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English translation prepared by IETcc – original version in Spanish language

General Part

Technical Assessment Body issuing the European Technical Assessment:	Instituto de Ciencias de la Construcción Eduardo Torroja (IETcc)
Trade name of the construction product:	**RECENSE PDP Column Shoe**
Product family to which the construction product belongs:	Column shoe for structural connections of reinforced concrete columns
Manufacturer:	**Industrial Recense S.L.** Parque empresarial de A Pontenova Parcelas 33 – 39. 27720 A Pontenova (Lugo). España website: www.recense.com
Manufacturing plant:	**Industrial Recense S.L.** Parque empresarial de A Pontenova Parcelas 33 – 39. 27720 A Pontenova (Lugo). España
This European Technical Assessment contains:	10 pages including 4 annexes which form an integral part of this assessment. Annex D1 contains confidential information and is not included in the European Technical Assessment when that assessment is publicly available.
This European Technical Assessment is issued in accordance with Regulation (EU) No. 305/2011, on the basis on:	EAD 200102-00-0302. "Column shoes for structural connections of reinforced concrete columns", ed. September 2018.

Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and shall be identified as such.

This European Technical Assessment may be withdrawn by the issuing Technical Assessment Body, in particular pursuant to information by the Commission in accordance with Article 25, section 3, of Regulation (EU) No. 305/2011

SPECIFIC PART

1. Technical description of the product

The Recense PDP Column Shoe consists of a horizontal part called base plate, vertical side plates, vertical anchor bars and a rear bar. The different components are connected to each other by welding.

The product description is given in Annex A.

2. Specification of the intended use in accordance with the applicable European Assessment Document

The column shoes serve as connectors between a concrete column and foundation or between two columns.

The performances given in Section 3 are only valid if the column shoe is used in compliance with the specifications and conditions given in Annex B.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the anchor of at least 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 enonomically reasonable working life of the works.

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

3.1 Mechanical resistance and stability (BWR 1)

Essential characteristics n. 1	Performances
Resistance to tension and shear loads	See Annex C

3.2 Safety in case of fire (BWR 2)

Essential characteristics n. 2 to 3.	Performances
Reaction to fire	Meets the requirements for class A1
Resistance to fire	No performance assessed

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

In accordance with the European Assessment Document EAD 200102-00-0302 the applicable European legal act is Commission Decision 2000/606/EC.

The system to be applied is: 2+.

5. Technical details necessary for the implementation of the AVCP system, as provided in the applicable European Assessment Document.

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with the Instituto de Ciencias de la Construcción Eduardo Torroja.

Instituto de Ciencias de la Construcción Eduardo Torroja
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Madrid on 27th September 2022

