

European Technical Assessment

ETA-22/0770 dated 08/11/2022

English translation prepared by CSTB - Original version in French language

General Part

Nom commercial:
Trade name

HighKI Wood System

Famille de produit:
Product family

Etriers à âmes intérieures pour accrochage d'éléments bois lamellé collé sur des supports bois lamellé collé. Ancrages pour accrochage d'éléments bois lamellé collé sur support métal ou béton.

Concealed beam hangers for connection of glulam wood elements to glulam - Hold down for connection of glulam wood elements to steel or concrete support.

Titulaire:
Manufacturer

KI Wood
93, rue du Docteur Roux
94100 SAINT MAUR DES FOSSES
FRANCE

Usine de fabrication:
Manufacturing plants

BX Kaneshin
Nojima Kakusei Co. Ltd
327-2 Fukushima Shinden, NIIGATA, JAPAN

Cette évaluation contient:
This Assessment contains

14 pages incluant 11 pages d'annexes qui font partie intégrante de cette évaluation
14 pages including 11 pages of annexes which form an integral part of this assessment

Base de l'ETE :
Basis of ETA

DEE 130186-0-0603
EAD 130186-0-0603

Cette évaluation remplace:
This Assessment replaces

-

Specific Part

1 Technical description of the product

The HighKI Wood System are beam hanging connectors / hole down connectors made of steel plate according to ISO 3575 with tensile strength $Re \geq 270 \text{ N/mm}^2$ and $Rm \geq 570 \text{ N/mm}^2$ evaluated according to ISO 6892-1. They are used in combination with cylindric bolts E 235B graded according to ISO 630 in order to connect glulam-wood column on a or rigid type support in a structure like concrete or steel support.

The commercial references of the products assessed, their geometries and implementation are indicated in Annex A1 to A5.

The connectors are coated with Hot-dip zinc 6%, Aluminum 3%, plated steel sheet of magnesium with a minimum target value of 90 g/m^2 tested according to ISO 9227 and wich provide an appropriated protection for utilization in service class 1 and 2.

2 Specification of the intended use

The HighKI Wood System are intended to be used for connections of beam and post or Sill and post with square or rectangular cross sections. The beam, sills and posts are of glulam according to EN 14080 with a minimum strenght grade of GL24h and pre-machined according to the dimensions given by the manufacturer. With regard to moisture behavior of the support and/or beam, the use is possible in service classes 1 and 2 as defined in EN 1995-1-1 for the hangers and holddown made out of Hot-dip zinc 6%, Aluminum 3%, plated steel sheet of magnesium.

This European Technical Assessment concerns the use of connectors for assemblies subject to static or quasi-static loading. The use in applications where they would be susceptible to seismic loading has not been assessed. The connectors must only be used with the corresponding assembly components described in Annexes A and B.

The characteristic resistances given in Annex C are valid only if the connectors are used under the conditions and tolerances defined for each connector in Annex A and B.

The provisions made in this European technical assessment are based on an assumed working life of the anchor of 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product

3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance	See Annex C1 – C5

3.2 Safety in case of fire (BWR 2)

Not relevant.

3.3 Hygiene, health and the environment (BWR 3)

Based on the declaration of the manufacturer, the connectors do not contain harmful or dangerous substances as defined in the EU database.

In addition to the specific clauses relating to dangerous substances contained in this European Technical Approval, there may be requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions).

3.4 Safety in use (BWR 4)

For Basic requirement Safety in use the same criteria are valid as for Basic Requirement Mechanical resistance and stability.

3.5 Protection against noise (BWR 5)

Not relevant.

3.6 Energy economy and heat retention (BWR 6)

Not relevant.

3.7 Sustainable use of natural resources (BWR 7)

For the sustainable use of natural resources no performance was determined for this product.

3.8 General aspects relating to fitness for use

Serviceability of the connectors is understood as their ability to resist loads without unacceptable deformations.

4 Assessment and verification of constancy of performance (AVCP)

According to the Decision 97/638/EC of the European Commission¹, as amended, the system of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) given in the following table apply.

Product	Intended use	Level or class	System
THREE-DIMENSIONAL NAILING PLATES	For fixing and/or supporting to concrete or wood, structural elements (which contributes to the stability of the works)	—	2+

5 Technical details necessary for the implementation of the AVCP system

Technical details necessary for the implementation of the Assessment and verification of constancy of performance (AVCP) system are laid down in the control plan deposited at Centre Scientifique et Technique du Bâtiment.

