

# FIRE RESISTANCE CLASSIFICATION REPORT No. 22606C

## OWNER OF THE CLASSIFICATION REPORT

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## INTRODUCTION

This classification report defines the classification assigned to a non-loadbearing partition wall consisting of horizontal sandwich panels. type: JI TF WALL 1100, thickness: 100 mm, stitched at exposed and unexposed side, in accordance with the procedures given in EN 13501-2:2016: Fire classification of products and building elements – Part 2: Classification using data from fire resistance tests, excluding ventilation services.

This classification report consists of 15 pages and 2 annexes and may only be used or reproduced in its entirety.

## 1 Details of classified product

### 1.1 General

The element, JI TF WALL 1100, thickness: 100 mm, stitched at exposed and unexposed side, is defined as a non-loadbearing partition wall consisting of horizontal sandwich panels with fire resistance characteristics.

### 1.2 Description

The element, JI TF WALL 1100, thickness: 100 mm, stitched at exposed and unexposed side, is fully described below, in support of this classification. The drawings of the test element as it was tested, are enclosed in the annexes 1 till 2 of this classification report.

#### 1.2.1 Composition of the test specimen as tested

The test specimen is a non-loadbearing wall consisting of horizontally placed sandwich panels. The sandwich panels are fixed to the concrete furnace frame by means of L-profiles.

Outer dimensions of the test specimen:

- height: 3000 mm;
- width: 3000 mm;
- thickness: 100 mm;

#### 1.2.2 Supporting structure

1. L-profile	
Material	Steel
Thickness	0.5 mm
Section dimensions	80 mm x 80 mm
Fixing to the concrete frame	With sealing anchors (reference: Hilti DBZ 6/4.5, material: galvanized steel, diameter: 6 mm, length: 45 mm), c/c distance: 300 mm

### 1.2.3 Sandwich panels

2. Sandwich panel	
Manufacturer	Joris Ide NV
Reference	JI TF WALL 1100 100 mm
Thickness	100 mm
Dimensions	1100 mm (w) x 3000 mm (h)
Surface mass	10.98 kg/m <sup>2</sup>
Joint system	See annex 3
Joint overlap	Exposed side: 23.6 mm Unexposed side: 23.6 mm
Panel orientation	Horizontal
Composed of	Exposed panel skin Insulation core Unexposed panel skin
Fixing to the L-profiles	With self-drilling screws with bonded washer (type: Joris Ide Fastovis 6 + VG16, material: galvanised steel, diameter: 6.3 mm, length: 32 mm), c/c distance: 300 mm
Panel to panel stitching	With self-drilling screws with bonded washer (type: Joris Ide Fastovis 6 + VG16, material: galvanised steel, diameter: 6.3 mm, length: 32 mm) at the exposed and unexposed side, c/c distance: 250 mm
3. Exposed panel skin	
Reference	Linear
Profile depth	1.3 mm
Material	Polyester coated steel
Sheet thickness	0.37 mm (NV)
Coating thickness	15 µm (NV)
Fixing to the core	Self-adhesive
Colour	RAL9002
4. Insulation core	
Manufacturer	Joris Ide NV
Reference	JI 51G
Material	Polyisocyanurate foam
Thickness	100 mm
Density	39.70 kg/m <sup>3</sup>

5. Unexposed panel skin	
Reference	Linear
Profile depth	1.3 mm
Material	Polyester coated steel
Sheet thickness	0.37 mm (NV)
Coating thickness	15 µm (NV)
Fixing to the core	Self-adhesive
Colour	RAL9002

#### 1.2.4 Sealant

6. Mastic	
Manufacturer	Kingspan
Reference	Safire intumescent mastic
Material	Foaming mastic
Position	Between the panels (see annex 2 detail D)

#### 1.2.5 Free edge cap

7. Free edge cap	
Profile type	L profile
Number	2
Material	Steel
Thickness	1.0 mm
Dimensions	80 mm x 80 mm
Length	3000 mm
Fixing	With self-drilling screw with bonded washer (brand and type: Joris Ide Fastovis 6 + VG16, material: galvanised steel, diameter: 6.3 mm, length: 160 mm) and sound washer (material: steel, thickness: 0.8 mm, dimensions: Ø 70 mm), c/c: 375 mm on both exposed and unexposed side.