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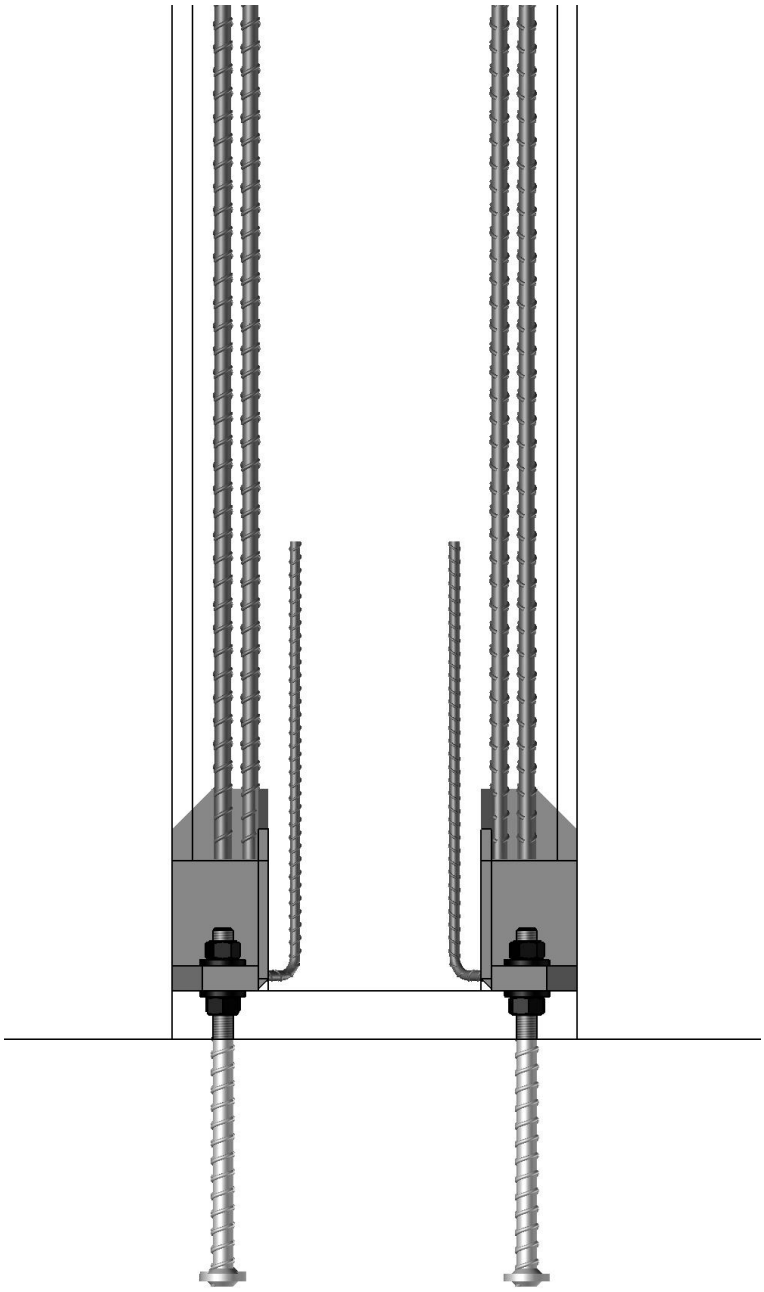
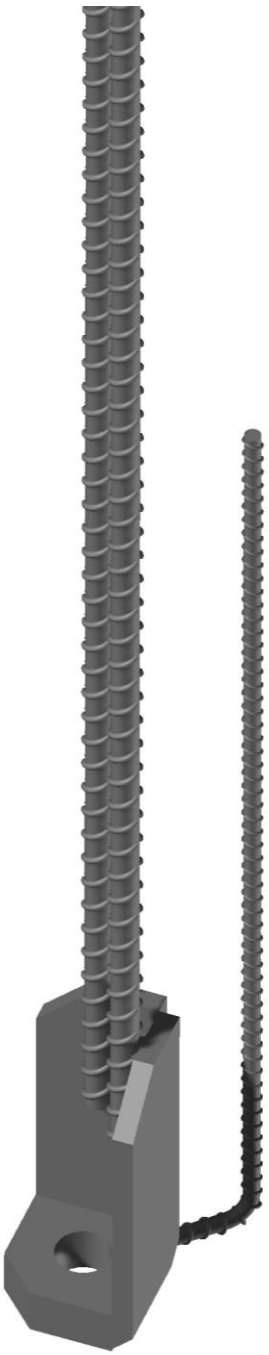
Director IETcc-CSIC



