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## European Technical Assessment

**ETA 23/0265**  
of 24.07.2023



### General part

<b>Technical Assessment Body issuing the ETA: ITeC</b>	
ITeC has been designated according to Article 29 of Regulation (EU) No 305/2011 and is member of EOTA (European Organisation for Technical Assessment)	
<b>Trade name of the construction product</b>	<b>SEI connection system</b>
<b>Product family to which the construction product belongs</b>	33 - Fixings
<b>Manufacturer</b>	<b>DASEIN INGENIEROS, S.L.</b> Plaza San José, 4 – 3º ES31001 PAMPLONA (Navarra) Spain
<b>Manufacturing plant(s)</b>	According to Annex N kept by ITeC.
<b>This European Technical Assessment contains</b>	10 pages including 1 Annex which forms an integral part of this assessment.
<b>This European Technical Assessment is issued in accordance with Regulation (EU) 305/2011, on the basis of</b>	European Assessment Document 332001-02-0602 <i>Clamping systems for connection of precast concrete members</i> , edition July 2023.

### **General comments**

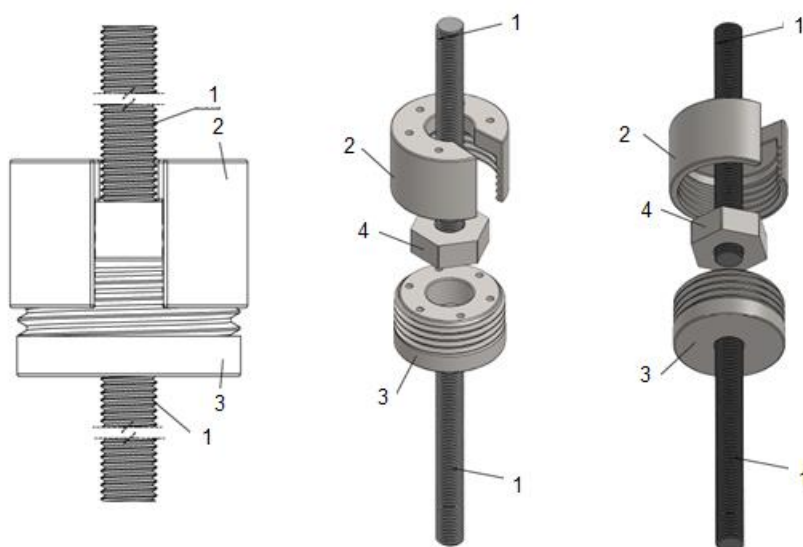
Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full (excepted the confidential Annex(es) referred to above). However, partial reproduction may be made, with the written consent of issuing Technical Assessment Body. Any partial reproduction has to be identified as such.

## Specific parts of the European Technical Assessment

### 1 Technical description of the product

The SEI connection system consists of three metallic pieces: an internally threaded upper bushing, a hexagonal nut, and an internally and externally threaded bottom sleeve. Steel grades S355 JR, J0 or J2 according to EN 10025-2, or steel C45 according to EN ISO 683-1 are used for the upper bushing, the hexagonal nut, and the bottom sleeve. Threaded steel bars M20 strength class 10.9 are embedded in the precast concrete columns to be joined and are made of steel according to ISO 898-1. A general description of the SEI connection system is given below.



#### Key:

- 1: Threaded bar
- 2: Internally threaded upper bushing
- 3: Internally and externally threaded bottom sleeve
- 4: Hexagonal nut

**Figure 1.1:** SEI connection system.

Detailed information and data of all the components are given in Annex A.

The concrete poured on site and the steel threaded bars in the precast concrete columns, are not covered in this ETA.

## 2 Specification of the intended use(s) in accordance with the applicable European Assessment Document (hereinafter EAD)

### 2.1 Intended use

The SEI connection system is used to connect load bearing precast reinforced structures (column-beam-column).

The system transfers axial (tension or compression) and shear forces between the connected threaded bars.

Minimum strength class of the concrete poured on site on top of the precast concrete beams is C25/30 according to EN 206.

This ETA covers the construction product only, i.e. the design of the concrete structures is not covered.

The concrete structures are subjected only to static or quasi-static actions.

The system is completely embedded by concrete in service and is only exposed to the environment during installation.

## 2.2 Working life

The provisions made in this ETA are based on a working life for SEI connection system of 50 years when installed in the works. These provisions are based upon the current state of the art and the available knowledge and experience.

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 and reference to the methods used for its assessment

The assessment of SEI connection system for the intended use was performed following EAD 332001-02-0602 *Clamping systems for connection of precast concrete members*. Performance of SEI connection system is shown in Table 3.1.

**Table 3.1:** Performance of SEI connection system.

Basic Works Requirement	Essential characteristic	Performance
BWR 1 Mechanical resistance and stability	Characteristic tensile strength in service	192,74 kN
	Characteristic tensile strength during installation	180,92 kN
	Characteristic shear strength	143,53 kN
	Characteristic compression strength in service	245,14 kN
	Characteristic compression strength during installation	220,91 kN
	Characteristic strength of T-connection	Not relevant
	Durability against corrosion	Not relevant. The system is completely embedded in concrete during its working life.
BWR 2 Safety in case of fire	Reaction to fire	A1

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

According to the decision 98/214/EC, as amended of the European Commission<sup>1</sup>, the systems of AVCP (see EC delegated regulation (EU) No 568/2014 amending Annex V to Regulation (EU) 305/2011) given in the following table applies.