## 1.2.6 Insulation

8. Insulation 1	
Manufacturer	Unifrax
Reference	Fiberfrax Durablanket Z
Material	Zirconia stabilised ceramic fibre
Initial thickness	25 mm
Density	96 kg/m <sup>3</sup> (NV)
Position 1	Pressed tightly in between the concrete furnace frame and the sandwich panel at the horizontal fixed edge, covered by the L-profiles
Position 2	At the horizontal free edge under and around the free edge cap (see annex 2 detail C-C)
9. Insulation 2	
Manufacturer	Rockwool
Reference	Rockflex 214
Material	Stone wool
Initial thickness	60 mm
Density	38.8 kg/m <sup>3</sup>
Position	Pressed tightly in between the concrete furnace frame and the sandwich panels at the vertical fixed edges, covered by the L-profiles

## 2 Test reports/EXAP reports and test results in support of the classification

### 2.1 Test reports/EXAP reports

Name of the laboratory	Report ref. no.	Name of the owner	Date of the test	Method
WFRGENT nv	22606A	Joris Ide NV	27/02/2023	EN 1364-1:2015
WFRGENT nv	22606B	Joris Ide NV	-	EN 15254-5:2018

#### Exposure conditions during the fire resistance test:

Temperature/time curve: standard as in EN 1363-1:2020.

Direction of exposure: The test specimen is a symmetrical construction.

The panels are stitched at the exposed and unexposed sides.

No extra load supplementary to the own weight of the non-loadbearing partition wall consisting of horizontal sandwich panels was applied during the test.

One horizontal edge is free, the other edges are fixed.

## 2.2 Test results

Parameters	Results
<b>Thermal insulation – I</b>	
$\Delta T_m = 140^\circ\text{C}$	39 minutes
$\Delta T_M = 180^\circ\text{C}$	33 minutes
<b>Integrity – E</b>	
Spontaneous and sustained flaming	90 minutes, no failure <sup>(1)</sup>
Failure with gap gauge $\varnothing$ 6 mm	90 minutes, no failure <sup>(1)</sup>
Failure with gap gauge $\varnothing$ 25 mm	90 minutes, no failure <sup>(1)</sup>
Ignition of cotton pad	90 minutes, no failure <sup>(2)</sup>
<b>Radiation – W</b>	
Radiation intensity = 15 kW/m <sup>2</sup>	90 minutes, no failure <sup>(1)</sup>

<sup>(1)</sup> The test was discontinued after 90 minutes at the request of the sponsor.

<sup>(2)</sup> No failure until the moment of failure of the thermal insulation (I).

### 3 Classification and field of application

#### 3.1 Reference of classification

This classification has been carried out in accordance with clause 7 of EN 13501-2:2016.

#### 3.2 Classification

The element, type: JI TF WALL 1100, thickness: 100 mm, stitched at exposed and unexposed side, is classified according to the following combinations of performance parameters and classes as appropriate. No other classifications are permitted.

The classifications are valid for both sides of the non-loadbearing partition wall.

<p><b>EI 30</b> span 4 m, <b>EI 20</b> span 7.5 m, <b>EI 15</b> span 7.5 m</p> <p><b>EW 90</b> span 4 m, <b>EW 60</b> span 7.5 m, <b>EW 30</b> span 7.5 m, <b>EW 20</b> span 7.5 m</p> <p><b>E 90</b> span 4 m, <b>E 60</b> span 7.5 m, <b>E 30</b> span 7.5 m, <b>E 20</b> span 7.5 m</p>
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Explanation: span x m: the span length = the horizontal length of the horizontally placed sandwich panels is limited to x m for that particular classification.



### 3.3 Field of direct application

This classification is valid for the following end use applications according to EN 1364-1:2015.

