

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2.3 Warringtonfire fire resistance test No. FRT 180137

In Warringtonfire fire resistance test FRT 180137 the specimen was a 1,830 mm long x 1,590 mm wide x 70 mm to 130 mm thick composite floor system penetrated by service penetrations. In particular Specimen E was a BOSS Fire® Transit Box 150 mm square x 270 mm deep enclosing a nominal 32 mm diameter copper pipe, a 32 mm diameter galvanized pipe, an air conditioning pair coil, a 25 mm uPVC pipe, a bundle of nine 3-core x 2.5 mm^2 power cables, a bundle of 15 CAT6 data cables and a bundle of 15 Fire Sense cables. On the unexposed side only, the services were wrapped in 300 mm long x 40 mm thick BOSS P40-MAK wrap. BOSS FireMastic-300 was used to seal between the BOSS Fire® Transit Box and the floor slab.

The various pipes and cables and their protection systems were tested in accordance with AS 1530.4:2014 for a duration of 121 minutes. The BOSS Fire® Transit Box and service penetrations described above achieved an overall fire resistance of 121 minutes Integrity and 85 minutes Insulation.

2.4 Warringtonfire fire resistance test No. FRT 180473

In Warringtonfire fire resistance test No. FRT 180473 the specimen was a 1,600 mm high x 1,600 mm wide x 75 mm thick Hebel Power Panel wall penetrated in a number of locations by various pipes and cables. In particular Specimen B was a BOSS Fire® Transit Box consisting of a rectangular steel box 300 mm wide x 131 mm deep x 80 mm high and enclosing four intumescent bags installed on each of the top and bottom cover and sides. The BOSS Fire Box was inserted into the aperture and secured to the separating element with 20 mm x 20 mm angles on the exposed side. A 25 mm x 25 mm fillet of FireMastic-300 was provided around the BOSS Fire® Transit Box at the interface between the wall and the BOSS Fire® Transit Box and in the annular gap between the BOSS Fire® Transit Box and the wall aperture. Beyond the fillet the BOSS Fire® Transit Box was exposed without any wrap.

Included in the various penetrations through the BOSS Fire® Transit Box was a 50NB (60.3 mm outside diameter) galvanised steel sprinkler pipe, a nominal 32 mm diameter copper pipe lagged with 19 mm thick Armaflex FRV lagging, a power cable with 70 mm^2 aluminium conductor and a power cable with a 185 mm^2 aluminium conductor. The pipes were closed on the fire exposed ends. The penetrating services were not wrapped.

The various pipes and cables and their protection systems were tested in accordance with AS 1530.4:2014 for a duration of 121 minutes. The BOSS Fire® Transit Box and service penetrations described above achieved a fire resistance as listed in the following Table 1.

Table 1: Results for fire resistance test FRT 180473

Penetration	Fire resistance	FRL
BOSS Fire® Transit Box	-/121/56	-/120/30
50NB (60.3 mm outside dia.) galvanised pipe	-/121/121	-/120/120
32 mm dia. lagged copper pipe	-/121/121	-/120/120
Cable 70 mm^2 aluminium conductor	-/121/33	-/120/30
Cable 185 mm^2 aluminium conductor	-/121/33	-/120/30

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2.5 Warringtonfire fire resistance test report No. 180474, Revision R3.0

In Warringtonfire fire resistance test No. FRT 180474 the specimen was a 235 mm thick ceiling system penetrated by a variety of ten penetration systems. In particular Specimen F consisted of a range of cables and pipes passing through a BOSS Fire® Transit Box BFB 150 sealed into the ceiling with BOSS FireMastic-300. The ceiling consisted of 190 timber framing with two layers of 13 mm fire rated plasterboard screw fixed directly to the timber framing on the underside (exposed face) and 19 mm thick particle board flooring to the upper side (unexposed face). The fire transit box was installed in a 170 mm x 170 mm aperture in the floor/ceiling and BOSS FireMastic was applied between the box and the plasterboard on both sides. On the exposed side the mastic was finished with a 15 mm x 25 mm fillet and finished flush with the surface on the unexposed side. On the unexposed side BOSS P40-MAK was wrapped around the fire transit box and penetration services and extended to nominal 300 mm. The specimen included the following penetrations services:

- 10 x TPS – 2.5 mm^2 2C & E power cables
- 10 x Cat 6 cables
- 1 x Kembla Pair coil FR - 9/15 mm
- 2 x Ardent Pair coils - 13/19 mm
- 1 x DN 25 copper pipe 25.4 mm OD with 9.4 mm thick K-FLEX insulation
- 1 x 25 mm uPVC electrical conduit

The specimen was tested in accordance with AS 1530.4:2014 for a duration of 91 minutes and achieved Integrity of 91 minutes without failure and Insulation of 75 minutes, i.e. an FRL of -/90/60. The power cables failed the insulation criteria after 75 minutes while none of the other penetrations failed insulation for the 91 minutes duration of the test.

2.6 Warringtonfire fire resistance test No. FRT190309

In Warringtonfire fire resistance test No. FRT 190309 a 118 mm thick fire resistant plasterboard wall was penetrated by three BOSS Fire® Transit Boxes enclosing various pipes and cables. The specimens were tested in accordance with AS 1530.4:2014 for a duration of 121 minutes. Specimen C transit contained a range of pipes and achieved a fire resistance as listed in the following Table 2.

Table 2: Fire resistance of Specimen C pipes from test FRT190309

Penetration	Fire resistance	FRL
BOSS Fire® Transit Box BFB-300 320 mm x 170 mm	-/121/79	-/120/60
50 mm dia. cPVC pipe	-/121/121	-/120/120
50 mm dia. uPVC pipe	-/121/121	-/120/120
32 mm PE-RT Kelox pipe with 13 mm lagging	-/121/23	-/120/0
25 mm dia. PE-RT Kelox pipe	-/121/5	-/120/0
16 mm dia. PE-RT Kelox pipe	-/121/ns	-/120/0

ns = not stated

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2.7 Exova Warringtonfire fire resistance test No. WF 385573/C

In Exova Warringtonfire fire resistance test No. WF 385573/C a wall comprising two layers of 12.5 mm fire rated gypsum plasterboard each side of 50 mm deep steel studs with mineral wool insulation in the cavity, penetrated by a 100 mm deep Pass-It Transit System (equivalent to BOSS Fire® Transit Box) enclosing various cables, was tested in accordance with BS EN 1366-3:2009. The transit and cables achieved Integrity of 132 minutes without failure and Insulation of 85 minutes. This specimen contained a PVC insulated and sheathed four core 185 mm^2 copper cable. The wall thickness was 100 mm.

2.8 Warringtonfire Fire Assessment Report FAS190042

In Warringtonfire Fire Assessment Report FAS190042 it was considered that BOSS FirePillows in a masonry or concrete wall or floor protected without penetrations would achieve an FRL of up to -/180/180 in accordance with AS 1530.4:2014.

2.9 BRANZ Fire Assessment Report FAR 3921

In BRANZ fire assessment report it was considered that 50 mm thick and 100 mm thick BOSS Batts would achieve an FRL of at least -/60/60 and -/120/120 respectively.

2.10 CSIRO fire resistance test FSP 2191

In CSIRO fire resistance test FSP 2191 the specimen tested included one SikaSeal-631 Fire Box, nominally 150 mm wide x 150 mm high x 270 mm in a deep without wrap and no penetrations in a steel framed wall comprising 64 mm studs with two layers of fire rated plasterboard either side of the wall. The specimen achieved an FRL of -/120/120 in accordance with AS 1530.4:2014.

2.11 Warringtonfire Regulatory Information Report FAS210067

In Warringtonfire Regulatory Information Report FAS210067 it was considered that various AlphaPanel systems would achieve an FRL of up to 90/90/90 and -/120/120 in accordance with AS 1530.4:2014, depending on the system configuration given in Table 3.

Table 3: AlphaPanel wall systems

Wall system	FRL
35 mm AlphaPanel + 13 mm standard plasterboard	-/60/60
35 mm AlphaPanel + 13 mm standard plasterboard on the unexposed side	-/120/90
35 mm AlphaPanel + 16 mm fire-rated plasterboard	-/90/90
35 mm AlphaPanel + 16 mm fire-rated plasterboard	60/60/60
35 mm AlphaPanel + 2 x 13 mm fire-rated plasterboards	90/90/90
35 mm AlphaPanel + 35 mm AlphaPanel	90/90/90
35 mm AlphaPanel + 35 mm AlphaPanel	-/120/120
35 mm AlphaPanel + 9 mm fibre cement sheet	-/60/60
50 mm AlphaPanel	-/120/90
50 mm AlphaPanel + 13 mm standard plasterboard	-/120/120

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2.12 Summary of tests

Table 4 gives a summary of the background test reports on the Fire Box.

Table 4: Summary of test data

Test Report No.	Element	Element thickness (mm)	Box size	FRL fillet (min)	Overall FRL	Fillet size	Rows of sachets
FRT 180474	*Floor/ceiling*	*235*	*BFB-150*	*No TC*	*-/90/60*	*Flush*	*2*
WF 385573c	*PB wall*	*100*	*300x100*	*120*	*-/120/85*	*Flush*	*1*
EWFA 45917000.1	*PB wall*	*124*	*BFB-150 A*	*120*	*-/120/120*	*25x25*	*2*
EWFA 45917000.1	*PB wall*	*175*	*BFB-300 B*	*No TC*	*-/120/120*	*Flush*	*2*
EWFA 45917000.1	*PB wall + batt*	*124*	*BFB-300 C*	*No TC*	*-/120/120*	*Flush*	*2*
FRT 180473.1	*Hebel wall + 2 Batts*	*175*	*300x80*	*56*	*-/120/30*	*25x25*	*1*
FRT 190309.2	*PB wall*	*118*	*BFB-300 C*	*120*	*-/120/0*	*25x25*	*2*
FRT 180137.2	*Concrete floor*	*70 -130*	*BFB-150*	*No TC*	*-/120/60*	*20x20*	*2*
FSP 2091	*PB wall*	*118*	*BFB-300 1*	*90*	*-/90/90*	*15x15*	*1*
FSP 2091	*PB wall*	*118*	*BFB-300 2*	*90*	*-/90/90*	*15x15*	*1*
FSP 2191	*PB wall*	*116*	*150 x 150*	*120*	*-/120/120*	*20x20*	*2*

3. DISCUSSION

3.1 Wall thickness

Where the BOSS Fire® Transit Box is installed in a wall, the wall must have a minimum thickness of 100 mm. In WF 385573C the wall thickness was 100 mm as shown in Table 4. This is the minimum thickness of wall to achieve an Insulation of 120 minutes and therefore applies to all installations.

If the wall is less than 100 mm thick it may be increased by locally applied lining such as fire rated plasterboard, Boss Batts, P40 MAK Wrap or FireMastic-300 or a fillet of FireMastic-300 in order to maintain a minimum thickness of 100mm at the interface of the BOSS Fire Transit Box penetrating the construction element.

The BOSS FireMastic-300 may be substituted with fire rated sealants which have been approved in accordance with AS 1530.4:2014 for use against a steel element, provided that the FRL achieved by the sealant does not reduce the intended FRL of the element. The sealants approved for substitution are listed below with their test references:

- Knauf Bindex Fire Sealant (Test Ref 28139-06 and EWFA2752800)
- CSR Fire Seal (test ref provided to Branz directly)
- Hilti CP606 (Test ref FRT180461bm FRT180049 and FSV0857)
- HB Fuller Firesound (Test Ref 48763900.1 and FSV1731)
- Sika Flex-400 fire sealant (Test Ref EWFA54503700.1, FSP1839 and FC11177-001.2)

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3.2 BOSS Fire® Transit Box with penetrations

In Exova Warringtonfire fire resistance test EWFA No. 45917000 the three BOSS Fire® Transit Boxes were tested with a number of penetrations as listed in Section 2.1 above and achieved Integrity and Insulation of 121 minutes without failure.

The two sizes of BOSS Fire® Transit Box tested had dimensions of 150 mm wide x 150 mm high and 300 mm wide x 150 mm high and both were 270 mm deep. These contained two pairs of 85 mm wide HPE Sash Inlay (BOSS FireMastic HPE) around the internal perimeter of each box together with two pairs of 109 mm high x 9 mm deep BOSS FR BRUSH SEAL nylon brush smoke barrier across the full width of the top and bottom of the box. As the integrity of the system is primarily dependent on the expansion of the intumescent seal around the perimeter of the boxes it is considered that the height of the boxes can be reduced without prejudice to the fire resistance as the intumescent seal will still fill any cavities around the penetrations.

Also, provided the HPE Sash Inlay is continuous around the full internal perimeter of the box it is considered that the width of the box can be increased up to a proposed maximum of 900 mm wide. For widths greater than 450 mm it is proposed that additional fixings at 200 mm centres or a 20 mm x 20 mm flanged bracket be provided around the perimeter of the box to hold the box in place on one side of the wall, floor or ceiling. If using a bracket fixing method for under soffit applications, the flanged bracket shall be required on three sides only. It is considered that this will not prejudice the Integrity of the boxes for at least 120 minutes.

3.3 Integrity and Insulation

In test EWFA No. 45917000 all the penetrations were wrapped with BOSS P40 MAK-Wrap for a distance of at least 290 mm from the wall. Therefore, the temperatures were measured on the wrap or on the penetrations beyond the wrap and did not fail insulation for at least 120 minutes. In test FRT 180473 Specimen B was not lagged and the BOSS Fire® Transit Box passing through a 75 mm thick Hebel wall failed insulation on the seal fillet at 56 minutes. It is therefore considered that the BOSS Fire® Transit Box without an insulating wrap would achieve Insulation of at least 30 minutes. The thermal conduction through the metal BOSS Fire® Transit Box, and hence Insulation, would be dependent on the length of the box within the thickness of the wall and would not be expected to be significantly affected by the width and height of the box.

In test EWFA No. 45917000 there was no reported indication of integrity failure of any of the penetrations at the unexposed end of the unlagged BOSS Fire® Transit Box of specimen A. It is therefore considered that the penetrations tested are unlikely to fail integrity if they were not enclosed in the wrap.

In test Warringtonfire FRT190309 there was no reported indication of integrity failure of any of the penetrations of specimen C. It is therefore considered that the penetrations tested are unlikely to fail integrity. The unlagged pipes achieved the Insulation as stated in Table 2. The unlagged transit box failed the insulation criteria at 79 minutes and thus would achieve an Insulation of at least 60 minutes. This is an increase over that achieved in test FRT180473 and is considered to be due to the greater length of the transit from the fire exposure due to the thicker wall.

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In Exova Warringtonfire fire resistance test No. WF 385573/C the specimen contained an unlagged PVC insulated and sheathed four core 185 mm^2 copper cable which did not fail Integrity for the 132 minutes duration of the test and achieved Insulation of 85 minutes. It is generally accepted that any electrical cables with similar sheath and conductor size equal or less than the tested cable will achieve at least the same fire resistance. It is therefore considered that any of the PVC or XLPE insulated and sheathed electrical cables in Appendix D1 of AS 1530.4:2014 of size 185 mm^2 core or less would achieve Integrity of at least 120 minutes and Insulation of at least 60 minutes. Because of the substantially smaller conductor size, communication cables as in Appendix D2 would also achieve Integrity of 120 minutes and Insulation of at least 90 minutes without lagging.

In test EWFA No. 45917000 the temperatures recorded on the insulated 10/15 mm pair coil copper pipes beyond the BOSS P40 MAK-Wrap lagging were less than the temperatures recorded on the electrical cables beyond the lagging. Based on the Insulation of electrical cables as discussed above it is considered that the insulated pair coil refrigeration copper pipes would also achieve at least 90 minutes Insulation without additional lagging. The recorded temperatures on the pair coils were also substantially less than the insulation failure criteria and hence it is considered that the larger 13/19 mm pair coil could also achieve Insulation of at least 90 minutes without lagging and 120 minutes with lagging.

Unlagged copper or steel pipes would not be expected to achieve any significant Insulation due to the heat conducting properties of the pipes. In test FRT 180473 the 50NB (60.3 mm outside diameter) galvanized steel pipe without lagging and the lagged 32 mm copper pipe achieved Integrity and Insulation of at least 120 minutes. Also, in this test the cables with aluminium cores with 70 mm and 185 mm^2 conductors achieved Integrity of 121 minutes and Insulation of 33 minutes. It is therefore considered that any of the PVC insulated and sheathed electrical cables with aluminium conductors of size 185 mm^2 core or less would also achieve Integrity of 120 minutes and Insulation of at least 30 minutes without lagging.

In test FRT 190309.2 the lagged 50 mm copper pipe achieved 120 minutes Integrity. The temperature on the cooper pipe exceeded the Insulation criteria after 2 minutes, which is considered to be caused by furnace gasses, therefore can be ignored. In comparing its performance with the lagged 32 mm copper pipe tested in FRT 180473, which achieved 120 minutes Integrity and Insulation, it is considered that the lagged 50 copper pipe, because of its greater diameter, would achieve 120 minutes Integrity and 60 minutes Insulation. Additional protection with 300 mm length of wrap. Where the 50 mm copper pipe is unlagged it is considered that the wrap would provide sufficient protection for the pipe to achieve 120 minutes Insulation to obtain an FRL of -/120/120. With no wrapping or lagging the FRL would be -/120/-.

Considering the Insulation performance of the thermally insulated pair-coils discussed above it is considered that if the 25 mm copper pipe is insulated with at least 13 mm thick non-combustible insulation approved to AS 1530.3 it would also achieve Insulation of at least 60 minutes without wrap.

3.4 Range of Penetrations

Specimens A, B and C in fire resistance test EWFA No. 45917000 and Specimen B in fire resistance test report FRT 180473 demonstrated that a large number and range of penetrations contained within the BOSS Fire® Transit Box individually achieved Integrity and

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Insulation of up to 120 minutes. It is therefore considered that any combination of these penetrations, and any number of these penetrations in the BOSS Fire® Transit Box without causing damage to the internal intumescent strips or brush seals, will achieve at least 120 minutes Integrity and 120 minutes Insulation with the BOSS P40 MAK-Wrap as tested and for electrical cables and insulated pair coil copper pipes will achieve at least 30 minutes or 60 minutes Insulation respectively without the wrap.

3.5 Alternative walls

In the fire resistance tests described in Section 2 above the BOSS Fire® Transit Box specimens with penetrations were mounted in a steel framed plasterboard lined wall. It is generally accepted that if mounted in a concrete or masonry wall of the same or greater fire resistance the BOSS Fire® Transit Box would be expected to achieve at least the same fire resistance. It is therefore considered that the BOSS Fire® Transit Box as tested in fire resistance test EWFA No. 45917000 would achieve at least the same fire resistance if mounted in AAC, Speedpanel, solid or hollow masonry or concrete walls or other walls of at least -/120/120 FRL. It is also considered that if the BOSS Fire® Transit Box is installed in a wall of at least FRL of -/60/60 or -/90/90 the BOSS Fire® Transit Box and penetrations will achieve a fire resistance of at least -/60/60 or -/90/90 respectively. It is also considered that other forms of wall such as AFS, Barrierline, Dincel, Hebel, IntRwall, Korok, Pronto Panel, Shaftliner/Shaftwall, Speedpanel, Supapanel, Partiwall/Party Wall, INEX wall systems and AlphaPanel systems, will be acceptable provided they have the equivalent FRL to match the required BOSS Fire® Transit Box and penetrations rating. The BOSS Fire® Transit Box may also be used for penetrations through a blank infill panel consisting of vertically mounted BOSS Batts where a single layer of 50 mm thick BOSS Batt provides an FRL of -/60/60 and two layers of 50 mm BOSS Batt provides an FRL of -/120/120.

3.6 Penetrations through concrete floor slabs

Warringtonfire fire resistance test FRT 180137 demonstrated that the BOSS Fire® Transit Box with a range of penetrating services mounted through a 70 mm thick concrete floor slab could achieve Integrity of at least 120 minutes with Insulation depending on the relevant services. It is therefore considered that the BOSS Fire® Transit Box can also be used to protect services penetrating a concrete floor of at least 70 mm thick for Integrity up to 120 minutes and at least 110 mm thick for Insulation up to 120 minutes. In FRT180137 Insulation failure was recorded at 85 minutes on the floor slab separating element. No Insulation failure was recorded on the BOSS Fire® Transit Box or services at 120 minutes. Therefore this applies to any concrete floor greater than 70 mm thick limited to the FRL of the service or the floor slab, whichever is the lesser.

The penetration services may include power cables, data and communication cables, copper and steel pipes as discussed in this report. For plastic pipes this assessment is limited to 25 mm uPVC conduit as included in Warringtonfire fire resistance test FRT 180137.

Provided there is no damage to the internal intumescent strips or brush seals, the penetrations may be in any combination, and in any number in BOSS Fire® Transit Boxes up to 900 mm wide.

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3.7 Penetrations through ceiling or floor/ceiling system

Warringtonfire fire resistance test FRT 180474 demonstrated that the BOSS Fire® Transit Box with a range of penetrating services mounted through a 235 mm thick timber framed ceiling/floor could achieve Integrity of at least 90 minutes with Insulation depending on the relevant services. The performance of the transit and the penetrations in this test was substantially similar to that of the transit and penetrations in the other fire resistance tests in walls and concrete floors as described in Section 2 above and was only limited by the FRL of the nominally 90 minute floor/ceiling system. It is therefore considered that the fire resistance of the BOSS Fire® Transit Box would not be prejudiced by installation in a floor or floor/ceiling system up to the FRL of that floor/ceiling with any service which had previously been tested in a floor/ceiling or wall as the test data from the wall was consistent with that obtained on the floor/ceiling system.

The penetration services may include power cables, data and communication cables, copper and steel pipes as discussed in this report. For plastic pipes this assessment is limited to 25 mm uPVC conduit as included in Warringtonfire fire resistance test FRT 180474.

Provided there is no damage to the internal intumescent strips or brush seals, the penetrations may be in any combination, and in any number in BOSS Fire® Transit Boxes up to 900 mm wide.

3.8 AlphaPanel Systems

In Warringtonfire Regulatory Information Report FAS210067 various AlphaPanel wall systems were considered to achieve an FRL as given in Table 3. These systems include single and double solid AlphaPanel walls and steel framed walls with plasterboard linings on one side.

Figure 32 and Figure 33 show the BOSS Fire® Transit Box installed in such walls. Where the wall thickness is less than 100 mm additional material has been added to increase the thickness to 100 mm as discussed in paragraph 3.1 above.

The FRL of the BOSS Fire® Transit Box is the lesser of that specified in this report or as given in Table 3.

4. ADDITIONAL ITEMS

4.1.1 Box size

The intumescent at the side walls in any BOSS Fire® Transit Box is the same for any width of box.

