

FIRE RESISTANCE CLASSIFICATION ACCORDING TO EN 13501-2:2016

Initiator:	Ekovilla Oy Akseli Romppanen Katajajarjuntie 10 45720 KUUSANKOSKI
Carried out by:	Eurofins Expert Services Oy Paloturvallisuus Kivimiehentie 4, 02150 Espoo FINLAND
No. of notified body:	0809
Product name:	Load-bearing wooden stud wall insulated with Ekovilla dry-blown loose fiber cellulose insulation.
No. of classification report:	EUFI29-22002856-T1
Issue number:	1
Date of issue:	22.6.2021

This classification report consists of 6 pages and two annexes and may not be used or reproduced in part.

1 Introduction

This fire resistance classification report defines the classification assigned to the load-bearing wooden stud wall insulated with Ekovilla in accordance with the procedures of EN 13501-2:2016.

2. Details of the classified product

2.1 General Information

The load-bearing wooden stud wall insulated with Ekovilla is defined as a type-classified component. Their function is to resist the fire in terms of bearing capacity, physical barrier and thermal insulation.

2.2 Description

The load-bearing wooden stud wall insulated with Ekovilla is described in detail in the test reports that are the basis for the classification listed in section 3.1 and in the drawings in appendix 1.

3 Test report and test results to prove the classification

3.1 Test reports (basis of the REI classification)

Name of the laboratory	Initiator	Number of the test report	Test procedure
VTT Expert Services Oy	Ekovilla Oy	VTT-S-03741-17	EN 1365-1:2012/AC:2013
VTT Expert Services Oy	Ekovilla Oy	VTT-S-05067-17	EN 1365-1:2012/AC:2013

VTT-S-03741-17:

The test specimen was a load-bearing 2900 x 2900 x 341 mm³ wall structure consisting of six 198 x 48 mm², k 600 mm C24 class timber frames, four of which were load-bearing. The lower and upper runners and the upper guide beam were 198 x 48 mm², strength class C24 timber. The upper and lower runners were attached to each load-bearing frame with four 3.1 x 90 mm nails. The upper guide beam was attached to each load-bearing frame with five 3.1 x 90 mm nails, and a ~50 mm deflection gap was left below it in the edge frames.

On the fire side of the wooden frames, one layer of 9 mm thick Knauf KXT 9 wind protection boards (nominal square weight 7.2 kg/m²) was fixed vertically with 3.8 x 32 mm screws on the edges of the 150 mm boards and k 200 mm in the middle of the boards. 48 x 48 mm vertical joists with 3.1 x 90 mm nails k/k 350 mm were installed on top of the wind protection boards, to which 25 x 125 mm pegged exterior cladding boards were attached with two 2.3 x 50 mm nails / joist. The outer planking was left open at the top and bottom so that air can circulate freely in the ventilation gap.

On the opposite side of the fire, Ekovilla X5 air barrier paper was attached to the frames with staples and 48 x 48 mm horizontal timbers were installed on top of it, between which 50 mm thick Ekovilla insulation boards (nominal density 38 kg/m³) were placed. One layer of 13 mm thick Knauf KN13 plasterboard (nominal density 7.8 kg/m³) was attached to the horizontal construction with 3.8 x 32 screws. The plates were installed horizontally and the two lowest ones were 1200 x 2900 mm and the top plate was 500 x 2900 mm (height x width).

The air barrier paper was installed overlapping the papers and the visible seam was taped over with 50 mm wide Sitko Flex sealing tape (manufactured by Tectis). Ekovilla's insulating wool was blown into the structure through holes made in the air barrier paper at the top and bottom of each frame. The calculated installation density was 59.8 kg/m³.

More detailed information about the test specimen in the customer's drawings in Appendix 1.

