



ASSESSMENT REPORT

The fire resistance performance of UBIQ
INEX>RENDERBOARD wall systems if
tested in accordance with AS1530.4-2005

EWFA Report No:

19502800.7b

Report Sponsors:

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and

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DOCUMENT REVISION STATUS

Date Issued	Issue No	Description	Prepared by	Reviewed by
29/11/2013	19502800	Initial Issue	S. Hu	K. Nicholls
27/03/2014	19502800.1	Revision to include 30/30/30 system incorporating timber battens	D. Nicholson	K. Nicholls
18/08/2014	19502800.2	Revision to include 60/60/60 system	D. Nicholson	K. Nicholls
01/09/2014	19502800.3	Revision to details for all systems	D. Nicholson	K. Nicholls
27/02/2015	19502800.4	Typographical amendment	D. Nicholson	K. Nicholls
01/02/2016	19502800.5	Revision to include additional corner details	D. Nicholson	K. Nicholls
30/03/2016	19502800.6b	Revised to include RENDERBOARD 60/60/60 system only, other systems now in other report	D. Nicholson	K. Nicholls
11/04/2018	19502800.7b	Revised to add Terraçade external cladding to Inex Renderboard system and added Brickworks Building Products as co-sponsors	H. Wong	O. Saad

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1 INTRODUCTION

This report supersedes 19502800.5 and presents an assessment of the fire resistance performance of UBIQ INEX>RENDERBOARD wall systems if tested in accordance with AS1530.4-2005.

The tested systems are described in Section 2 and are to be subject to the proposed variations described in Section 3 and tested in accordance with the referenced test method described in Section 4. The conclusions of the report are summarised in Section 5.

The validity of this assessment is conditional on compliance with Sections 7, 8, and 9 of this report.

Summaries of the test data on which this assessment is based are provided in the Appendices together with a summary of the critical issues leading to the assessment conclusions including the main points of argument.

2 TESTED PROTOTYPES

This assessment is based on test reports EWFA 2890701.1 and EWFA 29061000 which were sponsored by UBIQ and were conducted by Exova Warringtonfire Aus Pty Ltd.

The test EWFA 2890701.1 describes a test of a loadbearing steel framed wall lined with a product identical to 16mm INEX>RENDERBOARD 16 sheeting on the exposed side and 10mm thick Gyprock Plasterboard CD on the non- fire side.

The test EWFA 29061000 describes a test of a loadbearing steel framed wall lined with 16mm INEX>RENDERBOARD 16 sheeting on the exposed side and 10mm thick Gyprock Plasterboard CD on the non- fire side. Refer to Appendix A for a detailed summary of the reference test data.

3 VARIATION TO TESTED PROTOTYPES

3.1 UBIQ INEX>RENDERBOARD WALL SYSTEM FOR 60 MINUTES

The wall construction shall be as tested in EWFA 29061000 subject to the following variations:

- INEX>RENDERBOARD jointing shall be off framing with backblocks and no sealant.
- Inclusion of optional cavity insulation, sarking, building paper or wall wrap.
- Framing may be steel or timber designed in accordance with the relevant framing standards.
- Non-fire side plasterboard may be any standard grade plasterboard with minimum thickness of 10mm.
- Steel Furring Channels shall be one of the following:
 - 16mm deep Rondo #308
 - 16mm deep Studco #M308
 - 28mm deep Rhondo #129
 - 28mm deep Studco #M29
 - 29mm deep Rondo #129
- Steel Top Hat battens shall be 24mm minimum depth and not less than 0.75BMT
- Arrangement shall include either vertical furring channels with horizontal INEX>RENDERBOARD or horizontal top hats with vertical INEX>RENDERBOARD
- Inclusion of Terraçade XP external cladding over the INEX>RENDERBOARD as detailed in figures 9 and 10.
- The top hats for the installation with Terraçade cladding shall be 24 or 35mm with tapered legs and with minimum 1.15BMT.
- Where screw fixings have been nominated, alternative screws of the same material strength with equivalent nominal lengths, diameters and thread (tpi) may be used provided that the screw heads have surface contact areas not less than those nominated for the tested specimen. In any case the screws shall not be more than 10% larger in diameters or lengths or if they intrude or break through other components of the wall.

3.2 SCHEDULE OF COMPONENTS

Table 1 – Schedule of Components

ID	Description	
1	Name	Internal Wall Lining
	Product	Standard Grade Plasterboard
	Size	One layer of 10mm thick
	Installation	Fixed to the unexposed side of the wall framing by using 6g x 25mm long Bugle Head Drill Point Fine Thread ZY PS screws at nominal 400mm centres in the field of the boards into the studs and 150mm staggered along vertical butt joints. Cladding joints taped and sealed with nominal 50mm wide paper tape and plaster cement.
2	Name	Steel Wall Framing
	Material	Cold formed steel
	Installation	Positioned at maximum of 600mm centres and shall be designed in accordance with relevant framing standards such as AS/NZS 4600.
3	Name	Timber Wall Framing
	Material	Timber
	Installation	Positioned at maximum 600mm centres and shall be designed in accordance with relevant framing standards such as AS1684 and AS1720
4	Name	Steel Furring channels / Top Hat Battens
	Product	<ul style="list-style-type: none"> - 16mm deep Rondo #308 - 16mm deep Studco #M308 - 28mm deep Rhondo #129 - 28mm deep Studco #M29 - 29mm deep Rondo #129 <p><i>Note that where steel Top Hats are used they shall be 24mm minimum depth and not less than 0.75BMT</i></p>
4	Installation	<p><i>Vertical:</i></p> <p>Positioned at maximum of 600mm centres vertically along framing studs (for horizontal INEX>RENDERBOARD) and clipped to fixing clips. At the base of the wall and for every 3m in height (or every 5th fixing clip), the battens shall be fixed to the fixing clip with 2 x 12g 14 Hex screws either side of the batten. Furring channel / batten spacing and span shall also meet project structural requirements.</p> <p><i>Horizontal:</i></p> <p>Positioned at maximum of 600mm centres horizontally across framing studs (for vertical INEX>RENDERBOARD). Furring channel / batten spacing and span shall also meet project structural requirements.</p>
	5	Name
Product		Studco #M237 Clip or Rondo #237 Clip (appropriate to the Steel Batten)
Installation		<p>For vertical steel battens, clips positioned on the exposed side of studs at maximum of 750mm centres. For every 3m in height (or every 5th fixing clip), the battens shall be fixed to the fixing clip with 2 x 12g 14 Hex screws either side of the batten.</p> <p>Fixed in place using minimum of 10g x 16mm long Flat tops Self-Drilling Screws. Clip spacing and fixing shall also meet project structural requirements.</p>
6	Name	INEX>RENDERBOARD 16
	Size	600mm wide and 16mm thick with tongue and groove along long edges.