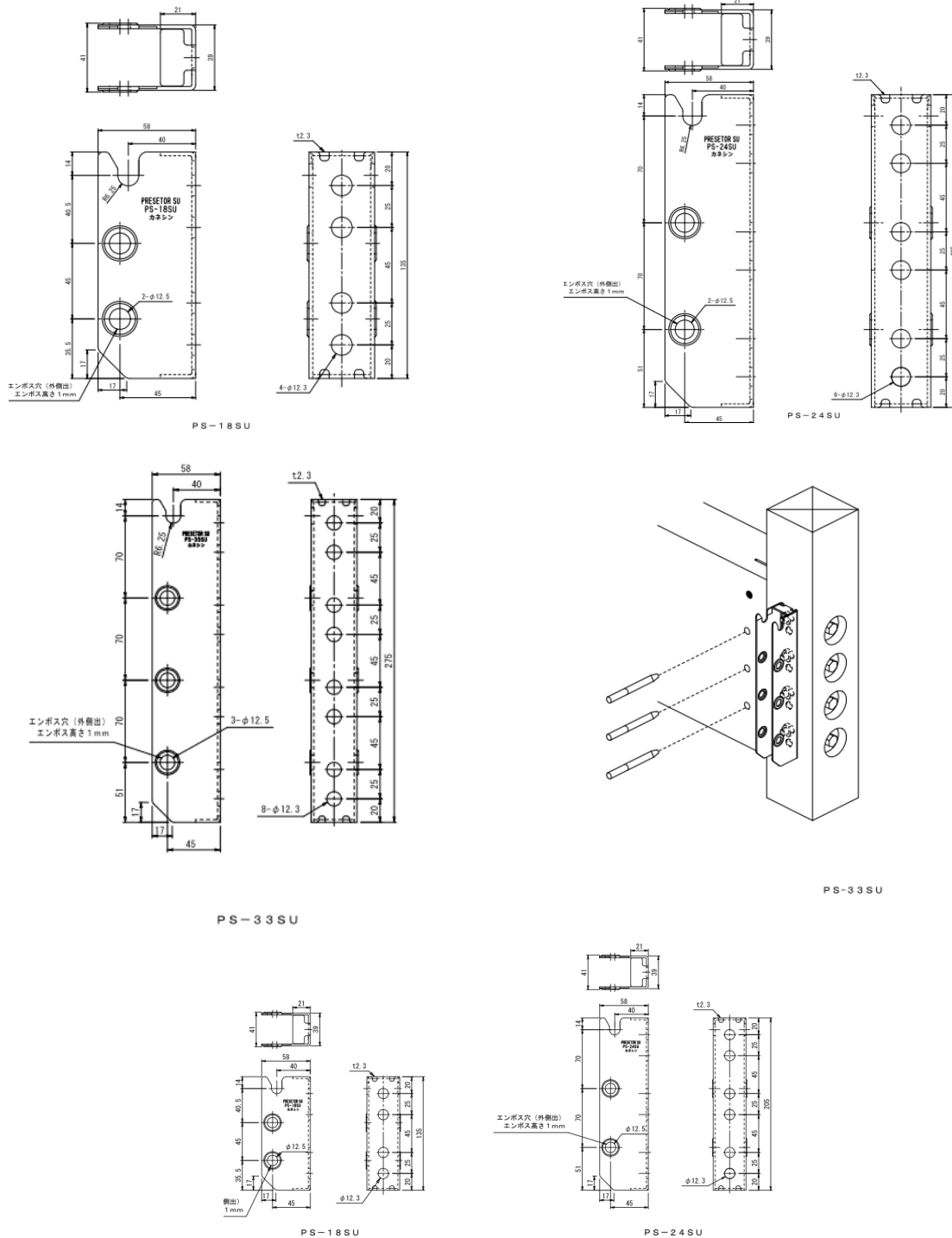
The manufacturer shall, on the basis of a contract, involve a notified body approved in the field of anchors for issuing the certificate of conformity CE based on the control plan.

