



# European Technical Assessment ETA 16/0034 of 25/02/2016

## I General Part

<b>Technical Assessment Body issuing the ETA</b>	<b>VTT Expert Services LTD</b>
<b>Trade name of the construction product</b>	<b>Leimet ABB Plus Pile joints and KK rock shoes</b>
<b>Product family to which the construction product belongs</b>	Pile joints and rock shoes for concrete piles
<b>Manufacturer</b>	Leimet Oy Yrittäjäntie 7 27230 Lappi
<b>Manufacturing plant</b>	Leimet Oy Yrittäjäntie 7 27230 Lappi
<b>This European Technical Assessment contains</b>	9 pages including 2 Annexes which form an integral part of this assessment
<b>This European Technical Assessment is issued in accordance with regulation (EU) No 305/2011, on the basis of</b>	European Assessment Document EAD 20014-00-01.03, edition January 2016.

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## II Specific Part

### 1 Technical description of the product

Pile joints are used to join precast reinforced concrete piles while providing high bending moment strength. The pile joints are placed in the mould before the pile is cast.

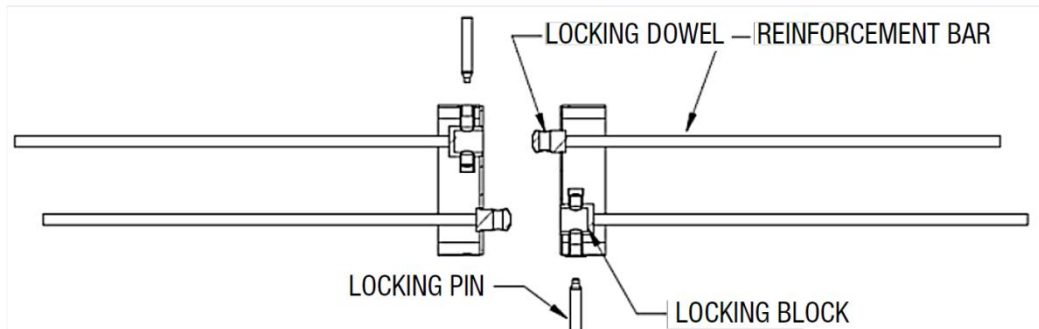
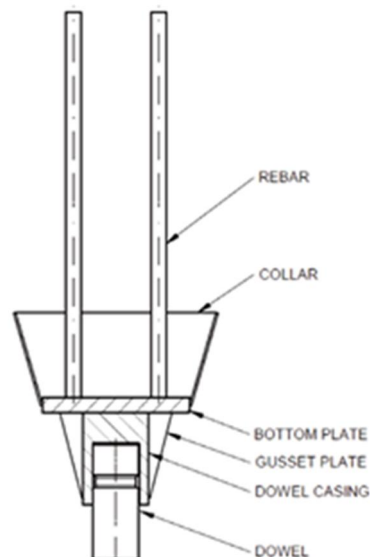


Figure 1: Leimet ABB Plus pile joint construction

Leimet rock point concentrates pile driving forces thus prevents breaking of the pile.

Rock point should be used where piles are to be driven to hard or steeply inclined bedrock or into soil with boulders.

Figure 2: Leimet rock point construction



## 2 Specification of the intended uses in accordance with the applicable EAD

### Intended uses

Pile joints and rock shoes are intended to be used with concrete piles made of concrete manufactured according to EN 206. They are intended to be used in undisturbed natural soils (sand, silt, clay, schist) and compacted non-aggressive fills of mineral soil materials. Corrosion rate 1,2 mm per 100 years as recommended in standard EN 1993-5 Table 4-1 should then be taken into account. Alternatively, empirical measurement data and statistical deterioration design model may be used when the conditions certainly can be classified as normal. Local conditions, standards and regulations in force at the place of use shall in both cases be considered and respected.

The provisions made in this European Technical Assessment are based on an assumed intended working life of the Leimet ABB Plus Pile joints and KK rock shoes of 100 years<sup>1</sup>.

