



Project: Proposed A&A Works for Water Meter Cabinet near Shop G001 & G002 at Marine Deck, Ocean Terminal, Canton Road, T.S.T., Kln.

Promatect H Fire Protective Board (Integrity & Insulation: 2hrs)

Test Reports for PNAP APP-13 Annex A.1 - Schedule of Building Materials and Products

BD Ref. No.: BD 2-3/4569/61/90

Fire Resistance Rating (FRR): 120 Minutes

Assessment Report No.: 382587B Issue 2

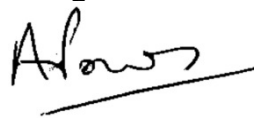
Report Date: 5 September 2019

Expiry Date: 31 August 2024



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Certification Engineer

Title:

The Fire Resistance
Performance of
PROMATECT-H Enclosures to
General Building Services in
Terms of BS 476: Part 20:
1987 for 120 minutes

**WF Assessment Report
No:**

382587B Issue 2

Prepared for:

**Promat International
(Asia Pacific)**

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Date:

**27th July 2017
Issue 2
5th September 2019**

Alows

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Foreword

This assessment report has been commissioned by Promat International (Asia Pacific) and relates to the fire resistance of PROMATECT-H enclosures in terms of BS 476: Part 20: 1987.

This assessment is for National Application and has been written in accordance with the general principles outlined in BS EN 15725: 2010; *Extended application reports on the fire performance of construction products and building elements*, as appropriate.

This assessment uses established empirical methods of extrapolation and experience of fire testing similar systems, in order to extend the scope of application by determining the limits for the design based on the tested constructions and performances obtained. The assessment is an evaluation of the potential fire resistance performance, if the elements were to be tested in accordance with BS 476: Part 20: 1987. This assessment cannot therefore be considered for a CE marking application nor can the conclusion be used to establish a formal classification against EN13501-2.

This assessment has been written using appropriate test evidence generated at a UKAS accredited laboratory to the relevant test standard. The supporting test evidence has been deemed appropriate to support the manufacturers stated PROMATECT-H enclosure design and is summarised in the "Summary of Primary Supporting Data" section of this report.

The defined scope presented in this assessment report relates to the behaviour of the proposed PROMATECT-H enclosure design under the particular conditions of the test; they are not intended to be the sole criterion for assessing the potential fire hazard of the system in use.

This assessment has been prepared and checked by product assessors with the necessary competence, who subscribe to the principles outlined in the PFPF guidelines to undertaking assessments in lieu of fire tests. The aim of the PFPF guidelines is to give confidence to end-users that assessments that are produced in the UK are of a satisfactory standard to be used in lieu of fire tests for building control and other purposes.

The PFPF guidelines are produced by the UK Fire Test Study Group (FTSG) an association of the major fire testing laboratories in the UK and are published by the PFPF, the representative body for the passive fire protection industry in the UK.

Executive Summary

Objective This report presents an appraisal of the fire resistance performance of PROMATECT-H enclosure systems to general building services in terms of the adopted integrity and insulation criteria of BS 476: Part 20: 1987. The enclosures are designed to prevent the spread of fire via the enclosure system from one fire compartment to another.

Report Sponsor **Promat International (Asia Pacific)**

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Summary of Conclusions Should the recommendations given in this report be followed, it can be concluded that the PROMATECT-H enclosure system would be expected to provide a fire resistance of 120 minutes integrity and insulation, in terms of the adopted performance criteria of BS 476: Part 20: 1987, for fire inside or outside the enclosure, as shown in the table below:

Integrity - minutes	Insulation - minutes	PROMATECT-H board – mm	Rock wool
120	120	12	1 x 50 mm x 100 kg/m ³

This assessment represents our opinion as to the performance likely to be demonstrated on a test in accordance with BS 476: Part 20: 1987, on the basis of the evidence referred to above. We express no opinion as to whether that evidence, and/or this assessment, would be regarded by any Building Control authority as sufficient for that or any other purpose. This assessment is provided to the client for its own purposes and we cannot opine on whether it will be accepted by Building Control authorities or any other third parties for any purpose.

Valid until 31st August 2024

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Introduction

This report presents an appraisal of the fire resistance performance of PROMATECT-H enclosure systems to general building services for external enclosures of sizes up to 6000 mm wide x 2500 mm high for 1, 2, 3 and 4-sided enclosures.

The proposed enclosure systems are required to provide a fire resistance performance of 120 minutes with respect to the adopted integrity and insulation criteria of BS 476: Part 20: 1987, when exposed to fire inside or outside the enclosure.

The enclosures may also include access panels of maximum size 600 mm x 600 mm.

FTSG

The data referred to in the supporting data section has been considered for the purpose of this appraisal which has been prepared in accordance with the Fire Test Study Group Resolution No. 82: 2001.

Assumptions

Supporting construction

It is assumed that the proposed enclosure system is supported from appropriate masonry/concrete or steel constructions that have a fire resistance of at least that required for the enclosure system in terms of BS 476: Part 21 or 22: 1987 and are capable of providing adequate support to the constructions for the required period of fire resistance.

Proposals

PROMATECT-H enclosure system

The enclosure system to general building services is constructed with steel channel and angle framing members and PROMATECT-H board 12 mm thick, lined with 1 x 50 mm thick x 100 kg/m³ layer nominal density rock wool, for a fire rating of 120 minutes for fire inside or outside the enclosure. The constructions of the enclosure systems are shown in Figures 1 to 16.

The joints in the rock wool are tight butt joints.

4-sided enclosures

The 4-sided PROMATECT-H services enclosure system is designed for installations where the services are either supported in a steel tray, rack or trunking or are self-supporting (e.g. steel pipes). The horizontal services are suspended using steel hangers at nominal 1830 mm centres that have vertical drop rods and angle, channel or RHS horizontal bearers. The tensile stress in the hanger members, including the weight of the PROMATECT-H enclosure, must not exceed 10 N/mm² for fire exposures up to 120 minutes.

Steel frames, made of channel-section minimum 50 mm wide x 50 mm deep x 0.8 mm thick, are fitted inside the enclosure at 1220 mm maximum centres. The frames are folded at the corners and the flanges fastened together with M4 steel self-tapping screws or 4.8 mm diameter steel rivets. The PROMATECT-H boards and longitudinal steel angles are fastened to the frames with M4 steel self-tapping screws at nominal 200 mm centres. Transverse

board joints are coincident with the channel frames.

The construction of the 4-sided enclosures is the same as that described for the 3-sided enclosure system except that the services are enclosed on all four sides. The channel frames are wrapped and fastened around the services and are supported by the steel tray, rack, trunking or pipes. These members must be strong enough to support the weight of the services and the PROMATECT-H enclosure. The channel frames are at 1220 mm maximum centres for all the enclosure sizes up to 6000 mm wide x 2500 mm high. All other details, including vertical enclosures, are the same as for the 3, 2 and 1-sided enclosures. Where the vertical rods from the hangers pass through the PROMATECT-H board, the holes should only be clearance holes and sealed with PROMASEAL-A sealant or alternatively fitted with a PROMATECT-H board collar, 75 mm x 75 mm.

Insulation

The inside of the 12 mm thick PROMATECT-H board enclosure is lined with rock wool, 1 x 50 mm thick x 100 kg/m³ nominal density. The rock wool must fill the channel frames.

3-sided enclosures

The PROMATECT-H services enclosure may be constructed as a one, two or three-sided box protection around the building services. The three-sided enclosure system, at external sizes up to 6000 mm wide x 2500 mm high, has a rectangular section with walls comprising a single layer of PROMATECT-H board of nominal thickness 12 mm. At the corners the boards are fastened to internal steel angles, 50 mm x 50 mm x minimum 0.8 mm thick, using M4 steel self-tapping screws at nominal 200 mm centres. The top steel angles are fastened to the concrete floor soffit with M6 all-steel expansion anchors (e.g. Hilti HKD anchors) at 400 mm nominal centres or M8 all-steel expansion anchors at 600 mm nominal centres. The bolts must penetrate the concrete by at least 50 mm.

The maximum area of unsupported board is 1.5 m². In order to achieve this for larger enclosure sizes either the spacing of the channel frames is reduced or longitudinal channels (the same size as the frames) fitted between the transverse frames. Any longitudinal board joint in the PROMATECT-H (other than a corner joint) must be backed by a steel channel (the same size as the frames). The longitudinal channels are fastened to the transverse frames with M4 steel self-tapping screws or 4.8 mm diameter steel rivets.

Penetrations

Where the enclosure passes through a compartment wall the penetration must be sealed. L-shaped collars of PROMATECT-H are fitted around the enclosure on both sides of the wall. The collars are made of strips at least 100 mm wide x either 12 mm thick. The strips are screwed to a galvanised steel angle, minimum 50 mm x 50 mm x 0.8 mm thick, with M4 steel self-tapping screws at 200 mm nominal centres. The L-collars are fastened to a steel channel frame within the enclosure with M4 steel self-tapping screws at 200 mm nominal centres. The space between the PROMATECT-H enclosure and the reveals of the opening, for the depth of the wall, is fitted with rock wool of minimum density 100 kg/m³. The collar is not fastened to the wall but is fitted against the wall with PROMASEAL-A sealant. Alternatively rock wool, 50 mm thick x 100 kg/m³ nominal density, is tightly sandwiched between the collar and the wall.

An alternative penetration seal method is shown in Figure 16. For this method the opening in the wall must be smaller than the inside dimensions of the enclosure. Steel angles, minimum 50 mm x 50 mm x 0.6 mm thick, are fastened to the wall, on both faces, with M6 all-steel expansion anchors (e.g. Hilti HKD anchors) at 400 mm nominal centres. The PROMATECT-H boards are fastened to the angles with M4 steel self-tapping screws at 200 mm nominal centres. PROMASEAL-A sealant is used to seal between the boards and the wall.

2 and 1-sided enclosures

The constructions of the 2-sided and 1-sided enclosures follow the same technique as the 3-sided enclosure. Where the enclosure is fitted to a wall the same angle-section fixing procedure is used as for the concrete soffit on a 3-sided enclosure. The stress in the screws and fixing angles to the wall and floor must not exceed 10 N/mm². Where the width of the enclosure exceeds 1500 mm a steel drop rod, minimum M12, is fitted at approximately mid width that passes through the enclosure and provides support to the bottom wall of the enclosure. The rods are spaced at maximum 1220 mm centres and coincide with a steel channel frame. A steel nut and large steel washer are fitted to the drop rod to support the bottom wall of the enclosure.

Vertical enclosures

Vertical enclosures follow the same construction as the horizontal enclosures. The design of the penetration seal for vertical ducts through concrete floors is the same as for horizontal ducts through masonry/concrete walls.

Services

The building services within the enclosure must be independently supported so that the weight of the services is not taken by the enclosure. The supports for the services must be strong enough to take the weight of the enclosure. The building services covered by this assessment are the usual services within buildings (e.g. pipes, cables etc).

Access panel Type 1

The arrangement of the access panel is shown in Figure 14. The opening in the enclosure for the access panel is bounded on all four sides by steel channels, minimum 50 mm x 50 mm x 0.8 mm thick, that are connected to the channel frames. The opening, maximum 600 mm x 600 mm, must not interrupt a channel frame. The access panel, with the same construction as the enclosure, is reinforced around the perimeter with steel angle, 25 mm x 50 mm x 0.6 mm thick. The panel overlaps the opening by 25 mm on all four sides and is fastened to the steel frame of the enclosure with minimum M4 self tapping screws at 200 mm maximum centres.

Access panel Type 2 – Promat proprietary fire resistant hinged access panel

The arrangement of the Promat proprietary fire resistant hinged access panel is shown in Figures 15, 16 and 17. The access panel has nominal dimensions of 600 mm x 600 mm, with an opening of 500 mm x 500 mm. The PROMATECT-H board is screw fixed to a 100 mm x 50 mm x 1.5 mm thick channels on two opposite sides of the access panel and these channels are supported by tie rods attached to the concrete slab above, to support the weight of the access panel. The back of the channel is protected with 1 x 12 mm thick PROMATECT-H board.