VTT-S-05067-17:

The test specimen was a load-bearing 2900 x 2900 x 341 mm³ external wall structure consisting of six 198 x 48 mm², k 600 mm C24 class wooden frames, of which the middle four were load-bearing and the outermost ones were non-load-bearing. The lower and upper runners and the upper guide beam were 198 x 48 mm², strength class C24 timber. The upper and lower runners were attached to each load-bearing frame with four 3.1 x 90 mm nails. The upper guide beam was attached to each load-bearing frame with five 3.1 x 90 mm nails, and a ~50 mm deflection space was left below it in the edge frames.

One layer of 9 mm thick Knauf KXT 9 wind protection boards (nominal square weight 7.2 kg/m²) was attached vertically to the side of the wooden frames opposite the fire with 3.8 x 41 mm screws k 150 mm on the edges of the boards and k 200 mm in the middle of the boards. 48 x 48 mm² vertical joists with 3.1 x 90 mm nails k 300 mm were installed on top of the wind protection boards, to which 20 x 125 mm pegged exterior cladding boards were attached with two 2.3 x 50 mm nails / joist. The outer planking was left open at the top and bottom so that air could circulate freely in the ventilation gap.

On the side of the fire, Ekovilla X5 air barrier paper was attached to the frames with staples and 48 x 48 mm² horizontal timbers were installed on top of it, between which 50 mm thick Ekovilla insulation boards were placed (nominal density 38 kg/m³). One layer of 13 mm thick Knauf KN13 gypsum board (nominal square weight 7.8 kg/m²) was attached to the horizontal construction with 3.8 x 41 mm screws k 150 mm from the edges of the board and k200 mm from the center of the plate. The boards were installed horizontally and the size of the two bottom boards was 1200 x 2900 mm² and the top board was 500 x 2900 mm² (height x width).

The air barrier paper was installed overlapping the papers and the visible seam and the holes made for blowing insulation were taped with 50 mm wide Sitko Flex sealing tape (manufactured by Tectis). Ekovilla's insulating wool was blown into the structure through holes made in the air barrier paper at the top and bottom of each frame. The calculated installation density was 61.1 kg/m³.

More detailed information about the test specimen in the customer's drawings in Appendix 1.

3.2

Test results

Procedure, test report number and date		Results
EN 1365-1:2012/AC:2013 VTT-S-03741-17 22.9.2017	<p>Added load</p> <p>Carryin capacity (R) -Deformation criteria exceeded after [min]: -Compression or compression speed - limit value exceeded after [min]:</p> <p>Physical barrier (E) -Time until the cotton ball becomes inflamed [min]: -Time to the occurrence of continuous flames [min]: Time until the split criterion fails [min]:</p> <p>Thermal Insulation (I) -Time after the average temperature increase on the non-flamed side exceeds 140 °C [min]: -Time after the maximum temperature increase on the non-flamed side exceeds 180 °C [min]:</p>	<p>16,3 kN/m</p> <p>66 min</p> <p>66 min</p> <p>66 min</p> <p>66 min</p> <p>66 min</p> <p>66 min</p> <p>66 min</p>
EN 1365-1:2012/AC:2013 VTT-S-05067-17 30.10.2017	<p>Added load</p> <p>Carryin capacity (R) -Deformation criteria exceeded after [min]: -Compression or compression speed - limit value exceeded after [min]:</p> <p>Physical barrier (E) -Time until the cotton ball becomes inflamed [min]: -Time until the split criterion fails [min]: -Time to the occurrence of continuous flames [min]:</p> <p>Thermal Insulation (I) -Time after the average temperature increase on the non-flamed side exceeds 140 °C [min]: -Time after the maximum temperature increase on the non-flamed side exceeds 180 °C [min]:</p>	<p>16,3 kN/m</p> <p>52 min</p> <p>52 min</p> <p>52 min</p> <p>52 min</p> <p>49 min</p> <p>49 min</p> <p>49 min</p>

Expert Services

5 (6)

4 Classification and direct application area

4.1 Reference to classification

This classification was carried out according to EN 13501 -2: 2016, section 7.3.2.