### Design

This European technical approval is based on the assumption that all plans needed have been made correctly according to the regulations valid on the building site.

### Execution of construction works

It is the responsibility of the manufacturer to ensure that proper information for the use of the Pile joints and rock shoes is enclosed to each delivery, including general guidance on the basis of this ETA and the specific installation instructions and construction details. With regard to the assumed working life regular maintenance is necessary. The manufacturer shall provide with written documents which contain descriptions about type and frequency of the maintenance.

The completed building (the works) shall comply with the building regulations (regulations on the works) applicable in the Member States in which the building is to be constructed. The procedures foreseen in the Member State for demonstrating compliance with the building regulations shall also be followed by the entity held responsible for this act. An ETA for a Leimet ABB Plus Pile joints and KK rock shoes does not amend this process in any way.

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<sup>1</sup> This means that it is expected that when this working life has elapsed, the real working life may be, in normal use conditions, considerably longer without major degradation affecting the essential requirements of the works. The indications given as to the working life of a Pile joints and rock shoes cannot be interpreted as a guarantee given by the producer or the approval body. They should only be regarded as a means for the specifiers to choose the appropriate criteria for Pile joints and rock shoes in relation to the expected, economically reasonable working life of the works.

### 3 Performance of the product and references to the methods used for its assessment

Table 1. Basic requirements for construction works and essential characteristics

Basic requirement and essential characteristics	Performance
<b>BWR 1. Mechanical resistance and stability</b>	
Resistance of pile joint	Clause 3.1
Resistance of rock shoe	Clause 3.1
Robustness and rigidity of pile joint	Clause 3.1
Dimensional tolerances	Clause 3.1
<b>BWR 2. Safety in case of fire</b>	
Reaction to fire	Class A1
<b>BWR 3. Hygiene, health and the environment</b>	
Not relevant	
<b>BWR 4. Safety and accessibility in use</b>	
Not relevant	
<b>BWR 5. Protection against noise</b>	
Not relevant	
<b>BWR 6. Energy economy and heat retention</b>	
Not relevant	
<b>BWR 7. Sustainable use of natural resources</b>	
Not relevant	

#### 3.1 Mechanical resistance and stability, BWR 1

##### Resistance of pile joints and rock shoes

For pile joints and rock shoes, class 1 applies according to the standard EN 12794.

##### Robustness and rigidity of pile joint

Robustness and rigidity of pile joint fulfilled class A, detailed results are given in Annex 1.

##### Dimensional tolerances

Dimensional tolerances are given in Annex 1 and Annex 2.

#### 3.2 Safety in case of fire, BWR 2

##### Reaction to fire

Pile joints and rock shoes for concrete piles made of steel are considered to satisfy the requirements for performance Class A1.

##### Identification

The components and materials are identified as being of a generic type or giving a brand name, as described in Annex 1 and specified in the manufacturer's Contents of delivery list.

The component under a given brand name may be changed by the manufacturer to another with corresponding performance.

**4 Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base**

For the products covered by this EAD the applicable European legal act is: 2000/606//EC

The system to be applied is: 2+

**5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD.**

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at VTT Expert Services Ltd.