The panel can also be installed vertically, and the tie rods are not required as the weight of the access panel will be taken by the side wall of the enclosure.

Basic Test Evidence

PROMATECT-H

The tests referenced BRANZ Nos. FR 3829 and FR 3682 and described briefly in the supporting data section of this report describe the fire resistance tests conducted on steel duct assemblies protected with rock wool and 15 mm or 20 mm thick PROMATECT-H board. The tests show that the PROMATECT-H duct systems are able to satisfy the test criteria for ducts A and B for 120 minutes.

The test referenced BFTC No. 98/27 and described briefly in the supporting data section of this report describes a fire resistance test conducted on a self-supporting duct assembly constructed with 12 mm thick PROMATECT-H board. The test shows that PROMATECT-H board is suitable for fire exposures in excess of 120 minutes.

The test referenced CSIRO No. 1212 and described briefly in the supporting data section of this report describes a fire resistance test conducted on a ceiling membrane assembly constructed with 9 mm thick PROMATECT-H board. The test shows that PROMATECT-H board is able to remain intact and in position for in excess of 120 minutes in the standard fire resistance test.

Promat proprietary fire resistant hinged access panel

The test referenced FSRG 2018/033 and described briefly in the supporting data section of this report describes fire resistance test conducted on Promat access panel system fitted into a non-loadbearing ceiling. The test showed that the Promat access panel system is able to satisfy the integrity and insulation criteria of BS 476 Part 20 in excess of 120 minutes.

Assessed Performance

PROMATECT-H enclosure system

Many fire resistance tests have been carried out on PROMATECT-H board as part of partitions, ceiling and duct constructions for fire exposures up to 240 minutes. Examples of the tests are provided in the supporting data section of this report. In the tests the PROMATECT-H boards generally performed well, remaining in position and intact and maintaining the integrity of the constructions for the durations of the heating periods. Although some cracks occurred in the boards during the tests these did not compromise the integrity performance of the boards. Therefore it is expected that 12 mm or 15 mm thick PROMATECT-H board is suitable for use in the construction of the proposed enclosure system for a fire exposure of 120 minutes.

120 minute system

Fire test BRANZ FR 3829 was carried out in accordance with BS 476: Part 24. Two type B ducts were tested, constructed with 15 mm and 20 mm thick PROMATECT-H board respectively. The cross-section size of the ducts, 1000 mm wide x 250 mm deep, was the same as that recommended in the test standard. The duct assembly has shown that a steel duct clad with 50 mm x 100 kg/m³ rock wool and 15 mm PROMATECT-H board is able to satisfy the stability, integrity and insulation criteria of the standard for 210, 201 and 119 minutes respectively.

The second duct in the test, constructed with 20 mm thick PROMATECT-H board and 50 mm x 100 kg/m³ rock wool, satisfied the stability, integrity and insulation criteria of the standard for 210, 157 and 128 minutes respectively.

Fire test BRANZ No. FR 3682 was carried out in accordance with BS 476: Part 24. The cross-section size of the duct, 1000 mm wide x 250 mm deep, was the same as that recommended in the test standard. The duct assembly has shown that a steel duct clad with 50 mm x 100 kg/m³ rock wool and 15 mm PROMATECT-H boards, when subjected to external fire exposure of the duct (duct A), is able to satisfy the stability, integrity and insulation criteria of the standard for 227, 245 and 209 minutes respectively.

The suitability of 12 mm thick PROMATECT-H boards for fire exposures in excess of 120 minutes has been demonstrated in fire test reference BFTC No. 98/27 where a self-supporting duct assembly, constructed with 12 mm thick boards fastened together at the longitudinal corners with internal steel angles, 0.7 mm thick, and steel self-tapping screws at 200 mm centres, remained intact for a 240 minute test and satisfied the adopted stability and integrity criteria of BS 476: Part 24 for the duration of the test. The integrity at the penetration seals and the stability and integrity of the section of duct outside the furnace were maintained for the duration of 240 minute heating period. Although the section of duct inside the furnace collapsed after 116 minutes of the heating period, this was because the PROMATECT-H board was heated on both sides at once. The test standard does not apply the stability criterion to the section of the duct inside the furnace for the fire inside (duct B) situation. No steel channel collars were fitted to the duct, only steel angles at the longitudinal corners.

Many fire resistance tests in accordance with BS 476: Parts 20 to 22 have been carried out on partitions, external wall systems, ceiling membrane and suspended ceiling systems constructed with 12 mm thick PROMATECT[®] H board screwed to a steel framework for fire exposures up to four hours. Examples of such tests are PSB 54S053839, CSIRO No. FSH 1126 and CSIRO No. 1212, described briefly in the supporting data section of this report. In the tests the PROMATECT[®] H boards generally performed well, remaining in position and intact and maintaining the integrity of the constructions for the durations of the heating periods. Therefore it is expected that 12 mm thick PROMATECT[®] H board is suitable for use in the construction of the proposed duct system for fire exposures up to 120 minutes.

The support provided to the PROMATECT-H boards in the enclosure systems is at least that provided in test BRANZ No. FR 3829 and BRANZ No. FR 3682, with channel frames at 1220 mm centres and steel angles at the longitudinal corners. The minimum thickness of the angles and channels has been increased from 0.6 mm (as tested) to 0.8 mm to compensate for the absence of the steel duct. For larger enclosures the minimum thickness is 1.2 mm. For the 3, 2 and 1-sided enclosures not only is the board supported by the channel frames, but also by the steel angles fastened to the wall or floor and at the corners of the enclosure. These provide a more uniform support for the enclosures than hangers at up to 1220mm centres.

For 2 and 1-sided enclosures the weight of the enclosure is supported by the steel angles fastened to the floor or wall. The limiting stress in the screws and fixing angles to the wall and floor is set at 15 N/mm² for 120 minutes. This is greater than the 10 N/mm² stress limits usually stated for steel members directly exposed to the fire. The steel angles are protected by the PROMATECT-H board on one side and the rock wool on the other. Therefore a slightly higher stress limit has been set in recognition that the protection will limit the temperature rise of the angles.

As there is not a British Standard test specifically for enclosures to building services this assessment has been carried out adopting the general heating conditions and performance criteria described in BS 476: Part 20: 1987. The enclosures are designed to prevent the spread of fire via the enclosure system from one fire compartment to another and from within the enclosure into a fire compartment.

Insulation – 120 minutes

The proposed enclosure systems requiring an insulation performance of 120 minutes, are constructed with 12 mm thick PROMATECT-H board and rock wool insulation. The specification for the rock wool insulation has been determined from the performances achieved in tests BRANZ Nos. FR 3682 for duct A and FR 3829 for duct B, although the density for the rock wool should be a minimum of 100 kg/m³ rather than the 89 kg/m³ which was used in test FR 3829. This increase in density should provide the additional 1 minute required to achieve 120 minutes insulation.

For fire outside the enclosure (i.e. a duct A scenario) test FR 3682 using 1 x 15 mm PROMATECT-H board and 50 mm x 100 kg/m³ rock wool achieved 245 and 209 minutes integrity and insulation respectively.

Test BFTC No. 98/27 was a test on a duct B using 12 mm thick PROMATECT-H board but no rock wool and obtained 240 and 41 minutes integrity and insulation respectively.

A very conservative interpolation between the above results indicates that reducing the thickness of the PROMATECT-H board from 15 mm to 12 mm while maintaining rock wool at 50 mm x 100 kg/m³ will provide 120 minutes integrity and insulation.

For fire inside the enclosure (i.e. a duct B scenario) test FR 3829 using 1 x 15 mm PROMATECT-H board and 50 mm x 100 kg/m³ rock wool gave 201 and 119 minutes integrity and insulation. The insulation failed at the thermocouple positioned at approximately 1000 mm from the wall on the underside of the duct. At the end of the test, there was a brown discoloration on the board along the width of the duct, at the point where it failed the insulation. This indicates that the rock wool had either shrunk due to a butt joint at that position or had split due to expansion of the duct. However, the measured density of the rock wool was 89 kg/m³ so by using rock wool with a minimum density of 100 kg/m³ then the duct would achieve 120 minutes insulation.

When testing ducts, a test on a duct B i.e fire inside the duct, is considered far more onerous than a duct A test where the fire is external to the duct. However, for an enclosure an internal fire is far less severe as the fire is only inside the duct, and there are no hot gases being drawn along the inside of the enclosure. For this reason it is considered that an internal fire to an enclosure only has the same severity as an external fire, and so the fire protection

system can be the same i.e. the inside of the 12 mm thick PROMATECT-H board enclosure is lined with rock wool, 1 x 50 mm thick x 100 kg/m³ nominal density. The rock wool is either bonded to the board with a high temperature adhesive such as Vicubond or is held in place with stainless steel wire, nominal 1.5 mm diameter, which is tied back to the channel frames. The wire is spaced at 300 mm nominal centres. The rock wool must fill the channel frames.

Access panel Type 1

The construction of the access panels is the same as for the enclosure, and is reinforced around the perimeter with steel angle. The panels are then bolted to the steel frame of the enclosure at 200 mm maximum centres, providing a robust construction, which would be expected to maintain the overall performance of the enclosure. The maximum size of the access panel is 600 mm x 600 mm.

Access panel Type 2 – Promat proprietary fire resistant hinged access panel

The construction of the Promat proprietary fire resistant hinged access panel is similar to that tested in FSRG 2018/033, which gave over 120 minutes integrity and insulation. The panel has a 100 x 50 x 1.5 mm thick channel around the edges which is thicker than the 1.0 mm tested in FSRG 2018/033, which will only serve to improve performance. The additional weight of the access panel is taken by tie rods attached to the concrete floor above, which will in turn serve to reinforce the enclosure also.

This type of access panel can also be installed in a vertical position. The panel is constructed in the same manner as for a horizontal panel, but no tie rods are required as the weight of the panel is taken by the enclosure.

The maximum size of this access panel in either orientation is 600 mm x 600 mm.

Vertical enclosures

The fire test on the duct system was carried out on a horizontal duct assembly. However the enclosure installations may also include some sections of vertically orientated enclosures. In order to make an assessment of the fire performance of the enclosure systems in the vertical orientation, an evaluation must be made in relation to the performance criteria of the standard. During the fire test on the horizontal duct no failure of the integrity criterion occurred through the walls or joints of the duct sections even in those locations where the self-weight of the duct was putting the duct joints and fixings in tension. Therefore no failure would be expected for vertical enclosures where the self-weight of the enclosure is putting the enclosure joints and fixings in compression. As vertical enclosures are to be supported, the same design of penetration seal will perform as effectively through concrete floors as through masonry or concrete walls. The weight of the enclosures should be taken at each compartment floor by steel brackets so that the weight is distributed and not all taken by the base.

Conclusions

The horizontal and vertical PROMATECT-H enclosure systems to general building services with external sizes up to 6000 mm wide x 2500 mm high for 1, 2, 3 and 4-sided enclosures, as described in the proposals section of this report, would be expected to provide a fire resistance of 120 minutes integrity and insulation in terms of the adopted performance criteria of BS 476: Part 20: 1987 for fire inside or outside the enclosure, as shown in the table below, given the requirements stated in this report:

Integrity - minutes	Insulation - minutes	PROMATECT-H board – mm	Rock wool
120	120	12	1 x 50 mm x 100 kg/m ³

This assessment represents our opinion as to the performance likely to be demonstrated on a test in accordance with BS 476: Part 20: 1987, on the basis of the evidence referred to above. We express no opinion as to whether that evidence, and/or this assessment, would be regarded by any Building Control authority as sufficient for that or any other purpose. This assessment is provided to the client for its own purposes and we cannot opine on whether it will be accepted by Building Control authorities or any other third parties for any purpose.

Validity

This assessment is issued on the basis of test data and information available at the time of issue. If contradictory evidence becomes available to Warringtonfire the assessment will be unconditionally withdrawn and Promat International (Asia Pacific) Ltd will be notified in writing. Similarly the assessment is invalidated if the assessed construction is subsequently tested because actual test data is deemed to take precedence over an expressed opinion. The assessment is valid initially for a period of five years i.e. until 31st August 2024, after which time it is recommended that it be returned for re-appraisal.