4.2 Classification

The component (described in the mentioned test reports) is classified in relation to its fire resistance class as follows:

R	E	I	W		t	t	-	M	S	C	IncSlow	sn	ef	r	G	K
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Flaming from the outside (VTT-S-03741-17)

Fire resistance classification:	REI 60	RE 60	R 60
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Flaming from the inside (VTT-S-05067-17)

Fire resistance classification:	REI 45	RE 30	R 30
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4.3 Application area

This classification is valid for the following practical application (end use).

- Reduction of the height of the wall
- Increasing the wall thickness
- Increasing the thickness of associated materials
- Reduction of the length dimensions of plates or panels, but not the thickness
- Reduction of the stand spacing
- Reduction of the distances between fasteners
- Horizontal seams may be added provided that the structure has been tested with a horizontal seam located 500±150 mm from the top edge
- Reduction of the applied load
- Widening

Other changes are not allowed.

5 Restrictions

The classification document does not constitute a type approval or certification of the product.

Espoo, 22.6.2021

Allekirjoittaja

Hyväksyjä



Jens Pedersen

Teemu Vesala

Senior Expert

Senior Expert

ATTACHMENTS

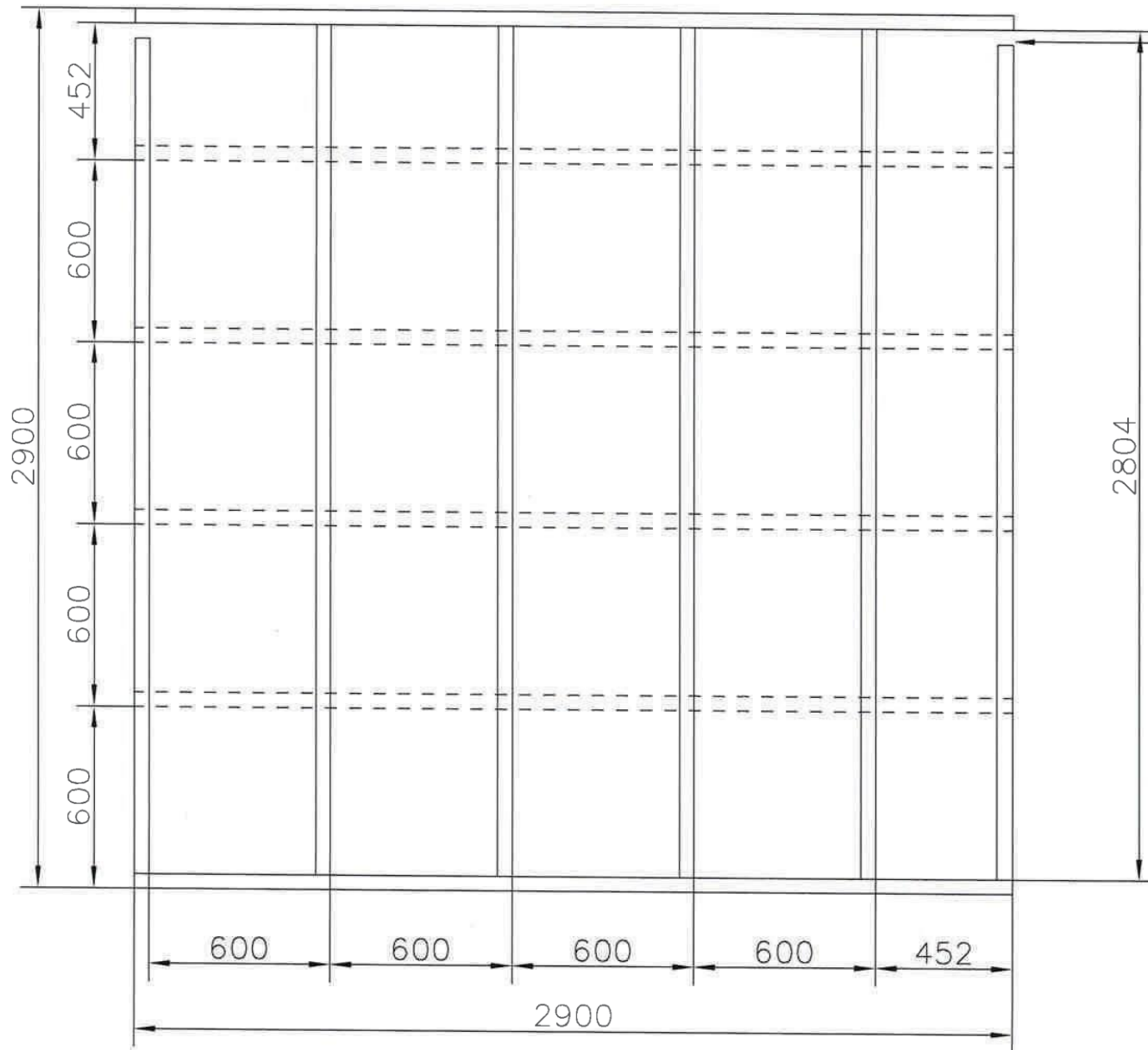
Appendix 1

Drawings VTT-S-03741-17 (3 pages)

Appendix 2

Drawings VTT-S-05067-17 (3 pages)

RAKENNE EDESTÄ



TOLPPAPITUUS 2804 MM
REUNIMMAISET TOLPAT 2754 MM

Eurofins Expert Services Oy

Jens Pedersen

Jens Pedersen

APPENDIX NO. 1 1/3
REPORT NO: VIT-5-03741-17
SIGNATURE Jens Pedersen
VIT EXPERT SERVICES LTD

KUORMITETUN REI 60
ULKOSEINÄRAKENTEEN
PALONKESTÄVYYSKOE
LIITE RAKENNE 1/1: 20

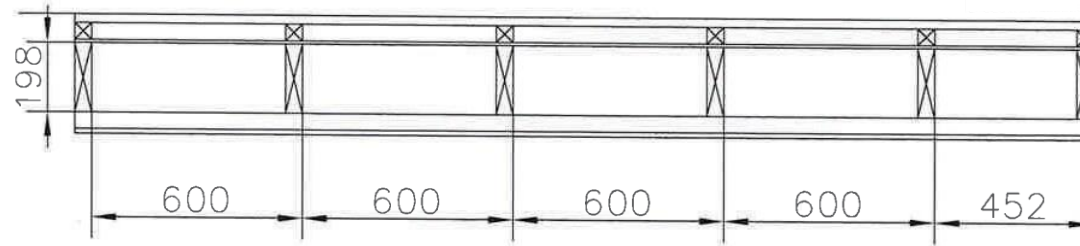
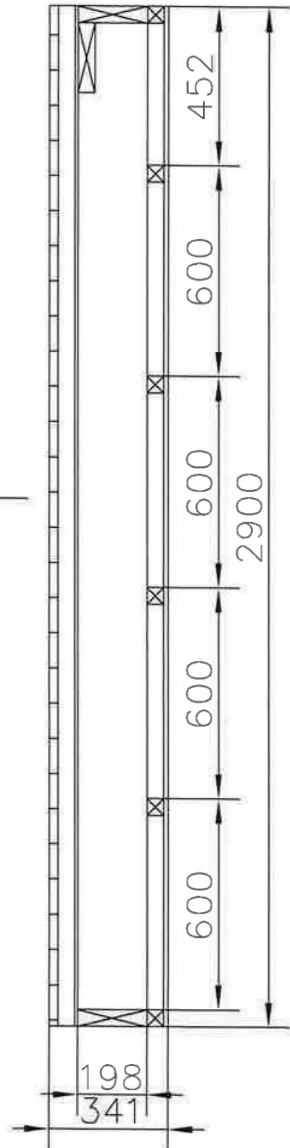
8.5.2017
EKOVILLA OY

