



FIRE ASSESSMENT REPORT

FAR 3314 ISSUE 2

FIRE RESISTANCE ASSESSMENT OF TRAFALGAR ACCESS PANELS IN ACCORDANCE WITH AS 1530.4:2014

CLIENT

Trafalgar Group Pty Ltd
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REPORT NUMBER:

FAR 3314 ISSUE 2

ISSUE DATE:

28 June 2021

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ASSESSMENT OBJECTIVE

To assess the fire resistance, in accordance with AS 1530.4:2014 and AS 4072.1-2005 Section 3, of Trafalgar access panels.

CONCLUSION

It is considered that the access panels tested in FP 4026, FP 4109 and FR 3982 with the following variations would achieve Integrity up to 120 minutes or as stated below, if tested in accordance with AS 1530.4:2014, AS 4072.1-2005 Section 3 and BS 476: Part 22: 1987:

- Any of the following lock hardware
 - Budget lock
 - Gainsborough 6200F rim night latch
 - Lockwood 507 rim night latch
 - Trafalgar FCAP rim night latch
- Intumescent seal either
 - HP4002 intumescent seal, or
 - Trafalgar 20 mm perimeter strip intumescent seal
- Increase in size - Hinged access panels
 - Panels up to 600 mm x 600 mm; one lock with two hinges
 - Panels from 600 mm x 600 mm to 1,000 mm x 600 mm; two locks with three hinges.
 - Panels from 1,000 mm x 600 mm to 1,000 mm x 1,000 mm, three locks with three hinges, one lock along each perpendicular edge.
- Screw fixed access panels
 - 400 mm x 400 mm 2 screws per side
 - 600 mm x 600 mm 3 screws per side
 - 1,000 mm x 1,000 mm 4 screws per side
- Frame edge detail either set edge or standard detail.
- Panel facing
 - MDF 60 minutes Integrity
 - MDF plus intumescent paint 90 minutes Integrity
 - Fibre cement or Magnesium oxide board 120 minutes Integrity

These variations apply to both horizontal and vertical orientations.

For wall applications the access panels can be faced with MDF and/or with intumescent paint and achieve 120 minutes Integrity.



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The insulation achieved from the tests is as follows:

Average temperature rise measured on the panel exceeds 140 K rise after 60 minutes.

Maximum temperature rise measured on the frame exceeds 180 K rise after 15 minutes.

RISF of at least 60 minutes

For wall applications where the frame is covered with an MDF architrave the average temperature rise is at least 60 minutes.

LIMITATION

This assessment is subject to the completeness and accuracy of the information supplied.

BRANZ reserves the right to amend or withdraw this assessment should additional information become available regarding the fire performance of the items assessed in this report.

Note RISF does not apply to BS 476: Part 22: 1987.

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The results reported here relate only to the item/s described in this report.



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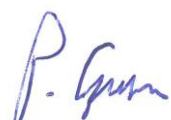
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DOCUMENT REVISION STATUS

ISSUE NO.	DATE ISSUED	DESCRIPTION
01	8 September 2009	Initial Issue
02	28 June 2021	Update to AS 1530.4: 2014, amendment to report sponsor and formatting – FC14239-001



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1. INTRODUCTION

This report gives BRANZ's assessment of the fire resistance to AS 1530.4:2014 and BS 476: Part 22: 1987 of Trafalgar's access panels installed into walls and ceilings.

2. BACKGROUND

2.1 Supporting Data - BRANZ Fire Resistance Tests

In pilot fire resistance test FP 4109 an un-reported access panel was tested in a plasterboard ceiling with timber joists. The access panel consisted of a steel frame mounted within an opening in the plaster board ceiling which was trimmed to all sides with timber joists and full depth blocking. The frame was secured directly to the timber framing. The leaf consisted of a nominal 30 mm thick calcium silicate panel faced with 5 mm MDF to each face with two mild steel budget hinges and a steel locking mechanism. A Trafalgar 20 mm perimeter strip intumescent seal was positioned on the frame rebate around the four edges of the panel. The panel was nominally 390 mm x 386 mm x 40 mm thick with an intumescent coating applied to the MDF facing.