The appraisal is only valid provided that no other modifications are made to the tested construction other than those described in this report.

Summary of Primary Supporting Data

BRANZ FR 3829

This report describes a fire resistance test that was carried out at the BRANZ laboratory on two PROMATECT-H horizontal ventilation steel ducts assemblies. The construction consisted of 0.7 mm thick rectangular steel ducts, 250 mm external height x 1000 mm external width. The 35 mm duct flanges were fastened together using No. 12 Tec-screws at 200 mm centres at the long side and 125 mm centres at the short side. Steel channel sections, 50 mm wide x 35 mm deep x 0.6 mm thick, were fitted around the duct at nominal 610 mm centres. Steel angles, 50 mm x 50 mm x 0.6 mm thick, were screwed to the channel collars, spanning between the collars at each of the four corners. The steel ducts were clad with a layer of 50 mm x 100 kg/m³ rock wool (filling the channel collars) and then PROMATECT-H board, 15 mm thick on the 1st duct and 20mm thick on the 2nd duct. The rock wool was fixed to the underside of the steel duct with steel pins and washers. The PROMATECT-H board was screwed to the steel channels and angles at nominal 200 mm centres. The steel duct was suspended at 1250 mm centres from M10 steel studding hangers. The test was carried out using the heating conditions specified in BS 476: Part 24: 1987 and adopting the stability, integrity and insulation criteria of that standard for internal and external fire exposure of the duct (duct B).

The duct assemblies satisfied the adopted stability, integrity and insulation criteria of the standard for 210, 201 and 119 minutes (for 15mm duct) and 210, 157 and 128minutes (for 20mm duct) respectively.

Test date : 24th July 2007

Test sponsor : Promat International (Asia Pacific) Ltd.

BRANZ FR 3682

This report describes a fire resistance test that was carried out at the BRANZ laboratory on a PROMATECT-H horizontal ventilation duct assembly. The construction consisted of a 0.8 mm thick rectangular steel duct, 250 mm external height x 1000 mm external width. The 35 mm duct flanges were fastened together using M8 bolts at 200 mm centres at the long side and 125 mm centres at the short side. Steel channel sections, 50 mm wide x 35 mm deep x 0.8 mm thick, were fitted around the duct at nominal 610 mm centres. Steel angles, 50 mm x 50 mm x 0.6 mm thick, were screwed to the channel collars, spanning between the collars at each of the four corners. The steel duct was clad with two layers of 25 mm x 100 kg/m³ rock wool (filling the channel collars) and then 15 mm PROMATECT[®] board. The rock wool was fixed to the underside of the steel duct with steel pins and washers. The PROMATECT-H board was screwed to the steel channels and angles at nominal 200 mm centres. The steel duct was suspended at 1250 mm centres from M10 steel studding hangers. The test was carried out using the heating conditions specified in BS 476: Part 24: 1987 and adopting the stability, integrity and insulation criteria of that standard for external fire exposure of the duct (duct A). The duct assembly included a T-junction and 90° bend.

The steel duct assembly satisfied the adopted stability, integrity and insulation criteria of the standard for 227, 245 (no failure) and 209 minutes respectively.

Test date : 30th August 2006

Test sponsor : Promat International (Asia Pacific) Ltd.

BFTC No. 98/27

This report describes a fire resistance test that was carried out at the Blackburn Fire Test Centre on a PROMATECT® H horizontal ventilation duct assembly, for a heating period of 240 minutes. The duct assembly was self-supporting and was 4.65m long with internal dimensions 1000mm wide x 250mm deep. It was suspended at 1220mm centres from M15 steel studding hangers. The duct was constructed with PROMATECT® H board 12mm thick. The test was carried out using the heating conditions specified in BS 476: Part 24: 1987 and adopting the stability, integrity and insulation criteria of that standard for internal and external fire exposure of the duct (duct B).

The duct assembly satisfied the adopted stability, integrity and insulation criteria of the standard for 240, 240 and 41 minutes respectively.

Test date : 11th December 1998

Test sponsor : Promat International (Asia Pacific) Ltd.

**CSIRO No. FSH
1212**

This report describes a fire resistance test that was carried out on a PROMATECT-H ceiling membrane system for a heating period of 241 minutes. The construction consisted of steel ceiling joists, channels 150 mm web x 64 mm flanges x 1.6 mm thick, spaced at 610 mm centres. The perimeter channels were the same size as the joist channels. The ends of the ceiling joists were fastened to the test frame via 5 mm thick steel angle brackets and M10 steel bolts and masonry anchors. The anchors also fastened the perimeter channels to the test frame. A fillet of PROMATECT-H board, 100 mm wide x 9 mm thick, was screwed to the top and bottom of the joist channels. A layer of 9 mm thick PROMATECT-H board was fitted above and below the steel framework. They were fastened to the channels, through the fillets, with steel self drill and tap screws at 200 mm centres. Transverse board joints were fitted with an internal PROMATECT-H board cover strip, 100 mm wide x 9 mm thick. The cavity of the ceiling membrane was filled with 75 mm x 100 kg/m³ rock wool (also filling the channel members). The ceiling measured 4585 mm long x 3655 mm wide (span) x 186 mm thick. The test was carried out in accordance with BS 476: Part 22: 1987

The ceiling membrane assembly satisfied the integrity and insulation criteria of the standard for 241 and 131 minutes respectively.

Test date : 11th April 2006

Test sponsor : Promat International (Asia Pacific) Ltd

FSRG 2018/033

This report describes a fire resistance test that was carried out on a Promat Access Panel system for a heating period of 146 minutes. The panel consisted of a 50 mm thick PROMATECT-L board on top of and bonded to a 9 mm thick PROMATECT-H board. The panel was fixed within a 1.0 mm galvanized steel frame, and installed within a non-loadbearing PROMATECT-H insulated ceiling system.

The Promat Access Panel system assembly satisfied the integrity and insulation criteria of the standard for 146 and 145 minutes respectively.

Alows

Test date : 21st May 2018

Test sponsor : Promat Building System Pte Ltd

Declaration by Promat International (Asia Pacific) Ltd

We the undersigned confirm that we have read and complied with the obligations placed on us by the UK Fire Test Study Group Resolution No. 82: 2001.

We confirm that the component or element of structure, which is the subject of this assessment, has not to our knowledge been subjected to a fire test to the Standard against which the assessment is being made.

We agree to withdraw this assessment from circulation should the component or element of structure be the subject of a fire test to the Standard against which this assessment is being made.

We are not aware of any information that could adversely affect the conclusions of this assessment.

If we subsequently become aware of any such information we agree to cease using the assessment and ask Warringtonfire to withdraw the assessment.

Signed:

For and on behalf of:

Signatories

Responsible Officer A Powers* - Certification Engineer

Approved A Kearns * - Technical Manager

For and on behalf of Exova Warringtonfire.

Report Issued: 27 th July 2017	
Issue 2 issued 5 th August 2019	To incorporate Promat proprietary fire resistant hinged access panel

The assessment report is not valid unless it incorporates the declaration duly signed by the applicant.


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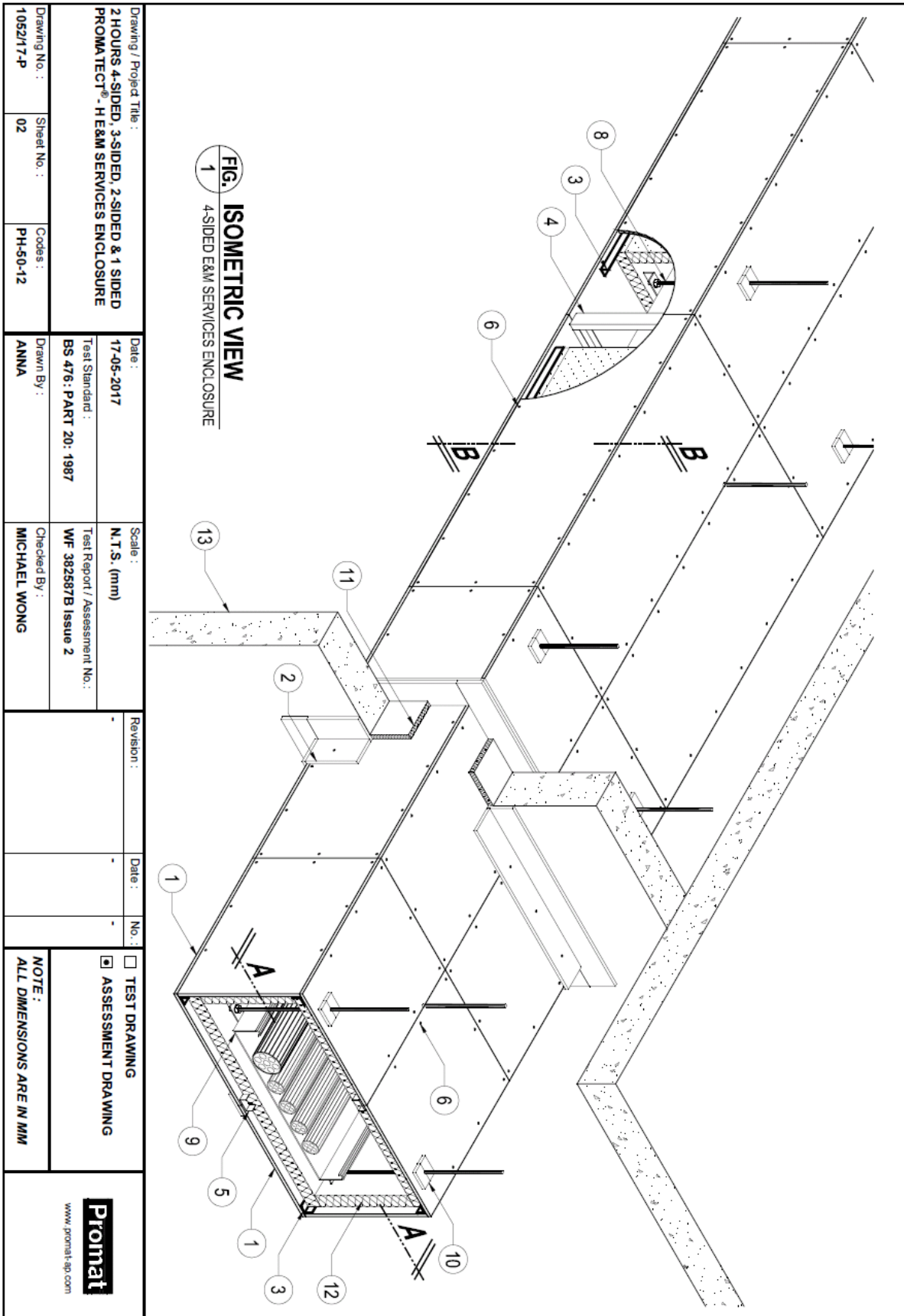
Figure 1 Construction of PROMATECT-H enclosure system – nomenclature

NO.	DESCRIPTION	SIZE	NO.	DESCRIPTION	SIZE
1	PROMATECT® - H BOARDS	12mm THK.			
2	PROMATECT® - H COLLAR	12mm THK.			
3	STEEL ANGLES AT CORNER JOINTS	50 x 50 x 0.8mm THK.			
4	STEEL CHANNEL COLLAR FRAME (FOLDER AROUND) AT NOMINAL 1220mm CENTRES	50 x 50 x 0.8mm THK.			
5	STEEL CHANNEL	50 x 50 x 0.8mm THK.			
6	M4 SELF-TAPPING SCREWS AT NOMINAL 200mm CENTRES				
7	M8 ANCHOR BOLTS AT NOMINAL 400mm CENTRES OR M8 ANCHOR BOLTS AT NOMINAL 600mm CENTRES				
8	CABLE TRAY STEEL HANGER AT NOMINAL 1830mm CENTRES	10 N/mm ²			
9	STEEL CABLE TRAY				
10	PROMATECT® - H COLLAR OR SEAL GAPS WITH FIRE RATED SEALANT OR EQUIVALENT	75 x 75 x 9mm THK.			
11	MINERAL WOOL PACK	100 kg/m ³			
12	MINERAL WOOL	50mm THK. x 100 kg/m ³			
13	CONCRETE OR MASONRY WALL				
14	PERIMETER STEEL ANGLES	50 x 50 x 0.8mm THK.			
15	CONCRETE FLOOR SLAB	50 x 50 x 0.8mm THK.			
16	STEEL ANGLES				
17	PROMASEAL® - A Acrylic Sealant				
18	M8 ANCHOR BOLTS AT NOMINAL 400mm CENTRES				