ID	Description	
	Installation	<p>Note that vertical furring channels shall be installed for INEX>RENDERBOARD and horizontal top hats with vertical INEX>RENDERBOARD.</p> <p>The sheets are installed on the exposed side of framing and fixed with 4 equally spaced screws at each stud and at butt joints maintaining 50mm from tongue and groove edge. Butt joints shall be off framing and backed with an 800mm x 200mm backblock.</p> <p><i>Fixings to Steel Battens</i> – 10g x 30mm long Countersunk Ribbed Head, Square Drive, Coarse Thread screws.</p>
	Orientation	Either horizontal or vertical based on design
6a	Name	Optional Terraçade XP external wall cladding
	Size	Nominally 600mm wide x 300mm high x 40mm thick
	Installation	The Terraçade XP tiles are basically terracotta based tiles installed onto the Inex>Renderboard via Terraçade XP aluminium rails with 12g x 30mm B8 coated self-driller screws in accordance with the manufacturers' instructions and as detailed in Figures 9 & 10.
7	Name	Optional Cavity Insulation
	Material	Option of any of the following: <ul style="list-style-type: none"> • None • Glasswool, Rockwool or Polyester
	Installation	Installed in the space between the studs/noggins.
8	Name	Sarking, Building Paper or Wall Paper
	Installation	Installed over the outer face of the frame prior to fixing any external cladding

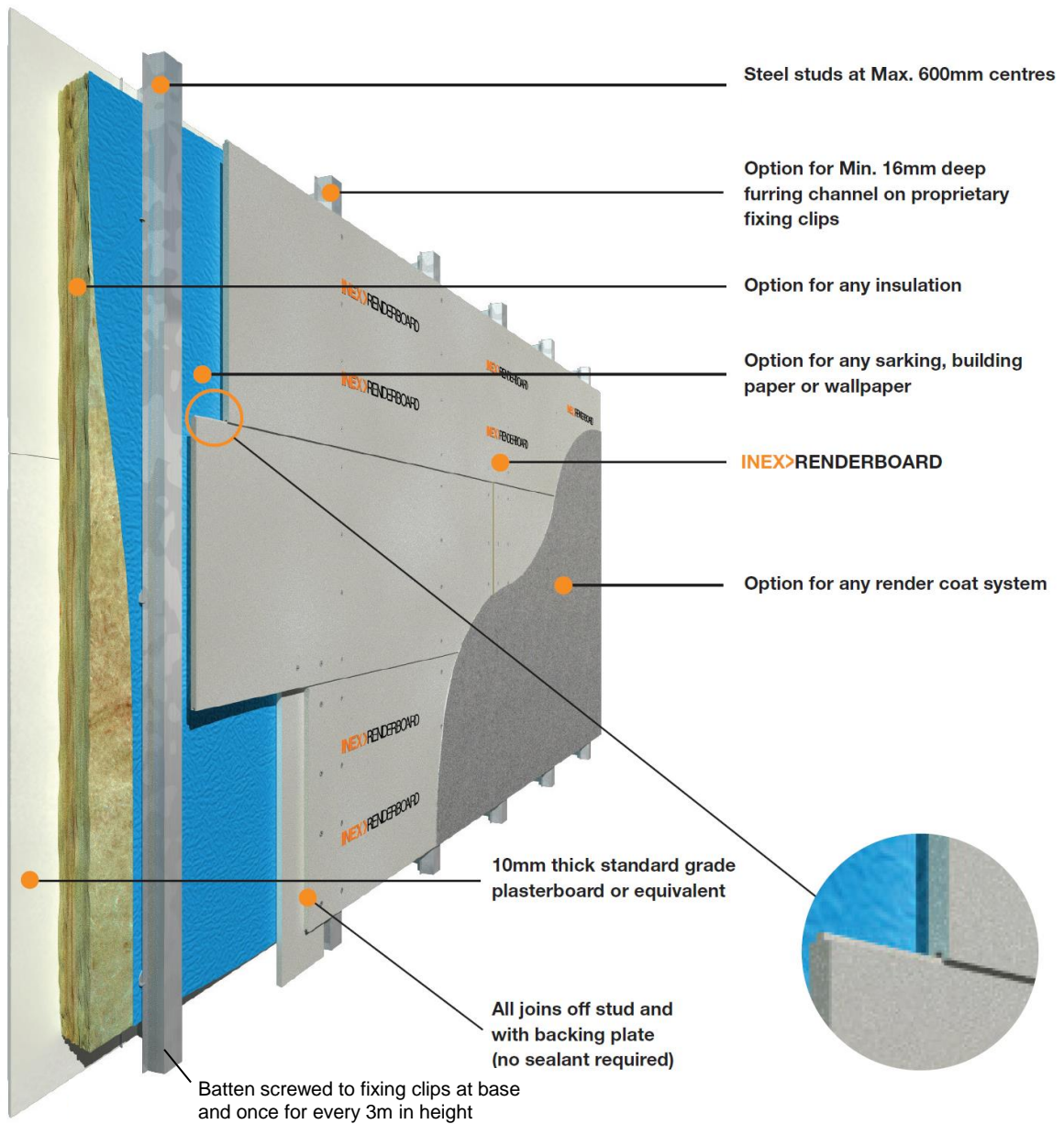


Figure 1 – Horizontal INEX>RENDERBOARD Wall System Steel Frame – General Arrangement

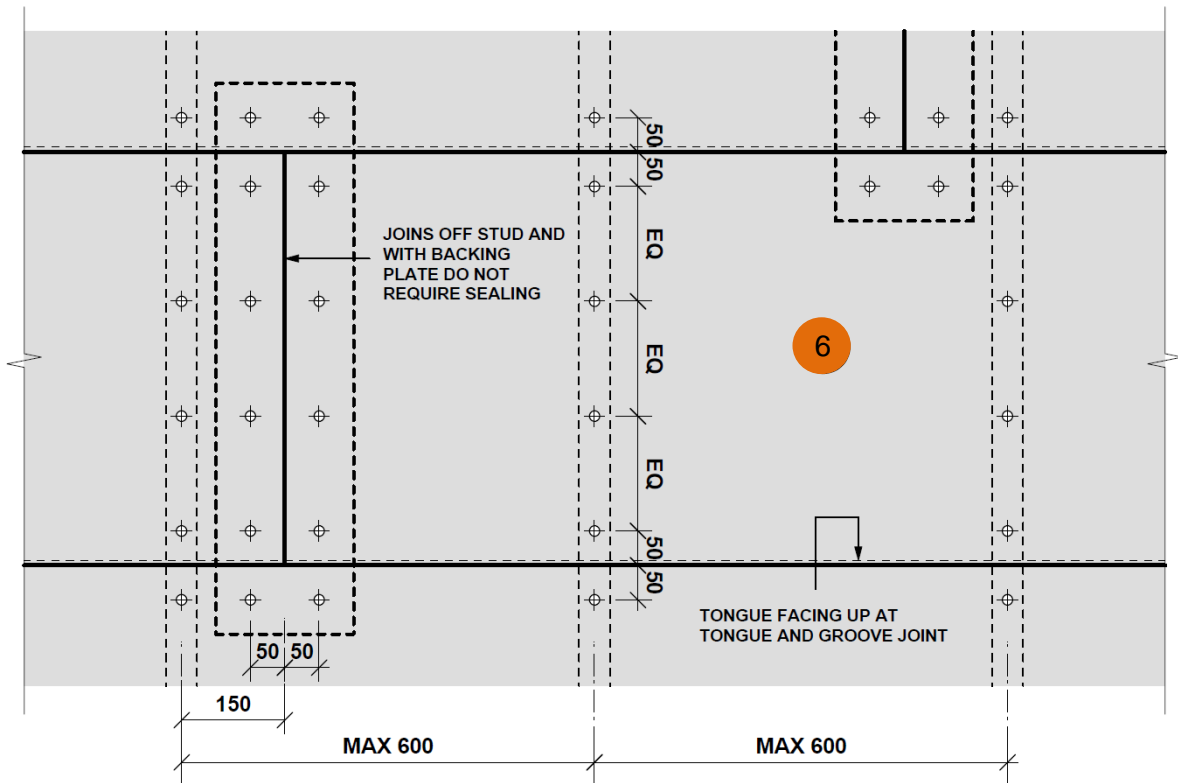


Figure 2 – Horizontal INEX>RENDERBOARD Wall System Steel frame – Sheet fixing details