Application example



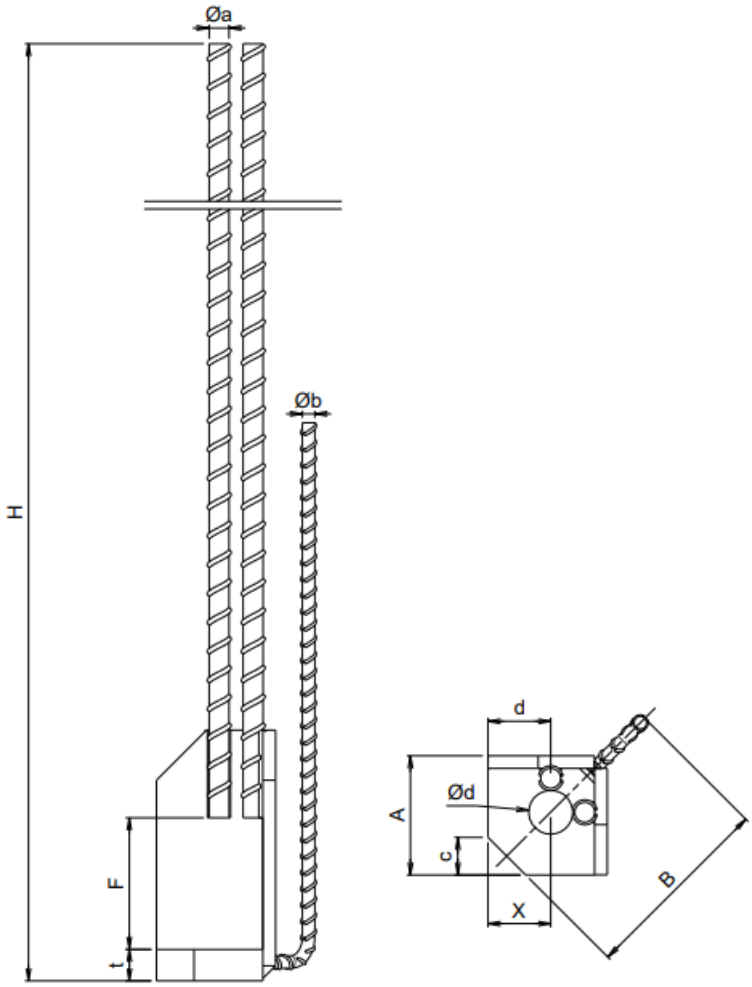
PDP Column Shoe

RECENSE PDP Column Shoe

Product description

Installed condition

Annex A1



	PDP16	PDP20	PDP24	PDP30	PDP39
H	750	835	1080	1350	1920
A	81	88	95	105	130
B	135	142	155	181	235
c	30	30	30	30	37
t	15	20	25	35	45
$Ø_a$	12	16	16	20	25
d	45	50	50	50	53
F	85	95	105	120	150
$Ø_d$	27	30	35	40	55
X	50	50	50	50	60
$Ø_b$	8	8	10	12	20

RECENSE PDP Column Shoe

Product description

Dimensions

Annex A2

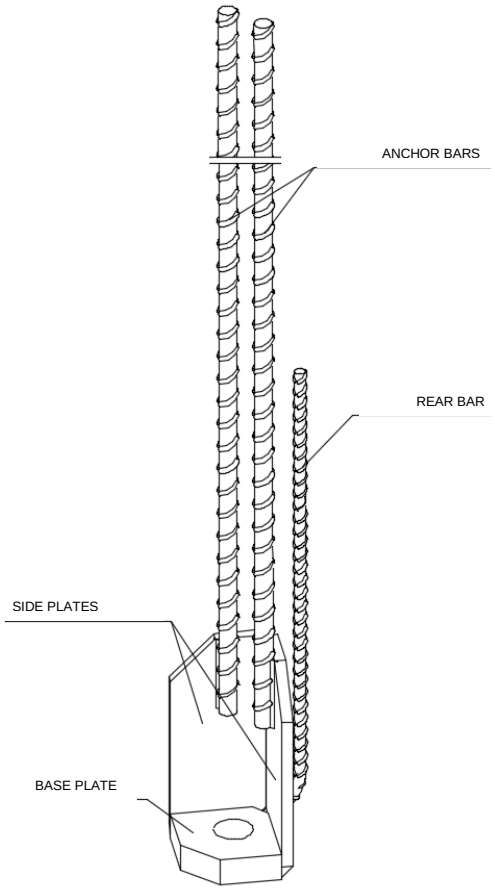


Table A1: Specifications, materials

ANCHOR BARS	Reinforcement steel rebar B500SD according to EN 1992-1-1:2004 + AC:2010, Annex C
REAR BAR	Reinforcement steel rebar B500SD according to EN 1992-1-1:2004 + AC:2010, Annex C
SIDE PLATES	Structural steel S355J2 according to EN 10025:2019
BASE PLATE	Structural steel S355J2 according to EN 10025:2019

Table A2: Minimum requirements for reinforcing steel

General	All requirements set in EN 10080:2005 and EN 1992-1-1:2004+AC10, Annex C for the reinforcing steel of Class B or Class C, strength class 500 MPa
Additional	The steel shall be weldable

Specifications of intended use

Design value of loads:

- Static and quasi-static load.
- Tension loads, compression loads and shear loads or any combination thereof.