The original French version is signed by

Anca Cronopol
Head of the division

¹ Official Journal of the European Communities L 254 of 08.10.1996

PS-(10/18/24/33/39)-SU



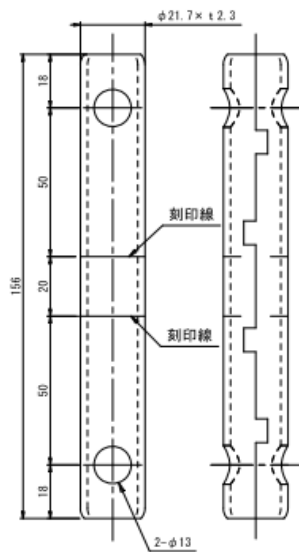
HighKI Wood System

Product description

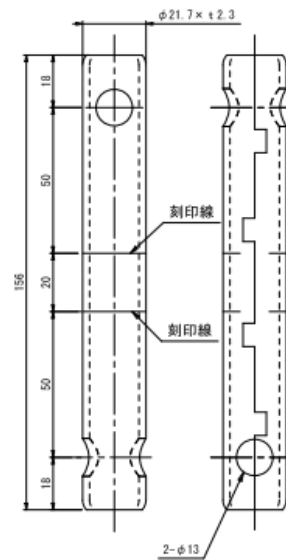
Beam hanging connector PS-(10/18/24/33/39)-SU
ISO 3575

Annex A1

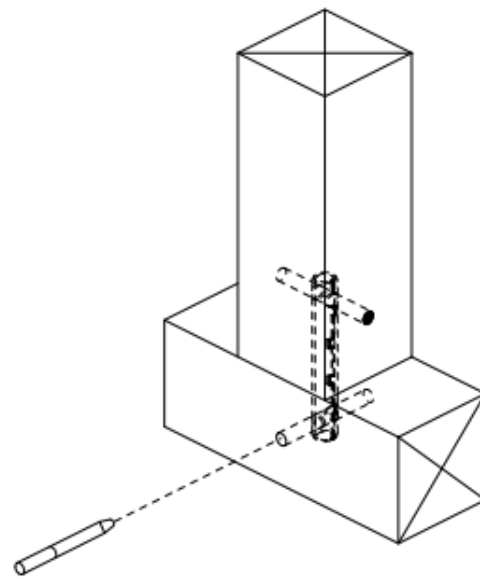
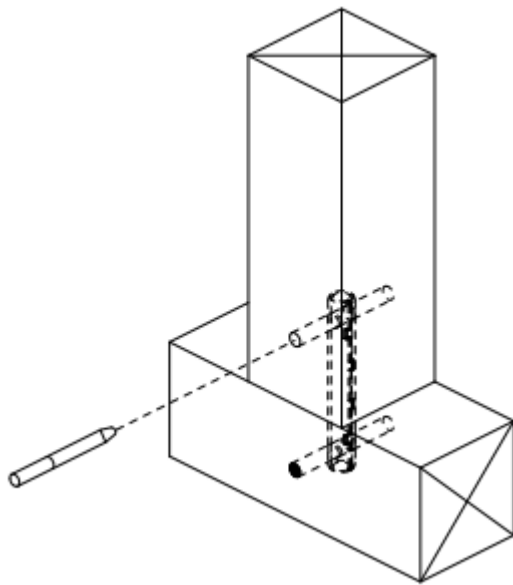
RP-10 / RP-10(+)



ロールパイプ RP-10



ロールパイプ RP-10 (+)