In pilot fire resistance test FP 4026 an access panel was tested in a plasterboard ceiling with timber joists. The access panel consisted of a steel frame mounted within an opening in the plaster board ceiling which was trimmed to all sides with timber joists and full depth blocking. The frame was secured directly to the timber framing. The leaf consisted of a nominal 30 mm thick calcium silicate panel faced with 4 mm MDF to each face with two mild steel budget hinges and a stainless steel rim night latch and key cylinder. A Lorient HP4002 intumescent seal was positioned on the frame rebate around the four edges of the panel. The panel was nominally 590 mm x 390 mm x 39 mm thick.

In fire resistance test FR 3982 a number of penetrations were tested including an access panel mounted in a 2 hour plasterboard wall. The access panel consisted of a steel frame mounted to the unexposed face of a plasterboard lined opening in the wall. The frame was screw fixed through the plasterboard to the steel studs. The panel was 390 mm x 390 mm and secured with two steel budget hinges and a Lockwood LW Rim night-latch. On the unexposed face the steel framing was overlaid with MDF architraves and achieved the following result:

Integrity	120 minutes
Insulation	67 minutes

In BRANZ fire resistance test FR 4047 nine removable access panels were tested in accordance with AS 1530.4-2005 for 246 minutes. The panels were supported on a steel frame structure covered with layers of Maxilite calcium silicate boards. The removable access panels were of varying thickness and sizes with one panel nominally 990 mm x 990 mm x 30 mm thick. There were no Integrity failures of the access panel for the 246 minute duration of the test.

3. BASIS OF ASSESSMENT

This assessment assumes that the Trafalgar access panels will be constructed as tested in the test reports described in Section 2 above.



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4. DISCUSSION

4.1 BS 476: Part 22: 1987 v AS 1530.4-2005

The testing referenced in Section 2 above described a series of fire resistance tests in accordance with AS 1530.4-2005. A comparison has been made between the test standards and it is determined the test criteria and failure criteria is sufficiently similar to transfer the test results of Integrity and Insulation. Therefore it is considered where a result has been achieved in accordance with AS 1530.4-2005 with regards to Integrity it would also apply to BS 476: Part 22:1987.

4.2 AS 1530.4-2005 v AS 1530.4:2014

The testing referenced in Section 2 above described a series of fire resistance tests in accordance with AS 1530.4-2005. A review has been undertaken between the 2005 and 2014 versions of AS 1530.4 with respect to access panel testing. Based on the review it is considered the changes in versions would not have changed the reported performance of the access panels. Therefore, it is expected had the access panels been tested in accordance with AS 1530.4:2014 a similar result for Integrity and Insulation would be expected.

4.3 Access Panel Hardware

In the fire resistance tests FP 4026, FP 4109 and FR 3982 a generic steel locking mechanism, a Lockwood night rim latch and a Trafalgar FCAP stainless steel rim night latch were tested respectively for up to 120 minutes. No failures were attributed to the locking mechanism of the access panels for the duration of the tests.

Trafalgar have supplied samples of the locksets tested and a Gainsborough 6200F and Lockwood 507 rim latches. The two locksets are similar in size and either mild or stainless steel construction including the latch bolt and strike. Based on the performance of the tested locking mechanisms it is considered the Gainsborough 6200F and Lockwood 507 rim latch would perform at least as well as those tested. Therefore it is considered the fire resistance of the access panels would not be prejudiced with any of the following locksets:

- Budget lock
- Gainsborough 6200F rim night latch
- Lockwood 507 rim night latch
- Trafalgar FCAP rim night latch

4.4 Panel Facing

The access panels have been tested in the following configurations:

Test No.	Core	Facing	Orientation	Integrity
FP 4026	30 mm Maxilite	4mm MDF	Ceiling	87 minutes
FP 4109	30 mm Maxilite	4mm MDF & intumescent coating	Ceiling	119 minutes
FR 3982	30 mm Maxilite	4mm MDF	Wall	120 minutes



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In FP 4026 and FP 4109 the access panels failed the Integrity criteria due to flaming of the MDF facing and glowing/flaming of a cotton pad. It is proposed to replace the facings with either 4 mm fibre cement or magnesium oxide board both of which are essentially non-combustible. It is considered that replacing the MDF with a material that does not erode during fire exposure will prevent ignition of the facing. It is also considered the gaps between the leaf and frame will remain the same during the test and therefore is not expected to fail a cotton pad test before 120 minutes. Therefore it is considered if the access panels were faced with either 4 mm fibre cement or magnesium oxide board it would not fail the integrity criteria before at least 120 minute.