POLTTOKOE REI 60 ULKOPUOLISTA PALOA VASTAAN

Eurofins Expert Services Oy

Jens Pedersen

Jens Pedersen



KANTAVA RUNKO 48x198
 KUUSI, LUOKKA C24
 (REUNIMMAISET TOLPAT 50 MM
 LYHYEMMÄT YLÄOHJAUSPUUN
 ALAOHJAUSPUUN ALAPUOLELTA)

RUNGON NAULAUS 90*3,1 MM
 4 KPL/TOLPPA
 YLÄOHJAUSPUUN NAULAUS PINNINKIIN
 PÄÄLTÄPÄIN 90*3,1 MM K 350 MM

KOOLAUSPUUT KUUSI, KIINNITYS
 90*3,1 MM K 600
 ULKOVERHOUSLAUTA KUUSI,
 KIINNITYS 2 KPL/LAUTA 60*2,3
 MM

TUULENSUOJALEVYN KIINNITYS:

KIPSILEVYRUUVI 32*3,8 MM
 RUUVIVÄLI LEVYN REUNOILLA
 K 150 MM JA LEVYN KESKELLÄ K 200 MM
 RUUVIN ETÄISYYS KARTONKIREUNASTA VÄH. 10 MM,
 LEIKATUSTA REUNASTA 15 MM

SISÄVERHOUSKIPSILEVYN KIINNITYS:

KIPSILEVYRUUVI 32*3,8
 RUUVIVÄLI KESKELLÄ K 200 MM, REUNOILLA K 150 MM
 RUUVIN ETÄISYYS KARTONKIREUNASTA 10 MM,
 LEIKATUSTA REUNASTA VÄH. 20 MM