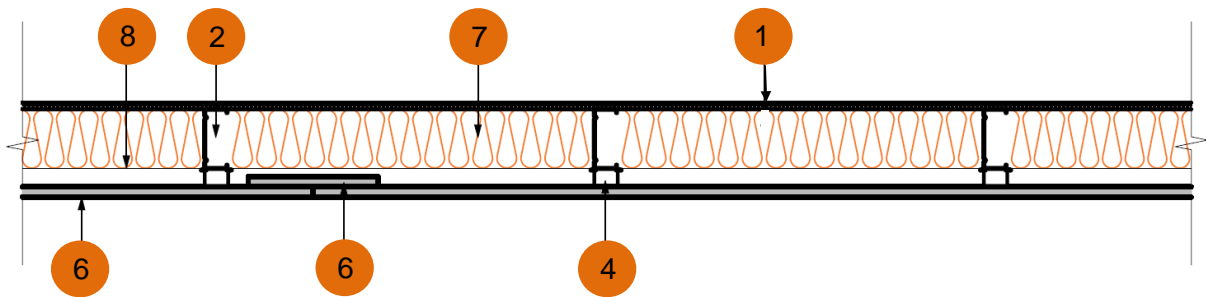


Figure 3 – Horizontal INEX>RENDERBOARD Wall System Steel Frame – Plan Section

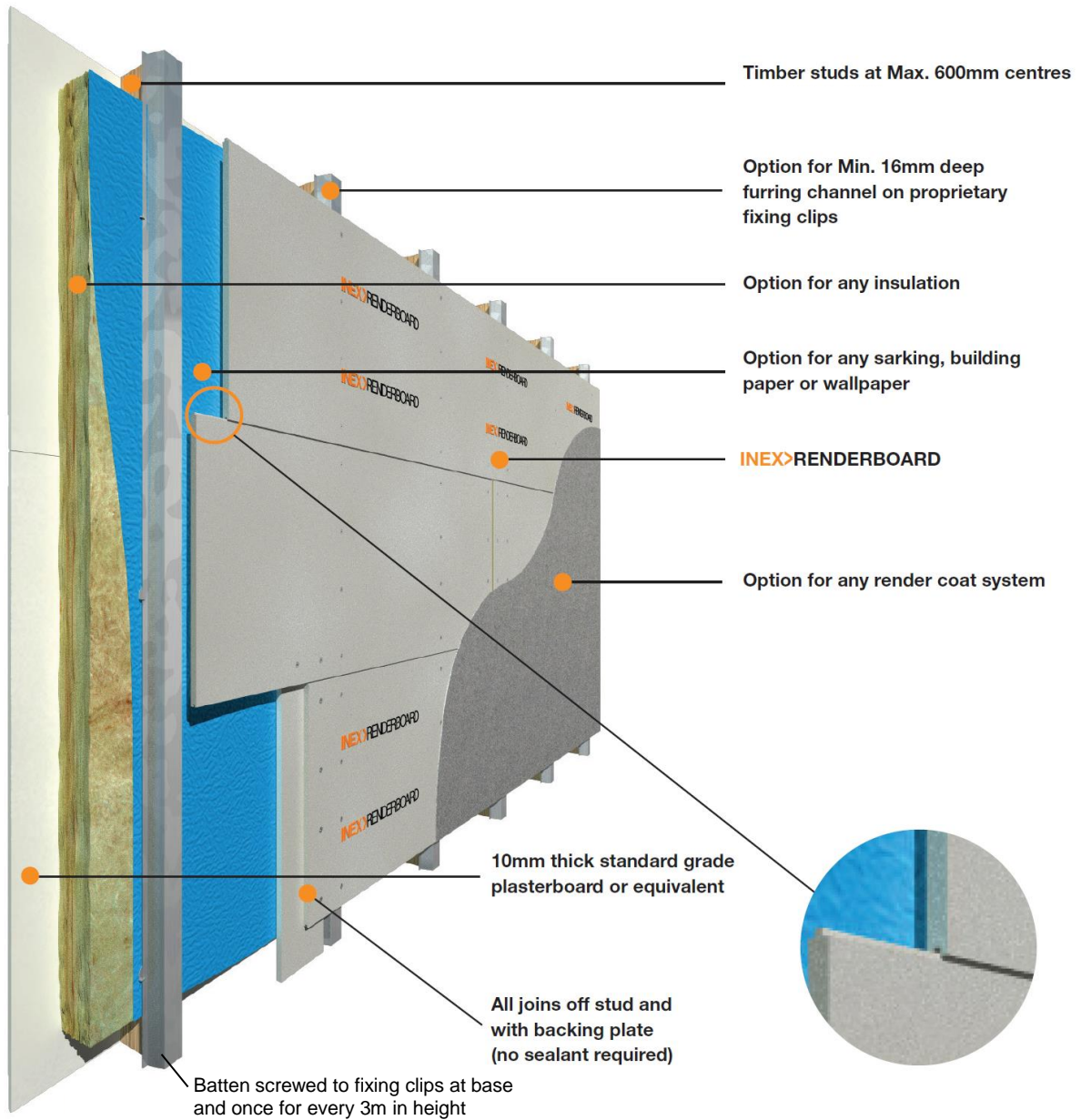


Figure 4 – Horizontal INEX>RENDERBOARD Wall System Timber Frame – General Arrangement