To correctly function the intumescent must close from top and bottom along its width. As the intumescent is installed along the full length and provided the box fill percent is no less than specified in 4.1.8 below, fixings to the element are as discussed in this document and the box includes a dual or single BOSS Intumescent Sash Inlay around the full internal perimeter together with two pairs of minimum 9 mm deep BOSS FR BRUSH SEAL nylon brush smoke barrier at the top and bottom of the box for full height and full width, the height of the BOSS Fire® Transit Box may be reduced in height and/or increased in width up to a maximum of 900 mm. Table 4 gives the number of rows of BOSS Intumescent Sash Inlay given in each

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test report referenced in Section 2 above. The results show that the FRL was not affected by the number of rows of BOSS Intumescent Sash Inlay.

4.1.2 Angle brackets

For widths up to 300 mm, alternative fixing method; steel angle brackets, minimum 40 x 40 mm, may be fixed to the external sides of the box, attaching to the soffit, aperture or noggin above or below the box.

4.1.3 Bracket Fix

In WF 190309, specimen B, was a BOSS Fire® Transit Box which was mounted to the soffit using two 40 mm x 40 mm x 0.8 mm angle brackets fitted outside the box. Fixings to the soffit were at nominally 340 mm centres. Therefore, for BOSS Fire® Transit Boxes up to 300 mm wide, external angles to the side of the box are considered suitable fixings.

4.1.4 BOSS Transit Boxes greater than 450 mm wide

For boxes with widths greater than 450 mm, additional fixings at 200 mm between centres are required for soffit or noggin mount, or a minimum 20 x 20 mm flanged bracket to be used around the perimeter to hold the BOSS Fire® Transit Box in place on one side of the wall, floor or ceiling. If using a bracket fixing method for under-soffit applications, the flanged bracket shall be required on three sides only.

The 20 x 20 mm flanged bracket used around the perimeter of the box, as described above, can also be used as an alternative fixing method for BOSS Fire Transit Boxes smaller than 450mm wide.

4.1.5 BOSS Fire® Transit Box depth

The depth of the BOSS Fire® Transit Box through the wall may be reduced to 100 mm or to the thickness of the wall, whichever is the greater. The box must not be recessed behind the wall lining. The BOSS Fire® Transit Box may be flush with the wall surface.

4.1.6 Installation in BOSS Batts

The BOSS Fire® Transit Box may be installed into a fire rated element of a single 50 mm BOSS Batt, with an additional build-up of 50 mm BOSS Batt, extending 100 mm around the BOSS Fire® Transit Box, for 60 minutes, or a double layer of 50 mm BOSS Batt for 90 and 120 minutes as detailed below. The additional layer(s) must be fixed with BOSS Pigtail screws or steel fixings with minimum 20 mm diameter washers. If the BOSS Fire® Transit Box is mounted to the underside of a soffit then the addition of a 50 mm BOSS Batt is only required to three sides.

60 min applications or less:

A BOSS Fire Transit Box may be installed into a construction element made up of a single 50 mm BOSS Batt for 60 minutes, provided that an additional Batt of 50 mm thick is applied locally to the point of penetration, so as to create a 100 mm perimeter around the box.

If the box is mounted to the underside of a soffit, then the addition of a 50 mm BOSS Batt is only required on 3 sides.

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For 90 min and 120 min applications:

A BOSS Fire Transit Box may be installed into a double layer of 50 mm thick BOSS Batt, thereby giving a 100 mm construction element, for applications requiring 90 min and 120 min ratings.

In all cases where 50mm BOSS Batts are installed together to form a double layer, the two layers must be fixed with BOSS Pigtail screws or steel fixings with minimum 20mm diameter washers.

4.1.7 Framed walls

On steel or timber framed plasterboard lined walls, the fire resistance of the BOSS Fire® Transit Box and penetrations is conditional upon the established framing requirements of the plasterboard wall system, including the position of studs and noggins within the wall system. Notwithstanding that, the BOSS Fire® Transit Box must be located no more than 35 mm from the nearest stud and a no more than 120 mm from the nearest noggin. For mid-wall mounting applications, the BOSS Fire® Transit Box may be affixed to a noggin from below, or alternatively be positioned on top of a noggin.

The maximum perimeter gap between the BOSS Fire® Transit Box and the wall lining is up to 20 mm. The gap is to be filled with BOSS FireMastic-300 sealant or any of the fire rated sealants listed below and approved in accordance with AS1530.4:2014 for use against a steel element, to the full depth of the plasterboard lining. Sealants which are applicable are:

- Knauf Bindex Fire Sealant
- CSR Fire Seal
- Hilti CP606
- HB Fuller Firesound
- Sika Flex-400 fire sealant

4.1.8 Box fill ratio

“Box fill ratio” refers to the area inside the box filled by service penetrations, relative to the total area inside the box, where larger empty spaces inside the box may limit fire integrity during initial exposure. The box fill ratio is based on various fire tests where the penetrations were installed with various fill ratios.

It is considered that once the services or the BOSS Fire® Transit Box are wrapped with thermal insulation wrap, the minimum CSA does not apply, as the thermal wrap nullifies any void that may exist.

However, for unwrapped services, it is considered that a minimum CSA or ‘Box Fill Ratio’ is necessary to maintain fire Integrity.

The lowest ratio of Cross Sectional Area (CSA) of services compared to the internal CSA of the opening of the BOSS Fire® Transit Box was zero, where an empty BFB-150 (150 x 150 mm, or 22,500 mm² open face) box was tested with no penetrating services and achieved FRL -/120/120.

The lowest CSA of services compared to the internal CSA of the opening of the BOSS Fire® Transit Box, where the services were unwrapped, was 14%.

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The lowest CSA of the services compared to the opening of the BOSS Fire® Transit Box, where the services were wrapped, was 12%.

The most critical period regarding the performance of the BOSS Fire® Transit Box is in the initial exposure period before the intumescent reacts, thereafter the percentage fill has no significance. As no Integrity failure was recorded in any BOSS Fire® Transit Box fire resistance tests referenced in Section 2 of this report, and the lowest fill ratio of unwrapped services in the BOSS Fire® Transit Box was 14%, the following are considered to apply to unwrapped BOSS Fire® Transit Boxes in order to maintain Integrity of at least 120 minutes.

- For 150 x150 mm fire box (or ≤22,500mm² open face) or smaller – no minimum fill requirement
- For greater than 150 x 150 mm (or >22,500mm²) larger boxes, minimum 14% fill requirement.

As an alternative to wrapping all services, any voids inside the Transit Box may be filled with BOSS Fire Pillows or BOSS Foam Blocks to fill any 'excess' space and seal against fire and smoke.

'Fill ratios' are calculated by adding up the total Cross Sectional Area, (CSA) of all services penetrating the box divided by the total CSA inside the box, expressed as a percentage.

4.1.9 Blank Boxes

Where the BOSS Fire® Transit Box is installed without service penetrations the box must be filled with a suitable fire rated material. Examples include:

- BOSS Fire Pillows. (achieved an FRL of -/180/180 as detailed in Section 2.8 of this report, and Test Reference FAS 190042);
- fire rated foam block as used in BOSS CT120 cable transit (In Fire Test Reference WF180473 the BOSS Foam Block achieved an FRL of -/120/120)
- BOSS Batts, 50 mm thick for an FRL of -/120/60 and 100 mm thick for an FRL of /120/120. Reference FAR 3921, as detailed in Section 2.9 of this report.a

4.1.10 Floor Mounting

For floor mounted applications, the BOSS Fire® Transit Box may be retrofitted to existing apertures or cast-in to the floor slab at the time of concrete pour.

4.1.11 Fillet sealant

In CSIRO fire resistance test FSP 2091 a 15 mm x 15 mm sealant was applied around the BOSS Fire® Transit Box. Temperatures measure on the fillet did not exceed the Insulation failure criteria for 120 minutes, therefore a 15 mm x 15 mm fillet is considered to be the minimum fillet size in order to maintain the FRL of the BOSS Fire® Transit Box.

4.1.12 Plastic Pipes

Section 2 of this report details various fire tests where plastic pipes were tested.

The maximum size of uPVC pipe tested was 55.8mm OD, achieving -/120/120 without a thermal wrap.

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The maximum size of CPVC pipe tested was 60.3mm OD achieving -/120/120 without a thermal wrap.

In CSIRO FSP 2091, 20 mm and 25 mm PEX and PEX-AL were tested, achieving -/90/90 without a thermal wrap. The maximum temperature rise reached in this test were 97°C and 79°C respectively.

In Exova Warringtonfire fire resistance test EWFA No. 45917000 two 20 mm PEX pipes and one 20 mm PEX/AL/PEX pipes achieved an FRL of -/120/120 with thermal wrap.

4.1.13 Trapeze

In some cases a trapeze may be included in the box. The trapeze is used where it is necessary to separate services such as hot and cold pipes, or power and communication cables. It has no function in maintaining the FRL of the box. Therefore the internal trapeze bar can be removed without detriment to the FRL of the transit box.

5. CONCLUSION

It is considered that the penetrations listed in the table below, included in the BOSS Fire® Transit Box specimens tested in Exova Warringtonfire fire resistance tests EWFA No. 45917000.1, FRT 180473 and CSIRO test FSP 2091 mounted in steel or timber framed plasterboard lined walls, blank infill panel of BOSS Batts, AAC, normal weight concrete, solid or hollow masonry walls or other walls such as AFS, Barrierline, Dincel, Hebel, IntRwall, Korok, Pronto Panel, Shaftliner/Shaftwall, Speedpanel, Supapanel, Partiwall/Party Wall, INEX wall systems, AlphaPanel systems, or concrete floors at least 70 mm thick and fire rated ceiling or ceiling/floors as tested in FRT 180474, would achieve an FRL, in accordance with AS 1530.4:2014, with reference to AS 4072.1-2005, or the lesser of that stated in the following table or the FRL of the wall, ceiling or floor/ceiling. All floor/ceiling installations must include MAK Wrap P40 insulation on the unexposed face. The table identifies the applicability of systems to walls or floors as appropriate. All floor systems include P40-MAK Wrap.

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FRL of BOSS Fire® Transit Box penetrations

Penetration	FRL With P40-MAK	FRL No Wrap
Blank Seals		
BOSS Fire® Transit Box 150 mm x 150 mm maximum (or ≤22,500 mm² opening size) in minimum 100 mm thick walls.	-/120/120	-/120/120
BOSS Fire® Transit Box in minimum 100 mm thick walls filled with BOSS Batt, FR Foam Block or BOSS FirePillows-240.	-/120/120	-/120/120
BOSS Fire® Transit Box in concrete floor slabs minimum 70 mm thick filled with BOSS Batt, FR Foam Block or BOSS FirePillows-240. Wrap above slab only	-/120/120	N/A
BOSS Fire® Transit Box in concrete floor slabs minimum 110 mm thick filled with BOSS Batt, FR Foam Block or BOSS FirePillows-240.	-/120/120	-/120/120
BOSS Fire® Transit Box without services in ceiling or ceiling floor systems filled with BOSS Batt, FR Foam Block or BOSS FirePillows-240.	-/120/120	-/120/120
Metal Pipes		
Paircoil up to 13/19 mm insulated copper pipes	-/120/120	-/120/90
Copper Pipe up to 25 mm OD with minimum 13 mm thick non-combustible lagging to AS1530.1 or Armaflex FRV, K-Flex lagging or Thermobreak lagging or similar elastomeric foam rubber such as nitrile, Neoprene, or cross-linked polyolefin with density from 25 kg/m³ to 75 kg/m³ and complying with AS 1530.3, SFI=0 and SDI≤5.	-/120/120	-/120/60
Copper Pipe up to 32 mm OD with minimum 19 mm thick continuous Armaflex FRV, K-Flex lagging or Thermobreak lagging Armaflex FRV, K-Flex lagging or Thermobreak lagging or similar elastomeric foam rubber such as nitrile, Neoprene, or cross-linked polyolefin with density from 25 kg/m³ to 75 kg/m³ and complying with AS 1530.3, SFI=0 and SDI≤5..	-/120/120	-/120/120
Copper Pipe up to 50.8 mm OD with minimum 25 mm thick FR lagging	-/120/120	-/120/60
Copper Pipe up to 50.8 mm OD uninsulated	-/120/120	-/120/-
Steel Sprinkler Pipe up to 60.3 mm OD	-/120/120	-/120/120
Plastic Pipes walls		
PEX & PEX-AL-PEX Pipes up to 25 mm OD with or without lagging	-/120/120	-/120/90
uPVC Pipe & Conduit up to 55.8 mm OD	-/120/120	-/120/120
cPVC Pipe up to 60.3 mm OD	-/120/120	-/120/120
PE-RT Pipe or PE-RT Kelox pipe up to 32 mm OD with or without lagging	-/120/120	-/120/-
Plastic Pipes concrete floor slab		
uPVC Pipe & Conduit up to 25 mm OD	-/120/120	N/A
Plastic Pipes floor/ceiling		
uPVC Pipe & Conduit up to 25 mm OD	-/90/90	N/A
Electrical Cables		
Appendix D1 Power Cables (except 630 mm²)	-/120/120	-/120/60
Multi Core Power Cables: Individual conductor size up to 16 mm². Total Maximum cross sectional area not greater than 48 mm² per cable.	-/120/120	-/120/90
Appendix D2 Data / Comms Cables also including: CAT5, CAT5E, CAT6, CAT7, COAX, MATV, SMATV, CATV, Fig 8, Fire Alarm, EWIS, LAN, Security, NBN, Fibre Optic & Speaker cables.	-/120/120	-/120/90
Cables with Aluminium core 185 mm² or less	-/120/120	-/120/30

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It is considered that:

1. The FRL given above is the maximum and will be subject to the FRL of the wall, floor or ceiling/floor in which the BOSS Fire® Transit Box is installed. The FRL will be the lesser of the building element or the FRL as given above.
2. The wall thickness must be at least 100 mm and the BOSS Fire® Transit Box sealed with at least 15 mm x 15 mm fillet of BOSS FireMastic-300. Where the wall thickness is less than 100 mm it may be increased by locally applied lining such as fire rated plasterboard, Boss Batts, P40 Mak wrap or FireMastic-300 or any fire rated sealant approved in accordance with AS 1530.4:2014 for use against a metal element.
3. In all cases the P40-MAK Wrap is 300 mm wide.
4. The BOSS Fire® Transit Box, without any wrap, must be filled with service penetrations as follows:
    a. For 150x150mm fire box (or ≤22,500mm² open face) or smaller – no minimum fill requirement
    b. For greater than 150x150mm (or >22,500mm²) larger boxes, minimum 14% fill requirement.
5. The BOSS Fire® Transit Box may be reduced in height and/or increased in width up to a maximum of 900 mm provided that the box includes a dual or single BOSS Intumescent Sash Inlay around the full internal perimeter together with two pairs of 9 mm deep BOSS FR BRUSH SEAL nylon brush smoke barrier at the top and bottom of the box for the full height and full width. For widths greater than 450 mm additional fixings at 200 mm centres or a minimum 20 mm x 20 mm flanged bracket is used around the perimeter to hold the BOSS Fire® Transit Box in place on one side of the wall, floor or ceiling. If using a bracket fixing method for under soffit applications, the flanged bracket shell be required on three sides only.
6. Where the Fire Transit Box is to be installed in a wall, the box manufacturer may supply a box with a reduced depth of minimum 100mm as 100 mm is the minimum box depth that had been tested and considered in this report. When a thermal wrap is required, as specified in this report, the wrap over the penetrations must be maintained at a minimum of 270mm.
7. The BOSS Fire® Transit Box can be installed into a fire rated element of a single 50 mm BOSS Batt for 60 minutes (with and addition patch of 50 mm BOSS Batt extending 100 mm around the BOSS Fire® Transit Box), or a double layer of 50 mm BOSS Batts for 90 minutes or 120 minutes.
8. On steel or timber framed lined walls, the fire resistance of the BOSS Fire® Transit Box and penetrations is conditional upon established framing requirements of the plasterboard wall system, including the position of studs and noggins within the wall system. Notwithstanding that, the BOSS Fire® Transit Box must be located no more than 35mm from the nearest stud and no more than 120mm from the nearest noggin. For mid-wall mounting applications, the BOSS Fire® Transit Box may be affixed to a noggin from below, or alternatively be positioned to the top of a noggin.

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9. The maximum perimeter gap between the BOSS Fire® Transit Box and the wall lining is up to 20 mm. The gap is to be filled with BOSS FireMastic-300 sealant or any of the fire rated sealants listed below and approved in accordance with AS1530.4:2014 for use against a metal element, to the full depth of the plasterboard lining. Sealants which are applicable are:
    - Knauf Bindex Fire Sealant
    - CSR Fire Seal
    - Hilti CP606
    - HB Fuller Firesound
    - Sika Flex-400 fire sealant

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6. NOTES TO FIGURE 1 TO FIGURE 31

Figure 1: BOSS Fire® Transit Box - Soffit Mount in Flexible Wall

This shows the BOSS Fire® Transit Box installed in a lightweight plasterboard wall under a slab. This installation is consistent with the method described in the text of this document.

Figure 2: BOSS Fire® Transit Box - Mid Mount in Flexible Wall

This shows the BOSS Fire® Transit Box installed in a lightweight plasterboard wall and shaftwall. This installation is consistent with the method described in the text of this document.

Figure 3: BOSS Fire® Transit Box – Mid, Soffit & Ceiling Mount in Other Wall Systems

This shows the BOSS Fire® Transit Box installed in a solid permanent formwork wall and floor slab. This includes systems such as Speedpanel, Korok or SupaPanel. AFS, ProntoPanel and Dincel. This installation is consistent with the method described in the text of this document.

Figure 4: BOSS Fire® Transit Box – Mid & Soffit Mount in Concrete Systems

This shows the BOSS Fire® Transit Box installed in ACC and Hebel systems. This installation is consistent with the method described in the text of this document.

Figure 5: BOSS Fire® Transit Box – Mid & Soffit Mount in Concrete/Masonry Systems

This shows the BOSS Fire® Transit Box installed in a block wall and floor slab. This also applies to solid & hollow masonry, concrete walls including concrete walls with Permanent Polymer Formwork. This installation is consistent with the method described in the text of this document.

Figure 6: BOSS Fire® Transit Box – Thicker Wall Systems Above 270 mm

This shows the BOSS Fire® Transit Box installed in lightweight lined wall and concrete/masonry greater than 270 mm thick. This installation is consistent with the method described in the text of this document.

Figure 7: BOSS Fire® Transit Box – Mid Mount Other Built-up Wall Systems (Plasterboard)

This shows the installation method for BOSS Fire® Transit Box in various wall systems with localised built-up wall thickness using FR Plasterboard. This installation is consistent with the method described in the text of this document.

Figure 8: BOSS Fire® Transit Box – Soffit Mount Other Built-up Wall Systems (Plasterboard)

These are similar details to Figure 7 with the BOSS Fire® Transit Box installed under the floor slab. This installation is consistent with the method described in the text of this document.

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Figure 9: BOSS Fire® Transit Box – Mid Mount Other Built-up Wall Systems (Boss Batt)

This shows the installation method for BOSS Fire® Transit Box in various wall systems with localised built-up wall thickness using 50 mm BOSS Batt. This installation is consistent with the method described in the text of this document.

Figure 10: BOSS Fire® Transit Box – Soffit Mount Other Built-up Wall Systems (Boss Batt)

This shows the installation method for BOSS Fire® Transit Box in various wall systems with localised built-up wall thickness using 50 mm BOSS Batt. This installation is consistent with the method described in the text of this document.

Figure 11: BOSS Fire® Transit Box – Soffit Mount in Other Wall Systems with P40 MAK Wrap Option (1)

This shows the installation method for BOSS Fire® Transit Box in various wall systems with P40 MAK-Wrap. This installation is consistent with the method described in the text of this document.

Figure 12: BOSS Fire® Transit Box – Soffit Mount in Other Wall Systems with P40 MAK Wrap Option (2)

This shows the installation method for BOSS Fire® Transit Box in various wall systems with P40 MAK-Wrap. Where P40-MAK Wrap is required for Insulation, its width is 300mm with sufficient additional material to increase the wall depth to 100 mm. This installation is consistent with the method described in the text of this document.

Figure 13: BOSS Fire® Transit Box – Soffit and Mid wall Mount with Sealant (1)

This shows the installation method for BOSS Fire® Transit Box in various wall systems with additional fillet mastic sealant. This installation is consistent with the method described in the text of this document.

Figure 14: BOSS Fire® Transit Box – Soffit and Mid wall Mount with Sealant (2)

This shows the installation method for BOSS Fire® Transit Box in various wall systems with additional fillet mastic sealant. This installation is consistent with the method described in the text of this document.

Figure 15: BOSS Fire® Transit Box – Installation in BOSS Batt Infill Panel. - Soffit Mount & Mid Wall Mount – Rigid Walls. – 60min FRL

Refer to clause 4.1.6 above for details.

Figure 16: BOSS Fire® Transit Box – Installation in BOSS Batt Infill Panel. - Soffit Mount & Mid Wall Mount – Rigid Walls – 60, 90 & 120min FRL

Refer to clause 4.1.6 above for details.

Figure 17: BOSS Fire® Transit Box – Installation in BOSS Batt Infill Panel. - Soffit Mount & Mid Wall Mount –Flexible Walls – 60, 90 & 120min FRL

Refer to clause 4.1.6 above for details.

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Figure 18: BOSS Fire® Transit Box – Multiple

This shows the installation method for multiple BOSS Fire® Transit Boxes. The separation of individual boxes is to be in accordance with AS 4072.1.

Figure 19: BOSS Fire® Transit Box –Vertical installation

This figure shows the BOSS Fire® Transit Box installed vertically. This is not considered to be detrimental to the FRL of the transit box or any penetrations discussed in this report.

Figure 20: BOSS Fire® Transit Box – Mount in Party System

This shows the installation method for BOSS Fire® Transit Box in a party wall system. This installation is consistent with the method described in the text of this document.

Figure 21: BOSS Fire® Transit Box – Installation in concrete floor slab with services

This shows the installation method for BOSS Fire® Transit Box in a concrete floor slab with cable and pipe penetrations. This installation is consistent with the method described in the text of this document. The MAK Wrap P40 extends to cover the box.

Figure 22: BOSS Fire® Transit Box – Floor Installation

This shows the installation method for BOSS Fire® Transit Box on a concrete floor slab. This installation is consistent with the method described in the text of this document.

Figure 23: BOSS Fire® Transit Box – Floor Installation with Large Opening

This shows the installation method for BOSS Fire® Transit Box on a concrete floor slab in a large opening. The framework supports the BOSS Fire® Transit Box and spaces around the box filled with BOSS Batt of thickness appropriate to the required FRL.