Issued in Espoo on February 25, 2016  
by VTT Expert Services Ltd



Tiina Ala-Outinen  
Business Manager



Pertti Jokinen  
Product Manager

**ANNEX 1**  
**DESCRIPTION AND PERFORMANCE OF LEIMET ABB PLUS PILE JOINTS AND KK**  
**ROCK SHOES**

**1 Standard parts of the Leimet ABB Plus Pile joints and KK rock shoes**

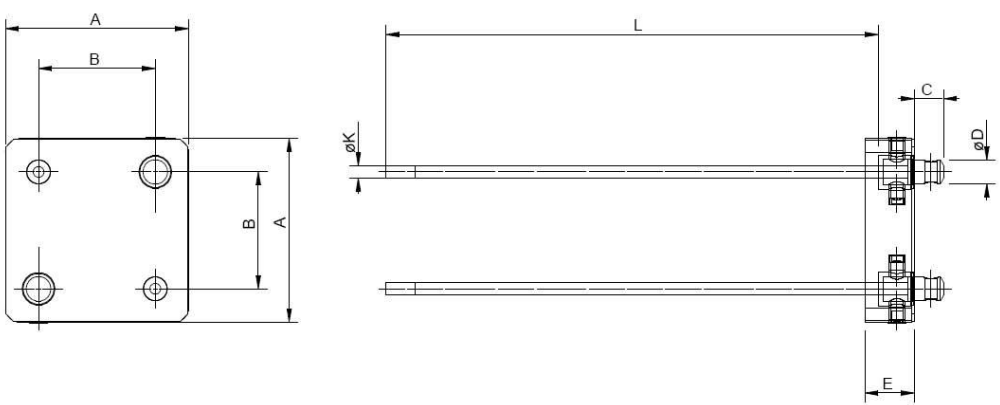
Table A1-1. Following types of pile joints fulfilled class A in robustness and rigidity performance tests according to EN 12794.

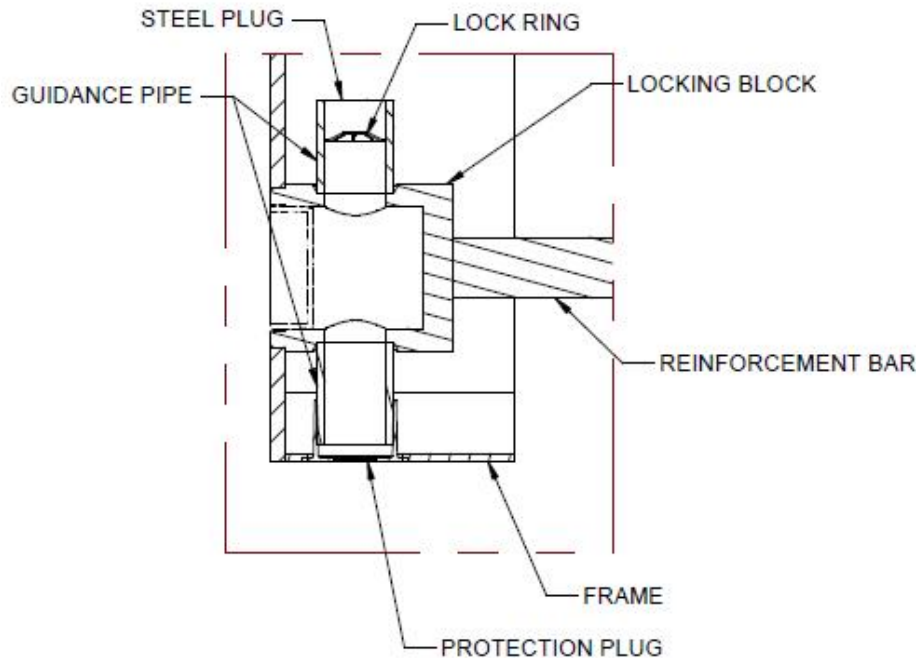
Capacity: Compression/tension and bending

Type of pile joint	Dimensions
ABB PLUS 250a	250x250 mm <sup>2</sup>
ABB PLUS 250b	250x250 mm <sup>2</sup>
ABB PLUS 300b	300x300 mm <sup>2</sup>
ABB PLUS 300c	300x300 mm <sup>2</sup>
ABB PLUS 350	350x350 mm <sup>2</sup>
ABB 350MA	350x350 mm <sup>2</sup>
Leimet rock shoe KK250	250x250 mm <sup>2</sup>
Leimet rock shoe KK300	300x300 mm <sup>2</sup>
Leimet rock shoe KK350	350x350 mm <sup>2</sup>
ABB Plus 235-4Ø16	235x235 mm <sup>2</sup>
ABB Plus 270-4Ø20	270x270 mm <sup>2</sup>
ABB Plus 400-4Ø20	400x400 mm <sup>2</sup>
ABB Plus 400-4Ø25	
ABB Plus 400-8Ø20	
ABB Plus 400-4M20x2.5	400x400 mm <sup>2</sup>
ABB Plus 400-8M20x2.5	
ABB Plus 400-8Ø20	400x400 mm <sup>2</sup>