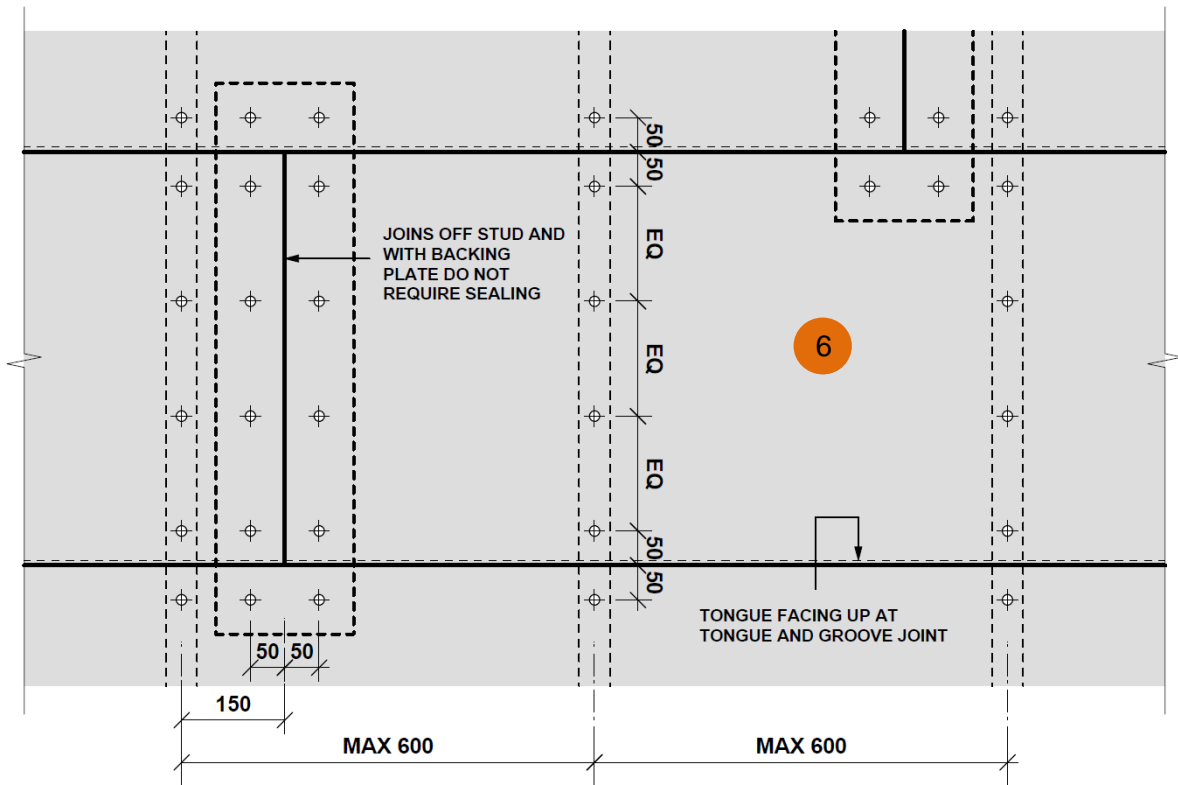


Figure 5 – Horizontal INEX>RENDERBOARD Wall System Timber frame – Sheet fixing details

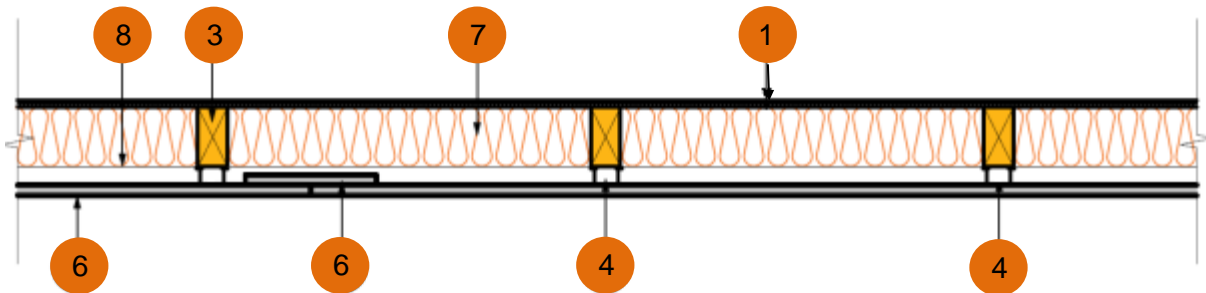


Figure 6 – Horizontal INEX>RENDERBOARD Wall System Timber Frame – Plan Section

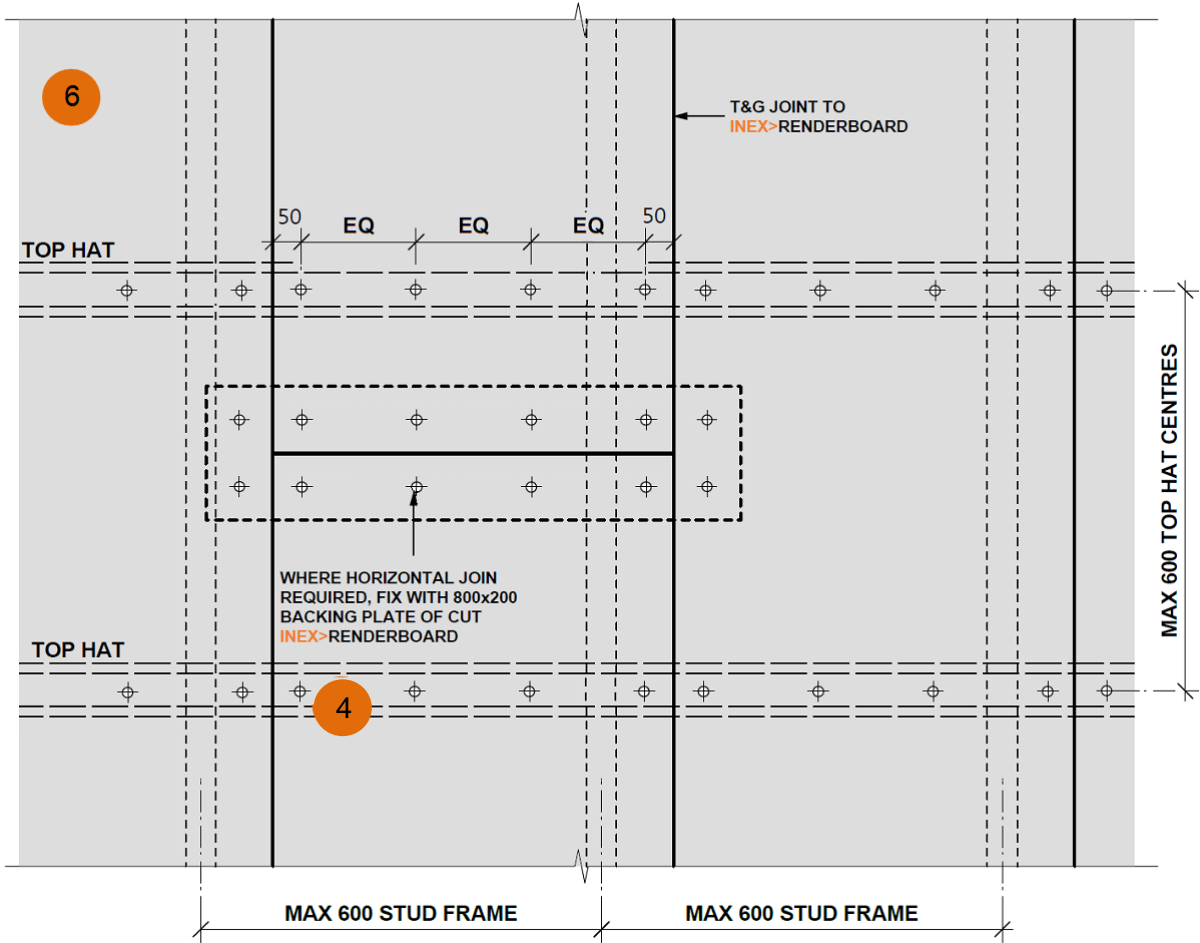


Figure 7 – Vertical INEX>RENDERBOARD Wall System Steel or Timber frame – Sheet fixing details