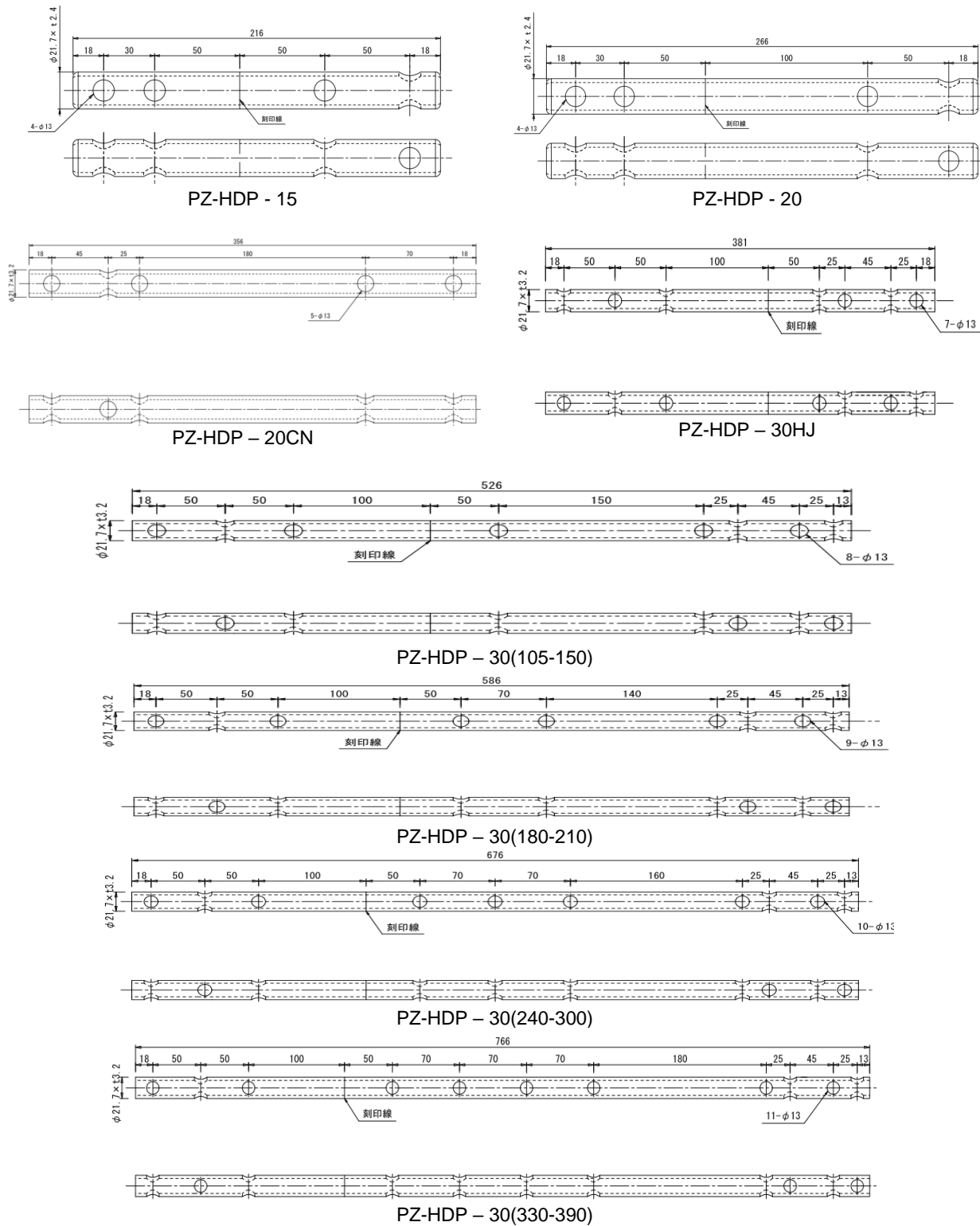
HighKI Wood System

Product description

Post - Sill / Post - Post connector RP-10 / 10(+)
ISO 3575

Annex A2

PZ-HDP – (15/20/20CN/30/30HJ)



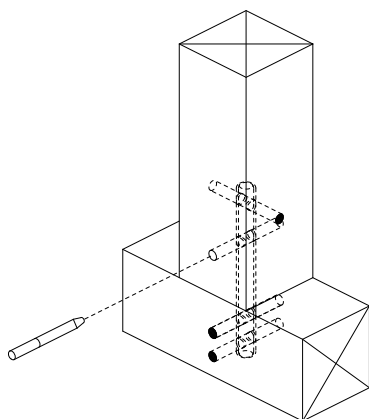
HighKI Wood System

Product description

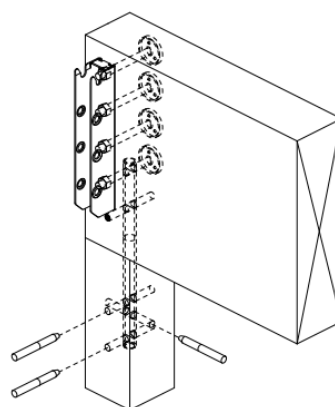
Post - Sill / Post - Post connector PZ Hole down pipe PZ-HDP-15/20/30
ISO630 E235B for HDP15/20, ISO630 C45E4 for HDP-20CN/30HJ

Annex A3

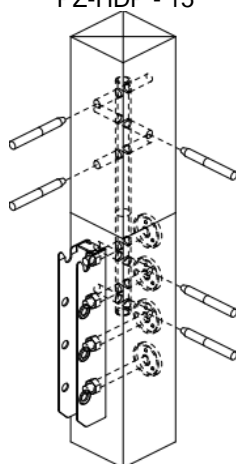
PZ-HDP – (15/20/20CN/30/30HJ)