Figure 24: BOSS Fire® Transit Box – Multiple in floor slab

This shows the installation method for multiple BOSS Fire® Transit Boxes on a concrete floor slab in a large opening. The framework supports the BOSS Fire® Transit Box and spaces around the box filled with BOSS Batt of thickness appropriate to the required FRL. The spacing must comply with AS 4072.2.

Figure 25: BOSS Fire® Transit Box – Concrete Slab Cast-in

The BOSS Fire® Transit box is cast in-situ with concrete poured after placement of the box so that it is completely surrounded and in contact with concrete. This will maintain the FRL of the system.

Figure 26: BOSS Fire® Transit Box – Floor/Ceiling Systems

This shows the general installation method for BOSS Fire® Transit Box with services in a framed floor system. This installation is consistent with the method described in the text of this document.

Figure 27: BOSS Fire® Transit Box – Technical Drawing

This shows details of the construction of the BOSS Fire® Transit Box.

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Figure 28: BOSS Fire® Transit Box – Standard configuration for cables

This shows the standard configuration of cables. Actual installation may vary. This installation is consistent with the method described in the text of this document.

Figure 29: BOSS Fire® Transit Box – Low fill of services

This shows a common configuration of mixed services with low fill of services. Service percentage fill is discussed in 4.1.8 above.

Figure 30: BOSS Fire® Transit Box – Installation detail - plastic pipes

This shows a typical configuration within the BOSS Fire® Transit Box with plastic pipes. Use of the trapeze is optional.

Figure 31: BOSS Fire® Transit Box – Installation detail -copper pipes

This shows a typical configuration within the BOSS Fire® Transit Box with lagged copper pipes and Paircoil. Use of the trapeze is optional.

Figure 32: BOSS Fire® Transit Box – Alpha Panel installation (Under slab)

Figure 33: BOSS Fire® Transit Box – Alpha Panel installation (Within wall)

Figure 32 and Figure 33 show typical installation in an Alpha Panel wall in various configuration of solid wall and framed wall. Where the construction has a thickness of less than 100 mm, additional material has been added to increase the wall thickness to at least 100 mm.

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Figure 1: BOSS Fire® Transit Box - Soffit Mount in Flexible Wall

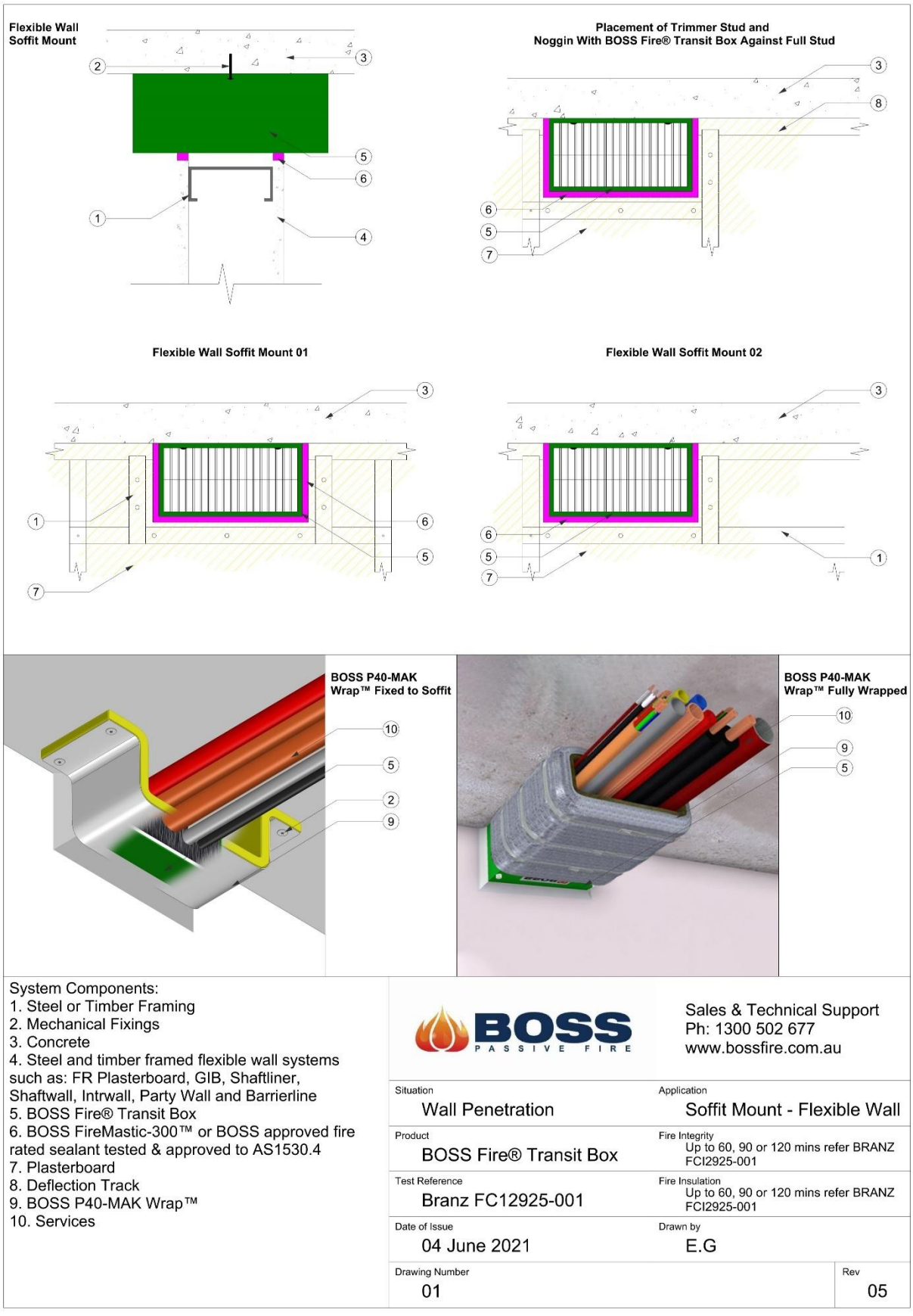
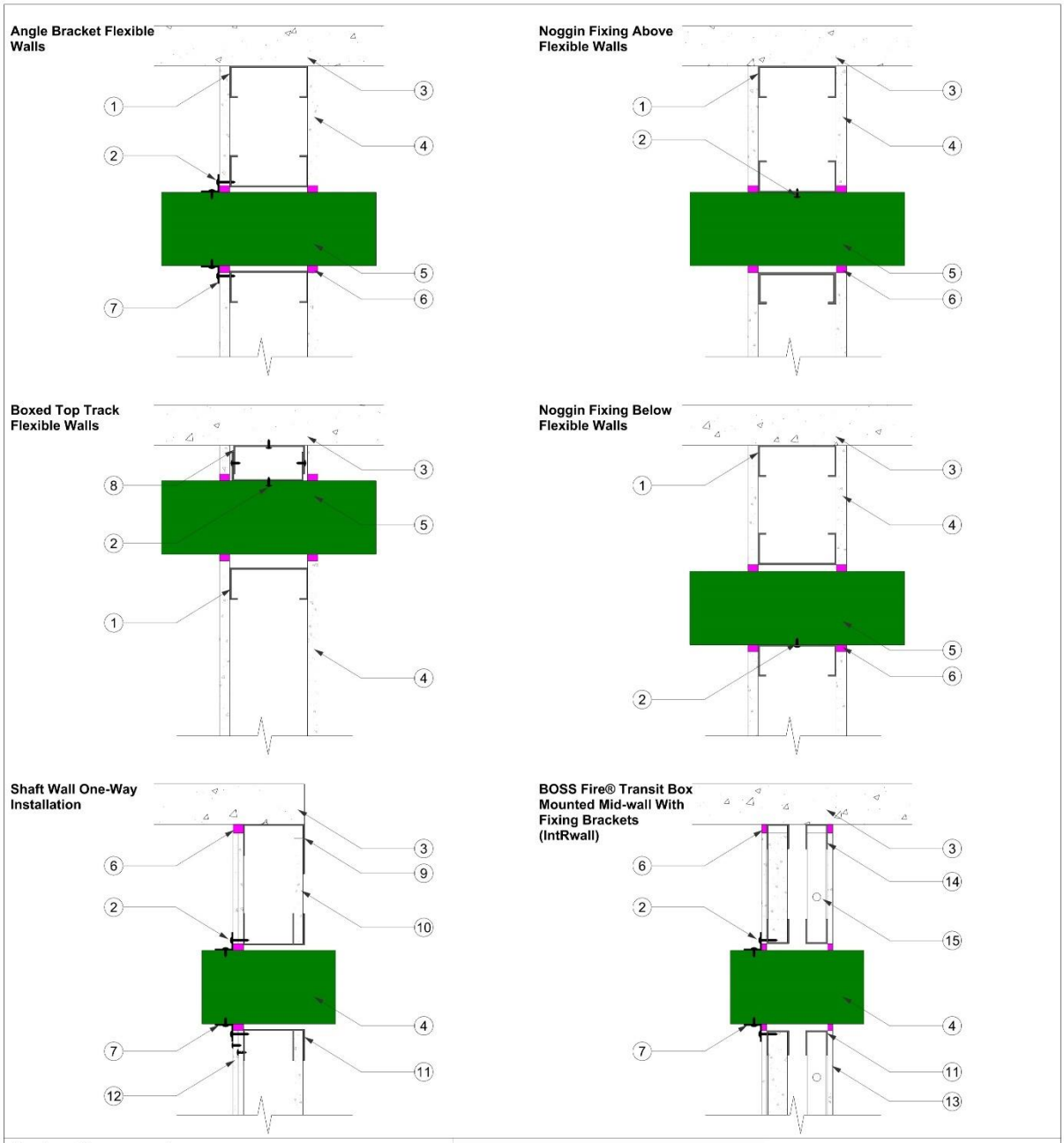


Figure 2: BOSS Fire® Transit Box - Mid Mount in Flexible Wall



System Components:
1. Steel or Timber Framing
2. Mechanical Fixings
3. Concrete
4. Steel and timber framed flexible wall systems such as: FR Plasterboard, GIB, Shaftliner, Shaftwall, IntRwall, Party Wall & Barrierline
5. BOSS Fire® Transit Box
6. BOSS FireMastic-300™
7. Minimum 20m x 20mm Steel Angle
8. Boxed Track
9. J-Track
10. Shaftliner Sheet
11. Noggin
12. Riser Shaft Wall System
13. Fire Rated Plasterboard
14. Deflection Head Track
15. Metal Stud

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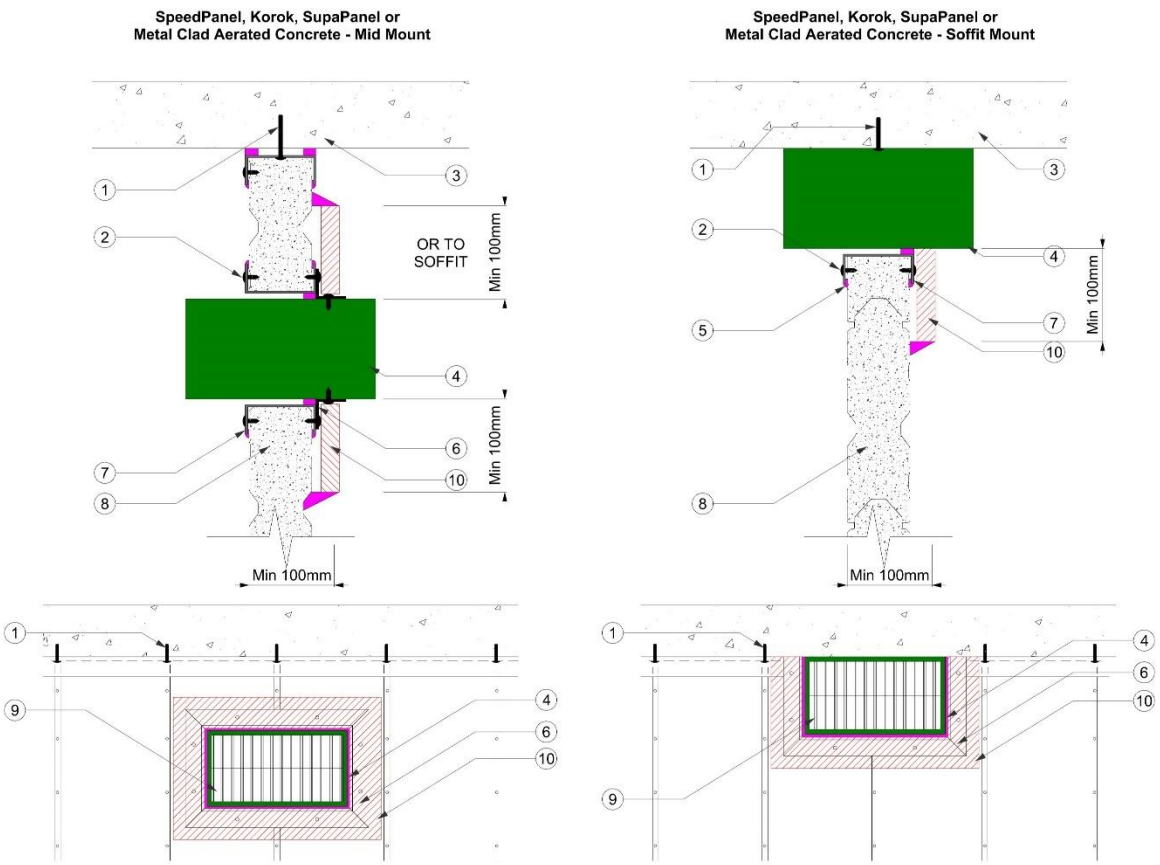
Situation: Wall Penetration	Application: Mid Mount - Flexible Wall
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 02	Rev: 05

Figure 3: BOSS Fire® Transit Box – Mid, Soffit & Ceiling Mount in Other Wall Systems



System Components:
1. Masonry Fixings
2. SDS Screw for SpeedPanel, Korok, SupaPanel or Metal Clad Aerated Concrete
3. Concrete
4. BOSS Fire® Transit Box
5. BOSS FireMastic-300™
6. Minimum 20m x 20mm Steel Angle
7. C-Track
8. Minimum width of 50mm with a FRL -/60/60 up to -/120/120 SpeedPanel, Korok, SupaPanel or Metal Clad Aerated Concrete
9. Brush Seals
10. Wall Build up Required:
-FR Plasterboard -Oversize Sealant Fillet
-BOSS Batt™ -BOSS P40-MAK Wrap™

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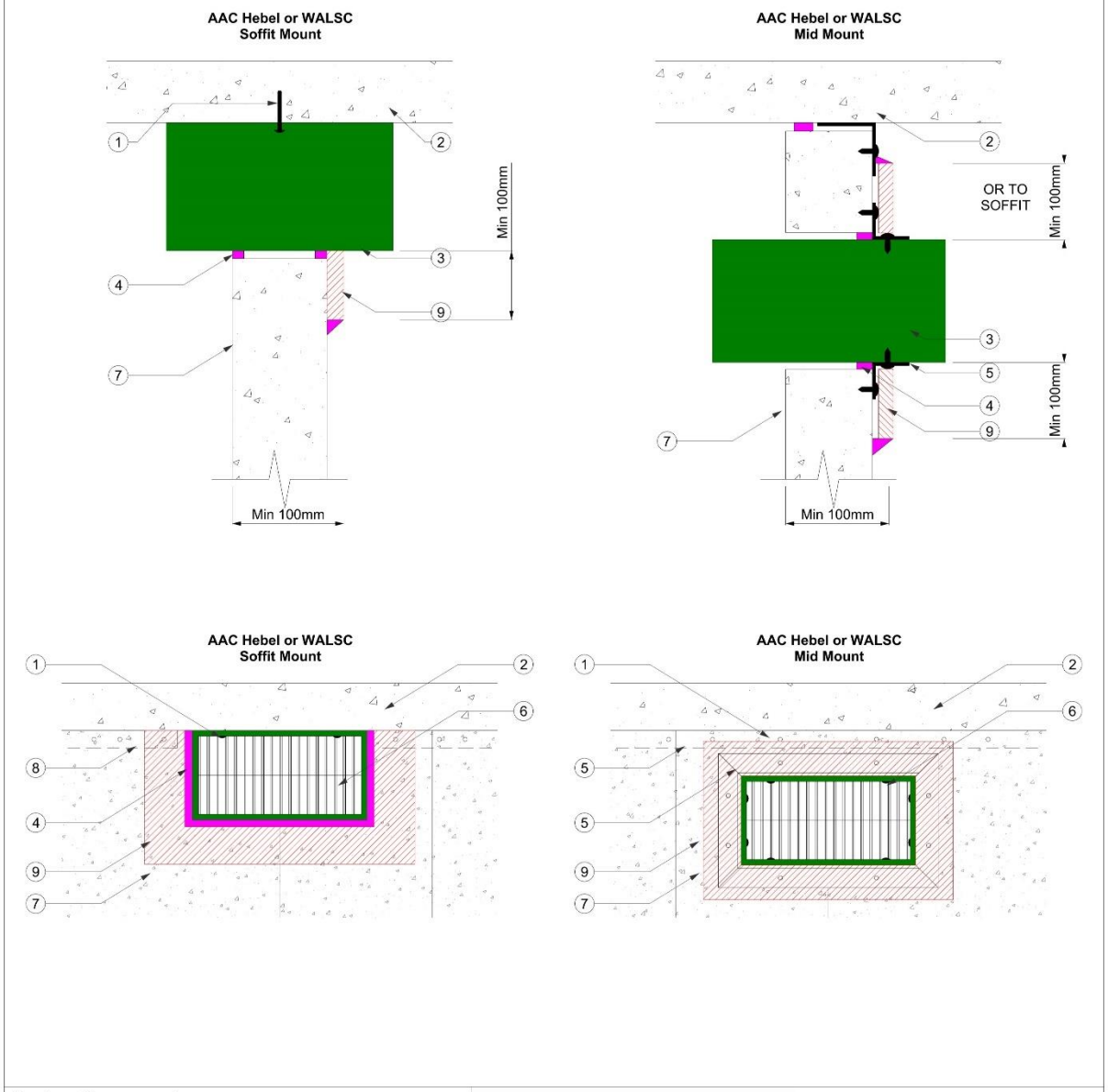
Situation: Mid Mount and Soffit Mount	Application: Other Wall Systems
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 03	Rev: 05

Figure 4: BOSS Fire® Transit Box – Mid & Soffit Mount in Concrete Systems



System Components:
1. Masonry Fixings
2. Concrete
3. BOSS Fire® Transit Box
4. BOSS FireMastic-300™
5. Minimum 20m x 20mm Steel Angle
6. Brush Seals
7. AAC, Hebel
8. Top Angle Removed at BOSS Fire® Transit Box Location
9. Wall Build up Required:
   -FR Plasterboard
   -BOSS Batt™
   -Oversize Sealant Fillet
   -BOSS P40-MAK Wrap™

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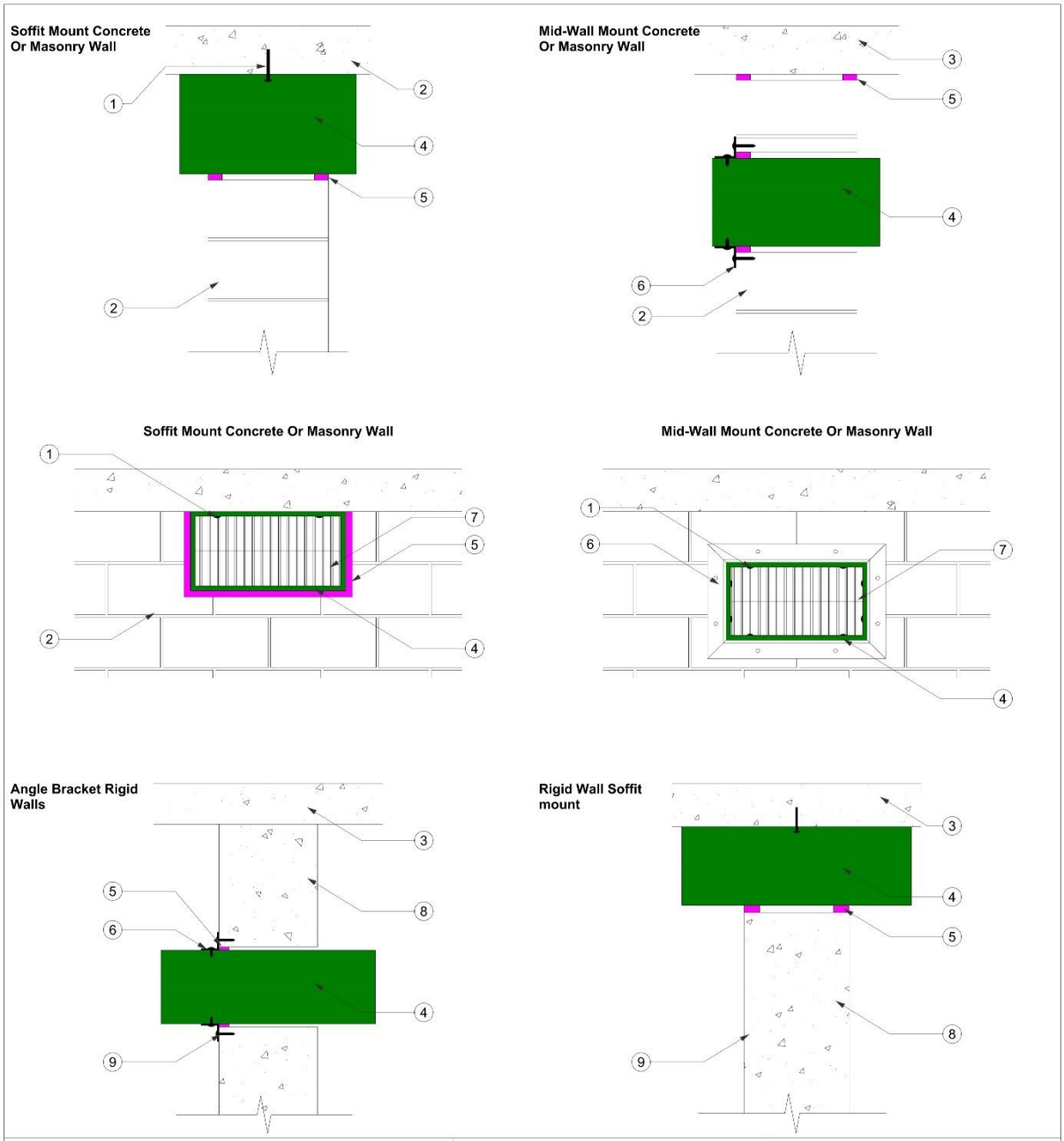
Situation: Mid Mount and Soffit Mount	Application: Other Wall Systems
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 04	Rev: 05

Figure 5: BOSS Fire® Transit Box – Mid & Soffit Mount in Concrete/Masonry Systems