Drawing / Project Title : 2 HOURS 4-SIDED, 3-SIDED, 2-SIDED & 1 SIDED PROMATECT® - H E&M SERVICES ENCLOSURE	Date : 17-05-2017	Scale : N.T.S. (mm)	Revision : -	Date : -	No. : A	<input type="checkbox"/> TEST DRAWING <input checked="" type="checkbox"/> ASSESSMENT DRAWING	 www.pronat-sg.com
Drawing No. : 105217-P	Sheet No. : 01	Codes : PH-50-12	Test Standard : BS 476: PART 20: 1987	Test Report / Assessment No. : WF 382587B Issue 2	Drawn By : ANNA	Checked By : MICHAEL WONG	

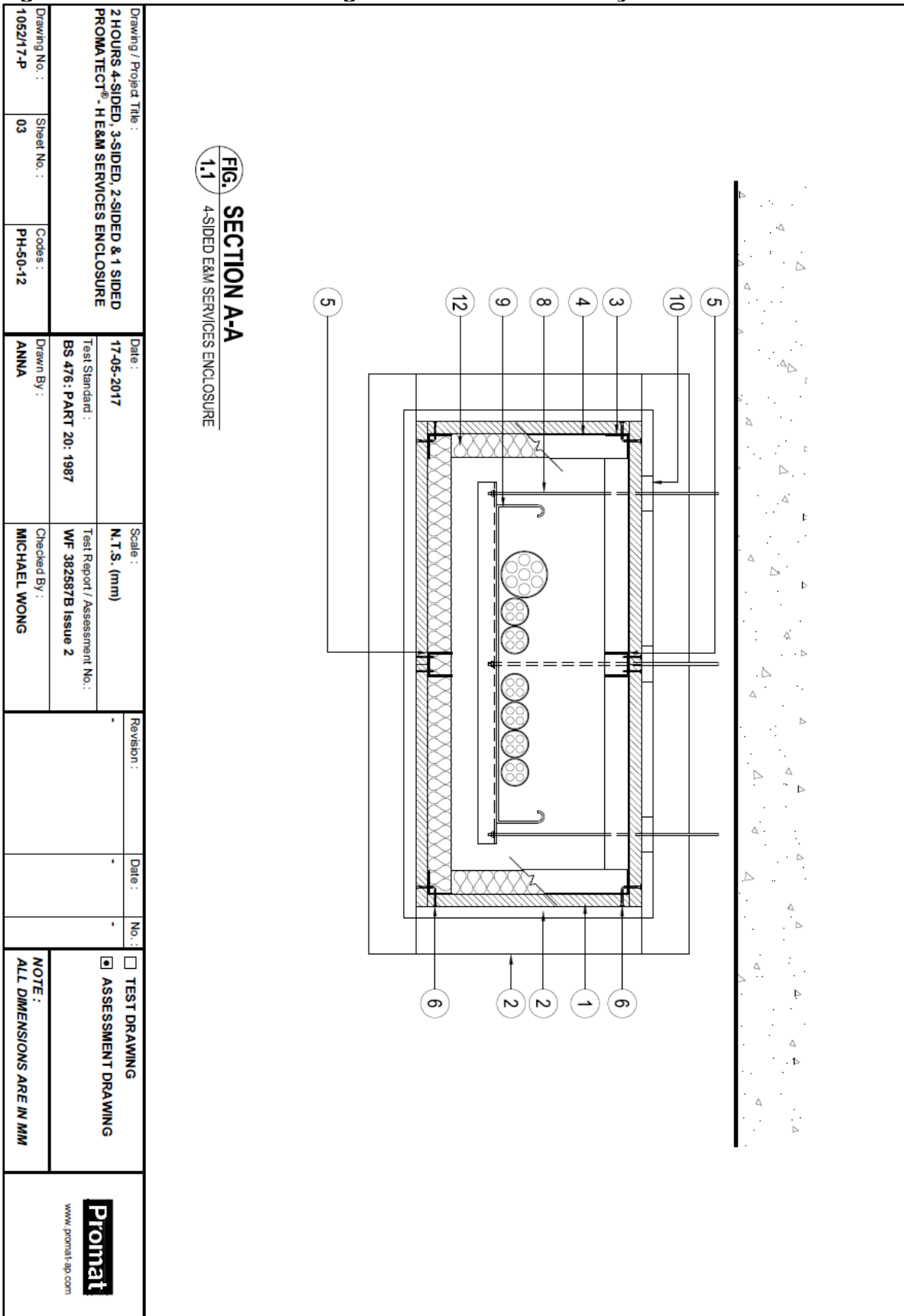
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Figure 2 Isometric view of 4-sided enclosure system



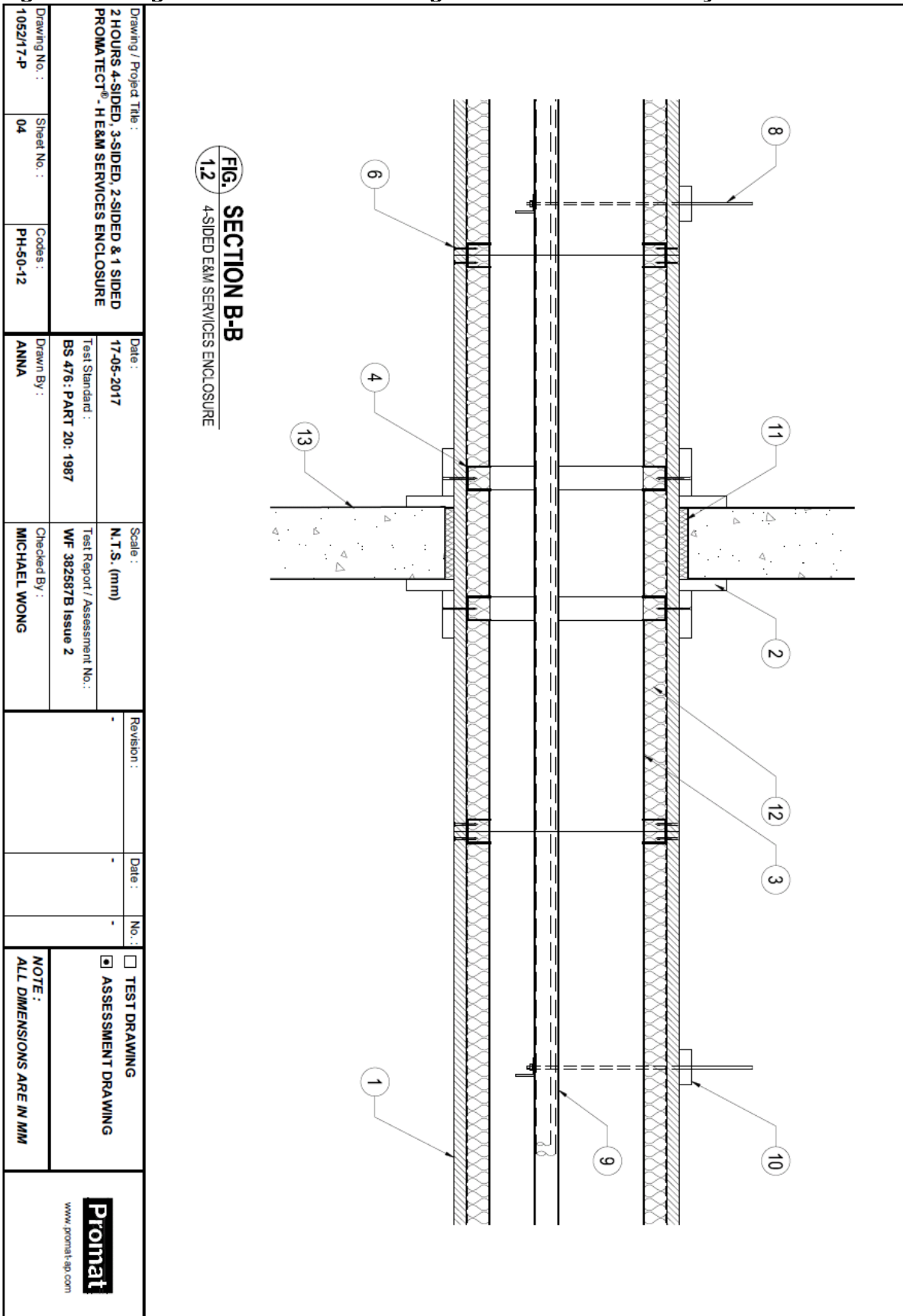
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Figure 3 Cross section through 4-sided enclosure system



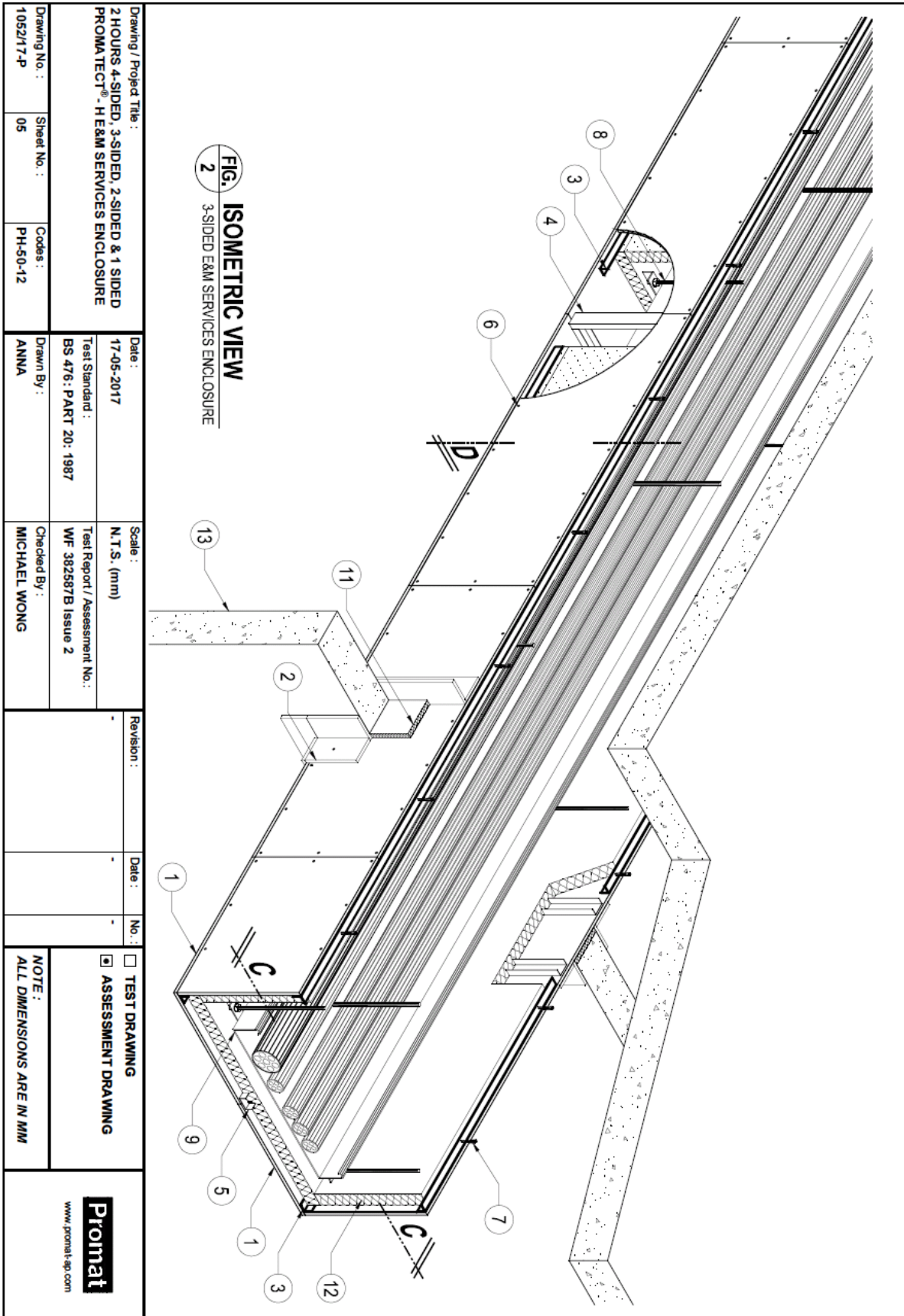
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Figure 4 Longitudinal section through 4-sided enclosure system