Anchoring base material:

- The grade of the reinforced concrete used for the column shall be in the range C30/37 to C70/85 according to EN 1992-1-1:2004 + AC:2010.
- In the region of the PDP Column Shoes, the concrete may be cracked or uncracked.

Use conditions (environmental conditions):

- For PDP column shoe under normal conditions of use, they are installed in concrete without additional measures or surface treatments and when they fall within the scope of application of the EN 1992-1-1:2004 + AC:2010. Under conditions of use in aggressive environments, such as a marine environment or a chemical exposure environment, modifications can be necessary.
- The European standard EN 1992-1-1:2004 + AC:2010, section 4 applies to PDP Column Shoes, that are planned to be installed with concrete cover.
- The lowest temperature in use is -20°C.

Design:

- The dimensioning of column shoes is carried out under the responsibility of an engineer experienced in the field of structural design and concrete constructions.
- The design is based on the Technical Report TR 068: Design of Structural Connections with Column Shoes.
- Verifiable calculation notes and drawings are prepared taking into account the loads to be transferred.
- The position of the column shoes, including the reinforcement required, has to be specified on the construction drawings and execution specifications.
- The splice laps between the main column reinforcement bars and anchor bars of PDP Column Shoes are designed according to EN 1992-1-1:2004 + AC:2010.
- The dimensioning and design of connected structural concrete members shall be done according to EN 1992-1-1:2004 + AC:2010.

RECENSE PDP Column Shoe	**Annex B1**
Intended use Specifications	

Installation

- Installation of the PDP Column Shoes is carried out by appropriately qualified workers under the supervision of the person responsible for technical matters on site.
- Use of PDP Column Shoes as supplied by the manufacturer, without any manipulation or exchanging of components.
- Installation of PDP Column Shoes in accordance with manufacturer's specifications.
- PDP Column Shoes have to be fixed on the formwork so that no movement of the column shoes will occur during the time of laying the reinforcement and of placing and compacting the concrete.
- Concrete around PDP Column Shoes has to be compacted properly.
- Area of the PDP Column Shoes has to be protected against penetration of concrete, water and oil.
- The spacing and clear distance between PDP Column Shoes must be selected according to EN 1992-1-1:2004 + AC:2010 and shall be such that the concrete can be placed and compacted satisfactorily for the development of adequate bond.
- Examples of distances and arrangements of PDP Column Shoes are given in figure B1 and table B1.
- The PDP Column Shoes may be used in any cross section of concrete column.

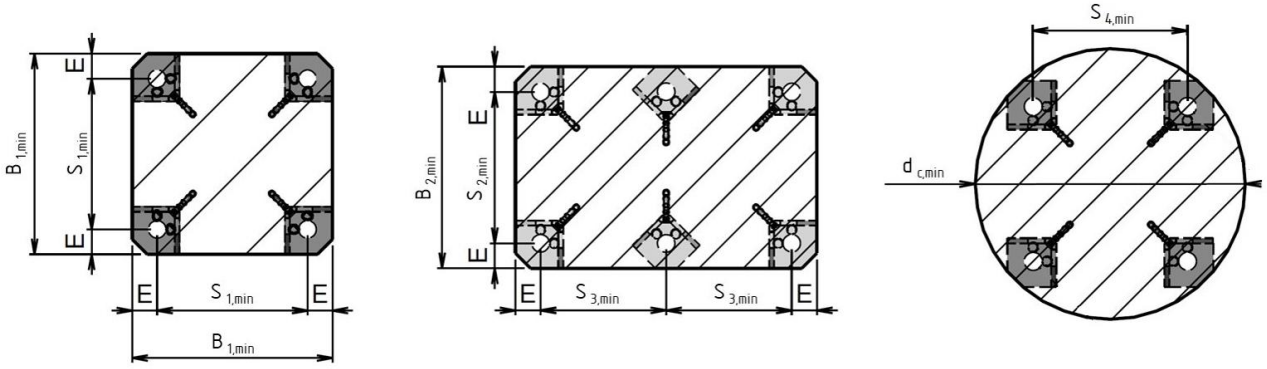
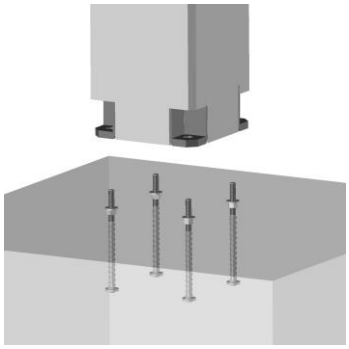