## ANNEX 1 DETAILS OF PILE JOINT

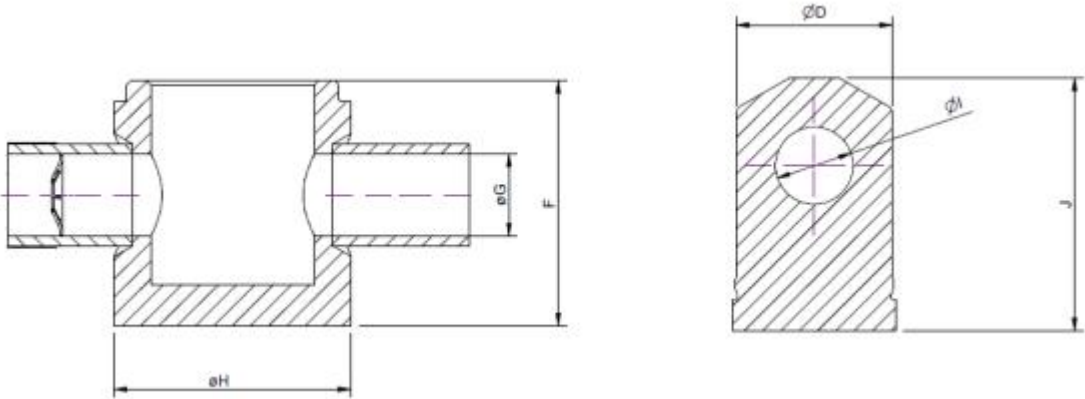
**Table A1-2. Principal dimensions of pile joints for precast concrete piles**

	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">PILE SIZE (mm)</th> <th style="text-align: center;"><math>A \pm 3</math> (mm)</th> <th style="text-align: center;"><math>B \pm 1</math> (mm)</th> <th style="text-align: center;"><math>C \pm 1</math> (mm)</th> <th style="text-align: center;"><math>\varnothing D \pm 1</math> (mm)</th> <th style="text-align: center;"><math>E \pm 5</math> (mm)</th> <th style="text-align: center;"><math>\varnothing K</math> (mm)</th> <th style="text-align: center;"><math>L</math> (mm) <math>\pm</math> 15 (mm)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"><b>from 200 x 200 to 400 x 400</b></td> <td style="text-align: center;">from 195 to 395</td> <td style="text-align: center;">from 70 to 270</td> <td style="text-align: center;">from 45 to 55</td> <td style="text-align: center;">from 35 to 50</td> <td style="text-align: center;">from 75 to 150</td> <td style="text-align: center;">from 16 to 32</td> <td style="text-align: center;">from 500 to 1200</td> </tr> </tbody> </table>	PILE SIZE (mm)	$A \pm 3$ (mm)	$B \pm 1$ (mm)	$C \pm 1$ (mm)	$\varnothing D \pm 1$ (mm)	$E \pm 5$ (mm)	$\varnothing K$ (mm)	$L$ (mm) $\pm$ 15 (mm)	<b>from 200 x 200 to 400 x 400</b>	from 195 to 395	from 70 to 270	from 45 to 55	from 35 to 50	from 75 to 150	from 16 to 32	from 500 to 1200
PILE SIZE (mm)	$A \pm 3$ (mm)	$B \pm 1$ (mm)	$C \pm 1$ (mm)	$\varnothing D \pm 1$ (mm)	$E \pm 5$ (mm)	$\varnothing K$ (mm)	$L$ (mm) $\pm$ 15 (mm)										
<b>from 200 x 200 to 400 x 400</b>	from 195 to 395	from 70 to 270	from 45 to 55	from 35 to 50	from 75 to 150	from 16 to 32	from 500 to 1200										