System Components:
1. Masonry Fixings
2. Concrete, Masonry, Solid or Hollow Block Wall
3. Concrete
4. BOSS Fire® Transit Box
5. BOSS FireMastic-300™
6. Minimum 20m x 20mm Steel Angle
7. Brush Seals
8. Dincel and AFS
9. Mechanical Fixing

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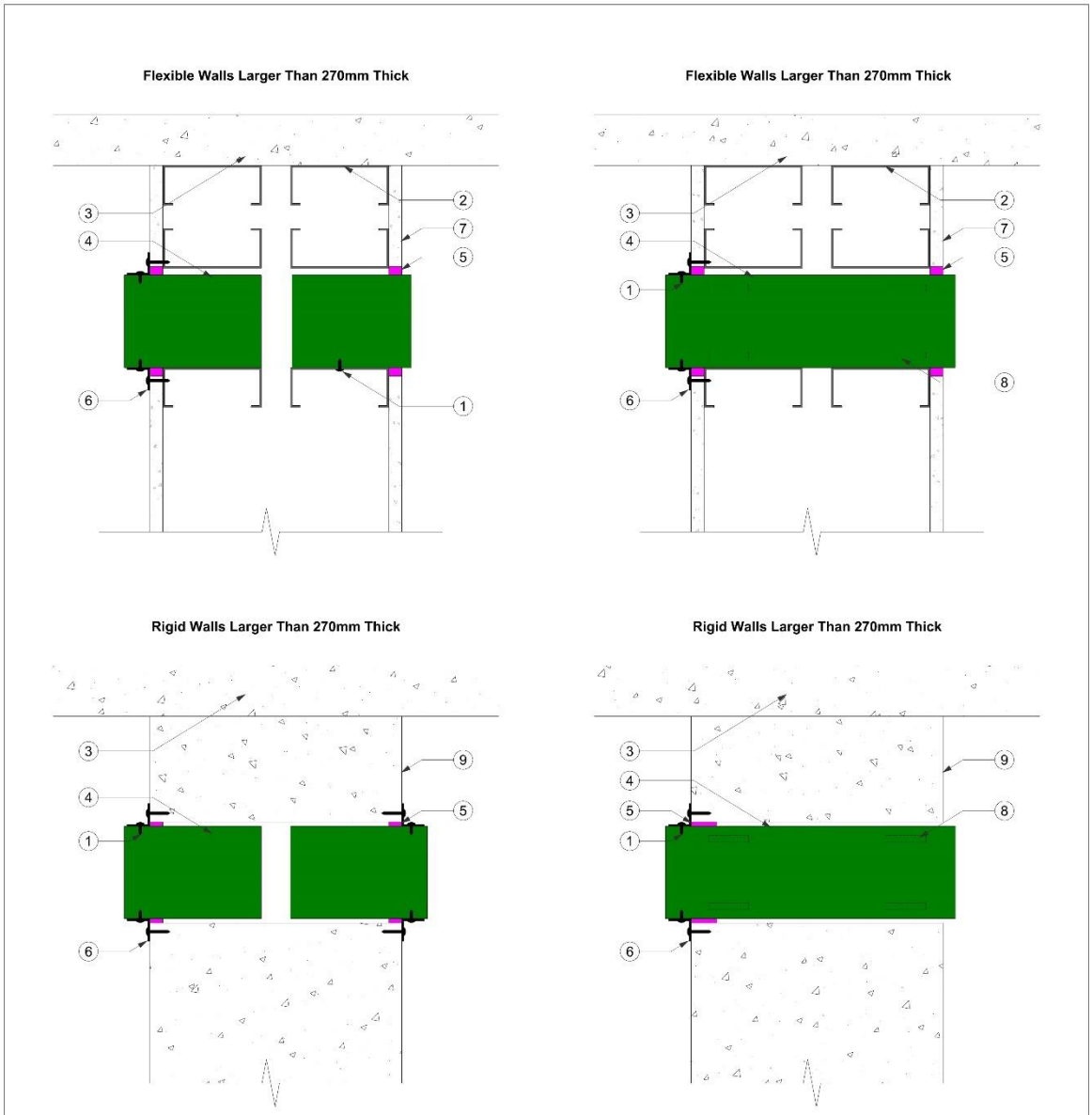
Situation: Mid Mount and Soffit Mount	Application: Other Wall Systems
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 05	Rev: 05

Figure 6: BOSS Fire® Transit Box – Thicker Wall Systems Above 270 mm



System Components:
1. Mechanical Fixing
2. Steel or Timber Framing
3. Concrete
4. BOSS Fire® Transit Box
5. BOSS FireMastic-300™
6. Minimum 20m x 20mm Steel Angle
7. Steel and timber framed flexible wall systems
8. 4x Intumescent Sachets around perimeter of Transit Box at each open end. Total 8 Sachets per Transit Box
9. Concrete, Masonry, Dincel and AFS & CLT

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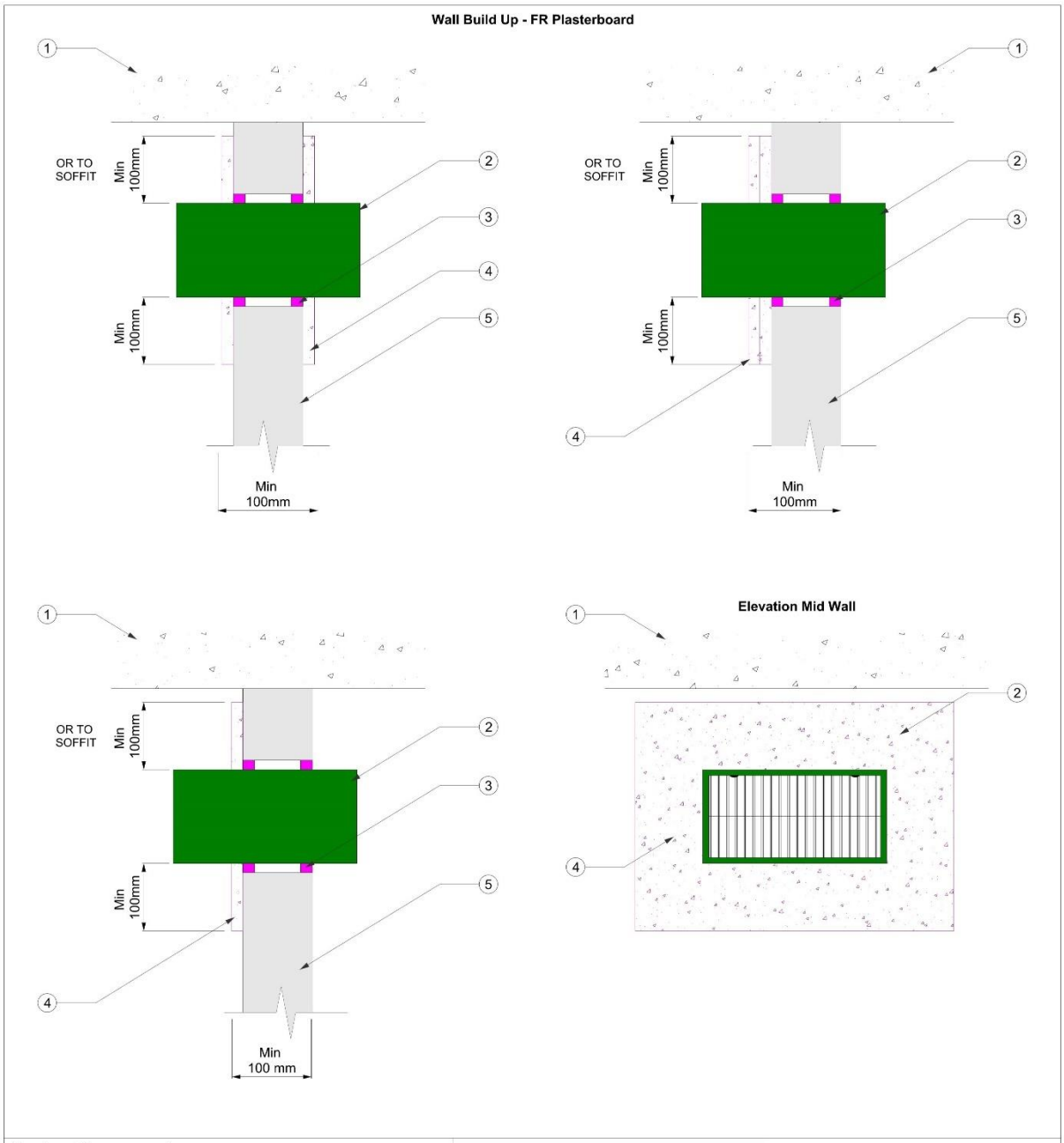
Situation: Thicker Wall Systems above 270mm	Application: Other Wall Systems
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 06	Rev: 05

Figure 7: BOSS Fire® Transit Box – Mid Mount Built-Up Wall Systems (Plasterboard)



System Components:
1. Ceiling
2. BOSS Fire® Transit Box
3. BOSS FireMastic-300™
4. FR Plasterboard
5. Wall Types:
   - -Steel or Timber Framed FR Plasterboard
   - -Concrete
   - -Solid or Hollow Masonry
   - -ACC / Hebel / WALSC
   - -Speedpanel / Korok / Supapanel
   - -Pronto Panel
   - -Shaftliner / Shaftwall
   - -IntRwall
   - -Barrierline
   - -BOSS Batt™

*Fixing details of the box not shown on this drawing for clarity of wall build up options. For fixing requirements please refer to drawings FC12925-01 to FC12925-06 and FC12925-15 to FC12925-22 relevant to specific wall type for your application.

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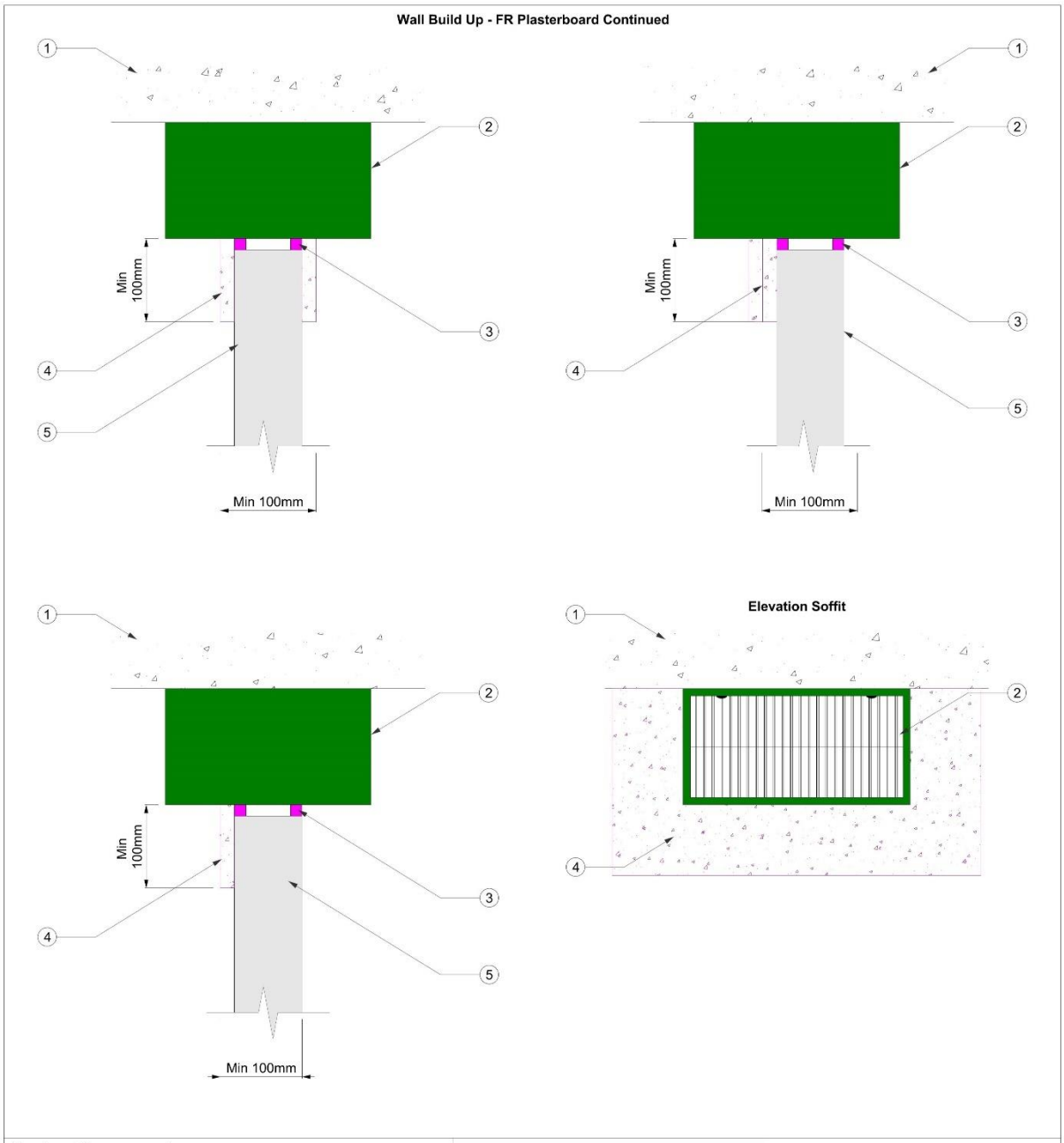
Situation: FR Plasterboard - Build Up	Application: Other Wall Systems
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 07	Rev: 05

Figure 8: BOSS Fire® Transit Box – Soffit Mount Built-Up Wall Systems (Plasterboard)



System Components:
1. Ceiling
2. BOSS Fire® Transit Box
3. BOSS FireMastic-300™
4. FR Plasterboard
5. Wall Types:
   - -Steel or Timber Framed FR Plasterboard
   - -Concrete
   - -Solid or Hollow Masonry
   - -ACC / Hebel / WALSC
   - -Speedpanel / Korok / Supapanel
   - -Pronto Panel
   - -Shaftliner / Shaftwall
   - -IntRwall
   - -Barrierline
   - -BOSS Batt™

*Fixing details of the box not shown on this drawing for clarity of wall build up options. For fixing requirements please refer to drawings FC12925-01 to FC12925-06 and FC12925-15 to FC12925-22 relevant to specific wall type for your application.

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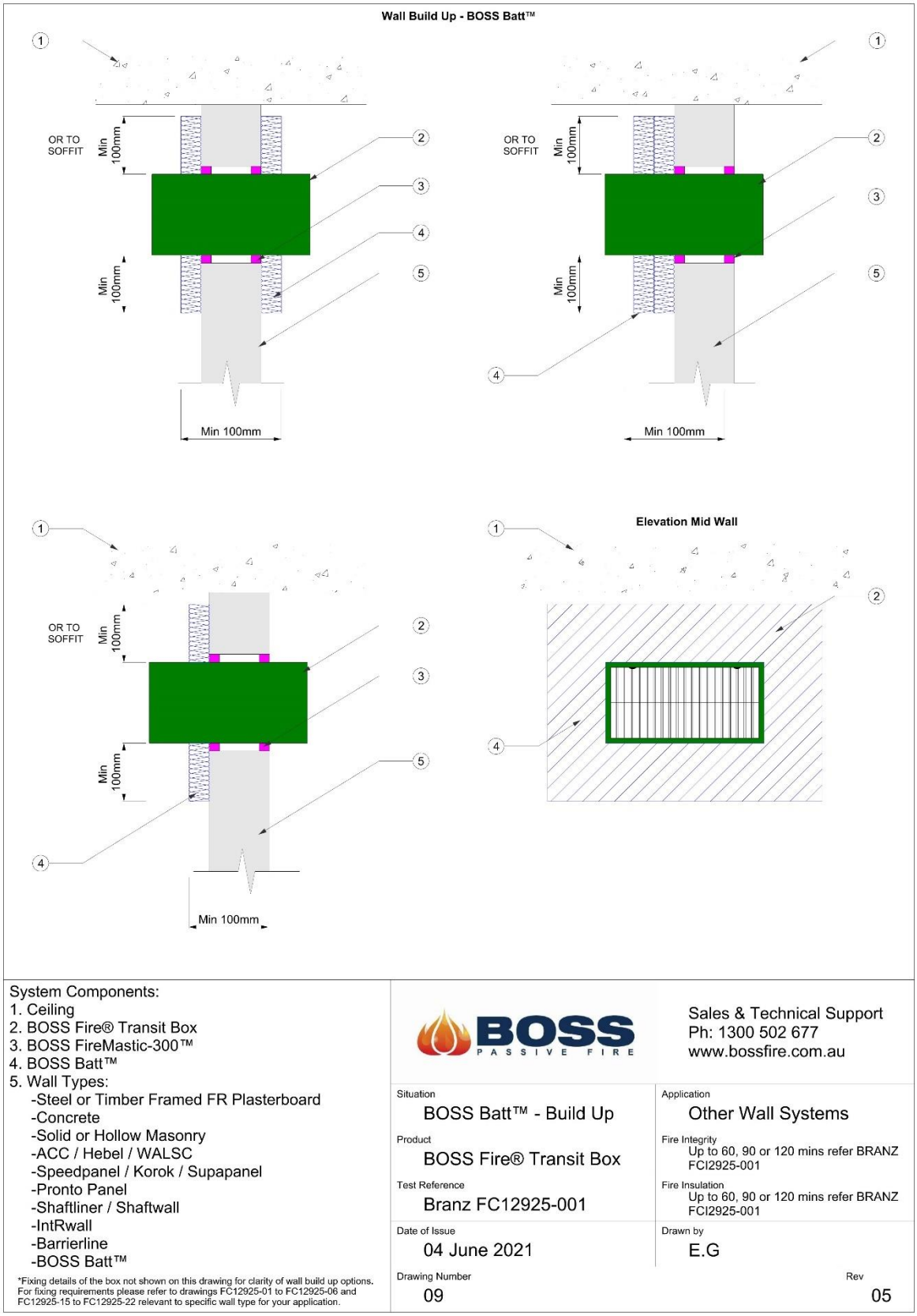
Situation: FR Plasterboard - Build Up	Application: Other Wall Systems
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 08	Rev: 05

Figure 9: BOSS Fire® Transit Box – Mid Mount in Built-Up Wall Systems (Boss batt)



System Components:
1. Ceiling
2. BOSS Fire® Transit Box
3. BOSS FireMastic-300™
4. BOSS Batt™
5. Wall Types:
   - -Steel or Timber Framed FR Plasterboard
   - -Concrete
   - -Solid or Hollow Masonry
   - -ACC / Hebel / WALSC
   - -Speedpanel / Korok / Supapanel
   - -Pronto Panel
   - -Shaftliner / Shaftwall
   - -IntRwall
   - -Barrierline
   - -BOSS Batt™

*Fixing details of the box not shown on this drawing for clarity of wall build up options. For fixing requirements please refer to drawings FC12925-01 to FC12925-06 and FC12925-15 to FC12925-22 relevant to specific wall type for your application.

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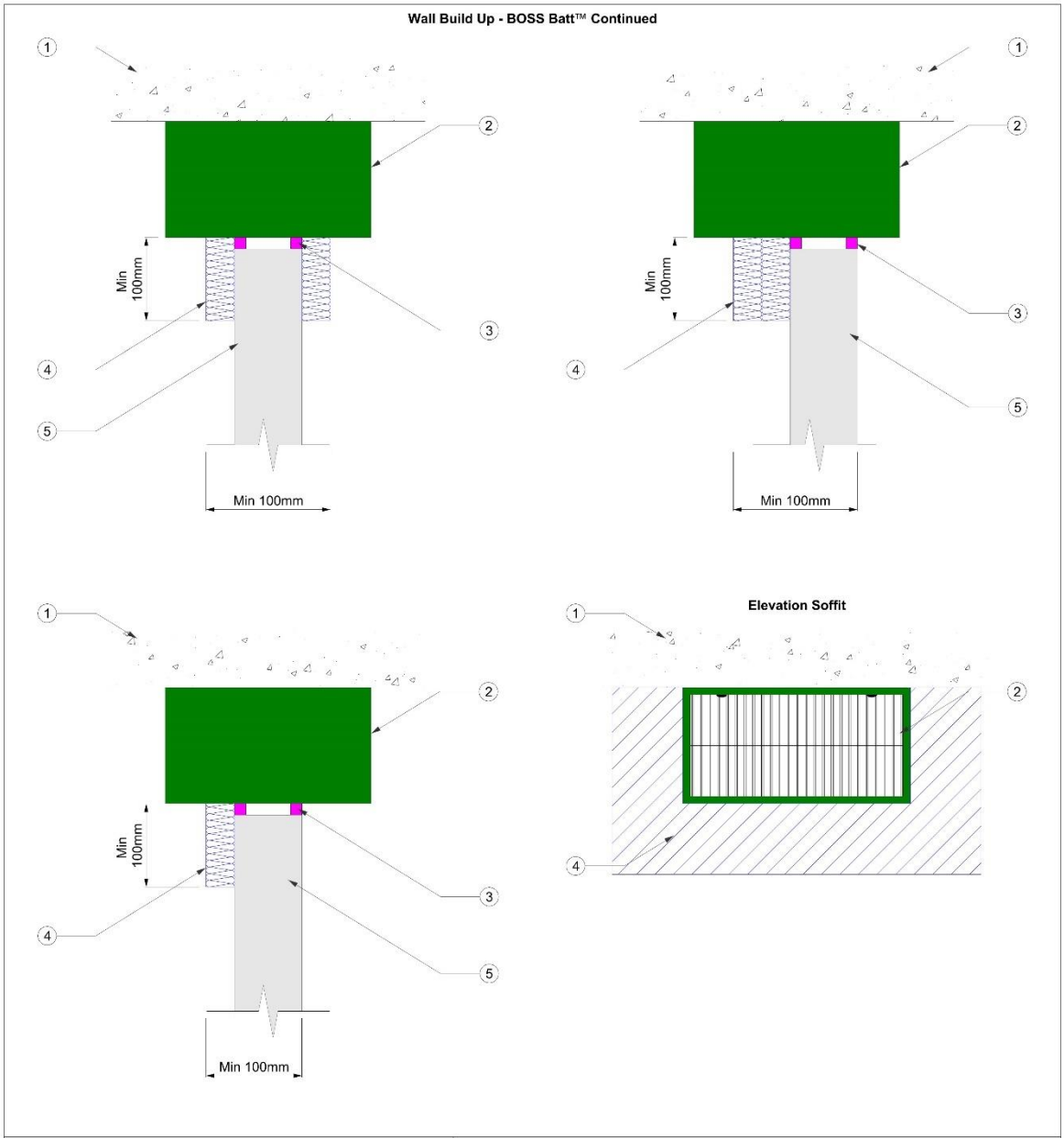
Situation: BOSS Batt™ - Build Up	Application: Other Wall Systems
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 09	Rev: 05

Figure 10: BOSS Fire® Transit Box – Soffit Mount in Built-Up Wall Systems (Boss batt)



System Components:
1. Ceiling
2. BOSS Fire® Transit Box
3. BOSS FireMastic-300™
4. BOSS Batt™
5. Wall Types:
   - -Steel or Timber Framed FR Plasterboard
   - -Concrete
   - -Solid or Hollow Masonry
   - -ACC / Hebel / WALSC
   - -Speedpanel / Korok / Supapanel
   - -Pronto Panel
   - -Shaftliner / Shaftwall
   - -IntRwall
   - -Barrierline
   - -BOSS Batt™

*Fixing details of the box not shown on this drawing for clarity of wall build up options. For fixing requirements please refer to drawings FC12925-01 to FC12925-06 and FC12925-15 to FC12925-22 relevant to specific wall type for your application.