The results of the fire test are directly applicable to similar constructions where one or more of the changes listed below are made and the construction continues to comply with the appropriate design code for its stiffness and stability:

- a) unlimited increase in height of the wall as given in 3.4.18;
- b) unlimited decrease in span length of the wall of 3 m;
- c) increase in span length of the wall up to 4 m if the expansion allowances are increased pro-rata;
- d) increase in the thickness of the wall (total thickness:  $\geq 100$  mm);
- e) increase in the thickness of the component materials:
  - thickness L-profile ( $\geq 0.50$  mm)
- f) decrease in linear dimensions of panels, but not the thickness:
  - span length ( $\leq 3000$  mm);
  - height ( $\leq 1100$  mm);
- g) decrease in distance of fixing centres:
  - of the L profiles to the edges of the surrounding building structure ( $\leq 300$  mm);
  - of the screws fixing the panels to the L-profiles ( $\leq 300$  mm);
  - of the panel to panel stitching: 250 mm;
- h) no fittings or fixtures are permitted;
- i) increase in the number of horizontal joints;
- j) only horizontal joints (of the type tested) are permitted;
- k) the non-loadbearing sandwich panel wall may be installed in a high density rigid supporting construction which has the same or greater classified fire resistance as the test specimen:
  - density ( $\geq 2000$  kg/m<sup>3</sup>).

### 3.4 Field of extended application

The situation with combined variations is always very complex and shall be considered case by case. To be able to combine variations there shall be an overrun of at least 20 % subject to a minimum 10 min compared to the classification.

#### 3.4.1 Metal facing: Chemical composition of coating

Unexposed side:

- A change in emissivity of - 10 % for a new coating compared to the tested one is allowed for following classification and lower:
  - EI 30, EW 90, E 90.
- Coatings with higher emissivity values compared to the tested one are allowed.
- If modifications in the coatings on the unexposed side are made compared to the tested one, the reaction to fire classification of the product shall be the same or better than the tested one. Test results are though valid for all colours of the same type of coating.

Exposed side:

- The test results are valid for all coatings.

Limitation: When a change in coating is made the manufacturer of the coated sheet shall provide emissivity properties for the products.

#### 3.4.2 Metal facing: Change from coated to non-coated metal

Unexposed side:

- A change from a coated to a non-coated sheet is not allowed.

Exposed side:

- A change from a coated to a non-coated sheet is allowed.

#### 3.4.3 Metal facing: Sheet thickness

Allowed up to  $\pm 0.2$  mm of tested thickness.

#### 3.4.4 Metal facing: Change from one metal to another

The test results are valid for all grades of steel.

### **3.4.5 Metal facing: Change in sheet geometry**

Panels with different metal thicknesses on both sides are regarded as symmetrical if the difference in thickness is max. 0.2 mm.

### **3.4.6 Metal facing: Changes in profile geometry of facing**

Any change in the range 0 mm to 5 mm profiling is allowed if the declared tensile strength value is equal or higher than for the tested panel. The panels are regarded as symmetrical.

### **3.4.7 Changes in core material: Type**

Changes from one core material to another are not allowed.

It is not possible to extend the results from one core material producer to another core material producer.

### **3.4.8 Changes in core material: Change in composition: Polyisocyanurate foam (PIR)**

Density:

- The test results are only valid for the same chemical system and blowing agent.
- The test results are valid for  $\pm 10$  % of tested density.

### 3.4.9 Span length: Decrease/Increase

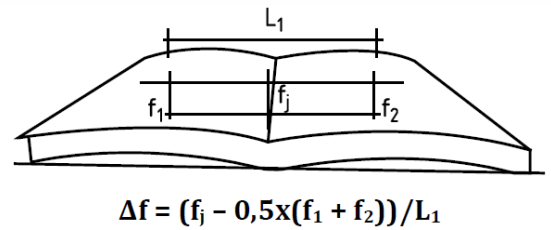
A decrease in span length is allowed.

An increase in span length of up to 7.5 m is allowed for following classification and lower:

- EI 20, EW 60 and E 60.

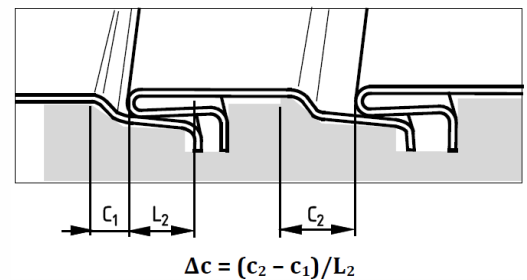
Calculation of  $\Delta f$ :