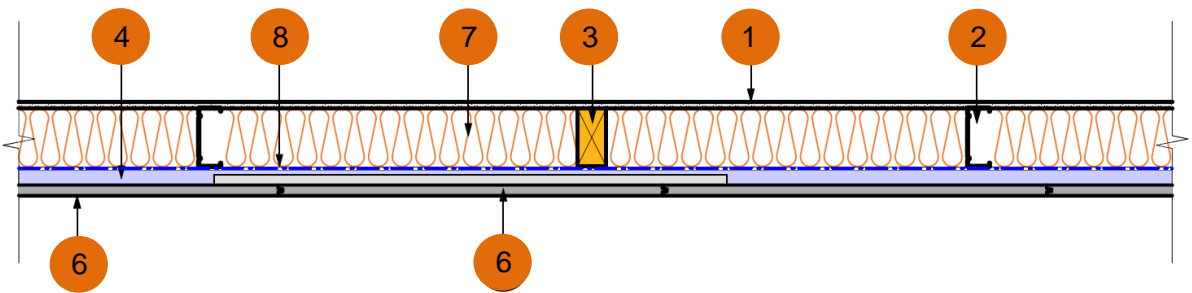
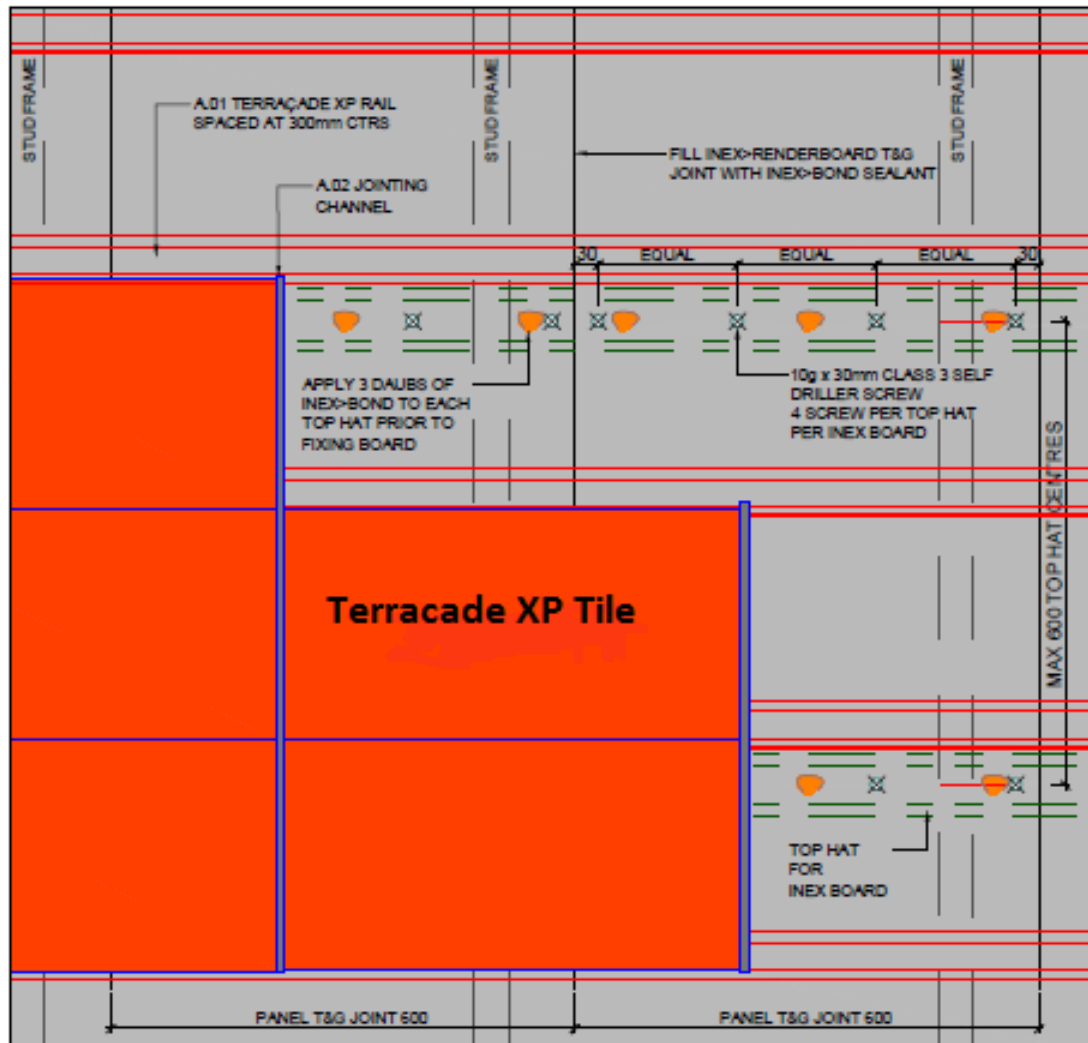
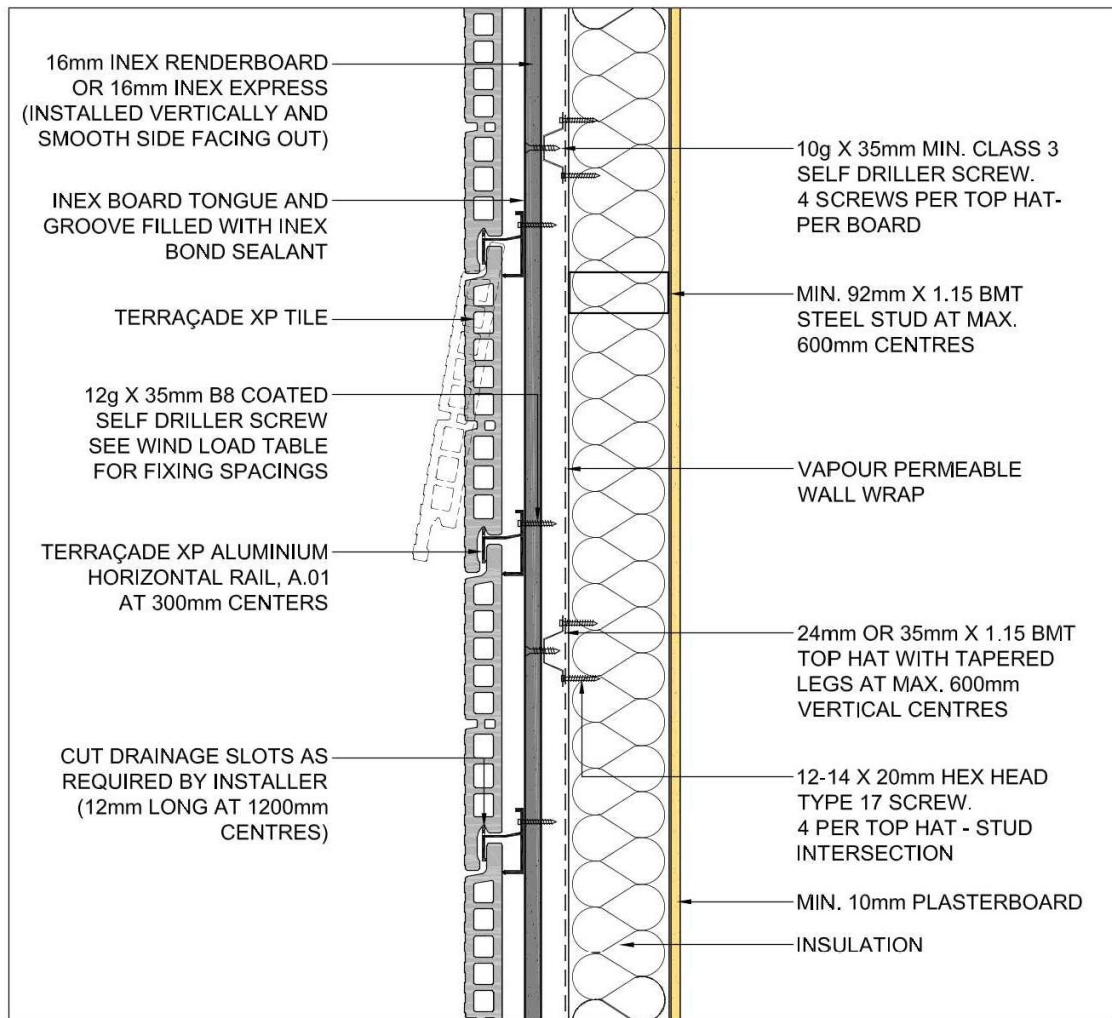


Figure 8 – Vertical INEX>RENDERBOARD Wall System Steel or Timber Frame – Plan Section



XP ON INEX BOARD FACADE FIXING

Figure 9 – Installation of Terraçade XP tiles over the INEX>RENDERBOARD – Front Elevation



TERRAÇADE INEX RENDER BOARD DETAIL

Figure 10 – Installation of Terraçade XP tiles over the INEX>RENDERBOARD – Vertical Cross-Section

4 REFERENCED TEST PROCEDURES

This report is prepared with reference to the requirements of AS1530.4-2005 as appropriate for walls.