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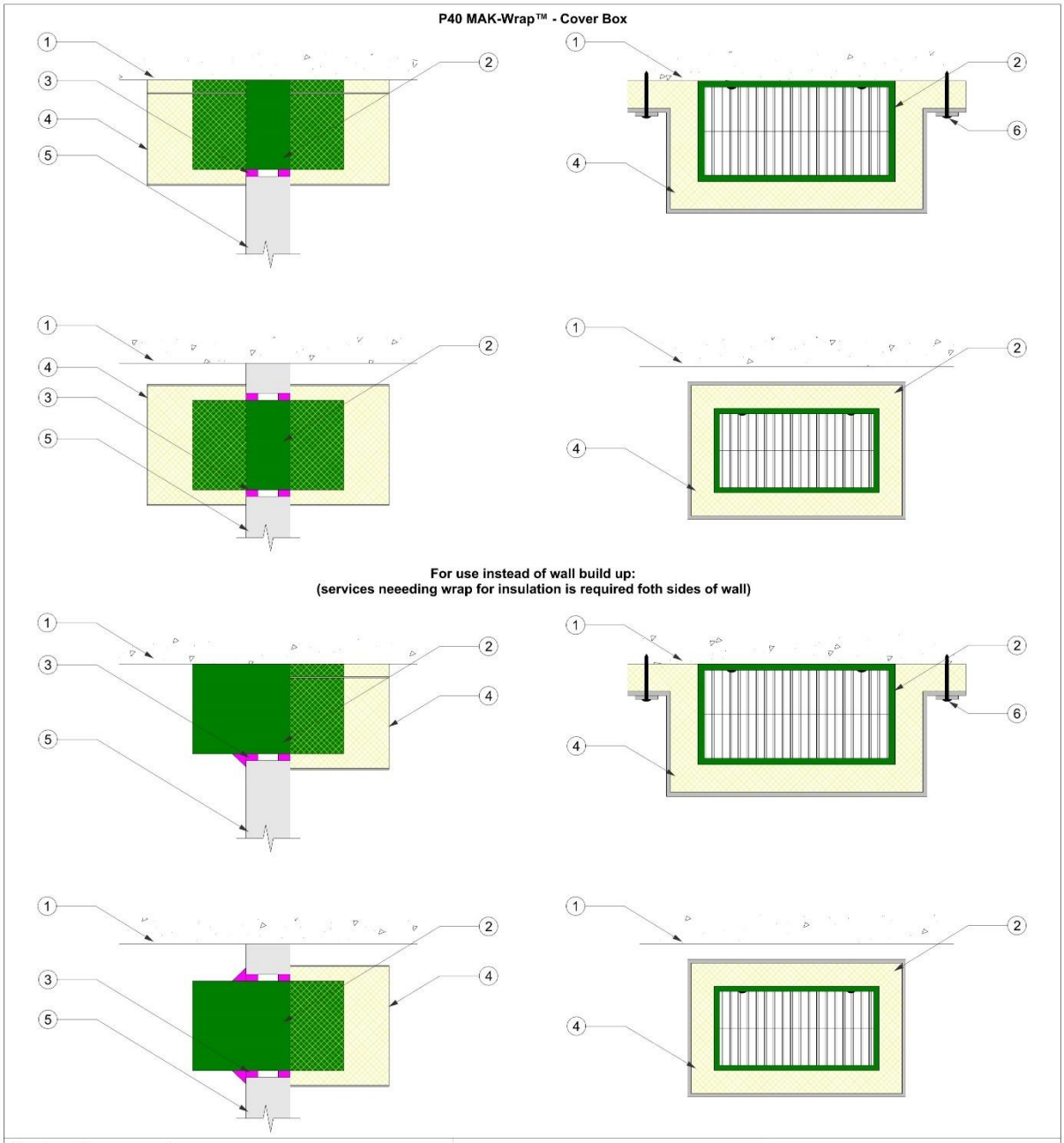
Situation: BOSS Batt™ - Build Up	Application: Other Wall Systems
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 10	Rev: 05

Figure 11: BOSS Fire® Transit Box – Soffit and Mid Mount with P40 MAK Wrap (1)



System Components:
1. Ceiling
2. BOSS Fire® Transit Box
3. BOSS FireMastic-300™
4. P40 MAK-Wrap™
5. Wall Types:
   - -Steel or Timber Framed FR Plasterboard
   - -Concrete
   - -Solid or Hollow Masonry
   - -ACC / Hebel / WALSC
   - -Speedpanel / Korok / Supapanel
   - -Pronto Panel
   - -Shaftliner / Shaftwall
   - -IntRwall
   - -Barrierline
   - -BOSS Batt™
6. Mechanical Fixing with Flat Bar or Large Washers

*Fixing details of the box not shown on this drawing for clarity of wall build up options. For fixing requirements please refer to drawings FC12925-01 to FC12925-06 and FC12925-15 to FC12925-22 relevant to specific wall type for your application.

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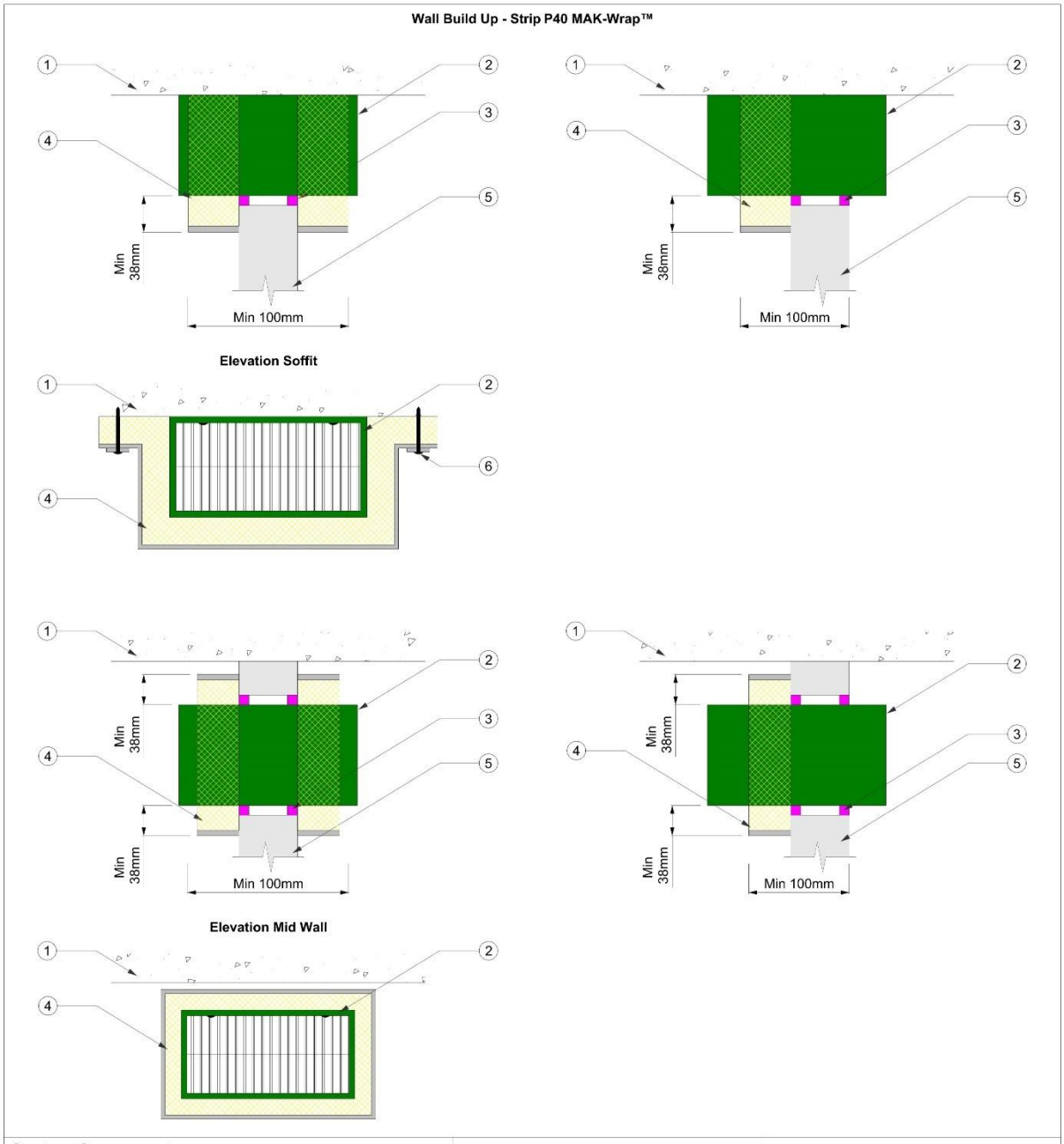
Situation: P40 MAK-Wrap™ - Cover Box	Application: Other Wall Systems
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 11	Rev: 05

Figure 12: BOSS Fire® Transit Box – Soffit and Mid Mount with P40 MAK Wrap (2)



System Components:
1. Ceiling
2. BOSS Fire® Transit Box
3. BOSS FireMastic-300™
4. BOSS P40 MAK-Wrap™
5. Wall Types:
   - -Steel or Timber Framed FR Plasterboard
   - -Concrete
   - -Solid or Hollow Masonry
   - -ACC / Hebel / WALSC
   - -Speedpanel / Korok / Supapanel
   - -Pronto Panel
   - -Shaftliner / Shaftwall
   - -IntRwall
   - -Barrierline
   - -BOSS Batt™
6. Mechanical Fixing with Flat Bar or Large Washers

*Fixing details of the box not shown on this drawing for clarity of wall build up options. For fixing requirements please refer to drawings FC12925-01 to FC12925-06 and FC12925-15 to FC12925-22 relevant to specific wall type for your application.

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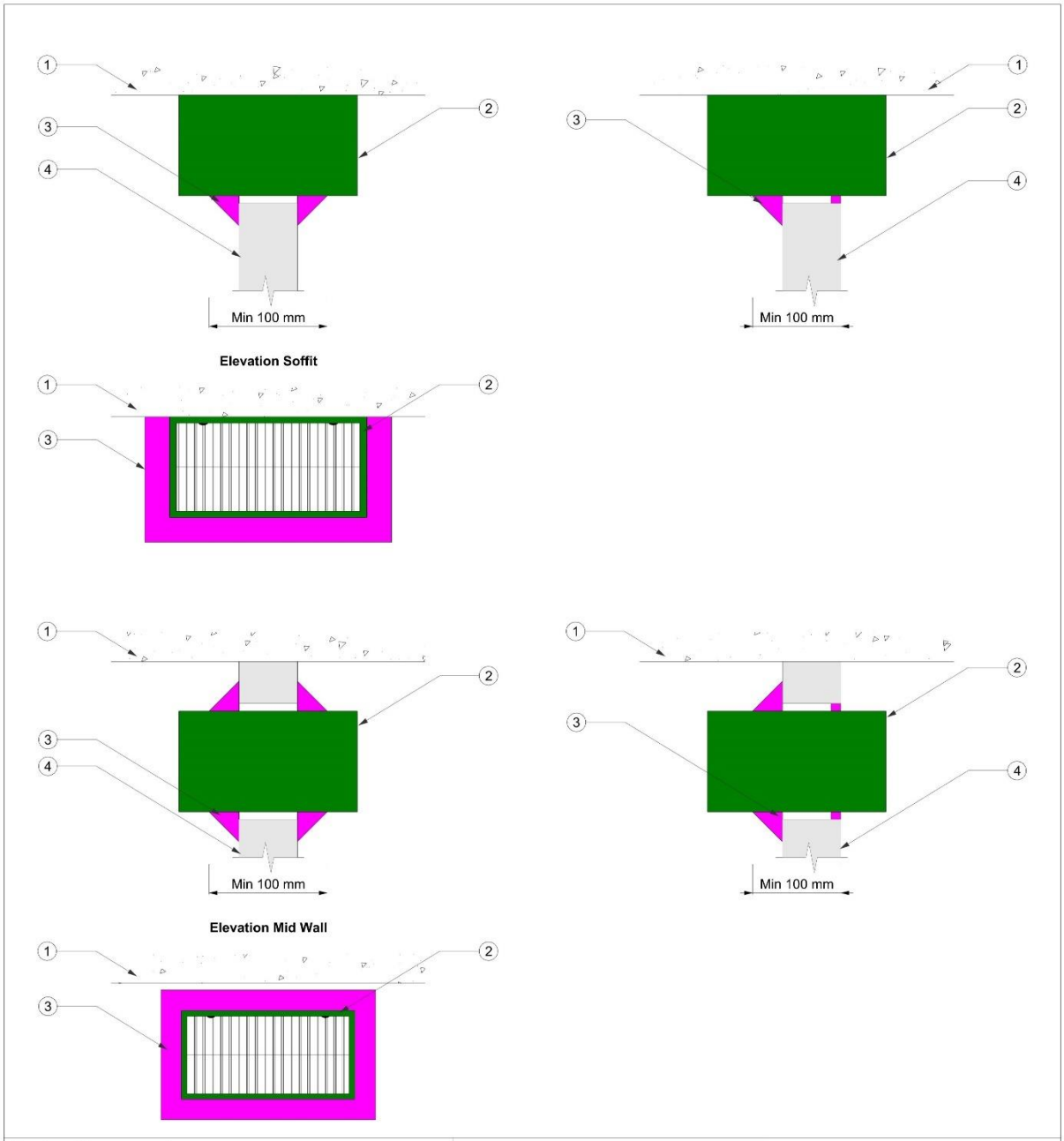
Sales & Technical Support
Ph: 1300 502 677
www.bossfire.com.au

Situation: P40 MAK-Wrap™ Shield	Application: Other Wall Systems
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 12	Rev: 05

Figure 13: BOSS Fire® Transit Box – Soffit and Mid wall Mount with Sealant (1)



System Components:
1. Ceiling
2. BOSS Fire® Transit Box
3. BOSS FireMastic-300™
4. Wall Types:
   - -Steel or Timber Framed FR Plasterboard
   - -Concrete
   - -Solid or Hollow Masonry
   - -ACC / Hebel / WALSC
   - -Speedpanel / Korok / Supapanel
   - -Pronto Panel
   - -Shaftliner / Shaftwall
   - -IntRwall
   - -Barrierline
   - -BOSS Batt™

*Fixing details of the box not shown on this drawing for clarity of wall build up options. For fixing requirements please refer to drawings FC12925-01 to FC12925-06 and FC12925-15 to FC12925-22 relevant to specific wall type for your application.

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Ph: 1300 502 677
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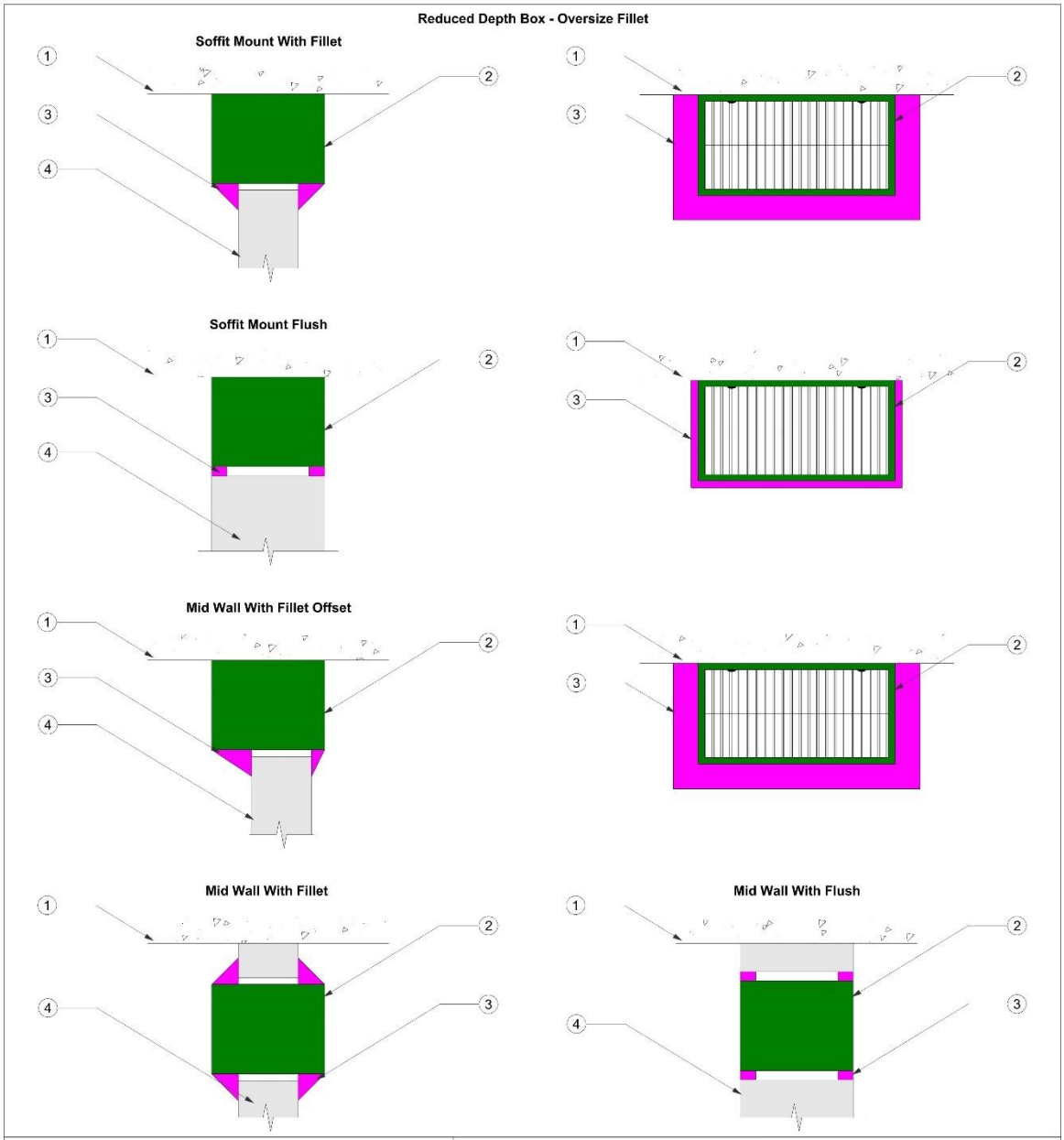
Situation: Oversize FireMastic-300™ Fillet	Application: Other Wall Systems
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 13	Rev: 05

Figure 14: BOSS Fire® Transit Box – Soffit and Mid wall Mount with Sealant (2)



System Components:
1. Ceiling
2. BOSS Fire® Transit Box
3. BOSS FireMastic-300™
4. Wall Types:
   - -Steel or Timber Framed FR Plasterboard
   - -Concrete
   - -Solid or Hollow Masonry
   - -ACC / Hebel / WALSC
   - -Speedpanel / Korok / Supapanel
   - -Pronto Panel
   - -Shaftliner / Shaftwall
   - -IntRwall
   - -Barrierline
   - -BOSS Batt™

*Fixing details not shown for clarity of sealant details. For fixing requirements please refer to drawings FC12925-01 to FC12925-06 and FC12925-15 to FC12925-22 relevant to specific wall type for your application.