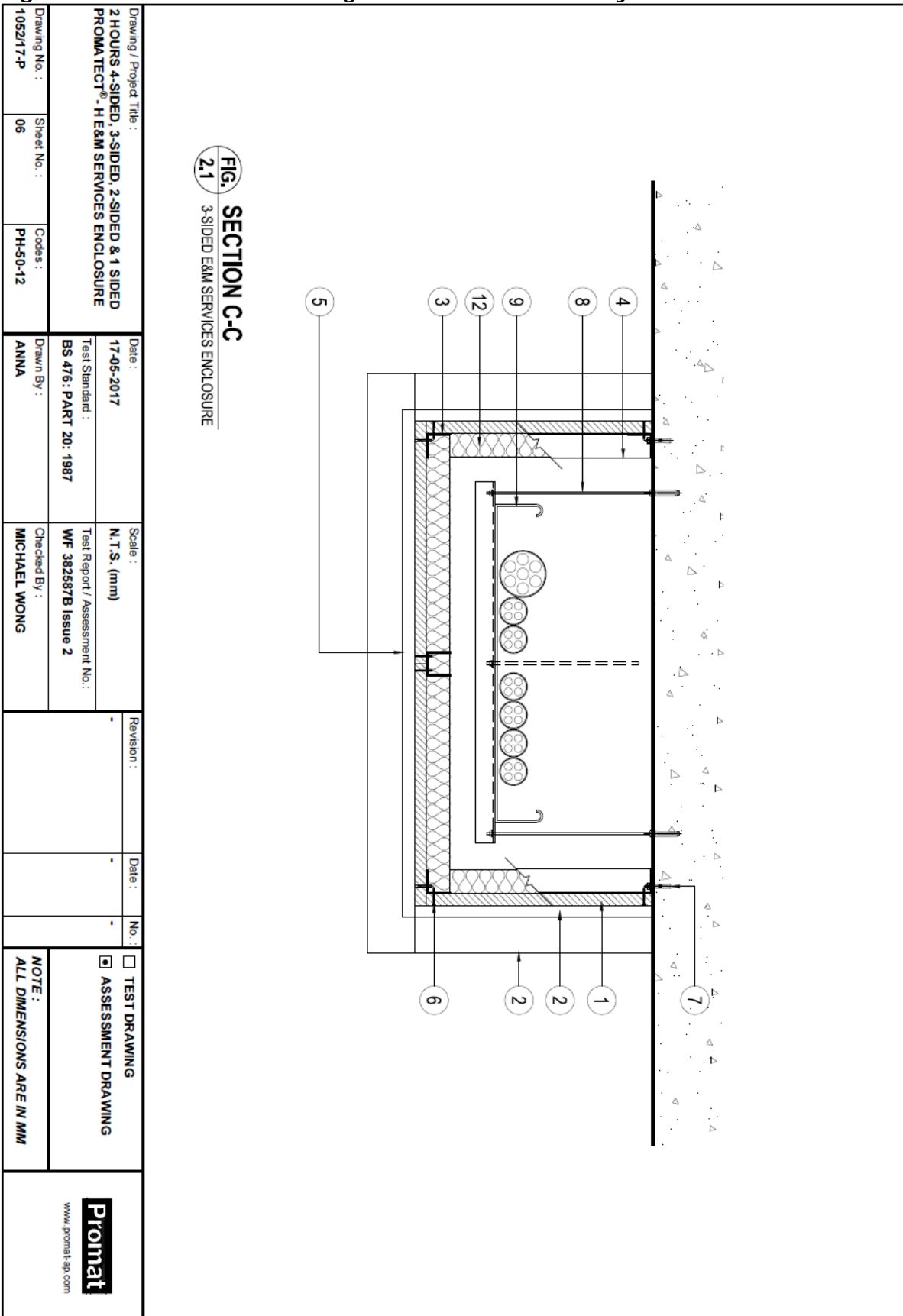
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Figure 5 Isometric view of 3-sided enclosure system



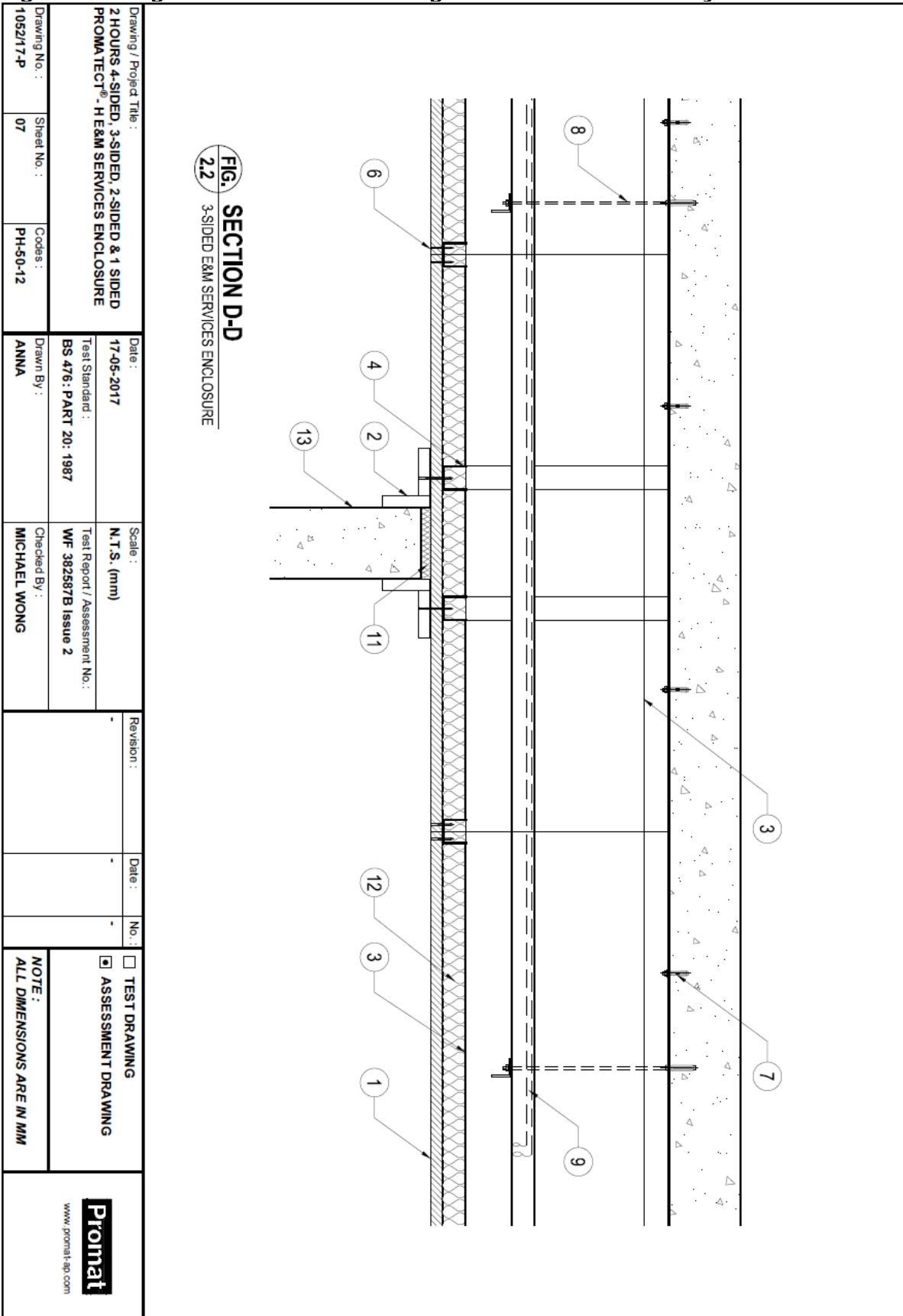
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Figure 6 Cross section through 3-sided enclosure system



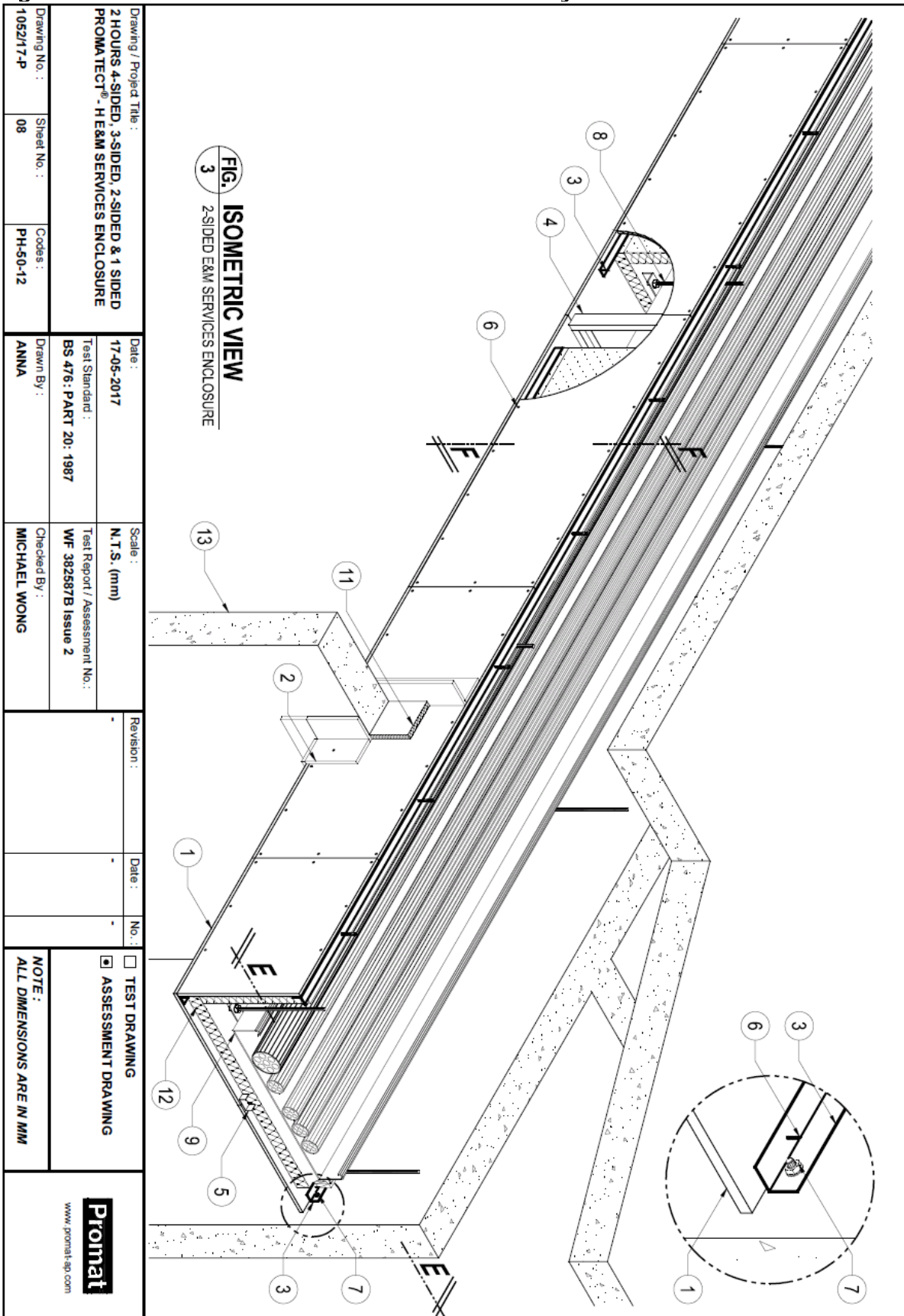
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Figure 7 Longitudinal section through 3-sided enclosure system