Time (min)	$\Delta f_1$	$\Delta f_2$	$\Delta f_3$
10	0.0007	-0.0142	-0.0166
20	-0.0028	0-0059	-0.0174
30	-0.0232	-0.0024	-0.0163
40	-0.0211	-0.0128	-0.0170
50	-0.0232	-0.0154	-0.0189
60	-0.0204	-0.0183	-0.0195
70	-0.0197	-0.0192	-0.0198
80	-0.0014	-	-
90	-	-	-



Calculation of  $\Delta c$ :

Time (min)	$\Delta c_1$	$\Delta c_2$	$\Delta c_3$
10	0	0	0
20	0	0.042	0.042
30	-0.042	0.085	-0.085
40	0	-0.042	-0.042
50	0	-0.042	0
60	0.42	0	0
70	0	-0.042	0
80	0	0	0
90	0	0	0



To determine the amount of fasteners (n) required to support the extended weight up to 7.5 m the calculation below is used.

Tensile force:

$$F_{t,Ed} = \frac{Lbq}{2} = \frac{7.5m \times 1.10m \times 0.3kPa}{2} = 1.238kN$$

Shear force:

$$F_1 = \frac{Lbq}{2} = \frac{7.5m \times 1.1m \times 0.3kPa}{2} = 1.238kN$$

$$F_2 = Lb \left( q + \frac{gL}{8b} \right) = 7.5m \times 1.10m \times \left( 0.3kPa + \frac{0.3892kPa \times 7.5m}{8 \times 1.10m} \right) = 5.212kN$$

$$F_{v,Ed} = (F_1^2 + F_2^2)^{1/2} = \sqrt{1.238kN^2 + 5.212kN^2} = 5.357kN$$

*with:*

*L = the panel span length (m)*

*b = the panel width (m)*

*q = the airpressure (0.3 kPa if nothing is specified) (kPa)*

*g = the own weight (kPa)*

*F<sub>t,Ed</sub> and F<sub>v,Ed</sub> = the calculated forces acting on the fasteners (kN)*

Calculation for the amount of fasteners (n):

$$\frac{F_{t,Ed}}{F_{t,Rd}} + \frac{F_{v,Ed}}{F_{v,Rd}} \leq n k_{y,\theta}$$

$$\frac{1.238kN}{F_{t,Rd}} + \frac{5.357kN}{F_{v,Rd}} \leq n k_{y,\theta}$$

*with:*

*F<sub>t,Rd</sub> and F<sub>v,Rd</sub> = the design tensile load on the used fastener in practice at normal temperature (kN)*

*k<sub>y,θ</sub> = the decrease on the yield strength of the used steel according to EN 1993-1-2 (k<sub>y,θ</sub> = 1 for steel temperature up to 400 °C, below 1 for steel temperature above 400 °C)*

*n = the number of fasteners*

Limitation: It has to be noted that extension in span length is only allowed with tested panel orientation.

#### **3.4.10 Variations in orientation**

The test results are only valid for the tested orientation.

#### **3.4.11 Panel width: Decrease/Increase**

A decrease in panel width is allowed.

An increase in panel width is allowed up to 20 % of the tested width.

#### **3.4.12 Panel thickness: Decrease/Increase**

A decrease in panel thickness is not allowed.

An increase in panel thickness is allowed.

#### **3.4.13 Joint Construction: Type**

Even small changes in the joint construction can easily affect the integrity of the wall and shall not be allowed with the following exception:

- An increase in the overlap in the metal facing at the joint is allowed if other dimensions remain unchanged.

#### **3.4.14 Joint Construction: Panel to panel stitching decrease/increase**

A decrease in amount of stitching is not allowed.

An increase in amount of stitching is allowed.

#### **3.4.15 Joint construction: Sealants**

The result is only valid for joints with the same type of sealing materials and shall not be valid for joints without sealants.

#### **3.4.16 Fixing to the surrounding building structure: Decrease/Increase**

Minor changes in the boundary conditions and fixing system (for example an increased amount of fasteners, increased diameter of fasteners; but material cannot be changed) are allowed provided that it can be shown that the bearing capacity is not reduced and the risk of collapse is not increased according to calculations as given in paragraph 3.4.9.

### 3.4.17 Protection of the fixings decrease/increase

An increase in protection ability is allowed.

### 3.4.18 Height of assembly: Horizontal installation

The height of the wall (provided that each panel is fixed to the bearing structure in such a way that the load is not accumulated from above to the lower parts of the wall) can be freely increased.