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Ph: 1300 502 677
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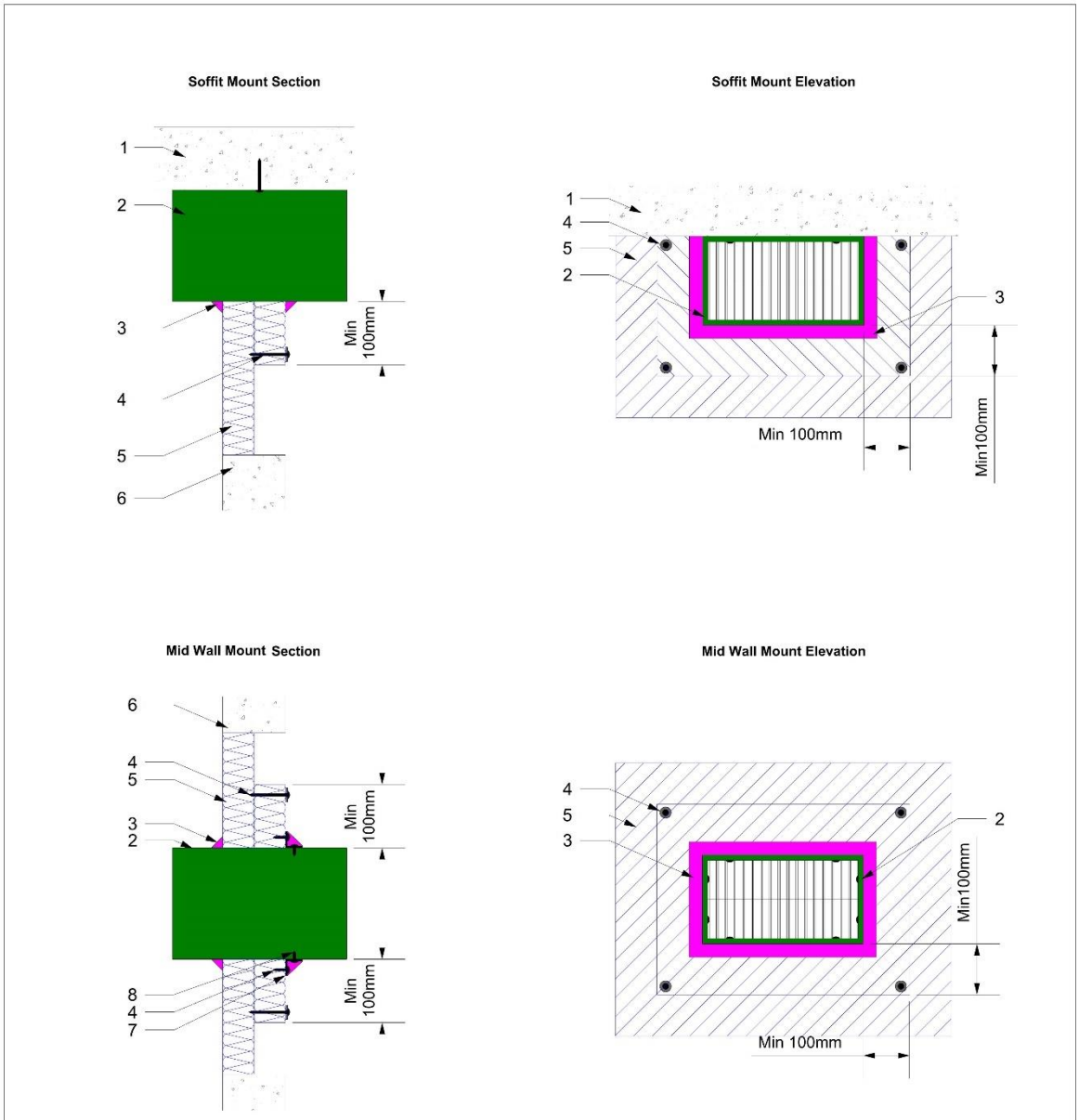
Situation: Flush Mount Installs (Reduced Box Depth)	Application: Other Wall Systems
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 14	Rev: 05

Figure 15: BOSS Fire® Transit Box – Installation in BOSS Batt Infill Panel. - Soffit Mount & Mid Wall Mount – Rigid Walls. – 60min FRL



System Components:
1. Concrete Slab
2. BOSS Fire® Transit Box
3. BOSS FireMastic-300™
4. Pig Tail Screws (with large washer when to Batt)
5. BOSS Batt™
6. All rigid walls with an FRL as specified in BRANZ FC12925-001 including Concrete, Masonry,Speedpanel, Korok, Supapanel, ACC, Hebel, WALSC, AFS & Dincel.
7. Minimum 20mm x 20mm Steel Angle
8. Self Drilling Metal Screw

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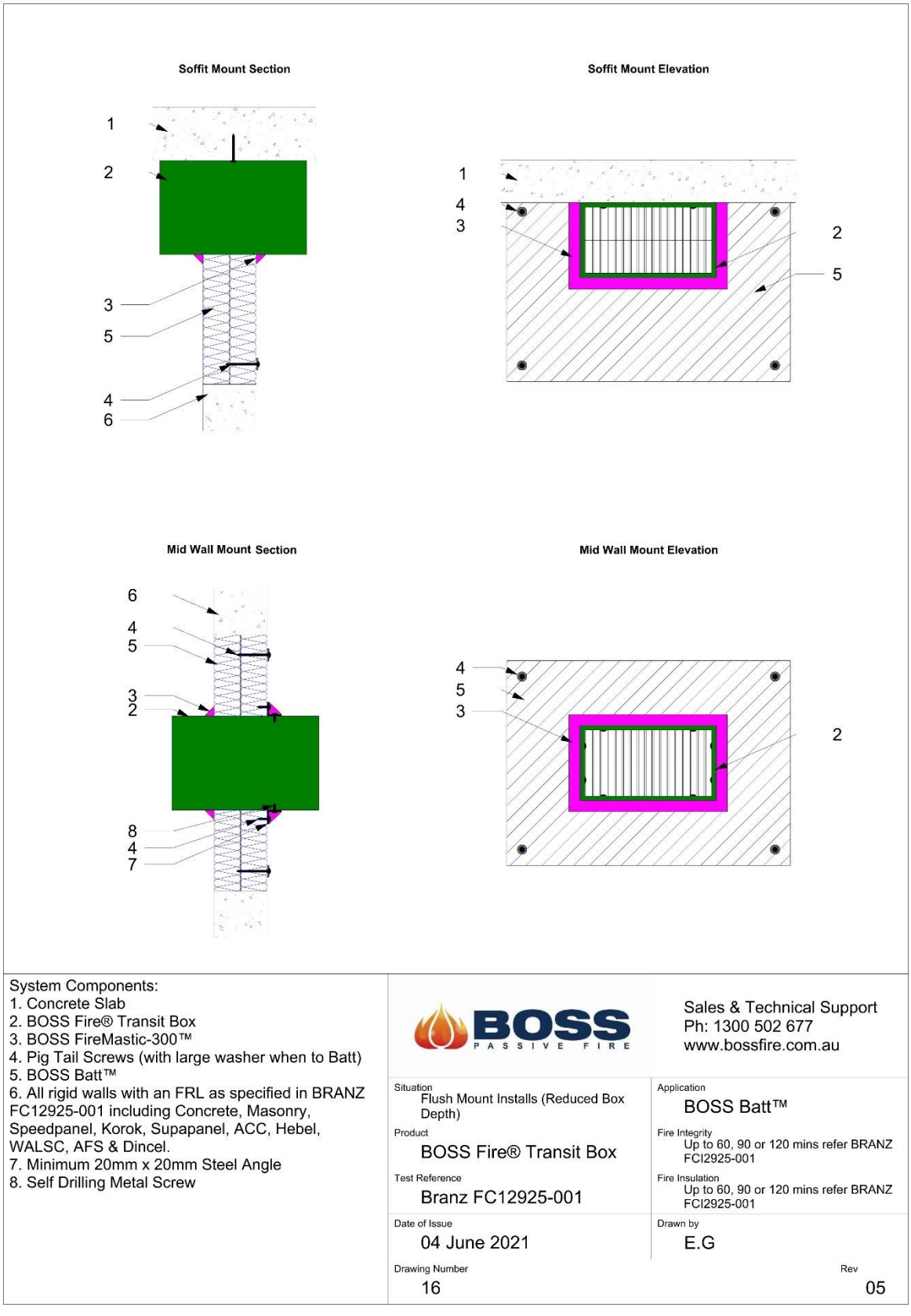
Sales & Technical Support
Ph: 1300 502 677
www.bossfire.com.au

Situation: Flush Mount Installs (Reduced Box Depth)	Application: BOSS Batt™
Product: BOSS Fire® Transit Box	Fire Integrity: 60 mins ref BRANZ FC12925-001
Test Reference: BOSS FC12925-001	Fire Insulation: 60 mins ref BRANZ FC12925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 15	Rev: 05

Figure 16: BOSS Fire® Transit Box – Installation in BOSS Batt Infill Panel. - Soffit Mount & Mid Wall Mount – Rigid Walls – 60, 90 & 120min FRL



System Components:
1. Concrete Slab
2. BOSS Fire® Transit Box
3. BOSS FireMastic-300™
4. Pig Tail Screws (with large washer when to Batt)
5. BOSS Batt™
6. All rigid walls with an FRL as specified in BRANZ FC12925-001 including Concrete, Masonry, Speedpanel, Korok, Supapanel, ACC, Hebel, WALSC, AFS & Dincel.
7. Minimum 20mm x 20mm Steel Angle
8. Self Drilling Metal Screw

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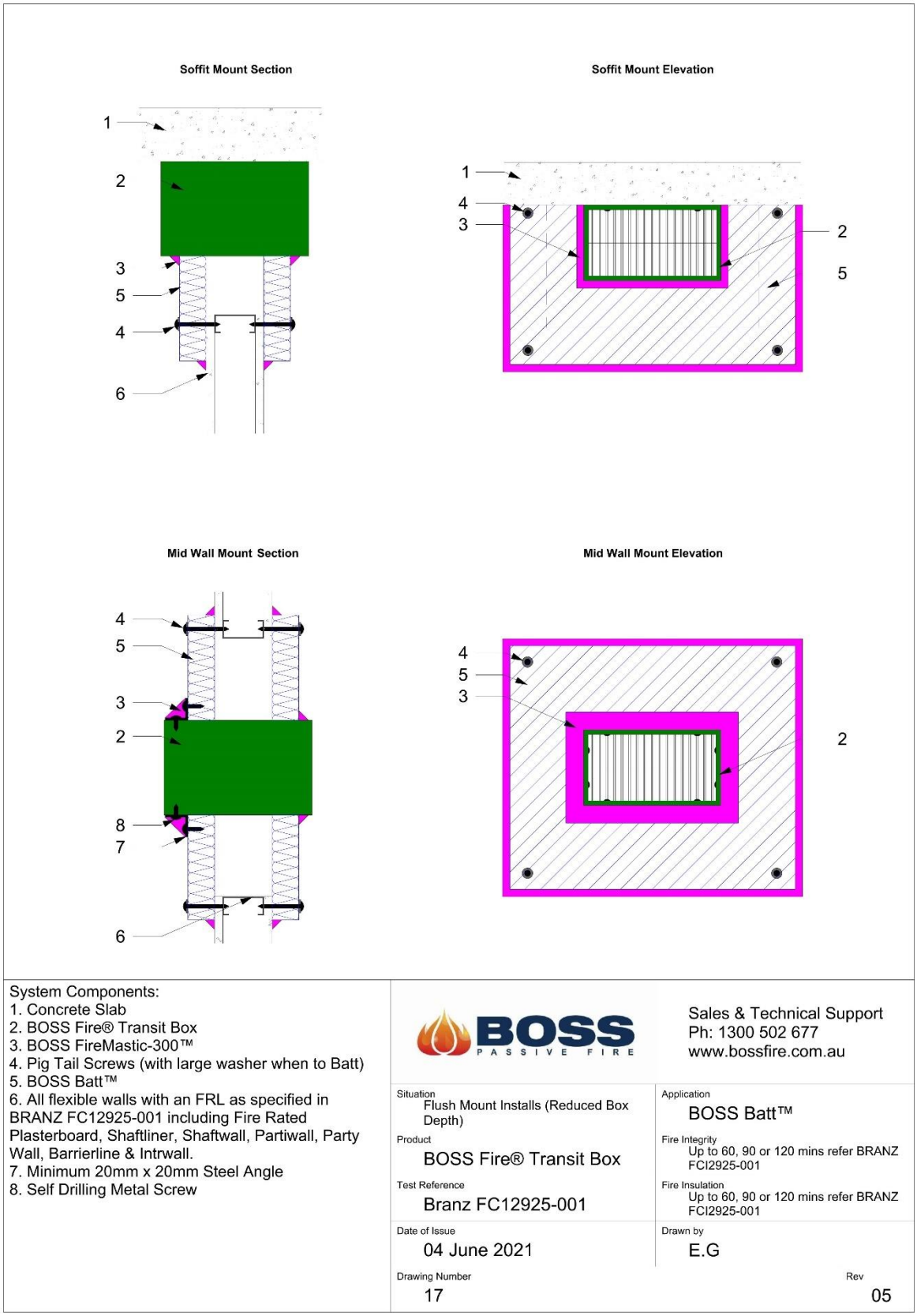
Sales & Technical Support
Ph: 1300 502 677
www.bossfire.com.au

Situation: Flush Mount Installs (Reduced Box Depth)	Application: BOSS Batt™
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 16	Rev: 05

Figure 17: BOSS Fire® Transit Box – Installation in BOSS Batt Infill Panel. - Soffit Mount & Mid Wall Mount –Flexible Walls – 60, 90 & 120min FRL



System Components:
1. Concrete Slab
2. BOSS Fire® Transit Box
3. BOSS FireMastic-300™
4. Pig Tail Screws (with large washer when to Batt)
5. BOSS Batt™
6. All flexible walls with an FRL as specified in BRANZ FC12925-001 including Fire Rated Plasterboard, Shaftliner, Shaftwall, Partiwall, Party Wall, Barrierline & Intrwall.
7. Minimum 20mm x 20mm Steel Angle
8. Self Drilling Metal Screw

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Ph: 1300 502 677
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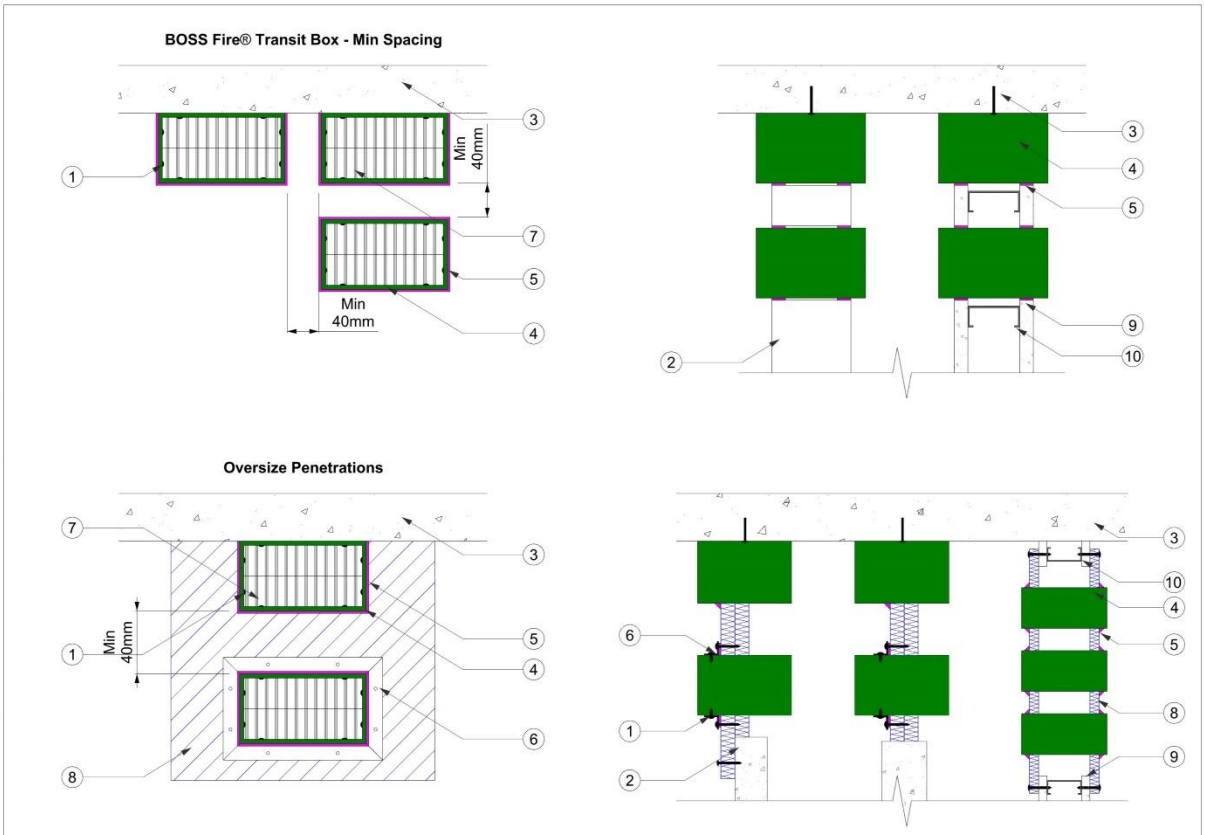
Situation: Flush Mount Installs (Reduced Box Depth)	Application: BOSS Batt™
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 17	Rev: 05

Figure 18: BOSS Fire® Transit Box – Multiple Units



System Components:
1. Mechanical Fixings
2. All Rigid walls with an FRL as specified in Branz FC 12925 including Concrete, Masonry, Speedpanel, Korok, Supapanel, AAC, Hebel, WALSC, AFS & Dincel.
3. Concrete
4. BOSS Fire® Transit Box
5. BOSS FireMastic-300™
6. Minimum 20m x 20mm Steel Angle
7. Brush Seals
8. BOSS Batt™ single for -/60/60 double for -/120/120
9. All flexible walls with an FRL as specified in Branz FC 12925 including FR Plasterboard, Shaftwall / Shaftliner, Barrierline, IntRwall and Partywall systems.
10. Steel Framing

*In accordance with clause 4.9.3 of AS4072.1-2005 separate services can be fitted in a modular form in the approved construction element with minimum 40mm separation.

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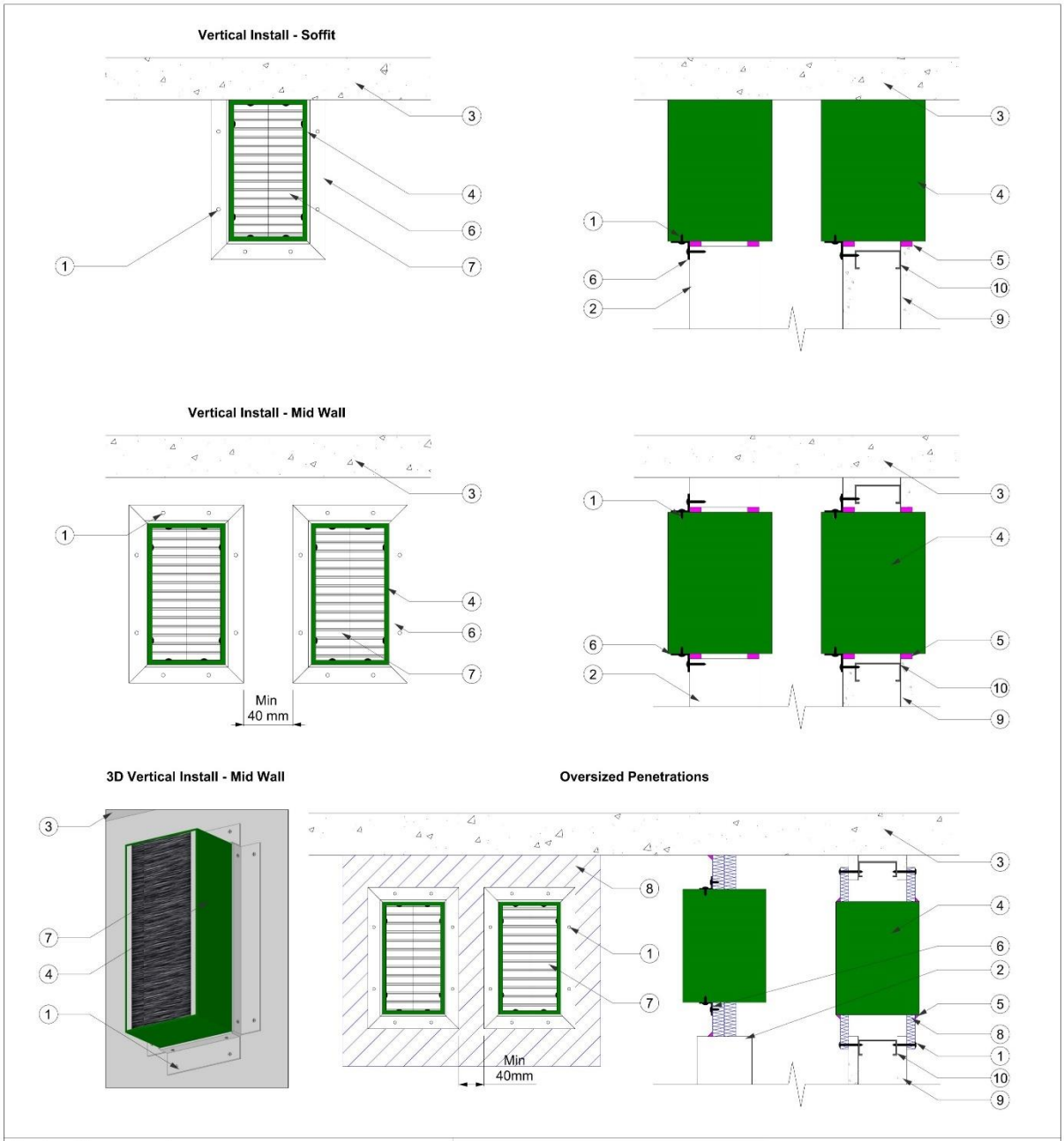
Situation: Mid Mount and Soffit Mount	Application: Wall & Batt Systems
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 18	Rev: 05

Figure 19: BOSS Fire® Transit Box – Vertical Installation



System Components:
1. Mechanical Fixings
2. All Rigid walls with an FRL as specified in Branz FC 12925 including Concrete, Masonry, Speedpanel, Korok, Supapanel, AAC, Hebel, WALSC, AFS & Dincel.
3. Concrete
4. BOSS Fire® Transit Box
5. BOSS FireMastic-300™
6. Minimum 20m x 20mm Steel Angle
7. Brush Seals
8. BOSS Batt™ single for -/60/60 double for -/120/120
9. All flexible walls with an FRL as specified in Branz FC 12925 including FR Plasterboard, Shaftwall / Shaftliner, Barrierline, IntRwall and Partywall systems.
10. Steel Framing

*In accordance with clause 4.9.3 of AS4072.1-2005 separate services can be fitted in a modular form in the approved construction element with minimum 40mm separation.

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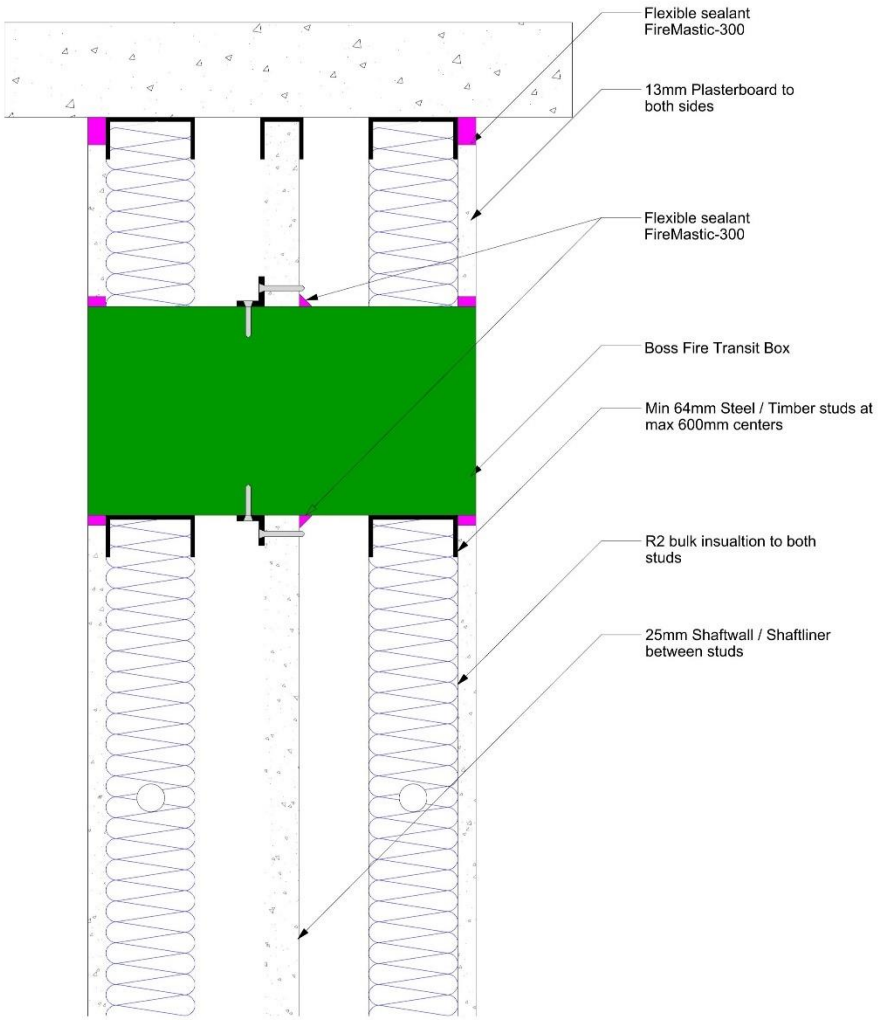
Situation: Vertical Orientation Mid Mount and Soffit Mount	Application: Wall & Batt Systems
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 19	Rev: 05

Figure 20: BOSS Fire® Transit Box – Party Wall systems

Residential Party Walls / Partiwall / IntRwall / Party Wall Systems



Services Summary:

1. To ensure support to plasterboard linings, additional studs may be required.
2. If the Boss Fire Transit Box is installed adjacent to a full length vertical stud then an additional trimmer stud and noggin may be required.
3. If the Boss Fire Transit Box is installed centrally between full length vertical studs, then 2 additional trimmer studs may be required.
4. Mid-wall applications can be fixed to the wall or plasterboard facing via a surface mounted angle flange bracket, minimum 20x20mm.
5. BOSS FireMastic-300TM to be used for perimeter seal and smoke seal around Boss Fire Transit Box.
6. For Shaft Wall applications with access from one side only face fit Angle Bracket to shaft lining and fasten to both Boss Fire Transit Box and wall face. For Angle Brackets mounted on both wall faces, fasten to wall face only.
7. Consult test approval and Tech Data Sheet for more information.