Figure B1: Examples of geometrical arrangements and distances of RECENSE PDP Column Shoe

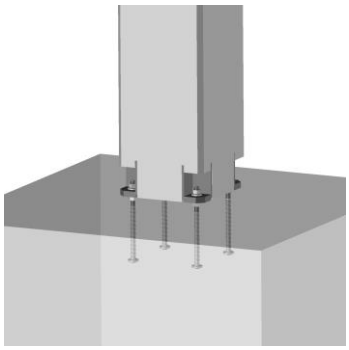
Table B1: Minimum distances (mm)

PDP Column Shoe	16	20	24	30	39
$B_{1,min}$	235	245	270	300	400
$B_{2,min}$	275	290	315	370	475
$S_{1,min}$	135	145	170	200	280
$S_{2,min}$	175	190	215	270	360
$S_{3,min}$	120	130	155	180	250
$S_{4,min}$	135	145	170	200	280
E	50	50	50	50	60
$d_{c,min}$	295	310	345	385	515

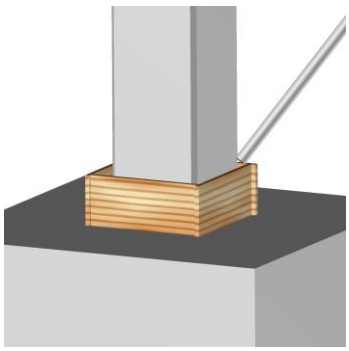
Installation instructions - precast element



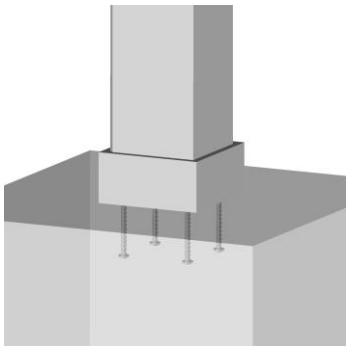
1. Column is installed directly on the pre-levelled washers and the lower nuts.



2. Upper washers are installed on the base plate and upper nuts are screwed on the bolts.



3. The formwork for the grouting joint and recesses is installed. The joint has to be grouted with non-shrink mortar.



4. The joint is finished when the formwork is removed and the grout has hardened.

NOTE: Joint has to be grouted with non-shrink mortar and has to reach the design strength before the column is loaded by other structures.

RECENSE PDP Column Shoe	
Intended use Installation instructions	**Annex B3**

Table C1: Resistances to tension, compression, and shear loads under static and quasi-static loading

PDP Column Shoe			16	20	24	30	39
Steel failure							
Tension resistance(1)	$N_{Rd,S}$	(kN)	62,1	96,9	139,6	222	386,4
Bending resistance factor	η_d	(-)	0,79				
Bending stiffness factor	K_L	(-)	1,0				
Shear resistance factor	K_S	(-)	1,0				

(1) For dimensioning, the factor η_d applies to these values.

RECENSE PDP Column Shoe	**Annex C1**
Performances Resistances to tension and shear loads under static and quasi-static loading	

Annex D1: Quality control

This confidential information and is not included in the European Technical Assessment when that assessment is publicly available.