### 3.4.19 Change of support structure

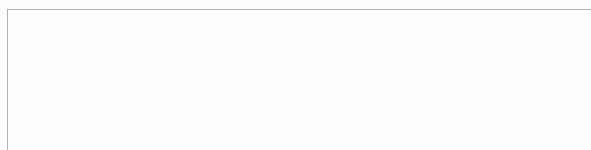
In practice, the panel assembly can be fixed to different types of support structures. The test results shall be valid if the following requirements on the support structure are fulfilled:

- the support structure has at least the same fire resistance classification time for loadbearing capacity (R) as the panel assembly has for insulation and/or integrity;
- the fixing system has the same loadbearing capacity (R) in the support structure as in the frame used in the reference test.
- the fixation area can also be protected with thermal insulation. If such thermal insulation is used in the test, thermal insulation with at least same fire performance shall also be used in end use conditions.

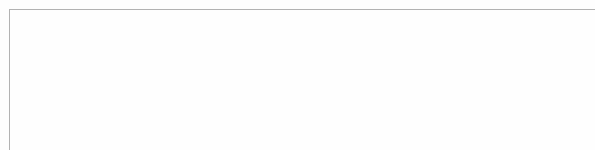
## 4 Limitations

This classification report does not represent type approval nor certification on the product.

SIGNED



APPROVED

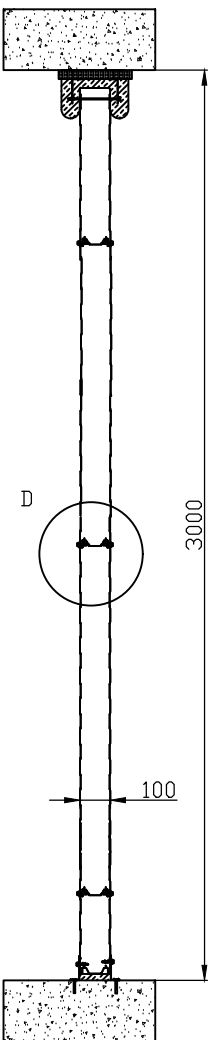


This document is the original version of the classification report and is written in English.