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Ph: 1300 502 677
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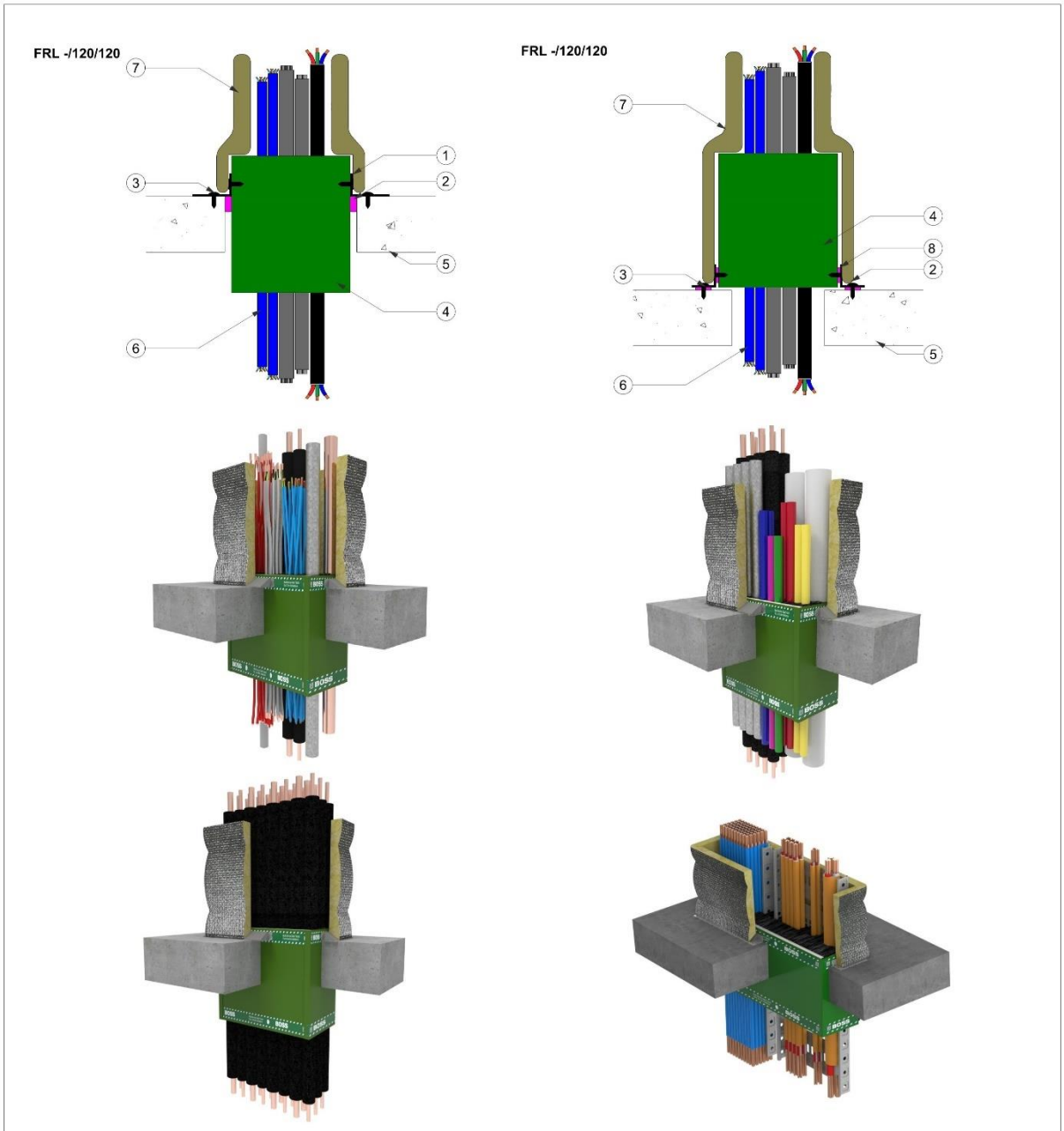
Situation: Boss Fire Transit Box in Party Wall Systems	Application: Mid wall or soffit wall mount
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Refrence: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn By: E.G
Drawing Number: 20	Rev: 05

Figure 21: BOSS Fire® Transit Box – Installation in concrete floor slab



System Components:
1. Min 20mm x 40mm with 40mm side against the concrete
2. BOSS FireMastic-300™
3. Mechanical Fixing
4. BOSS Fire® Transit Box
5. Concrete
6. Services
7. BOSS P40-MAK Wrap™
8. Min 20mm x 20mm Angle

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Ph: 1300 502 677
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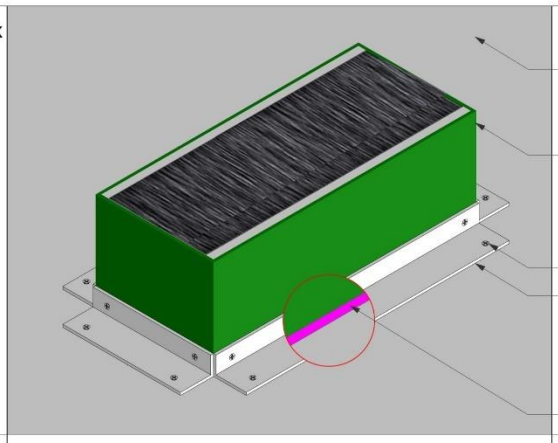
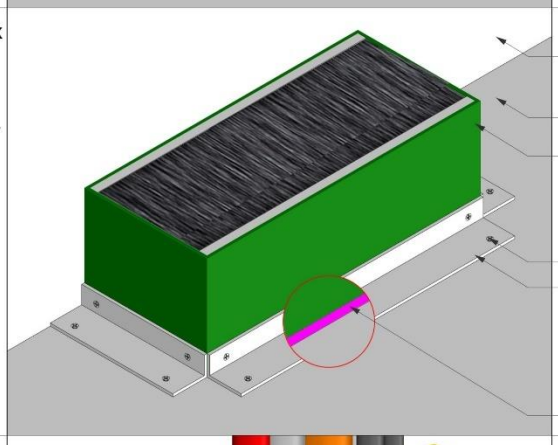
Situation: Floor Slab Penetration	Application: Concrete Floor Slab
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 21	Rev: 05

Figure 22: BOSS Fire® Transit Box – Floor installation

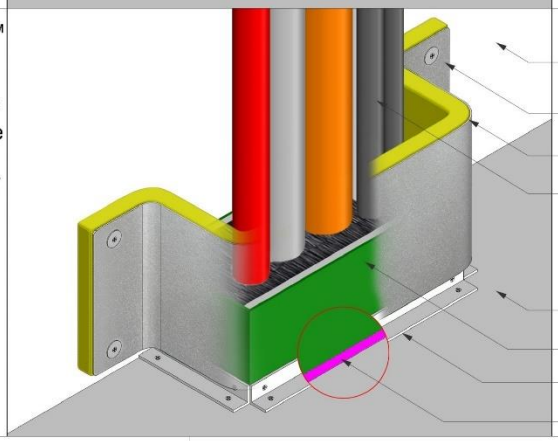
Where BOSS Fire® Transit Box penetrates or sits atop or underside a floor slab 20mm x 20mm equal angle must be fitted to all four side of box. Where box penetrates slab a 20 x 40mm angle will be required.



Where BOSS Fire® Transit Box penetrates or sits atop or underside a floor slab and is hard against a wall. 20mm x 20mm equal angle fixed to floor slab on 3 available faces. Where box penetrates slab a 20 x 40mm angle will be required.



Where BOSS P40-MAK Wrap™ cannot wrap around all four sides of the services due to services being against a wall or soffit P40-MAK Wrap™ Can be fixed to wall or soffit using suitable fixings and washers for substrate.



System Components:
1. 20mm x 40mm Angle when box penetrates concrete. Min 20mm x 20mm Anlge when box fixed, to top or underside of floor.
2. BOSS FireMastic-300™
3. Mechanical Fixing
4. BOSS Fire® Transit Box
5. Concrete
6. Services
7. BOSS P40-MAK Wrap™
8. Wall

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Ph: 1300 502 677
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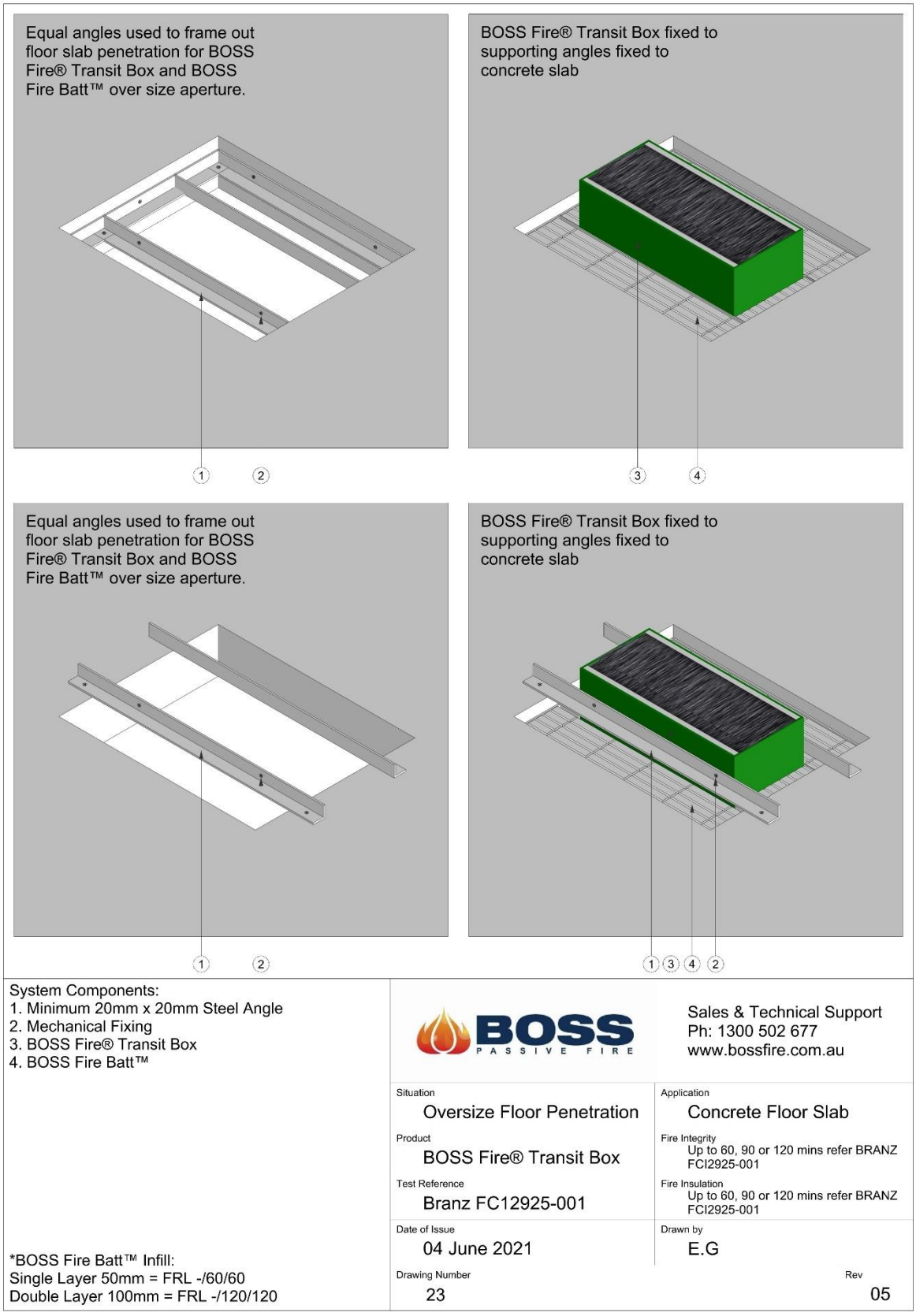
Situation: Floor slab Penetration -Mid Floor -Up against Wall	Application: Concrete Floor Slab
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 22	Rev: 05

Figure 23: BOSS Fire® Transit Box – Floor Installation with Large Opening



System Components:
1. Minimum 20mm x 20mm Steel Angle
2. Mechanical Fixing
3. BOSS Fire® Transit Box
4. BOSS Fire Batt™

*BOSS Fire Batt™ Infill:
Single Layer 50mm = FRL -/60/60
Double Layer 100mm = FRL -/120/120

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Ph: 1300 502 677
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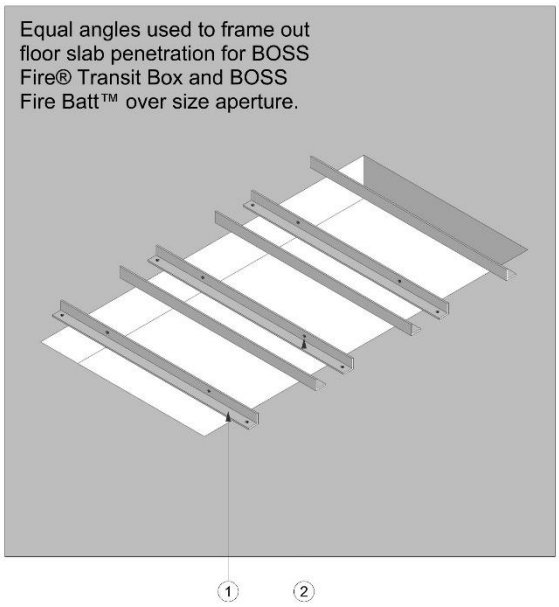
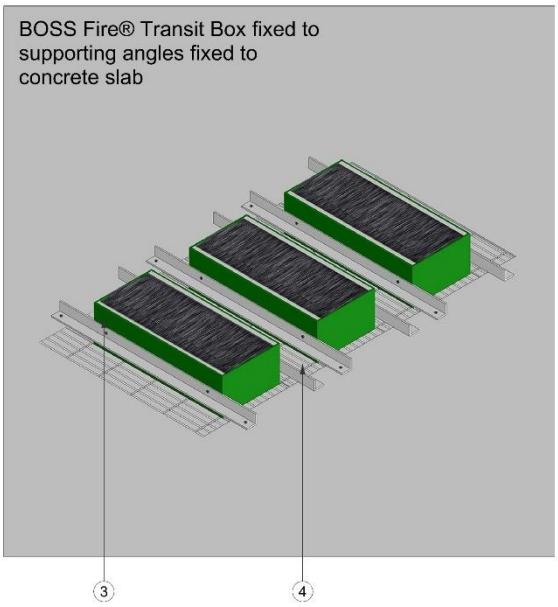
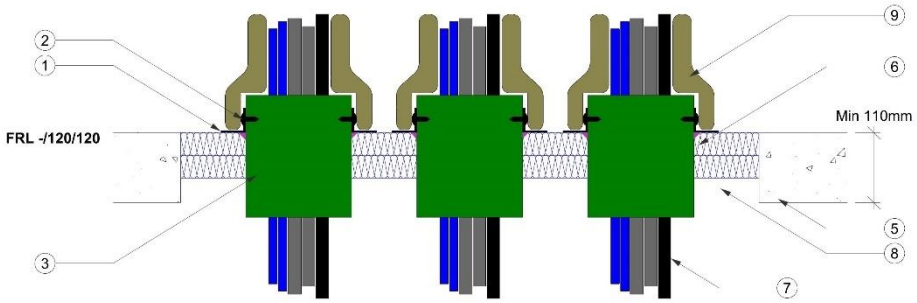
Situation: Oversize Floor Penetration	Application: Concrete Floor Slab
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 23	Rev: 05

Figure 24: BOSS Fire® Transit Box – Multiple in Floor Slab







System Components:
1. Minimum 20mm x 20mm Steel Angle
2. Mechanical Fixing
3. BOSS Fire® Transit Box
4. 50mm BOSS Fire Batt™
5. Concrete
6. BOSS FireMastic-300™
7. Services
8. Double 50mm BOSS Batt™
9. BOSS P40-MAK Wrap™

*In accordance with clause 4.9.3 of AS4072.1-2005 separating services can be fitted in a modular form in the approved construction element with minimum 40mm separation.

40mm seperation.
*BOSS Fire Batt™ Infill:
Single Layer 50mm = FRL -/60/60
Double Layer 100mm = FRL -/120/120

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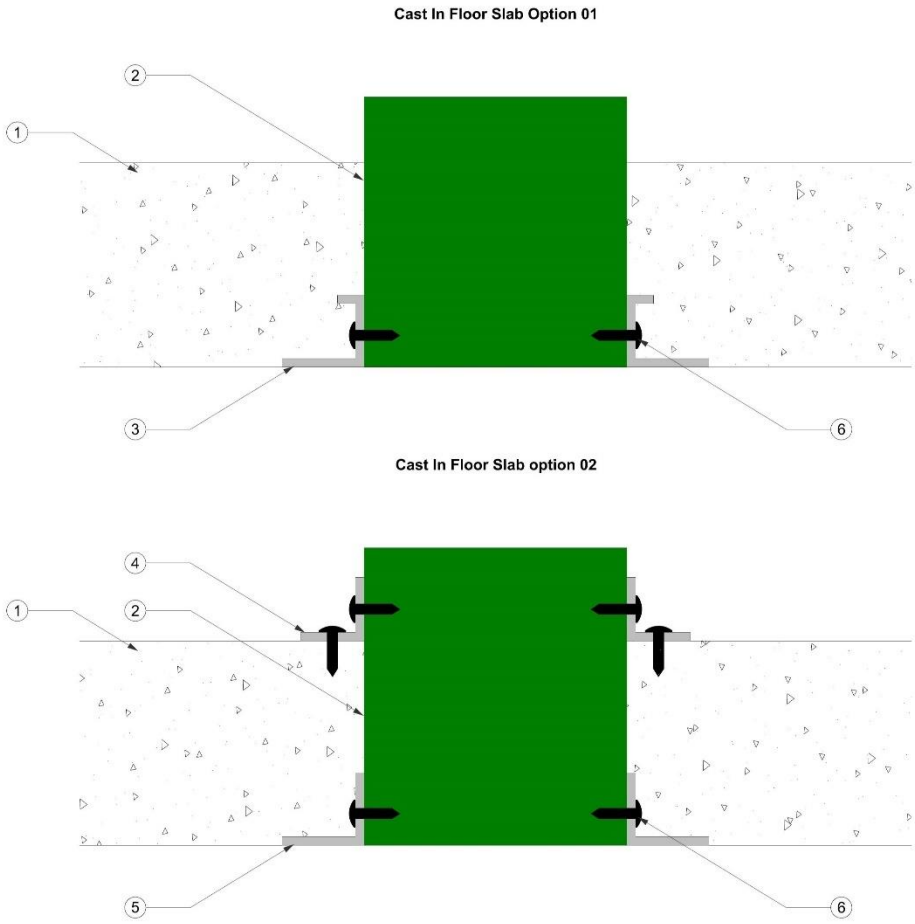
Situation: Oversize Floor Penetration	Application: Concrete Floor Slab
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 24	Rev: 05

Figure 25: BOSS Fire® Transit Box – Concrete Slab Cast-In Installation



System Components:
1. Concrete Slab
2. BOSS Fire® Transit Box
3. Pre-attached J-Track to box perimeter
4. Retrofit Min 20mm x 20mm Angle to box perimeter
5. Pre-attached angle to box perimeter
6. Mechanical Fixing

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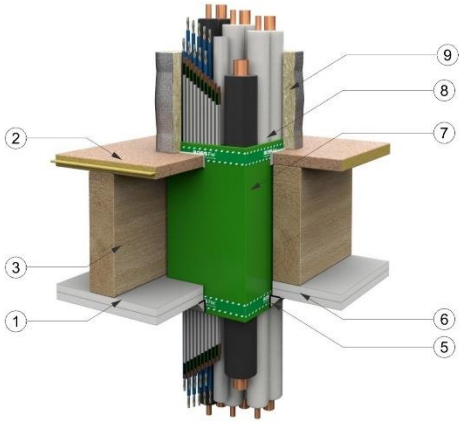
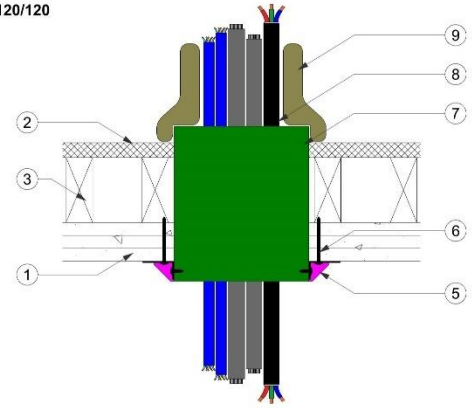
Ph: 1300 502 677
www.bossfire.com.au

Situation: Cast In Floor Slab	Application: Other Wall Systems
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 25	Rev: 05

Figure 26: BOSS Fire® Transit Box – Floor/Ceiling Systems



FRL -/120/120



System Components:
1. 13mm FR Plasterboard
2. 19mm Chipboard Flooring
3. Wooden Floor Joist
5. BOSS FireMastic-300™
6. Mechanical Fixing
7. BOSS Fire® Transit Box
8. Services
9. BOSS P40-MAK Wrap™

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Situation: Floor + Ceiling Penetration	Application: Floor + Ceiling
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 26	Rev: 05