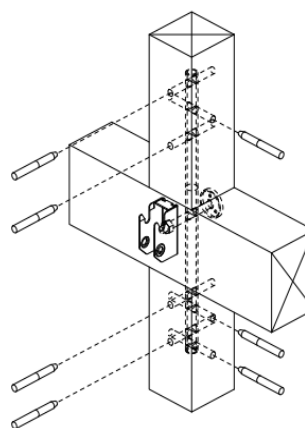
PZ-HDP - 15



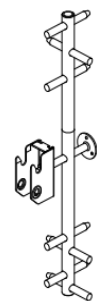
PZ-HDP – 20CN



PZ-HDP – 30HJ



PZ-HDP – 30HJ



金物組合せ図

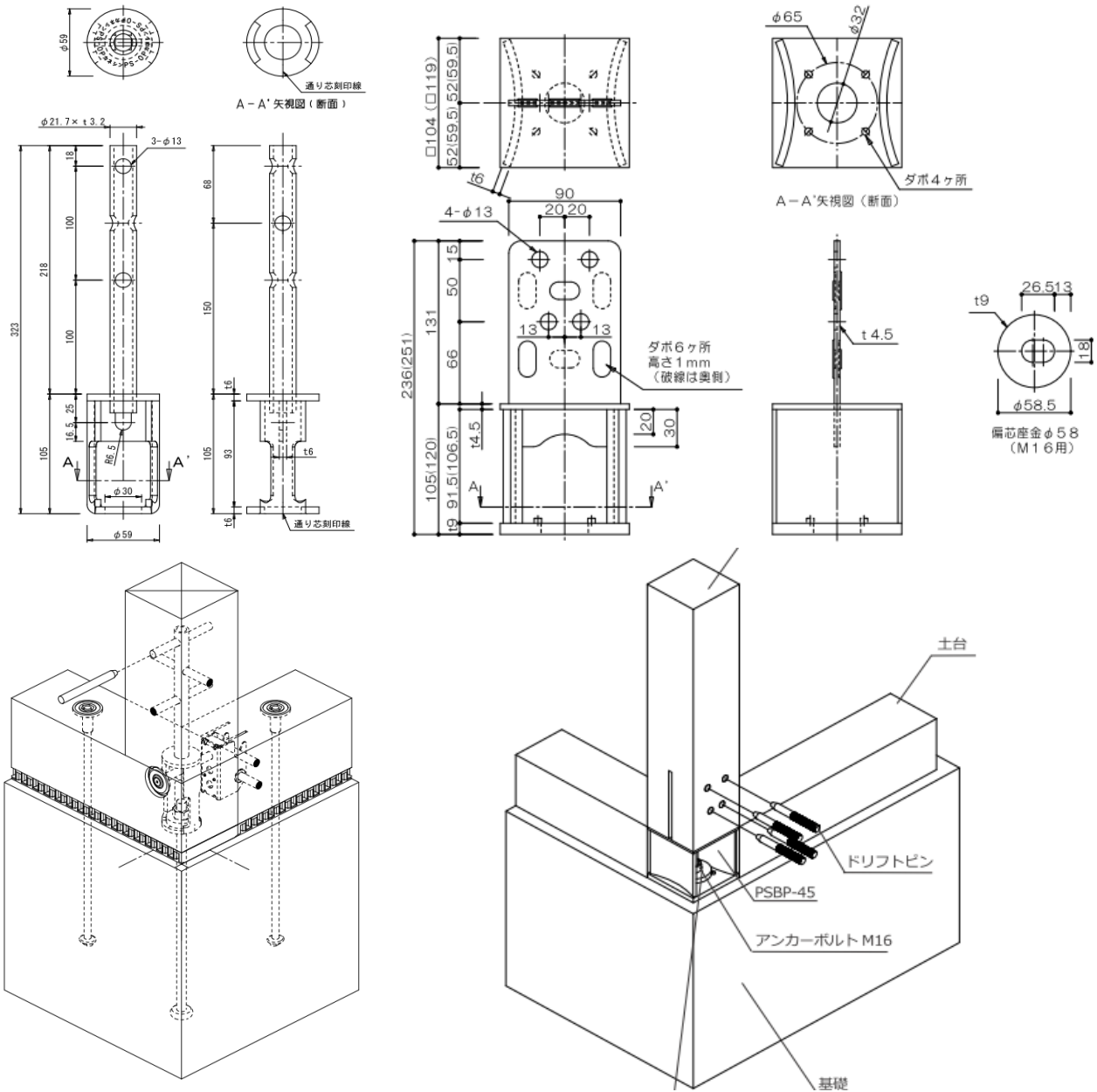
HighKI Wood System

Product description

Post - Sill / Post - Post connector PZ Hole down pipe PZ-HDP-15/20/30/20CN/30HJ
ISO630 E235B for HDP15/20, ISO630 C45E4 for HDP-20CN/30HJ/30

Annex A4

PS-OPSU PSBP-45



HighKI Wood System

Product description

Post - Sill / Post - Post connector PS-OPSU / PSBP-45

Annex A5

Specifications of intended use

Hold down and concealed beam hangers subject to:

Static or quasi-static loads only.