5 FORMAL ASSESSMENT SUMMARY

On the basis of the discussion presented in this report, it is the opinion of this testing authority that if the tested prototypes described in Section 2 had been varied as in Section 3, they will achieve the fire resistance performances below if tested in accordance with the test method referenced in Section 4 and subject to the requirements of Section 7.

Wall System	Construction details	FRL
UBIQ INEX>RENDERBOARD WALL SYSTEMS	Figure 1 to 8	60/60/60 from outside only
TERRAÇADE XP CLADDING WITH UBIQ INEX>RENDERBOARD WALL SYSTEMS	Figure 1 to 8 plus 9 & 10	

6 DIRECT FIELD OF APPLICATION

The results of this assessment are applicable to walls exposed to fire from the external cladding side only.

7 REQUIREMENTS

This report details the methods of construction, test conditions and assessed results that would have been expected had the specific elements of construction described herein been tested in accordance with AS1530.4.

Any further variations with respect to size, constructional details, loads, stresses, edge or end conditions, other than those identified in this report, may invalidate the conclusions drawn in this report.

It is required that the top of the wall is supported by construction capable of providing adequate lateral support for the fire resistance period.

8 VALIDITY

This assessment report does not provide an endorsement by Exova Warringtonfire Aus Pty Ltd of the actual products supplied.

The conclusions of this assessment may be used to directly assess the fire resistance performance under such conditions, but it should be recognised that a single test method will not provide a full assessment of the fire hazard under all fire conditions.

Because of the nature of fire resistance testing, and the consequent difficulty in quantifying the uncertainty of measurement, it is not possible to provide a stated degree of accuracy. The inherent variability in test procedures, materials and methods of construction, and installation may lead to variations in performance between elements of similar construction.

The assessment can therefore only relate only to the actual prototype test specimens, testing conditions and methodology described in the supporting data, and does not imply any performance abilities of constructions of subsequent manufacture. This assessment is based on information and experience available at the time of preparation. The published procedures for the conduct of tests and the assessment of test results are the subject of constant review

and improvement and it is recommended that this report be reviewed on or, before, the stated expiry date.

The information contained in this report shall not be used for the assessment of variations other than those stated in the conclusions above. The assessment is valid provided no modifications are made to the systems detailed in this report.

All details of construction should be consistent with the requirements stated in the relevant test reports and all referenced documents.

9 AUTHORITY

9.1 APPLICANT UNDERTAKINGS AND CONDITIONS OF USE

By using this report as evidence of compliance or performance, the applicant(s) confirms that:

- to their knowledge the component or element of structure, which is the subject of this assessment, has not been subjected to a fire test to the Standard against which this assessment is being made, and
- they agree to withdraw this assessment from circulation should the component or element of structure be the subject of a fire test by a test authority in accordance with the Standard against which this assessment is being made and the results are not in agreement with this assessment, and
- they are not aware of any information that could adversely affect the conclusions of this assessment and if they subsequently become aware of any such information, agree to ask the assessing authority to withdraw the assessment.

9.2 GENERAL CONDITIONS OF USE

This report may only be reproduced in full without modifications by the report sponsor. Copies, extracts or abridgments of this report in any form shall not be published by other organisations or individuals without the permission of Exova Warringtonfire Aus Pty Ltd.

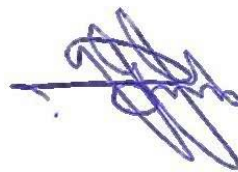
9.3 AUTHORISATION ON BEHALF OF EXOVA WARRINGTONFIRE AUS PTY LTD

Prepared by:



H. Wong

Reviewed by:



O. Saad

9.4 DATE OF ISSUE

11/04/2018

9.5 EXPIRY DATE

30/04/2023

APPENDIX A - SUMMARY OF SUPPORTING DATA

- A.1 TEST REPORT – EWFA 2890701
- A.1.1 Report Sponsor**
- A.1.1.1 UBIQ, 1/17 Chester Street, Annandale, NSW 2038, Australia.
- A.1.2 Test Laboratory**
- A.1.2.1 Exova Warringtonfire Aus Pty Ltd, Unit 2, 409-411 Hammond Road, Dandenong VIC 3175.
- A.1.3 Test Date**
- A.1.3.1 The test was conducted on 24th September 2013.
- A.1.4 Test standards prescribed**
- A.1.4.1 The test was conducted in general accordance with AS1530.4-2005.
- A.1.5 Description of Tested Assembly**
- A.1.5.1 The test assembly comprised a nominal 3000mm wide x 3000mm high x nominal 146mm thick loadbearing wall system.
- A.1.5.2 The wall was restrained at the top and was supported at the base on the loading jacks. The north and south vertical edges were free from lateral restraint.
- A.1.5.3 The test specimen comprised a 92mm thick steel stud framing with 28mm furring channels on the fire side and was clad with a product identical to 16mm INEX>RENDERBOARD 16 sheeting on exposed side and 10mm thick Gyprock Plasterboard CD on the non-fire side.
- A.1.5.4 The wall system was asymmetrical, with 16mm INEX>RENDERBOARD 16 sheeting to the exposed side.
- A.1.5.5 The steel studs were installed at 600mm nominal centres and noggings were installed at 1200mm centres from based and screw fixed to stud. Galvanised steel fixing clips were positioned on the exposed flange of the steel studs at nominal 750mm centres and fixed in place using 10g x 16mm long Flat tops Self-drilling screws. 28mm x 0.5BMT furring channels were positioned at nominal 600mm centres along steel studs and clipped to fixing clip.
- A.1.5.6 The exposed cladding, sheets were 600mm wide and installed on the exposed side of steel framing and screw fixed to the furring channels at 250mm centres in field of the sheeting and at butt joints by using 10g x 40mm long Countersunk Ribbed Head, Square Drive, Coarse Thread screws. The fixings were staggered by 50mm at butt joints. Bostik Fireban One sealant was applied between all vertical butt joints on the exposed side cladding.
- A.1.5.7 The cavity insulation, R2.5 Polyester: Polymax Thermal Insulation Batts were installed in the space between the studs/noggings/tracks.
- A.1.5.8 1200mm wide and 10mm thick CSR Gyprock plasterboard CD sheets were installed on the unexposed side and screw fixed to the steel framing by using 6g x 25mm long Bugle Head Drill Point Fine Thread ZY PS screws at nominal 400mm centres in the field of the boards into the studs and 150mm staggered along vertical butt joints.
- A.1.5.9 The unexposed cladding joints were taped and sealed with nominal 50mm wide paper tape and Gyprock™ Base Coat 45.
- A.1.6 Instrumentation**
- A.1.6.1 The instrumentation was provided and applied in general accordance with AS1530.4-2005.
- A.1.7 Test Results**
- A.1.7.1 The ambient temperature at the start of the test was 24°C and did not vary significantly during the test duration.
- A.1.7.2 The test duration was 49 minutes.
- A.1.7.3 The total load applied to the specimen was 12.7kN and was applied at 6 single point load

locations at 600mm centres to the bottom edge of the wall.