Figure 27: BOSS Fire® Transit Box – Technical Drawing

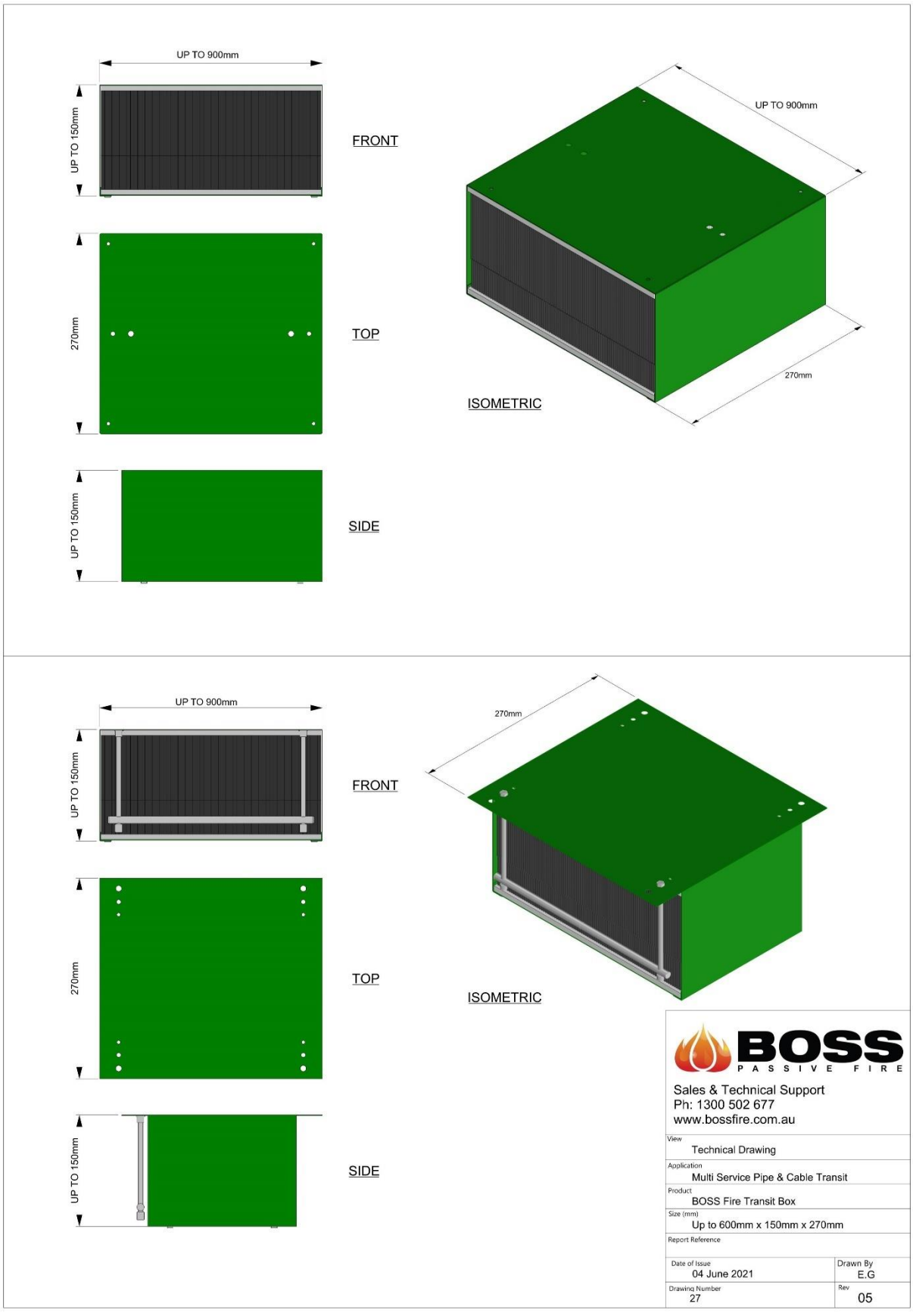
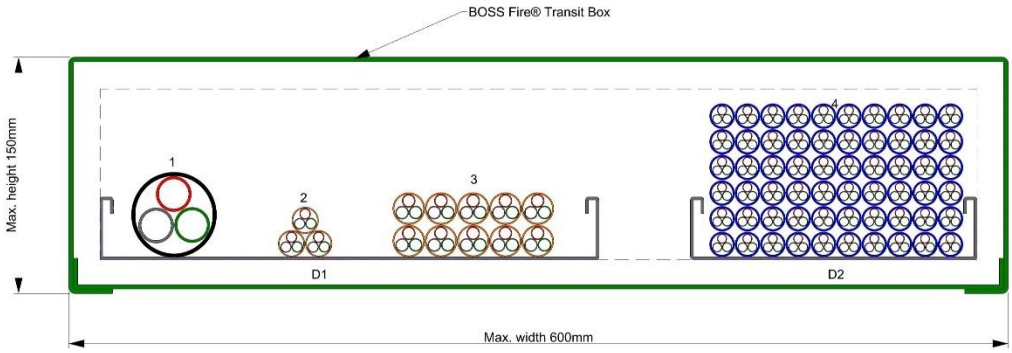
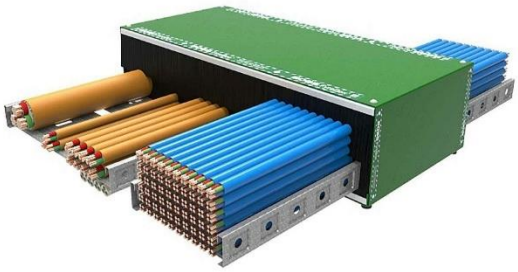


Figure 28: BOSS Fire® Transit Box – Standard Configuration for Cables





System Components:
1. Power Cables: Full range of power cables as per AS1530.4 Appendix D1 (excluding 630mm²) can be bundled into the BOSS Fire® Transit Box.
2. Data Cables: Full range of data communication cables as per AS1530.4 Appendix D2 can be bundled into the BOSS Fire® Transit Box.

Note:
AS30000 and associated wiring rules require separation between power and data cables. Always maintain minimum separation of at least 50mm between services and check with your local Authority of relevant Standard for more information.

BOSS PASSIVE FIRE

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Ph: 1300 502 677
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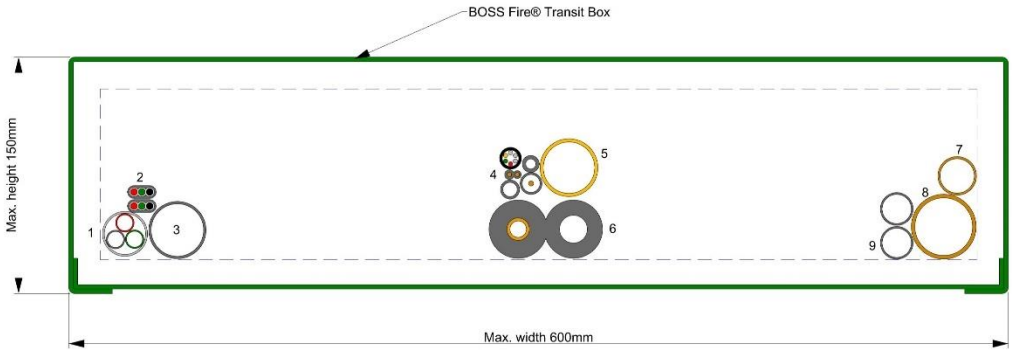
Situation: Standard configuration of cables	Application: Fire Wall & Riser Penetrations
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 28	Rev: 05

Figure 29: BOSS Fire® Transit Box – Low Fill Services



System Components:
1. 10mm² 2C & E Mains
2. 2.5mm² 2C 7 E TPS (2x)
3. 32mm uPVC Conduit
4. Comms cable - Coax, 6C security, 2C Firesense Alarm, Cat 5e & Cat 6 Cables
5. 32mm PEX-AL Gas Pipe
6. 13/19mm Pair Coil
7. 25mm Copper Water Pipe
8. 42mm Steel Sprinkler Pipe
9. 32mm PEX Water Pipe (2x)

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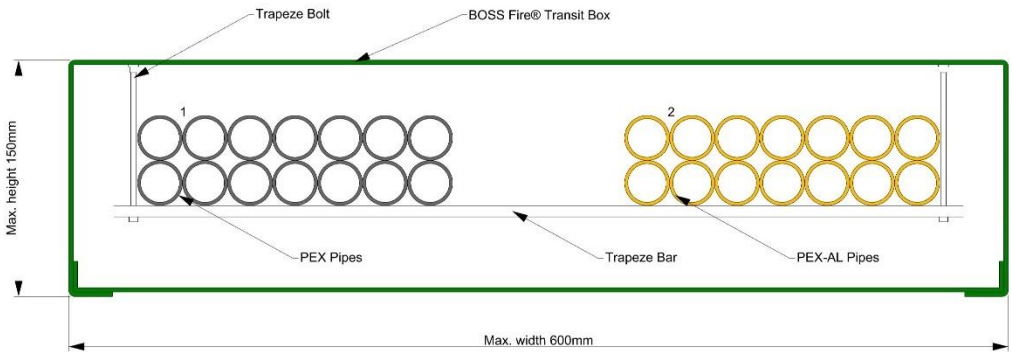
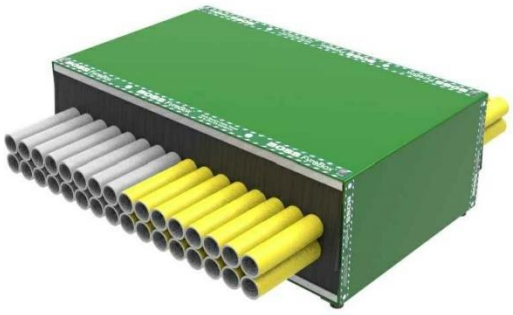
Situation: Service Spearation in Fire Walls	Application: Typical Apartment Arrangement
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 29	Rev: 05

Figure 30: BOSS Fire® Transit Box – Installation detail - plastic pipes





System Components:
1. PEX pipes up to 32mm diameter
2. PEX-AL pipes up to 32mm diameter
3. PVC pipes up to 32mm diameter

Note:
AS3500 plumbing standard may require minimum speration between services.

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Ph: 1300 502 677
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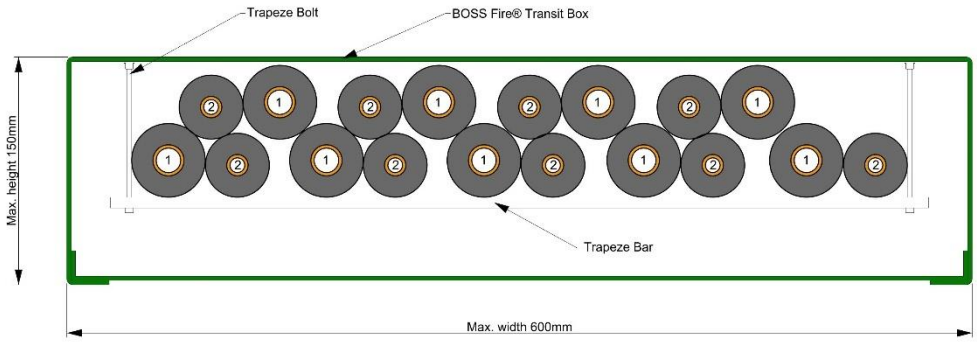
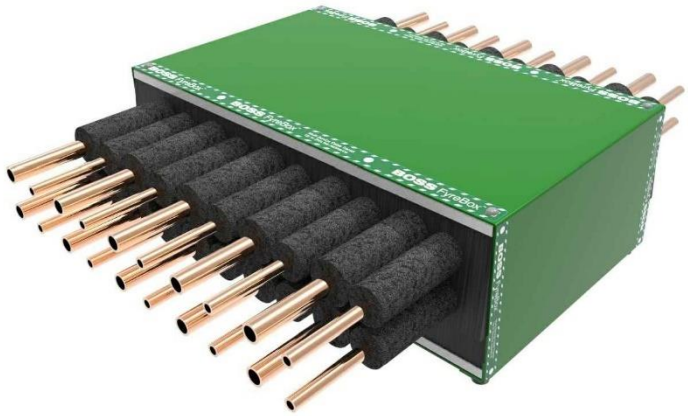
Situation: Bundled Plumbing Services	Application: Fire Wall & Riser Penetrations
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 30	Rev: 05

Figure 31: BOSS Fire® Transit Box – Installation detail - copper pipes





System Components:
- Paircoil up to 13/19mm insulated copper pipes.
- Copper Pipe up to 25mm OD with minimum 13mm thick non-combustible lagging AS1530.1.
- Copper Pipe up to 32mm OD with minimum 19mm thick continuous armaflex FRV, K-Flex lagging or Thermobreak lagging.
- Copper Pipe up to 50.8mm OD with minimum 25mm thick FR lagging.
- Copper Pipe up to 50.8mm OD uninsulated.

*All services have different insulation performance without P40-MAK Wrap. Refer to Branz FC12925-001 to obtain performance values.

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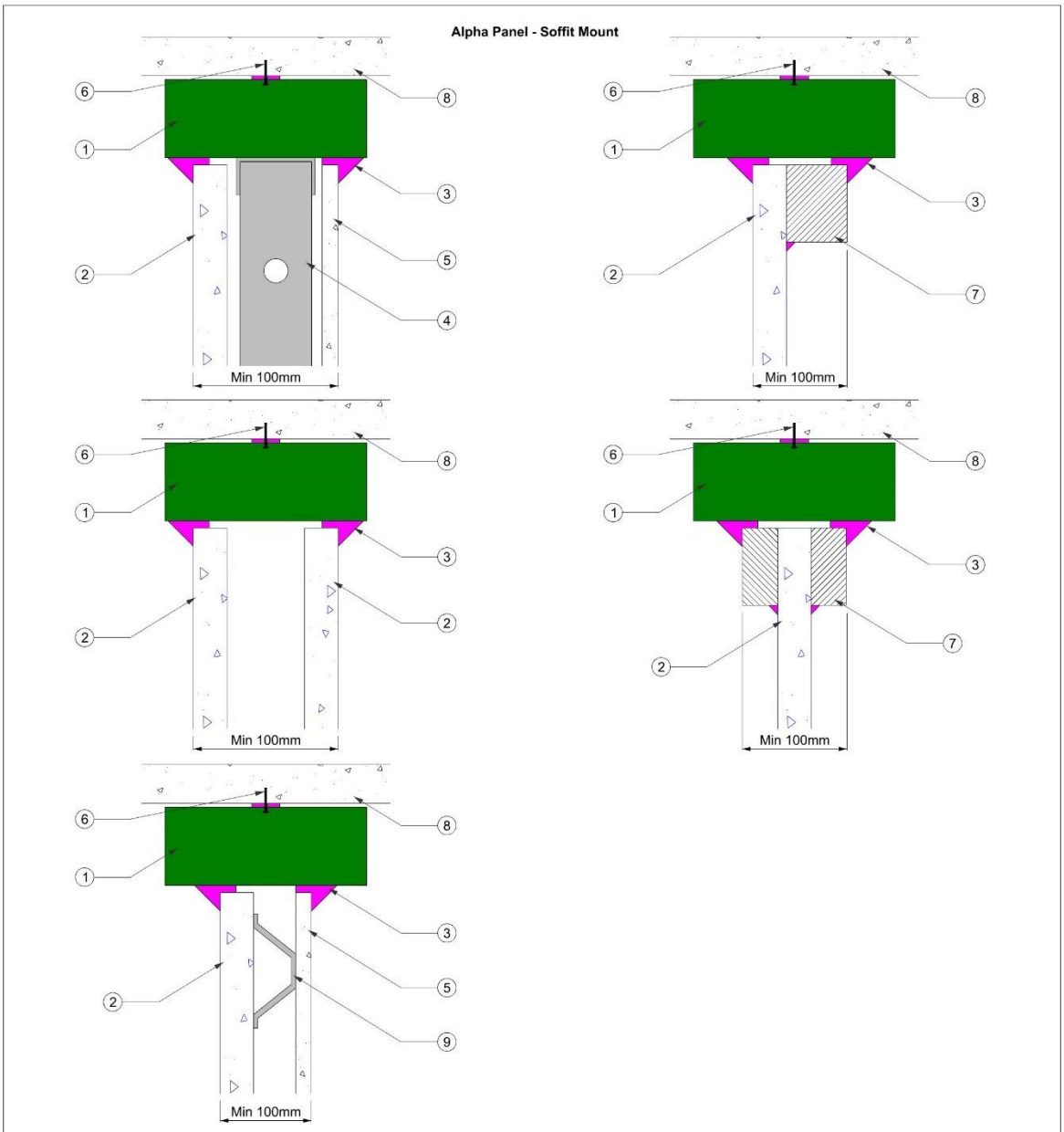
Situation: Bundled HVAC&R	Application: Fire Wall & Riser Penetrations
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 04 June 2021	Drawn by: E.G
Drawing Number: 31	Rev: 05

Figure 32: BOSS Fire® Transit Box – Alpha Panel installation (Under slab)



System Components:
1. BOSS Fire® Transit Box
2. Alpha Panel
3. BOSS FireMastic-300™ or other Approved Sealant
4. Steel Stud
5. Fire Rated Plasterboard
6. Mechanical Fixing
7. Localised Build up to Min 100mm:
   -Fire Rated Plasterboard
   -BOSS Batt
   -Calcium Silicate Board

Note: Minimum wall thickness to be100mm. This can include localised thickening to the wall using Fire Rated Plasterboard, BOSS Batt or Calcium Silicate Board. Minimum sealant fillet size to be 15mm x 15mm in addition to the minimum 100mm wall thickness.

8. Concrete Slab
9. Baton/Furring Channel

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Ph: 1300 502 677
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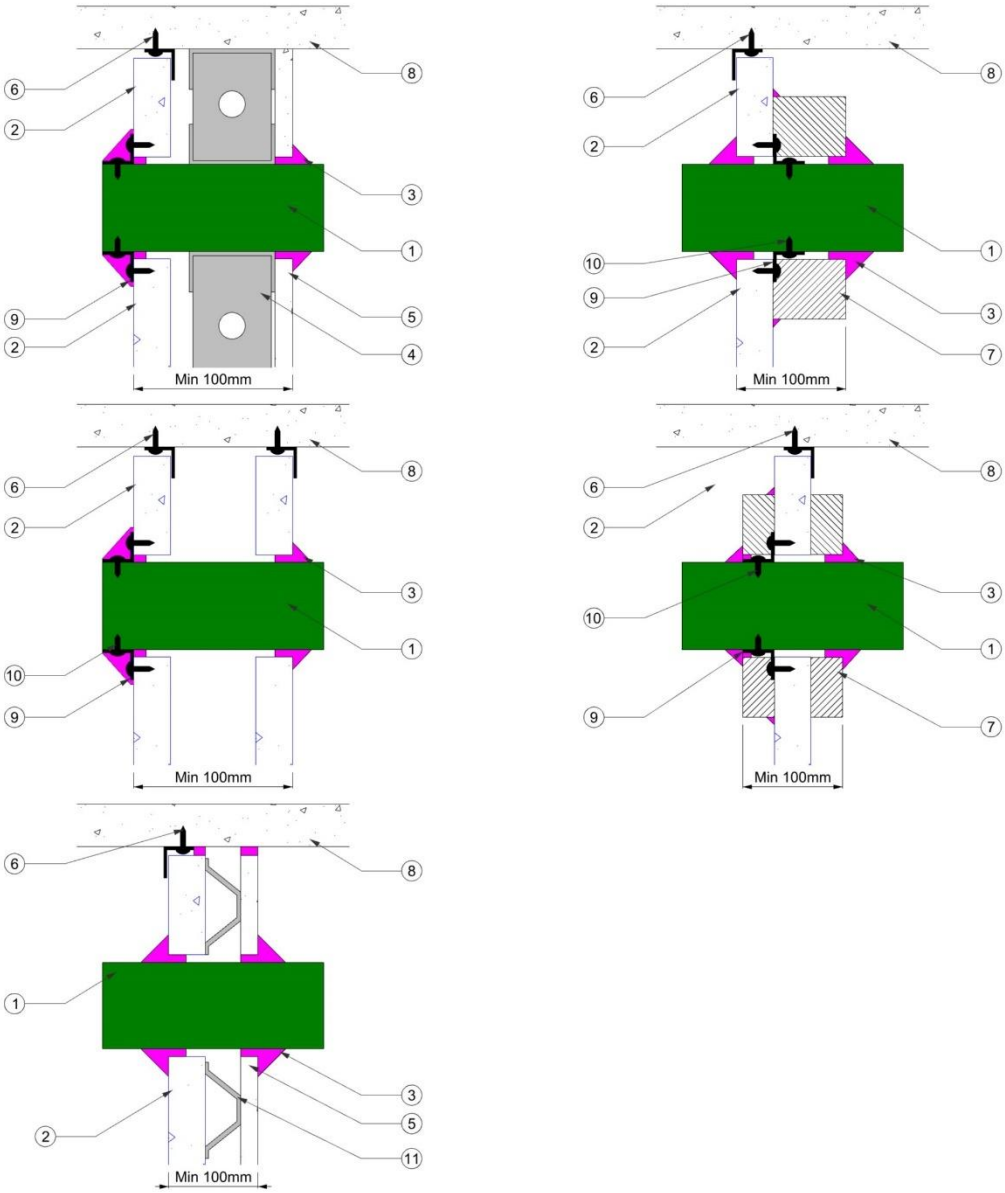
Situation: AlphaPanel Wall	Application: Soffit Mount
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 16 February 2022	Drawn by: E.G
Drawing Number: 32	Rev: 01

Figure 33: BOSS Fire® Transit Box – Alpha Panel installation (Within wall)



System Components:
1. BOSS Fire® Transit Box
2. Alpha Panel
3. BOSS FireMastic-300™ or other Approved Sealant
4. Steel Stud
5. Fire Rated Plasterboard
6. Mechanical Fixing
7. Localised Build up to Min 100mm:
   -Fire Rated Plasterboard
   -BOSS Batt
   -Calcium Silicate Board

Note: Minimum wall thickness to be 100mm. This can include localised thickening to the wall using Fire Rated Plasterboard, BOSS Batt or Calcium Silicate Board. Minimum sealant fillet size to be 15mm x 15mm in addition to the minimum 100mm wall thickness.

9. Steel Angle - Min 20mm x 20mm x 1mm
10. Screw
11. Baton/Furring Channel

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Sales & Technical Support
Ph: 1300 502 677
www.bossfire.com.au

Situation: AlphaPanel Wall	Application: Mid Wall Mount
Product: BOSS Fire® Transit Box	Fire Integrity: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Test Reference: Branz FC12925-001	Fire Insulation: Up to 60, 90 or 120 mins refer BRANZ FCI2925-001
Date of Issue: 16 February 2022	Drawn by: E.G
Drawing Number: 33	Rev: 01