**Figure A1-2. Locking block of pile joints for precast concrete piles**

**Table A1-3. Dimensions of the locking block of pile joints for precast concrete piles**



$F \pm 1$ (mm)	$\phi G \pm 1$ (mm)	$\phi H \pm 1$ (mm)	$\phi I \pm 0,2$ (mm)	$J \pm 1$ (mm)
from 50 to 65	from 20 to 30	from 50 to 70	from 15 to 30	from 60 to 75

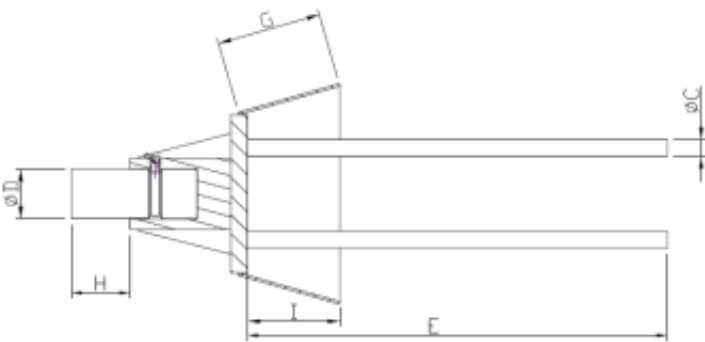
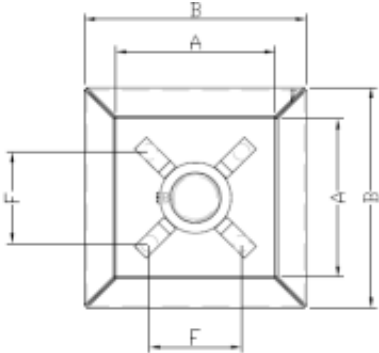
**Table A1-4. Materials of pile joint parts, examples.**

Part	Material	Standard
Locking block	S355J2+N	EN 10025-2
	S355J2+N	EN 10025-2
	19MnVS6M	EN 10267
Locking dowel	S355J2+N	EN 10025-2
	19MnVS6M	EN 10267
Reinforcement bar	$F_{yk} > 500$ N/mm, weldable	EN1992-1-1 Annex C
Frame	S235JR+AR	EN 10025-2
Guidance pipe	S235JR+AR	EN 10025-2
Lock ring	Steel	
Steel plug	Steel	
Locking pin	19MnVS6M	EN 10267
	42CrMo4	EN 10083-3



## ANNEX 2 DETAILS OF ROCK SHOE

**TableA2-1. Principal dimensions of rock shoes for precast concrete piles**

									
<b>Pile size (mm)</b>	<b>A</b> ±2(mm)	<b>B</b> ±3(mm)	<b>øC</b> (mm)	<b>øD</b> ±1(mm)	<b>E</b> ±20(mm)	<b>F</b> ±3(mm)	<b>G</b> ±3(mm)	<b>H</b> ±1(mm)	<b>I</b> ±3(mm)
<b>from 235 x 235 to 400 x 400</b>	from 160 to 395	from 230 to 395	from 16 to 32	from 59,5 to 79	from 500 to 1000	from 100 to 180	from 125 to 150	70	from 100 to 135

**Table A2-2. Materials of rock shoe parts, examples.**

Part	Material	Standard
Dowel	BCM 311 hardened to 520-640 HV	EN 10083-3
Dowel casing	S355J2	EN 10025-2
Gusset plate	S355J2	EN 10025-2
Bottom plate	S355J2	EN 10025-2
Collar	S235JR	EN 10025-2
Reinforcement bar	$F_{yk} > 500\text{N/mm}$ , weldable	EN1992-1-1 Annex C