A.1.7.4 The performance of tested specimen is summarised below;

Criteria	Result	Note
Structural Adequacy	Failed at 48 minutes	Wall no longer able to take load, multiple studs buckling and contracting. Failure of structural adequacy in accordance with AS1530.4-2005, clause 2.12.1a) where the specimen's axial contract exceeded the limits specified.
Integrity	Failed at 48 minutes	It had become evident that cladding at the top section of the specimen had detached from the specimen. Flaming appeared on the top of the specimen where the cladding had fallen off, Failure on integrity in accordance with AS1530.4-2005 Clause 2.12.2.4 due to the sustained flaming on the non-exposed side for greater than 10 seconds.
Insulation	Failed at 47 minutes	Failure on insulation in accordance with AS1530.4-2005 Clause 2.12.3 b) where the maximum temperature measured by the roving thermocouple exceeded the initial temperature by more than 180K.

A.2 TEST REPORT – EWFA 29061000

A.2.1 Report Sponsor

A.2.1.1 UBIQ, 1/17 Chester Street, Annandale, NSW 2038, Australia.

A.2.2 Test Laboratory

A.2.2.1 Exova Warringtonfire Aus Pty Ltd, Unit 2, 409-411 Hammond Road, Dandenong VIC 3175.

A.2.3 Test Date

A.2.3.1 The test was conducted on 5th May 2014.

A.2.4 Test standards prescribed

A.2.4.1 The test was conducted in general accordance with AS1530.4-2005.

A.2.5 Description of Tested Assembly

A.2.5.1 The test assembly comprised a nominal 3000mm wide × 3000mm high × nominal 159mm thick load-bearing wall system.

A.2.5.2 The wall was restrained at the top and was supported at the base on the loading jacks. The north and south vertical edges were free from lateral restraint.

A.2.5.3 The specimen wall was comprised of 92mm steel stud framing with 40mm Top Hats on the fire side and was clad with 16mm INEX>RENDERBOARD 16 sheeting on exposed side and 10mm thick Gyprock Plasterboard CD on the non-fire side.

A.2.5.4 The top of specimen was subjected to a total axial load of 19.44 kN (22.3 kN applied to the base of the wall reduced by the 2.9 kN to account for the self-weight of the wall). This load was applied for 88 minutes of the test.

A.2.5.5 For assessment purposes at 88 minutes the load was reduced to 12.6 kN (15.5 kN applied to the base of the wall).

A.2.5.6 The load was evenly applied at 6 single point load locations at 600mm centres at the bottom edge of the wall in line with the studs.

A.2.6 Instrumentation

A.2.6.1 The instrumentation was provided and applied in general accordance with AS1530.4-2005.

A.2.7 Test Results

A.2.7.1 The ambient temperature at the start of the test was 15°C and did not vary significantly during the test duration.

A.2.7.2 The test duration was 91 minutes.

A.2.7.3 The performance of tested specimen is summarised below;

Criteria	Result
Structural Adequacy	88 minutes Load of 3.24kN/stud
Integrity	63 minutes Flaming along the top edge of the specimen where the unexposed cladding had moved away from lintel
Insulation	62 minutes Mid-height, 15mm from a horizontal joint. Recorded a rise in temperature of more than 180°C

APPENDIX B - ASSESSMENT OF SPECIFIC VARIATIONS

B.1 LOADBEARING INEX>RENDERBOARD WALL SYSTEM FOR 60 MINUTES

B.1.1 Proposed Construction

B.1.1.1 The wall construction shall be as tested in EWFA 29061000 subject to the following variations:

- UBIQ INEX>RENDERBOARD jointing shall be off framing with backblocks and no sealant.
- Inclusion of optional cavity insulation, sarking, building paper or wall wrap.
- Framing may be steel or timber designed in accordance with the relevant framing standards.
- Non-fire side plasterboard may be any standard grade plasterboard with minimum thickness of 10mm.
- Steel Furring Channels shall be one of the following:
 - 16mm deep Rondo #308
 - 16mm deep Studco #M308
 - 24mm deep Studco M304 (0.75BMT)
 - 28mm deep Studco #M29
 - 29mm deep Rondo #129
- Optional inclusion of external Terracade cladding over the UBIQ INEX>RENDERBOARD

B.1.1.2 It should be noted that even though furring channels may be utilised for mounting of the panels in one instance, top hats may be required for application in other variants of the panels. Top hats or furring channels will be selected to suit its effectiveness in fixing the particular panels. Furring channels and top hats of equal material thicknesses and of the same material of construction have equal structural strength except for the slight difference in profile. It is therefore considered that there will be no adverse impact on the overall system fire resistance performance in replacing top hats with furring channels and vice versa.

B.1.2 Discussion

Structural Adequacy

B.1.2.1 The structural adequacy of the wall system is generally governed by wall cavity temperatures as timber and steel framing begin to degrade and reduce their axial load capacity.

B.1.2.2 The tested specimen in test EWFA 29061000 comprised a nominal 3000mm wide x 3000mm high x 159mm thick loadbearing steel framed wall consisting of 92mm thick steel stud framing with 40mm top-hat channels on the fire side and was clad with 16mm INEX>RENDERBOARD 16 sheeting on the exposed side and 10mm thick standard grade plasterboard on the non-fire side.

B.1.2.3 When tested, the construction did not fail the structural adequacy criteria for 88 minutes.

B.1.2.4 The proposed construction includes an additional layer of sarking, building paper or wall wrap. These materials are considered to provide a notional radiation barrier while in place and hence will tend to decrease the wall cavity temperature and also to reduce the gas permeability.

B.1.2.5 Due to the thermally thin nature of sarking it is considered it will tend to provide only a notional increase in performance and little negative effect and are positively assessed.

B.1.2.6 The proposed framing may be timber and at least 90mm deep and otherwise designed in accordance with the structural timber framing code.

B.1.2.7 With reference to the test EWFA 29061000, the specimen comprised an instrumented timber stud installed between two noggings. When tested the depth of the 300°C isotherm was around 6.5mm at 60 minutes based on the temperatures measured on and within the timber stud.

B.1.2.8 A calculation has been undertaken and it was verified that the load bearing capacity of timber stud framing designed in accordance with AS1684 will be maintained during the fire load case provided the timber stud is at least 90mm deep and the char depth does not exceed 10mm.

- B.1.2.9 Based on the above discussion it is considered that the proposed timber framing of 90mm depth will maintain structural adequacy for at least 60 minutes if tested in accordance with AS1530.4-2005.
- B.1.2.10 The proposed construction includes steel furring channels of various sizes with minimum depth of 16mm in lieu of the 40mm steel top hats tested.
- B.1.2.11 The fire side wall lining is fixed to the furring channels which are then fixed to the wall frame. Failure of the furring channels could potentially result in fall off of the fire side lining exposing the wall frame to direct radiant heat from the furnace, reducing the time to structural failure either by increased char rate for timber studs or increased loss in load capacity for steel studs.
- B.1.2.12 With reference to the test EWFA 2890701.1, the specimen was of similar construction with smaller furring channels. Considering that all other aspects of the construction were similar or identical to the construction tested in EWFA 29061000, and that the internal cavity temperatures were not appreciably different, the reduced cavity space between lining and frame is not expected to have a significant impact on internal cavity temperatures.
- B.1.2.13 Furthermore, additional insulation is proposed to be R2.5 Glasswool or Rockwool which will reduce the rate of temperature increase within the cavity.
- B.1.2.14 It is therefore considered that the proposed reduction in depth of the steel furring channels from 40mm to 16mm will not have any detrimental effect on the structural performance of the construction
- B.1.2.15 In light of above, it is considered that the proposed construction will maintain structural adequacy for at least 60 minutes if tested in accordance with AS1530.4-2005.