4.5 Alternative Perimeter Intumescent Seal

In fire resistance test FP 4109 a Trafalgar 20 mm perimeter strip intumescent seal was positioned in the rebate of the steel frame. The access panel maintained the Integrity criteria until ignition of a cotton pad after 119 minutes. In fire resistance test FP 4026 a Lorient HP4002 intumescent seal was positioned in the rebate of the steel frame. The access panel maintained the Integrity criteria until ignition of the MDF facing after 87 minutes. In FR 3982 the rebate was lined with a Lorient HP4002 strip of 1.65 mm thick x 20 mm wide intumescent. The access panel maintained the integrity criteria for 120 minutes until flaming of the MDF architrave. Based on the test results it is considered either the Trafalgar or Lorient intumescent seals can be used with the Trafalgar access panel for up to 60 minutes Integrity in either wall or ceiling applications when faced with MDF.

If the access panel is faced with either 4 mm fibre cement or 4 mm thick magnesium oxide board it is considered the integrity of the access panel with either intumescent seal can be extended up to an Integrity of 120 minutes.

4.6 Access Panel Size

In the Trafalgar fire resistance tests on the access panels the largest panel size tested was 590 mm x 390 mm in a ceiling system. The access panel consists of a nominally 30 mm thick calcium silicate panel faced with MDF. In fire resistance test FR 4047 panels up to 990 mm x 990 mm were tested for up to 240 minutes without significant deflection. The access panels tested in FR 4047 were resting on top of a calcium silicate support around the perimeter of each removable panel.

In fire resistance test FP 4026 the largest access panel tested was 590 mm x 390 mm. In FR 4047 panels supported on the underside were tested for 240 minutes without cracking or significant observations during the test. It is proposed to increase the maximum size for an access panel to 1,000 mm x 1,000 mm with the following configurations:

- Panels up to 600 mm x 600 mm; one lock with two hinges
- Panels from 600 mm x 600 mm to 1,000 mm x 600 mm; two locks with three hinges.
- Panels from 1,000 mm x 600 mm to 1,000 mm x 1,000 mm, three locks along the edge parallel to the three hinges, one lock along each perpendicular edge.

To ensure the larger access panels are supported to the same extent as tested the number of locks and hinges must also be increased.



Based on the performance of the tested access panels, information from FR 4047 and the fact the support of the panels is the same as tested as the size increases, it is considered an increase in size to a maximum of 1,000 mm x 1,000 mm would not prejudice the fire resistance of the access panels.

4.6.1 Screw Fixed Panel

As an alternative to the hinged panel design it is proposed to screw fix the panel to the access panel frame. The panels must be screw fixed as follows with at least 7g x 45 mm screws or larger:

- 400 mm x 400 mm 2 screws per side
- 600 mm x 600 mm 3 screws per side
- 1,000 mm x 1,000 mm 4 screws per side

It is considered the increase in panel size to 1,000 mm x 1,000 mm would not prejudice the fire performance of the access panel as the panel is secured along all four sides.

4.7 Alternative Frame Detail

In the fire resistance tests referenced above the steel frame of the access panel consisted of a double rebate section with a bottom flange which extended over the edge of the plasterboard opening in the ceiling. It is proposed to change this detail to include a set bead. Figure 1 to Figure 4 show the different frame details. Figure 1 is the tested frame design and Figure 2 to Figure 4 show the alternative design. The two main variations are the setting bead detail (Figure 2 and Figure 4) and the screw fixed detail (Figure 3 and Figure 4). As long as the fixing of the frame to the opening in the ceiling is the same as tested it is considered it would not prejudice the fire performance of the access panels.



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5. CONCLUSION

It is considered that the access panels tested in FP 4026, FP 4109 and FR 3982 with the following variations would achieve Integrity up to 120 minutes or as stated below, if tested in accordance with AS 1530.4:2014, AS 4072.1-2005 Section 3 and BS 476: Part 22: 1987:

- Any of the following lock hardware
 - Budget lock
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 - Panels from 1,000 mm x 600 mm to 1,000 mm x 1,000 mm, three locks with three hinges, one lock along each perpendicular edge.
- Screw fixed access panels
 - 400 mm x 400 mm 2 screws per side
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- Frame edge detail either set edge or standard detail.
- Panel facing
 - MDF 60 minutes Integrity
 - MDF plus intumescent paint 90 minutes Integrity
 - Fibre cement or Magnesium oxide board 120 minutes Integrity

These variations apply to both horizontal and vertical orientations.