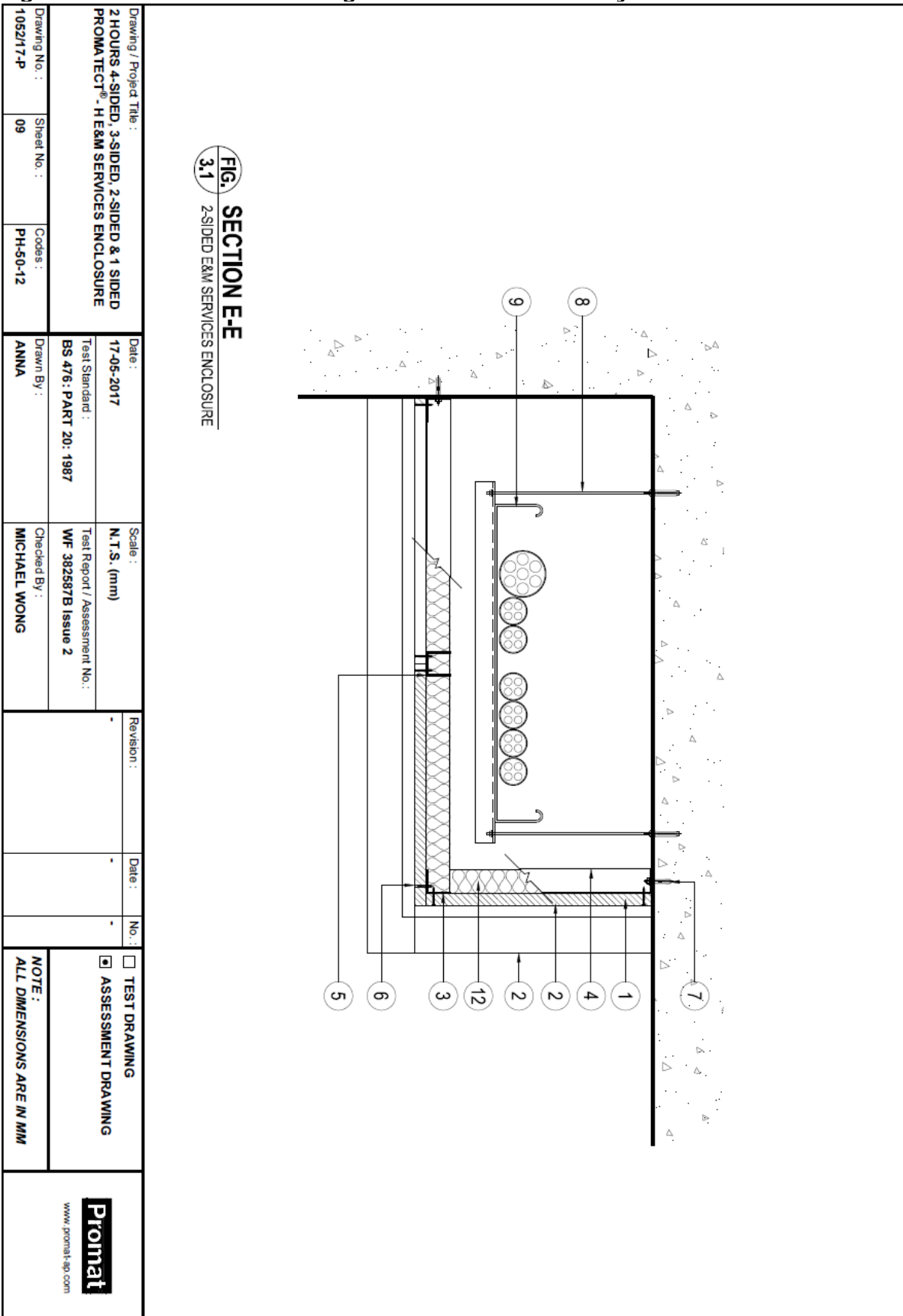
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Figure 8 Isometric view of 2-sided enclosure system



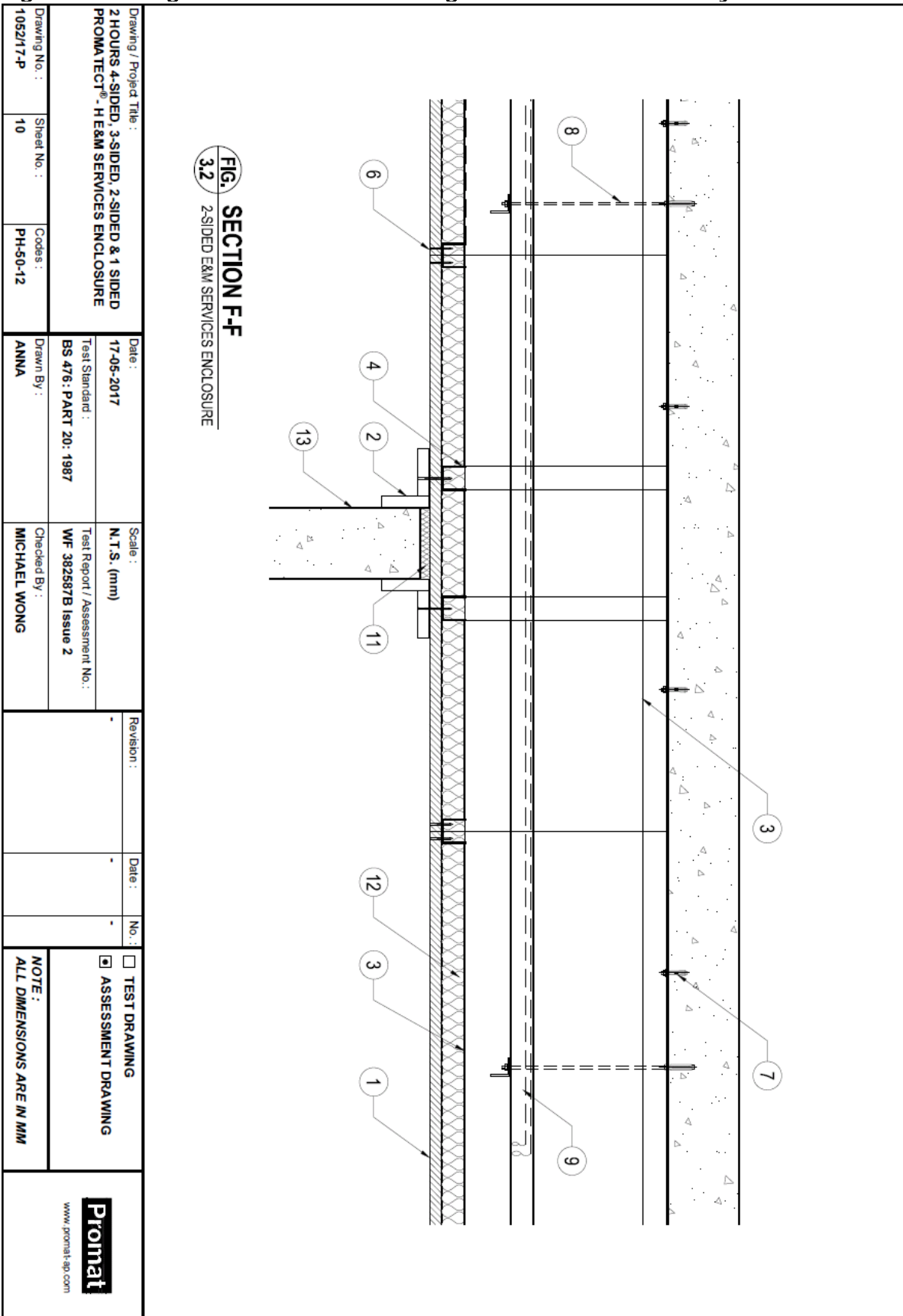
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Figure 9 Cross section through 2-sided enclosure system



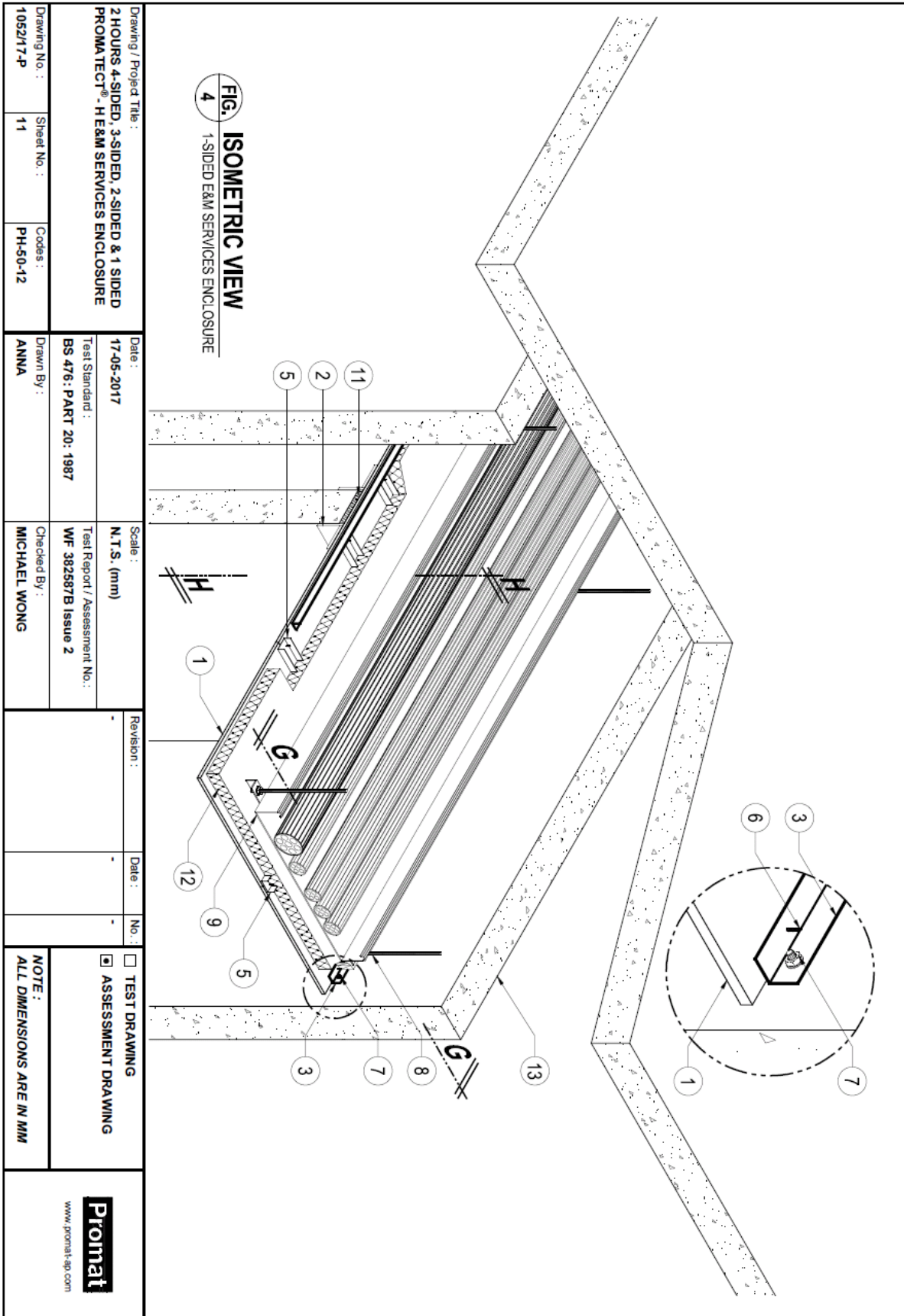
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Figure 10 Longitudinal section through 2-sided enclosure system