Requirements for the post, beam and sills

The wood members can only be of glued laminated timber classified as GL24h or a higher grade according to EN 14080 and made with European Red pine or white spruce.

The characteristic density of the wood members shall be at least 365 kg/m³.

All the tolerances for wood and connectors installation as described in Annex A have to strictly respected to warrentee the performance level given in the following tables.

The following characteristic resistance values are to be taken as they are indicated into the following table. The use of k_h dimension factor as indicated in § 3.3 of EN 1995-1-1 is not permitted.

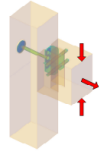
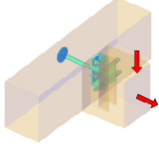
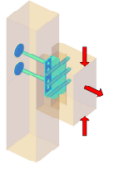
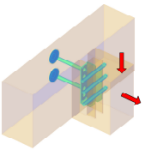
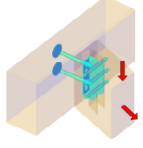
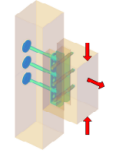
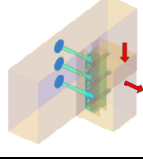
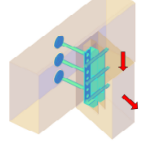
The resistance value given in this ETA have been evaluated by realizong full testing campaign. The results have shown a hundred percent of wood for both hold down and concealed beam hangers. are based.

In case of use with concrete support (hold down), concrete shall be specified according to EN 206 with a resistance class allowing to get a wood failure. Failure of concrete anchorage part of the hold down connexion is not permitted.

HighKI Wood System

Specifications of intended use

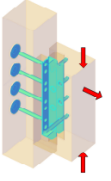
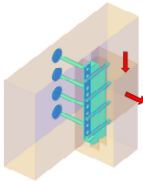
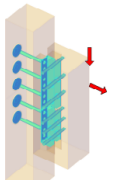
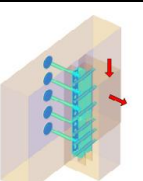
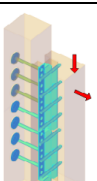
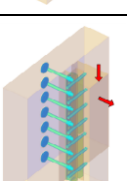
Annex B1

N°	Type	Minimum pins number diameter and length [mm]	Post / header section width x height [mm]	Beam section width x height [mm]	Characteristic Ultimate (R_k) and elastic ($R_{y,k}$) resistance values for each load direction (kN)		
					TENSIL	DOWN	UP
PS-10SU		2 x Ø12 - 103	105 to 200 x 105 to 200	105 to 200 x 105 to greater	$R_{y,k} = 8,40$	$R_{y,k} = 11,50$	$R_{y,k} = 7,60$
		2 x Ø12 - 103	105 to 200 x 105 to greater	105 to 200 x 105 to greater	$R_{y,k} = 8,60$	$R_{y,k} = 7,50$	$R_{y,k} = [-]$
PS-18SU		3 x Ø12 - 103	105 to 200 x 105 to 200	105 to 200 x 180 to greater	$R_{y,k} = 15,20$	$R_{y,k} = 19,50$	$R_{y,k} = 16,70$
		3 x Ø12 - 103	105 to 200 x 180 to greater	105 to 200 x 180 to greater	$R_{y,k} = 17,10$	$R_{y,k} = 17,70$	$R_{y,k} = [-]$
		3 x Ø12 - 103	105 to 200 x 180 to greater	105 to 200 x 180 to greater	$R_{y,k} = 17,10$	$R_{y,k} = 17,70$	$R_{y,k} = [-]$
PS-24SU		3 x Ø12 - 103	105 to 200 x 105 to 200	105 to 200 x 240 to greater	$R_{y,k} = 22,20$	$R_{y,k} = 31,40$	$R_{y,k} = 27,20$
		3 x Ø12 - 103	105 to 200 x 240 to greater	105 to 200 x 240 to greater	$R_{y,k} = 23,90$	$R_{y,k} = 26,40$	$R_{y,k} = [-]$
		3 x Ø12 - 103	105 to 200 x 240 to greater	105 to 200 x 240 to greater	$R_{y,k} = 23,90$	$R_{y,k} = 26,40$	$R_{y,k} = [-]$