For wall applications the access panels can be faced with MDF and/or with intumescent paint and achieve 120 minutes Integrity.

The insulation achieved from the tests is as follows:

Average temperature rise measured on the panel exceeds 140 K rise after 60 minutes.

Maximum temperature rise measured on the frame exceeds 180 K rise after 15 minutes.

RISF of at least 60 minutes

For wall applications where the frame is covered with an MDF architrave the average temperature rise is at least 60 minutes.



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Figure 1: Standard Frame Detail (tested)

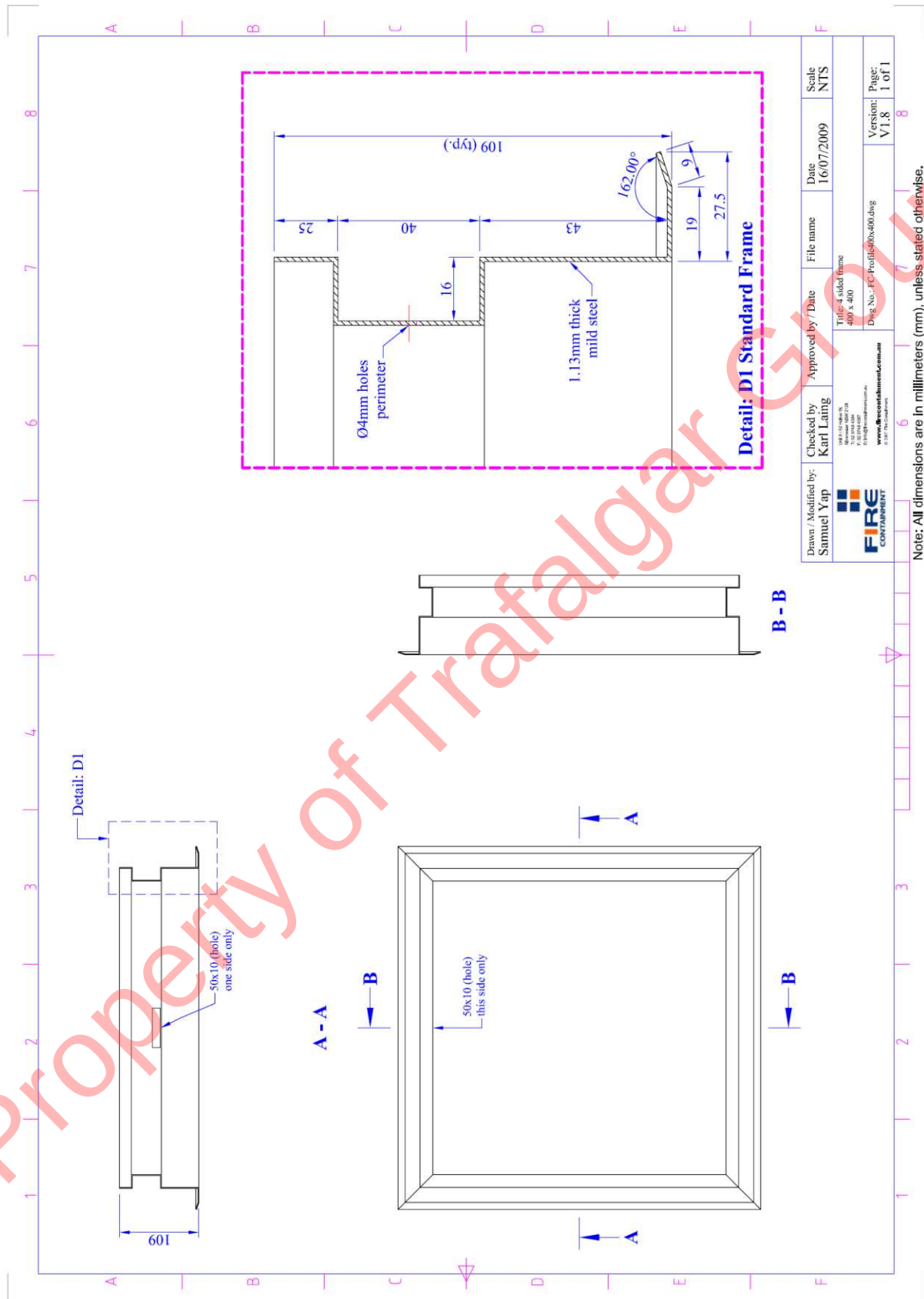


Figure 2: Frame Setting Bead

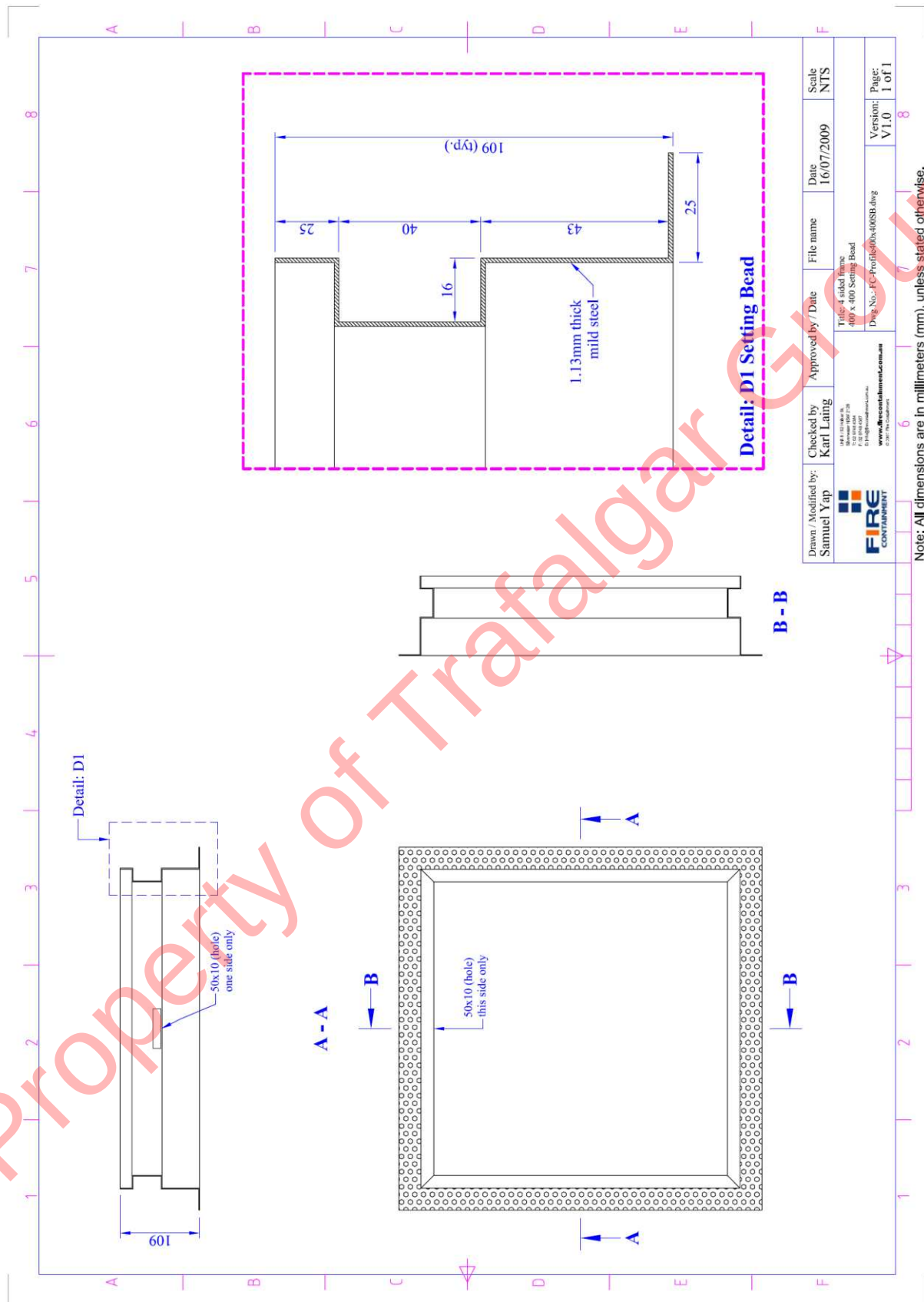


Figure 3: Standard Frame Screw Fixed