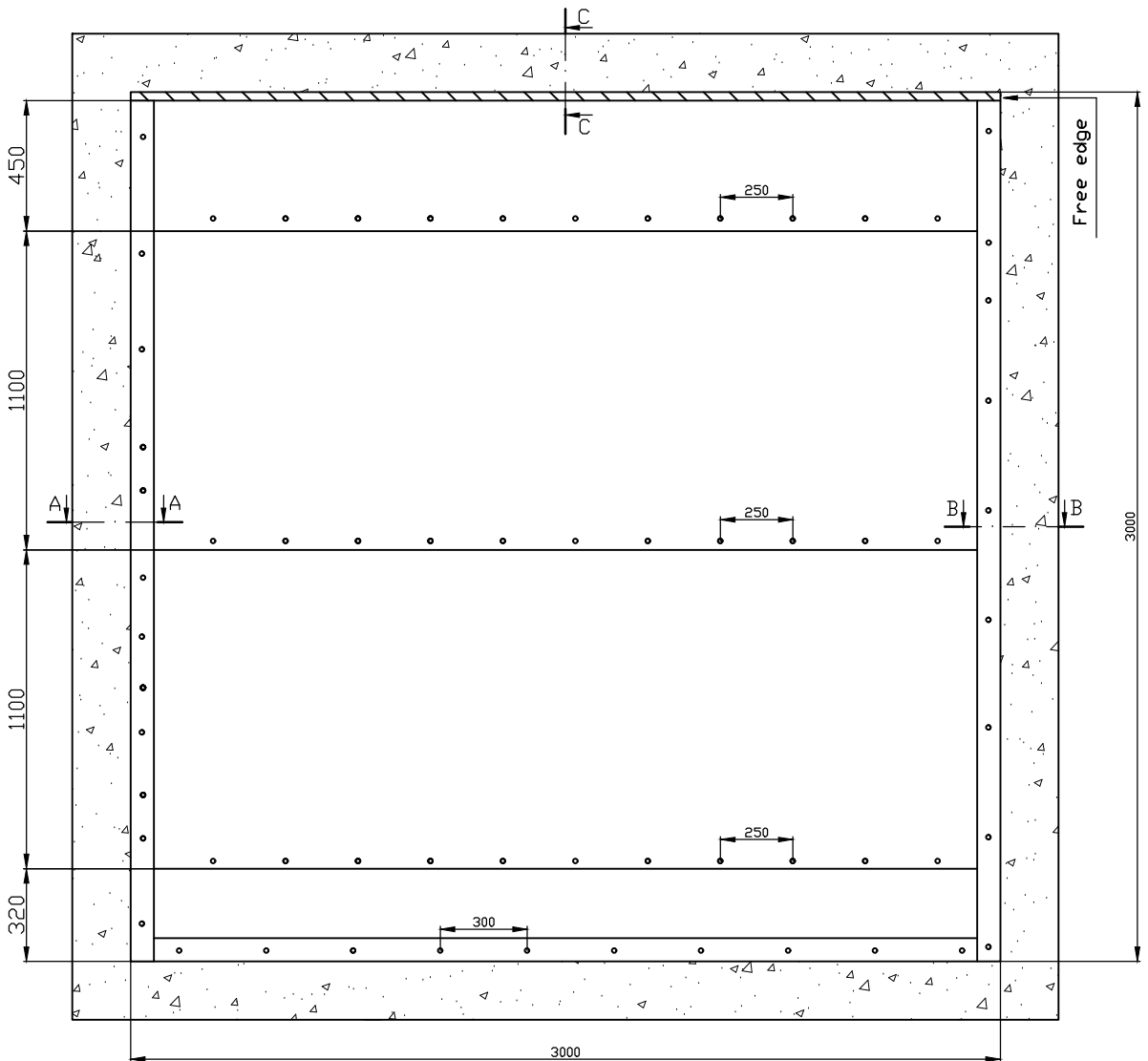
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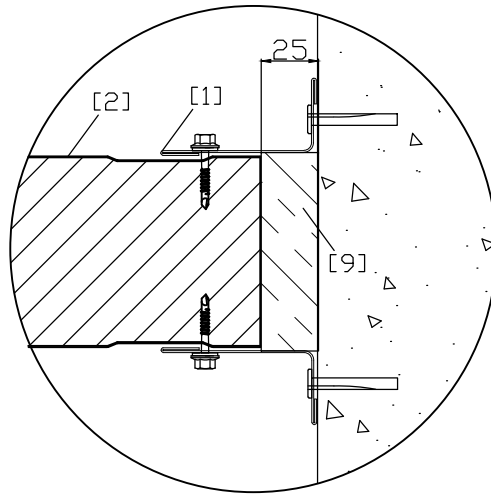
Front view -unexposed side) - dimensions.



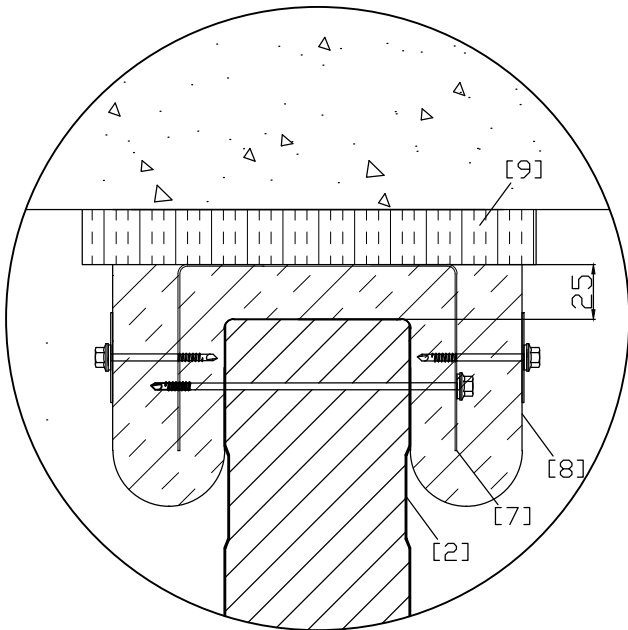


Section details A-A, B-B, C-C and D - dimensions.

### Section detail A-A & B-B



### Section detail C-C



### Detail D