HighKI Wood System

Performance
Load characteristic values

Annex C1

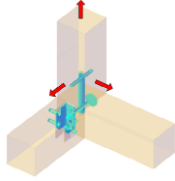
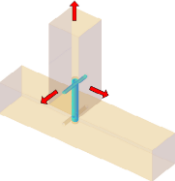
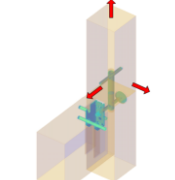
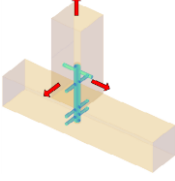
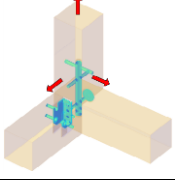
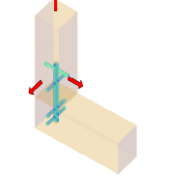
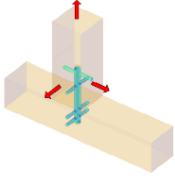
N°	Type	Minimum pins number diameter and length [mm]	Post / header section width x height [mm]	Beam section width x height [mm]	Characteristic Ultimate (R_k) and elastic ($R_{y,k}$) resistance values for each load direction (kN)		
					TENSIL	DOWN	UP
PS-33SU		4 x Ø12 - 103	105 to 200 x 105 to 200	105 to 200 x 330 to greater	$R_{y,k} = 31,50$	$R_{y,k} = 38,60$	$R_{y,k} = 32,20$
		4 x Ø12 - 103	105 to 200 x 330 to greater	105 to 200 x 330 to greater	$R_{y,k} = 33,0$	$R_{y,k} = 40,80$	$R_{y,k} = [-]$
PS-39SU		6 x Ø12 - 103	105 to 200 x 105 to 200	105 to 200 x 390 to greater	$R_{y,k} = 35,90$	$R_{y,k} = 45,90$	$R_{y,k} = [-]$
		6 x Ø12 - 103	105 to 200 x 390 to greater	105 to 200 x 390 to greater	$R_{y,k} = 42,10$	$R_{y,k} = 45,40$	$R_{y,k} = [-]$
PS-54SU		7 x Ø12 - 103	105 to 200 x 105 to 200	105 to 200 x 540 to greater	$R_{y,k} = 47,70$	$R_{y,k} = 52,30$	$R_{y,k} = [-]$
		7 x Ø12 - 103	105 to 200 x 540 to greater	105 to 200 x 540 to greater	$R_{y,k} = 54,30$	$R_{y,k} = 63,10$	$R_{y,k} = [-]$

HighKI Wood System

Performance

Load characteristic values

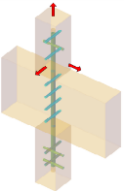
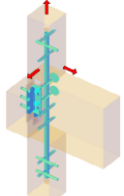
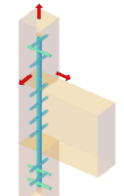
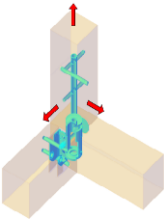
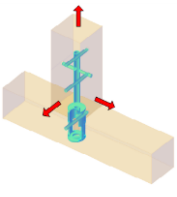
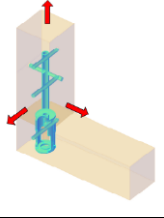
Annex C2

N°	Type	Minimum pins number diameter and length [mm]	Post / header section width x height [mm]	Beam section width x height [mm]	Characteristic Ultimate (R_k) and elastic ($R_{y,k}$) resistance values for each load direction (kN)		
					TENSIL	DOWN	UP
RP-10 RP 10(+)		2 x Ø12 - 103	105 to 200 x 105 to 200	105 to 200 x 105 to greater	$R_{y,k} = 12,70$	$R_{y,k} = 6,20$	$R_{y,k} = 6,80$
		2 x Ø12 - 103	105 to 200 x 105 to 200	105 to 200 x 105 to greater	$R_{y,k} = 11,20$	$R_{y,k} = 6,20$	$R_{y,k} = 6,80$
		2 x Ø12 - 103	105 to 200 x 105 to 200	[-]	$R_{y,k} = 11,40$	$R_{y,k} = 6,20$	$R_{y,k} = 6,80$
PZ HDP-15		3 x Ø12 - 103	105 to 200 x 105 to 200	105 to 200 x 105 to greater	$R_{y,k} = 12,70$	$R_{y,k} = 6,20$	$R_{y,k} = 6,80$
PZ HDP-20		3 x Ø12 - 103	105 to 200 x 105 to 200	105 to 200 x 105 to greater	$R_{y,k} = 12,70$	$R_{y,k} = 6,20$	$R_{y,k} = 6,80$
		3 x Ø12 - 103	105 to 200 x 105 to 200	105 to 200 x 105 to greater	$R_{y,k} = 12,70$	$R_{y,k} = 6,20$	$R_{y,k} = 6,80$
		3 x Ø12 - 103	105 to 200 x 105 to 200	105 to 200 x 105 to greater	$R_{y,k} = 12,70$	$R_{y,k} = 6,20$	$R_{y,k} = 6,80$