SISÄVERHOUS- JA TUULENSUOJALEVYJEN SAUMAJAKO
 1200 MM

APPENDIX NO. 1 2/3

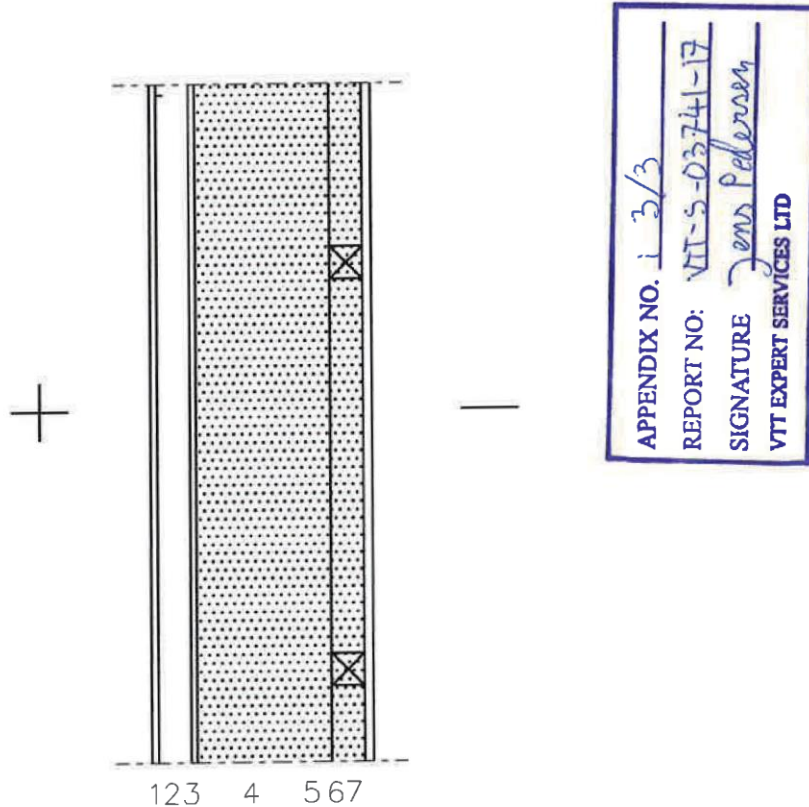
REPORT NO: VTT-S-03741-17

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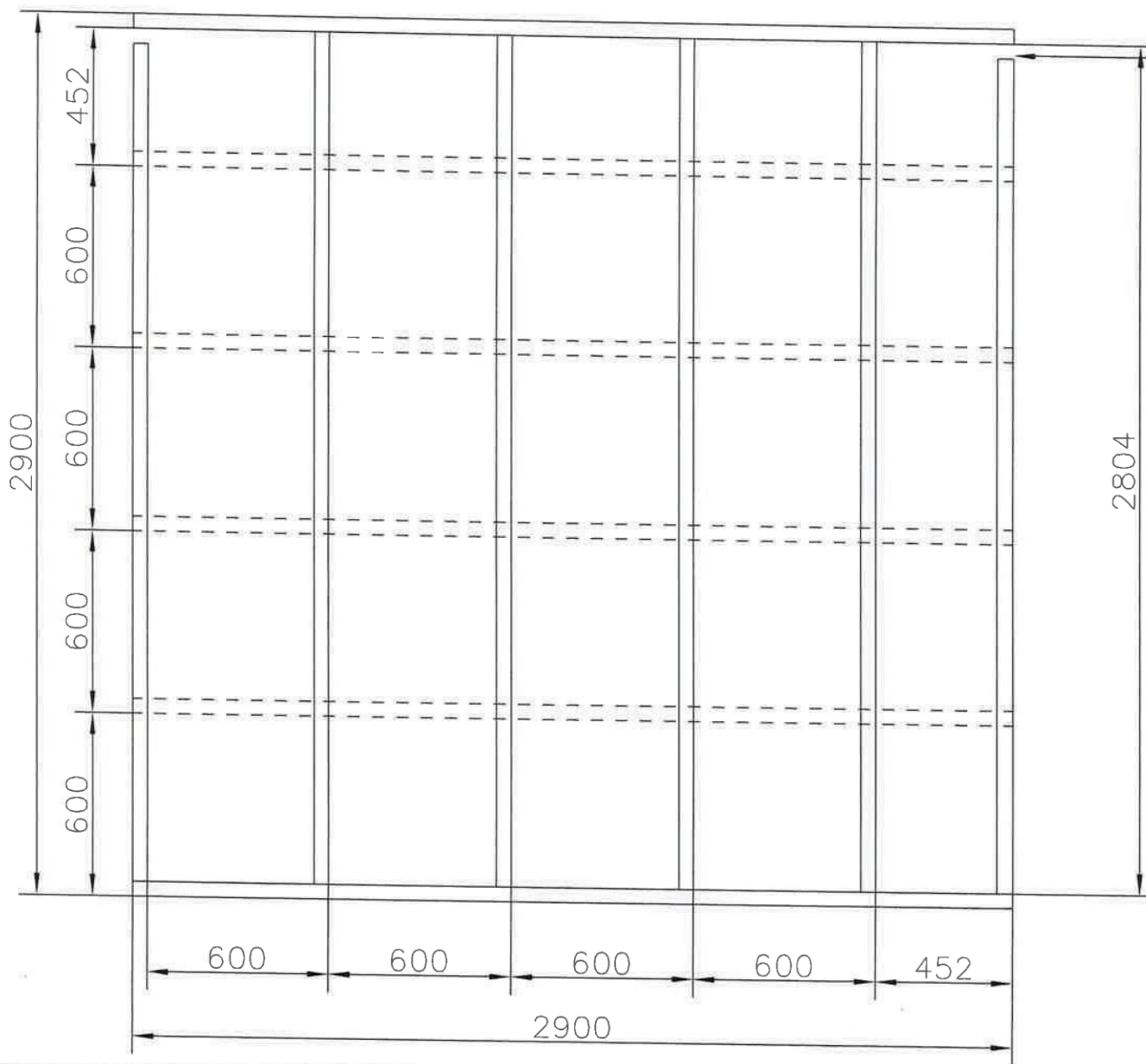
KUORMITETUN REI 60
 ULKOSEINÄRAKENTEEN
 PALONKESTÄVYYSKOE
 LIITE RAKENNE 2 / 1:20
 8.5.2017
 EKOVIILLA OY