Integrity

- B.1.2.16 The specimen tested in EWFA 29061000 comprised a loadbearing steel framed wall consisting 92mm thick steel stud framing with 40mm furring channels on the fire side and was clad with 16mm INEX>RENDERBOARD 16 sheeting on the exposed side and 10mm thick Gyprock Plasterboard CD on the non-fire side.
- B.1.2.17 When tested, the specimen maintained integrity performance for 63 minutes at which point sustained flaming appeared on the top edge of the specimen where the unexposed cladding had moved away from the lintel.
- B.1.2.18 The proposed construction is similar to the one tested in EWFA 29061000 and includes one additional layer of sarking, building paper or wall wrap applied between external cladding and wall framing.
- B.1.2.19 The presence of the additional layer of sarking, building paper or wall wrap are considered to provide a notional radiation barrier while in place and hence will tend to decrease the wall cavity temperature and also to reduce the gap permeability.
- B.1.2.20 It is therefore considered the proposed additional lining will not have any detrimental effect on the integrity performance of the construction.
- B.1.2.21 It is proposed that the construction include additional Rockwool or Glasswool cavity insulation. Rockwool or Glasswool insulation batts will reduce hot gas permeability of the construction and is not expected to have any detrimental effect on the integrity performance of the construction.
- B.1.2.22 In light of the above, it is considered that the proposed construction will maintain 60 minutes integrity performance if tested in accordance with AS1530.4-2005.

Insulation

- B.1.2.23 With reference to the test EWFA 29061000, the tested specimen failed the insulation criteria at 62 minutes when the temperature recorded by the thermocouple located at mid-height, 15mm from a vertical joint on the unexposed side cladding exceeded the initial temperature by more than 180K. The average and maximum temperature measured on the unexposed face of the sheets were 103°C and 123°C respectively at 60 minutes.
- B.1.2.24 The presence of the additional layer of sarking, building paper or wall wrap is considered to provide a notional radiation barrier while in place and hence will tend to decrease the wall cavity temperature and also to reduce the gap permeability.

- B.1.2.25 It is proposed that the construction include additional insulation cavity insulation. Polyester, Rockwool or Glasswool insulation batts will reduce hot gas permeability of the construction and is not expected to have any detrimental effect on the insulation performance of the construction.
- B.1.2.26 It is therefore considered that the proposed construction will maintain insulation for at least 60 minutes if tested in accordance with AS1530.4-2005.

B.2 VERTICAL INEX>RENDERBOARD

B.2.1 Proposed Construction

- B.2.1.1 The wall construction shall be as tested in EWFA 29061000 subject to the following variations:
- Arrangement shall include horizontal furring channels with vertical INEX>RENDERBOARD

B.2.2 Discussion

- B.2.2.1 The specimen tested in EWFA 29061000 included vertical furring channels with horizontal RENDERBOARD. The furring channels were screw fixed at the base to the bottom row of fixing clips only, at all other fixing clip locations, the batten was clipped in normally. During the test it is likely that the majority of the weight of the panels was transferred directly to the bottom screw fixing through the batten, essentially unloading the steel studs and the clips from the weight of the RENDERBOARD cladding.
- B.2.2.2 The proposed construction includes horizontal furring channels with vertical RENDERBOARD. If the battens were horizontal, the steel studs would be loaded with the full weight of the cladding for the duration of the test. The weight of the cladding is approximately 1.8kN (total) which is small compared to the 19.4kN applied to the wall during the test. The tested wall failed structural criteria at 88 minutes despite a large increase in cavity temperature soon after 60 minutes due to a breach in the exposed cladding. Given the large 28 minutes' margin over 60 minutes and the expected steel temperature of around 400°C at 60 minutes, it is considered that a 10% increase in load will not reduce time to failure to less than 60 minutes.
- B.2.2.3 The clips would also be loaded if battens were horizontal. Failure of the clips could occur at the fixing point to the stud or the clips could "let go" of the batten if they deformed significantly. There are 5 clips supporting each 600mm wide panel, each clip fixed to the stud with 2 x 12G – 14 hex screws. Considering the expected steel temperature of around 400°C at 60 minutes, the load is not expected to deform each clip significantly enough to cause the batten to fall out or to cause failure of the screws before 60 minutes.
- B.2.2.4 Further confidence in the performance of the fixing clips is gained when considering the specimen tested in EWFA 29061000. The furring channels were screw fixed at the base to the bottom row of fixing clips only, at all other fixing clip locations, the batten was clipped in normally. During the test it is likely that the majority of the weight of the panels was transferred directly to the bottom screw fixing through the batten to the fixing clip. Despite the concentrated loading the fireside cladding remained in place indicating that the fixing clips did not fail or significantly deform for the duration the of the test.
- B.2.2.5 Integrity and insulation performance is expected to be the same as the tested specimen. The formation of gaps is not expected to change due to the change in orientation of the panels to their tongue and groove edge details.
- B.2.2.6 It is therefore considered that the proposed construction will maintain structural adequacy, integrity and insulation criteria for at least 60 minutes if tested in accordance with AS1530.4-2005.
- ## B.3 OPTIONAL TERRAÇADE XP EXTERNAL CLADDING
- ### B.3.1 Discussion
- B.3.1.1 It is proposed that the tested Ubiq Inex>Renderboard wall system as tested in EWFA 29061000 be optionally clad over externally with Terraçade XP tiles as shown in figures 9 and 10.
- B.3.1.2 The Terraçade XP tiles are basically of terracotta material with hollow sections and fixed onto the Inex>Renderboard via Terraçade XP aluminium rails and 12g x 35mmB8 coated self-driller screws.

- B.3.1.3 The Terraçade tiles, being of terracotta material is effectively incombustible. With the hollow core profile and mounting via aluminium rails, it creates both as a fire resistant barrier and an insulator (with the hollow sections and the air gap formed by the rails) over the surface of the Inex>Renderboard surface.
- B.3.1.4 The installation of the Terraçade XP tiles would therefore more likely improve on the overall fire resistance performance of the wall system (in terms of improvement in insulation and integrity) than to cause any adverse effect.
- B.3.1.5 With the use of aluminium rails, the added Terraçade XP cladding would fall away early when the tiles crack and break allowing hot gases to infiltrate to the Inex>Renderboard. With continues temperature rise over the surface, the aluminium rails, having a relatively low melting point will soften and melt before the Inex>Renderboard start to fail. The early fall away of the outer Terraçade XP cladding will therefore not cause any undue damage to the main wall system.
- B.3.1.6 From the above discussion, it is considered that the addition of the Terraçade XP cladding will not affect the fire resistance performance of the external wall system and therefore will attain the same FRL of 60/60/60 if tested in accordance with AS 1530.4-2005.
- B.3.1.7 The weight of the Terraçade XP tiles including the mounting aluminium rails, as advised by the sponsor, total 52.5kg/m² of the wall area. The design engineers should be aware of the added mass and make allowance for the additional load due to the Terraçade XP tiles and fixings over the originally tested wall system when designing any new Terraçade and UBIQ Inex wall systems.