HighKI Wood System

Performance
Load characteristic values

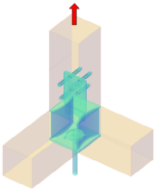
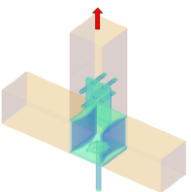
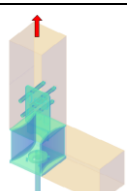
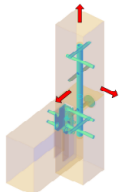
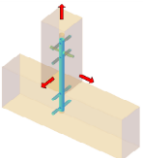
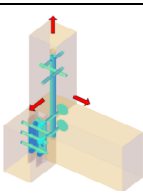
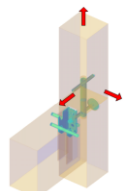
Annex C3

N°	Type	Minimum pins number diameter and length [mm]	Post / header section width x height [mm]	Beam section width x height [mm]	Characteristic Ultimate (R_k) and elastic ($R_{y,k}$) resistance values for each load direction (kN)		
					TENSIL	DOWN	UP
PZ-HDP-30		8 x Ø12 - 103	105 to 200 x 105 to 200	105 to 200 x 160 to greater	$R_{y,k} = 45,40$	$R_{y,k} = 6,20$	$R_{y,k} = 6,80$
		8 x Ø12 - 103	105 to 200 x 105 to 200	105 to 200 x 160 to greater	$R_{y,k} = 45,40$	$R_{y,k} = 6,20$	$R_{y,k} = 6,80$
		8 x Ø12 - 103	105 to 200 x 105 to 200	105 to 200 x 160 to greater	$R_{y,k} = 45,40$	$R_{y,k} = 6,20$	$R_{y,k} = 6,80$
PS-OPSU		3 x Ø12 - 103	105 to 200 x 105 to 200	105 to 200 x 105 to 120	$R_{y,k} = 41,0$	$R_{y,k} = 6,20$	$R_{y,k} = 6,80$
		3 x Ø12 - 103	105 to 200 x 105 to 200	105 to 200 x 105 to 120	$R_{y,k} = 41,0$	$R_{y,k} = 6,20$	$R_{y,k} = 6,80$
		3 x Ø12 - 103	105 to 200 x 105 to 200	105 to 200 x 105 to 120	$R_{y,k} = 41,0$	$R_{y,k} = 6,20$	$R_{y,k} = 6,80$

HighKI Wood System

Performance
Load characteristic values

Annex C4

N°	Type	Minimum pins number diameter and length [mm]	Post / header section width x height [mm]	Beam section width x height [mm]	Characteristic Ultimate (R_k) and elastic ($R_{y,k}$) resistance values for each load direction (kN)		
					TENSIL	DOWN	UP
PSBP-45		4 x Ø12 - 103	105 to 200 x 105 to 200	105 to 200 x 105 to 120	$R_{y,k} = 41,0$	$R_{y,k} = [-]$	$R_{y,k} = [-]$
		4 x Ø12 - 103	105 to 200 x 105 to 200	105 to 200 x 105 to 120	$R_{y,k} = 41,0$	$R_{y,k} = [-]$	$R_{y,k} = [-]$
		4 x Ø12 - 103	105 to 200 x 105 to 200	105 to 200 x 105 to 120	$R_{y,k} = 41,0$	$R_{y,k} = [-]$	$R_{y,k} = [-]$
PZ-HDP-30HJ		6 x Ø12 - 103	105 to 200 x 105 to 200	[-]	$R_{y,k} = 45,40$	$R_{y,k} = 6,20$	$R_{y,k} = 6,80$
PZ-HDP-20CN		3 x Ø12 - 103	105 to 200 x 105 to 200	105 to 200 x 180 to greater	$R_{y,k} = 26,80$	$R_{y,k} = 6,20$	$R_{y,k} = 6,80$
		3 x Ø12 - 103	105 to 200 x 105 to 200	105 to 200 x 180 to greater	$R_{y,k} = 26,80$	$R_{y,k} = 6,20$	$R_{y,k} = 6,80$
		3 x Ø12 - 103	105 to 200 x 105 to 200	105 to 200 x 180 to greater	$R_{y,k} = 26,80$	$R_{y,k} = 6,20$	$R_{y,k} = 6,80$

HighKI Wood System

Performance
Load characteristic values

Annex C5