Rakennuskohde	Sisältö	Mittakaava
ULKOPUOLISTA PALOA VASTAAN	REI 60 US_DET	1:10
Suunnittelija	Työ nro	US
	Päiväys	



- 1 Ulkoverhouslauta vaakaan 25x125mm
- 2 Tuuletusväli, pystykoolaus 48x48mm k 600
- 3 Kipsilevy Knauf KXT 9 N (9,5 mm-7,8kg/m²)
- 4 Kantava runko 48x198mm k 600
ja lämmöneriste EKOVILLA ontelopuh. 198mm
- 5 EKOVILLA X5-ilmansulku
- 6 Vaakakoolaus 48x48mm ja
lämmöneriste EKOVILLALEVY 50mm(38kg/m²)
- 7 Kipsilevy Knauf KN 13 O (13 mm-8,2 kg/m²)

RAKENNE EDESTÄ



TOLPPAPITUUS 2804 MM
REUNIMMAISET TOLPAT 2754 MM

Eurofins Expert Services Oy

Jens Pedersen

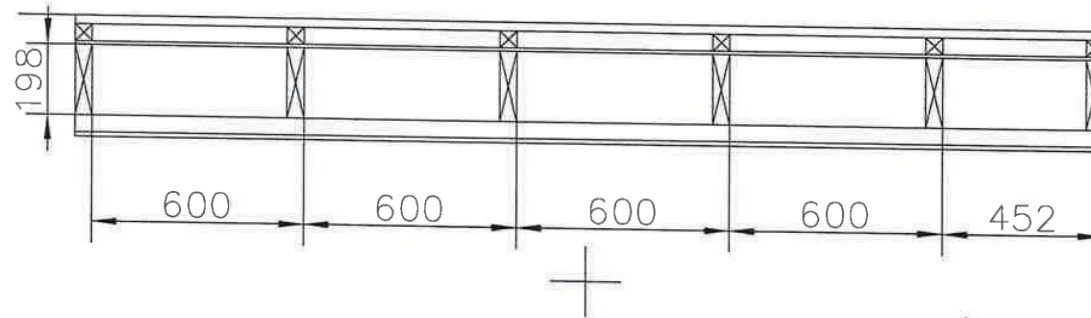
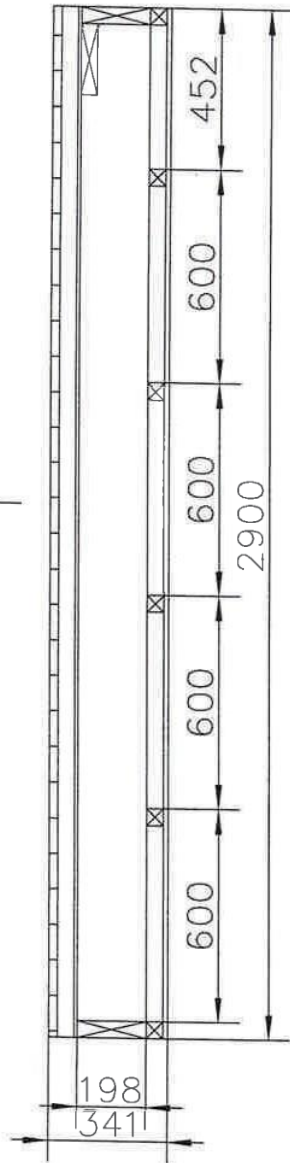
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KUORMITETUN REI 60
ULKOSEINÄRAKENTEEN
PALONKESTÄVYYSKOE
LIITE 1 / 1:20