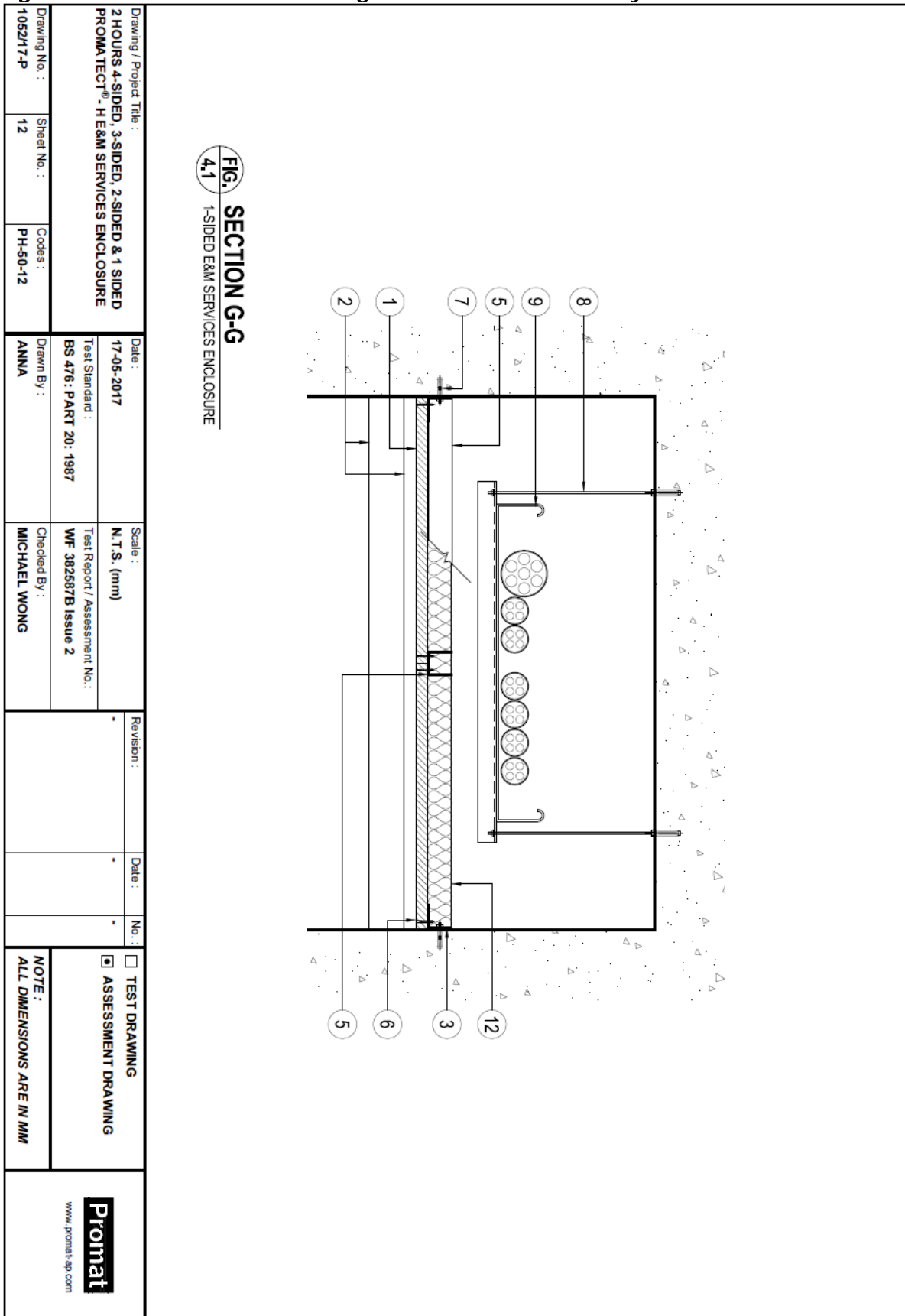
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Figure 11 Isometric view of 1-sided enclosure system



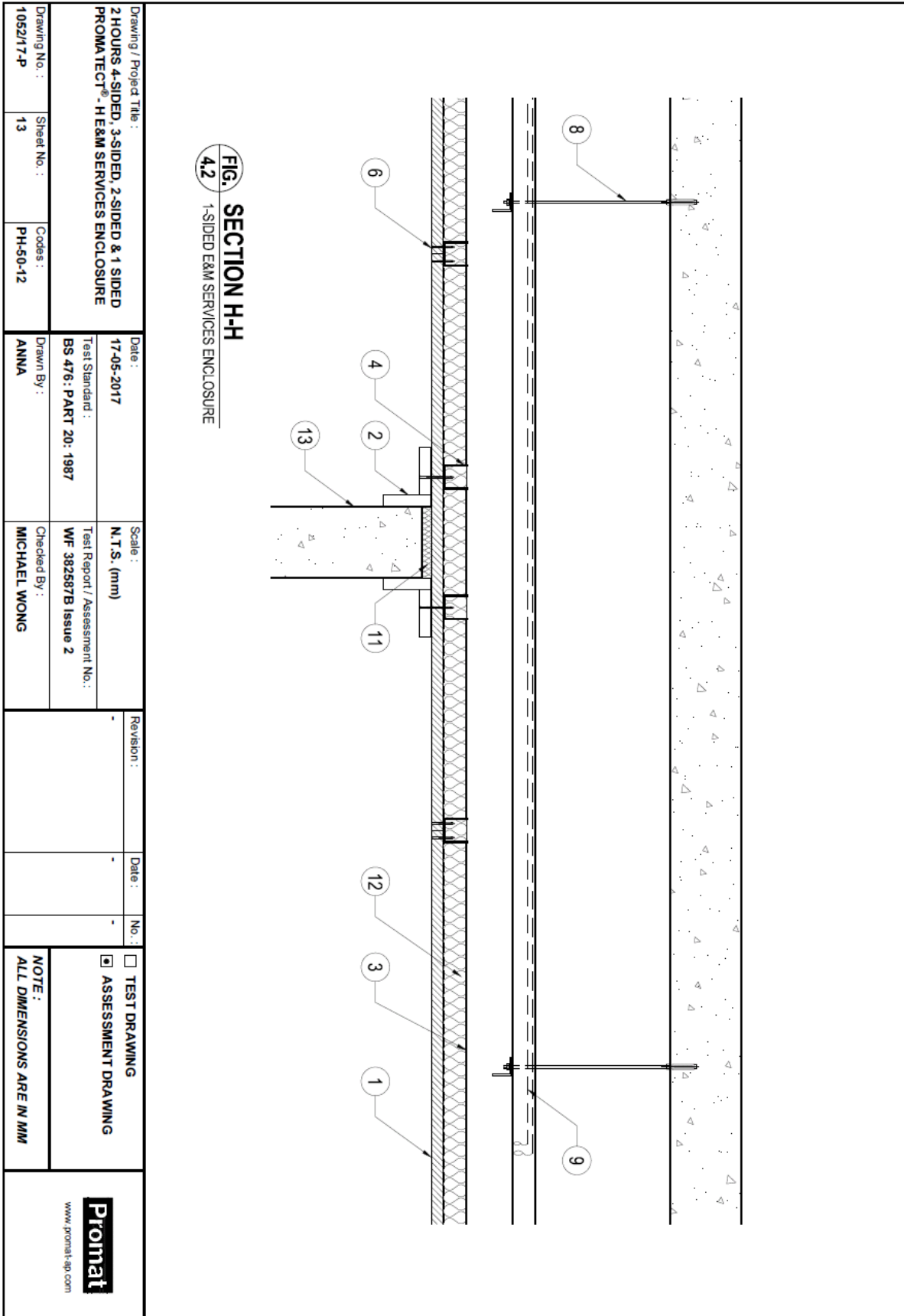
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Figure 12 Cross section through 1-sided enclosure system



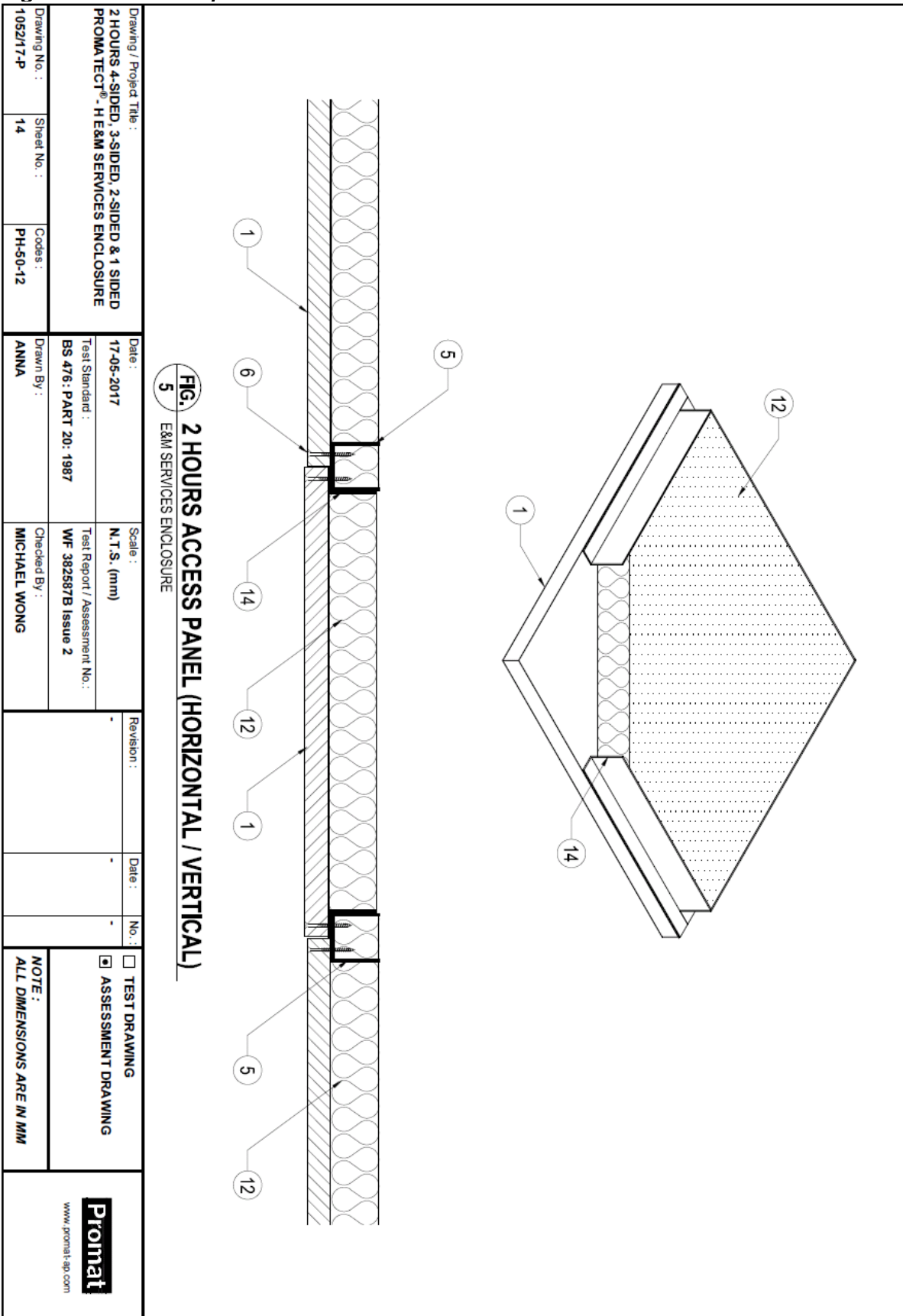
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Figure 13 Longitudinal section through 1-sided enclosure system