30.5.2017
EKOVILLA OY

POLTTOKOE REI 60 SISÄPUOLISTA PALOA VASTAAN



Eurofins Expert Services Oy

Jens Pedersen
Jens Pedersen

Korjaukset JPE 30.10.2017

KANTAVA RUNKO 48x198
KUUSI, LUOKKA C24
(REUNIMMAISET TOLPAT 50 MM
LYHYEMMÄT, YLÄOHJAUSPUUN
~~ALA-OHJAUSPUUN~~ ALAPUOLELTA)
MYÖS

RUNGON NAULAUS 90*3,1 MM
4 KPL/TOLPPA
YLÄOHJAUSPUUN NAULAUS PINNINKIIN *(ei neuvoston kehitys)*
PÄÄLTÄPÄIN 90*3,1 MM K 350 MM

KOOLAUSPUUT KUUSI, KIINNITYS
90*3,1 MM K ~~350~~ 300
ULKOVERHOUSLAUTA KUUSI,
KIINNITYS 2 KPL/LAUTA ~~60~~ 50*2,3
MM

TUULENSUOJALEVYN KIINNITYS:

⁴¹
KIPSILEVYRUUVI ~~32~~*3,8 MM
RUUVIVÄLI LEVYN REUNOILLA
K 150 MM JA LEVYN KESKELLÄ K 200 MM
RUUVIN ETÄISYYS KARTONKIREUNASTA VÄH. 10 MM,
LEIKATUSTA REUNASTA 15 MM

SISÄVERHOUSKIPSILEVYN KIINNITYS:

⁴¹
KIPSILEVYRUUVI ~~32~~*3,8
RUUVIVÄLI KESKELLÄ K 200 MM, REUNOILLA K 150 MM
RUUVIN ETÄISYYS KARTONKIREUNASTA 10 MM,
LEIKATUSTA REUNASTA VÄH. ~~20~~ 25 MM

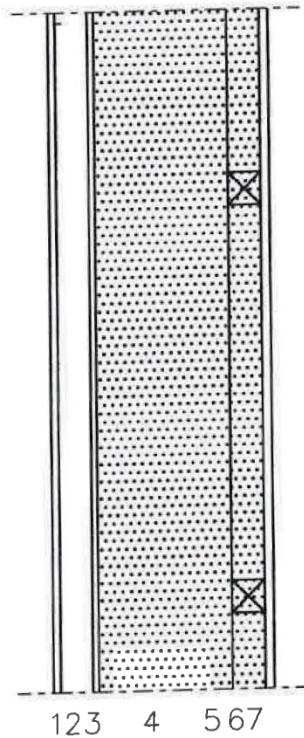
SISÄVERHOUS- JA TUULENSUOJALEVYJEN SAUMAJAKO
1200 MM

KUORMITETUN REI 60
ULKOSEINÄRAKENTEEN
PALONKESTÄVYYSKOE
LIITE RAKENNE 2 / 1:20
8.5.2017
EKOVILLA OY

APPENDIX NO. 1 2/3REPORT NO: VIT-S-05067-17SIGNATURE *Jens Pedersen*

VIT EXPERT SERVICES LTD

Rakennuskohde	Sisältö	Mittakaava
SISÄPUOLISTA PALOA VASTAAN	REI 60 US_DET	1:10
Suunnittelija	Työ nro	US
	Päiväys	



- 1 Ulkoverhouslauta vaakaan ²⁰25x125mm
- 2 Tuuletusväli, pystykoolaus 48x48mm k 600
- 3 Kipsilevy Knauf KXT 9 N (9,5 mm-7,8kg/m²)
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- 6 Vaakakoolaus 48x48mm ja
lämmöneriste EKOVILLALEVY 50mm(38kg/m²)
- 7 Kipsilevy Knauf KN 13 0 (13 mm-8,2 kg/m²)

Korjaukset JPE 30.10.2017

APPENDIX NO. 13/3
 REPORT NO: VTK05667-17
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