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Figure 14 Access panel



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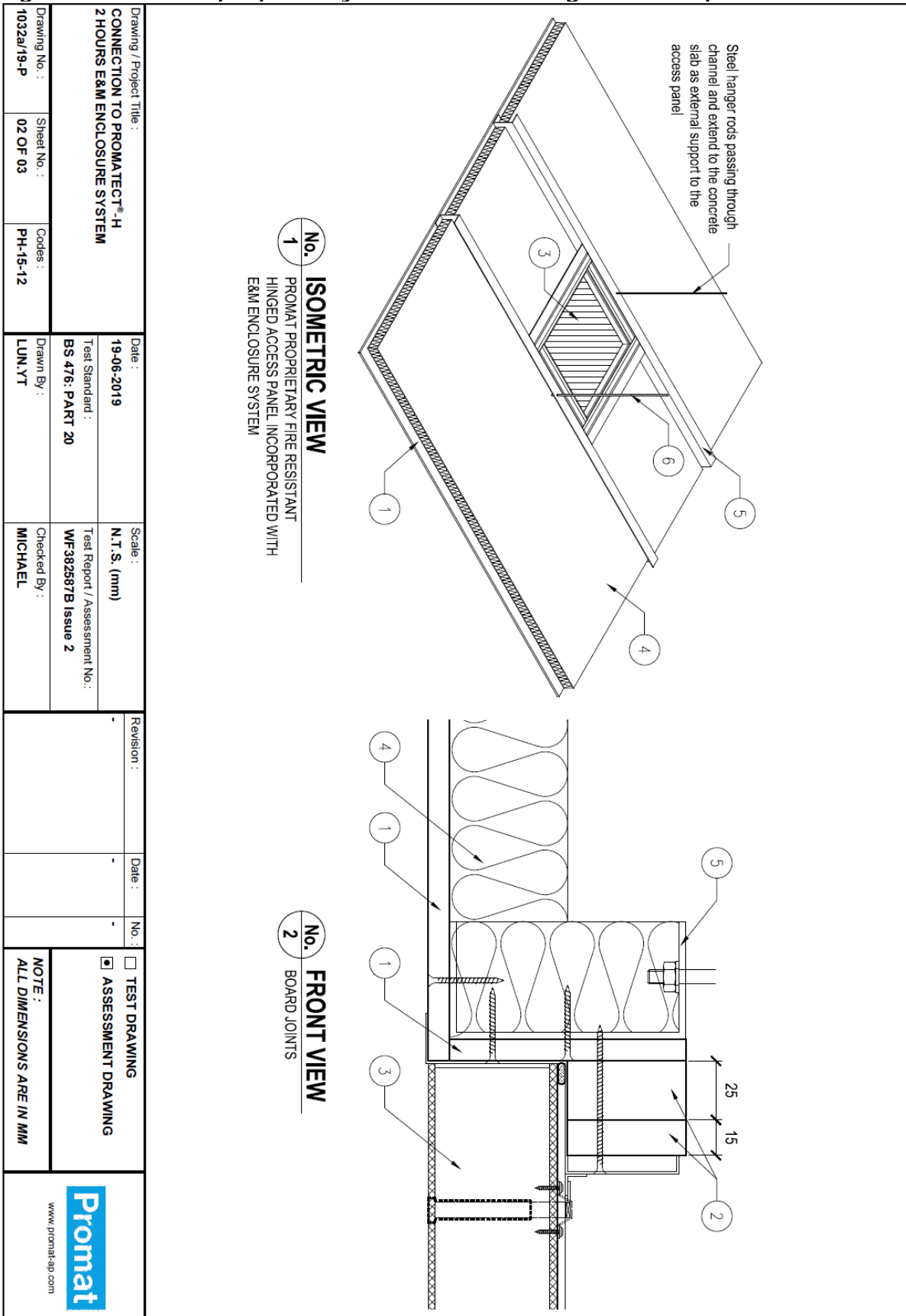
Figure 15 Promat proprietary fire resistant hinged access panel

NO.	DESCRIPTION	SIZE	NO.	DESCRIPTION	SIZE
1	PROMATECT®-H board	12mm thick			
2	PROMATECT®-H strip				
3	PROMAT proprietary fire resistant hinged access panel				
4	Mineral wool	50mm x 100kg/m ³			
5	C-channel	min. 100 x 50 x 1.5mm thick			
6	Steel hanger rod	M12			

Drawing / Project Title : CONNECTION TO PROMATECT®-H 2 HOURS EXM ENCLOSURE SYSTEM Drawing No. : 1032a/19-P Sheet No. : 01 OF 03 Codes : PH-15-12 Date : 19-06-2019 Test Standard : BS 476: PART 20 Scale : N.T.S. (mm) Test Report / Assessment No.: WF382587B Issue 2 Drawn By : LUN.YT Checked By : MICHAEL Revision : - Date : - No. : - <input type="checkbox"/> TEST DRAWING <input checked="" type="checkbox"/> ASSESSMENT DRAWING NOTE : ALL DIMENSIONS ARE IN MM	 www.promat-sip.com	
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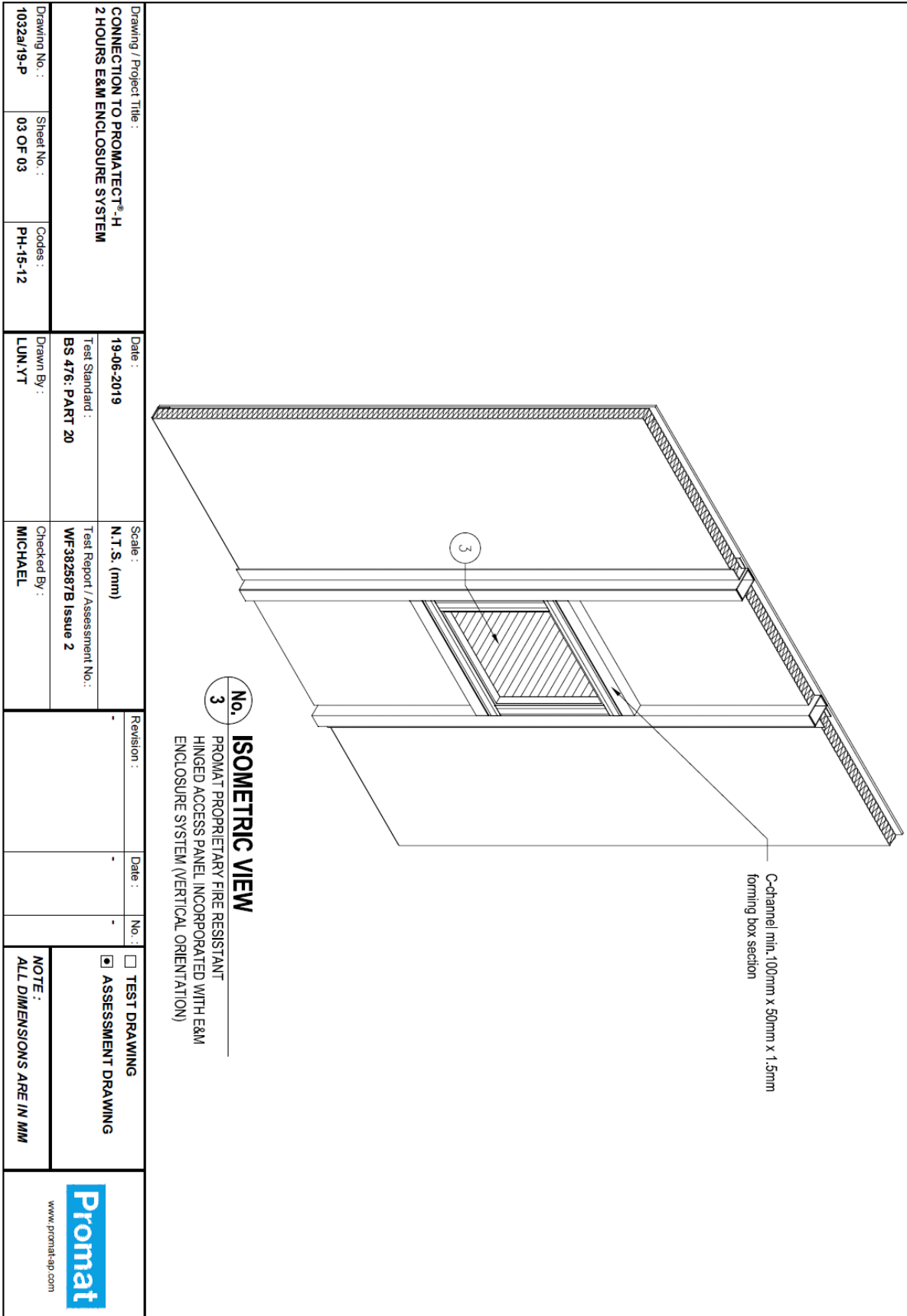
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Figure 16 Promat proprietary fire resistant hinged access panel



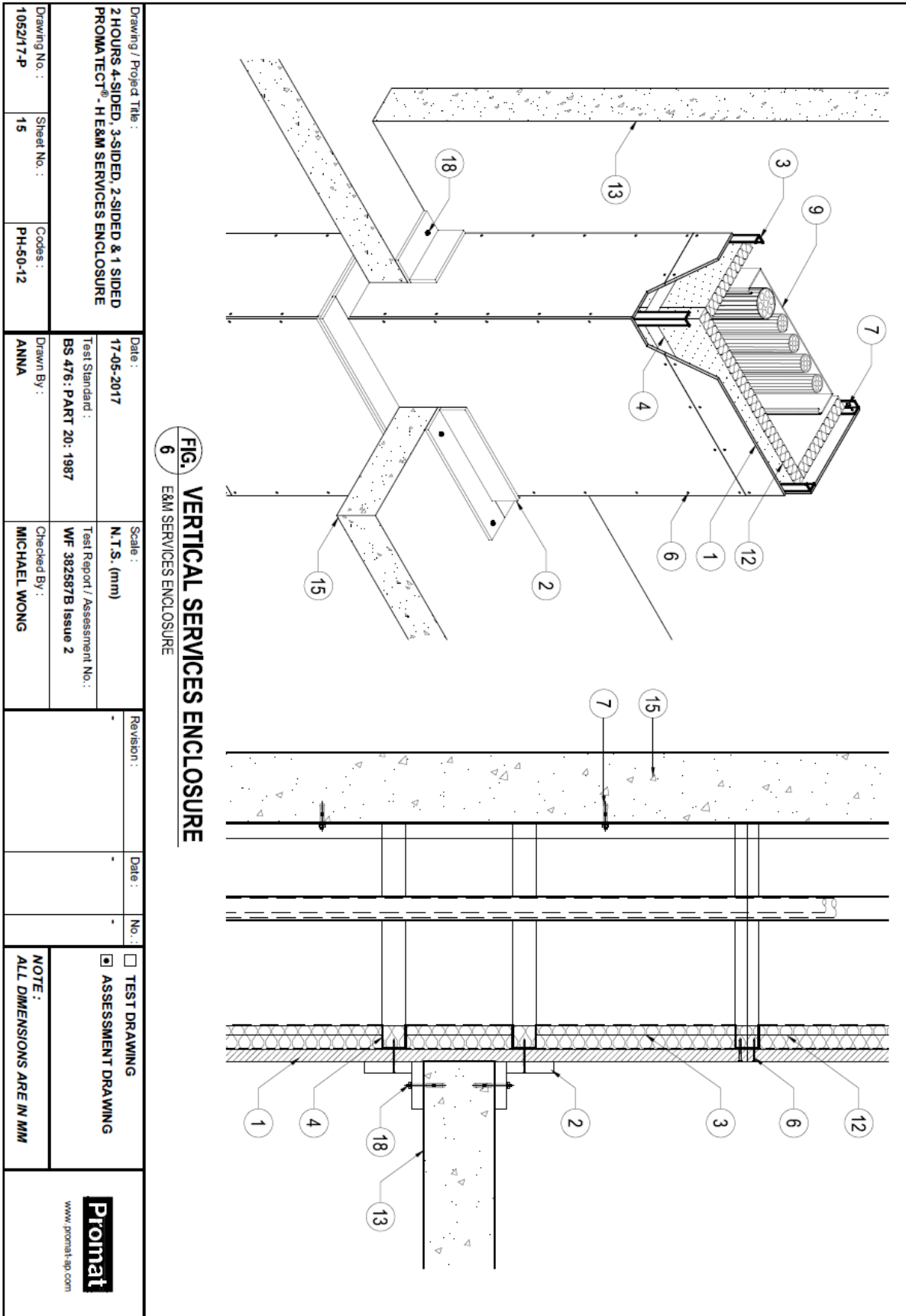
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Figure 17 Promat proprietary fire resistant hinged access panel – vertical



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Figure 18 3-sided vertical enclosure



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Figure 19 Alternative wall penetration detail