**Table 4.1:** Applicable AVPC system.

Product	Intended use(s)	Level or class	System
SEI connection system	Connection of load bearing precast reinforced concrete structures (column-beam-column)	Any	2+

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

All the necessary technical details for the implementation of the AVCP system are laid down in the *Control Plan* deposited with the ITeC<sup>2</sup>, with which the factory production control shall be in accordance.

Products not manufactured by the kit manufacturer shall also be controlled according to the Control Plan.

Where materials/components are not manufactured and tested by the supplier in accordance with agreed methods, then they shall be subject to suitable checks/tests by the kit manufacturer before acceptance.

Any change in the manufacturing procedure which may affect the properties of the product shall be notified and the necessary type-testing revised according to the *Control Plan*.

Issued in Barcelona on 24 July 2023

by the Catalonia Institute of Construction Technology.



Ferran Bermejo Nualart

Technical Director, ITeC

<sup>1</sup> Official Journal of the European Union (OJEU) L80/46 of 18/03/1998.

<sup>2</sup> The *Control Plan* is a confidential part of the ETA and is only handed over to the notified certification body involved in the assessment and verification of constancy of performance.

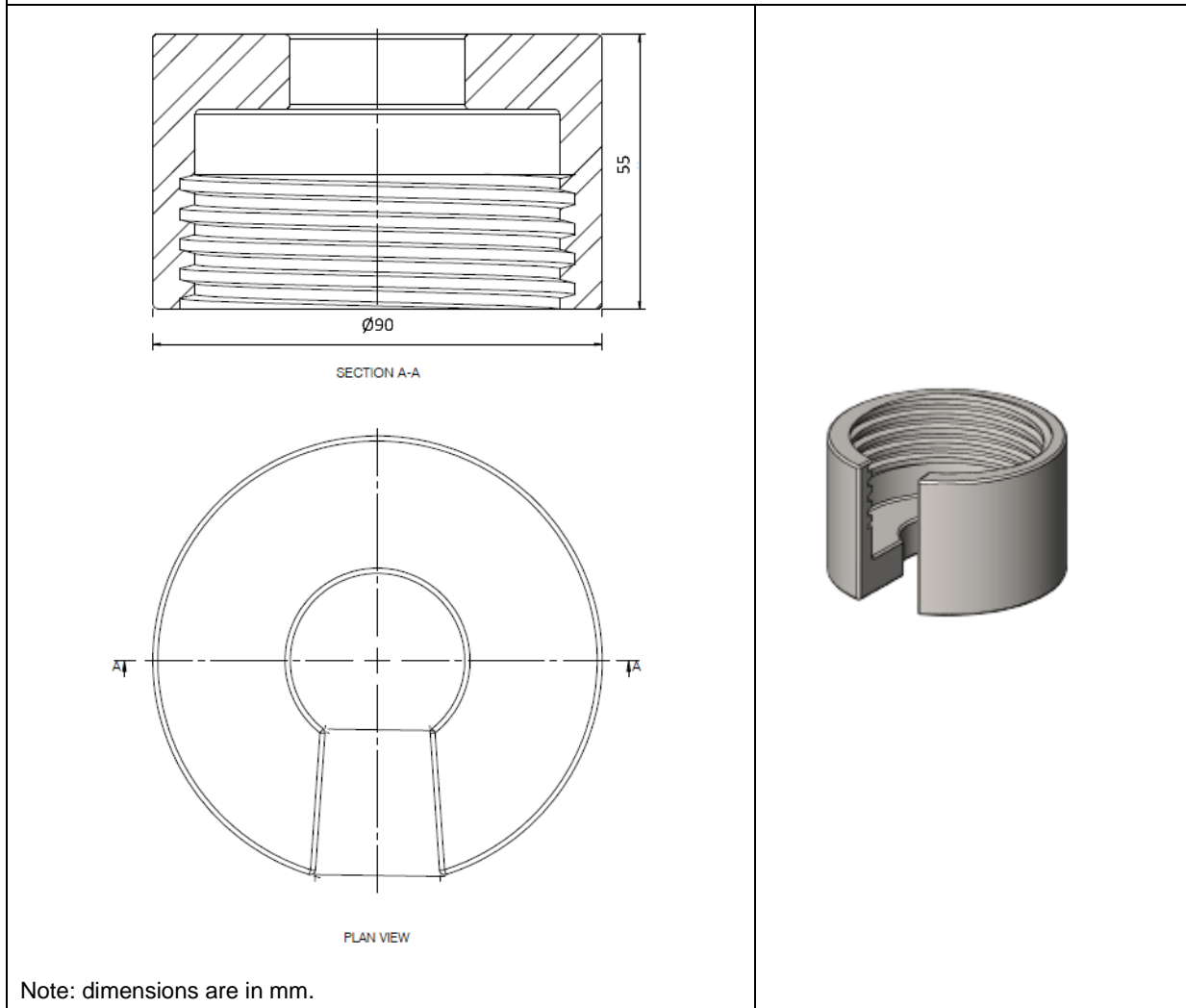
## ANNEX A: Description of SEI connection system

### A1 Dimensions of the components of the SEI connection system

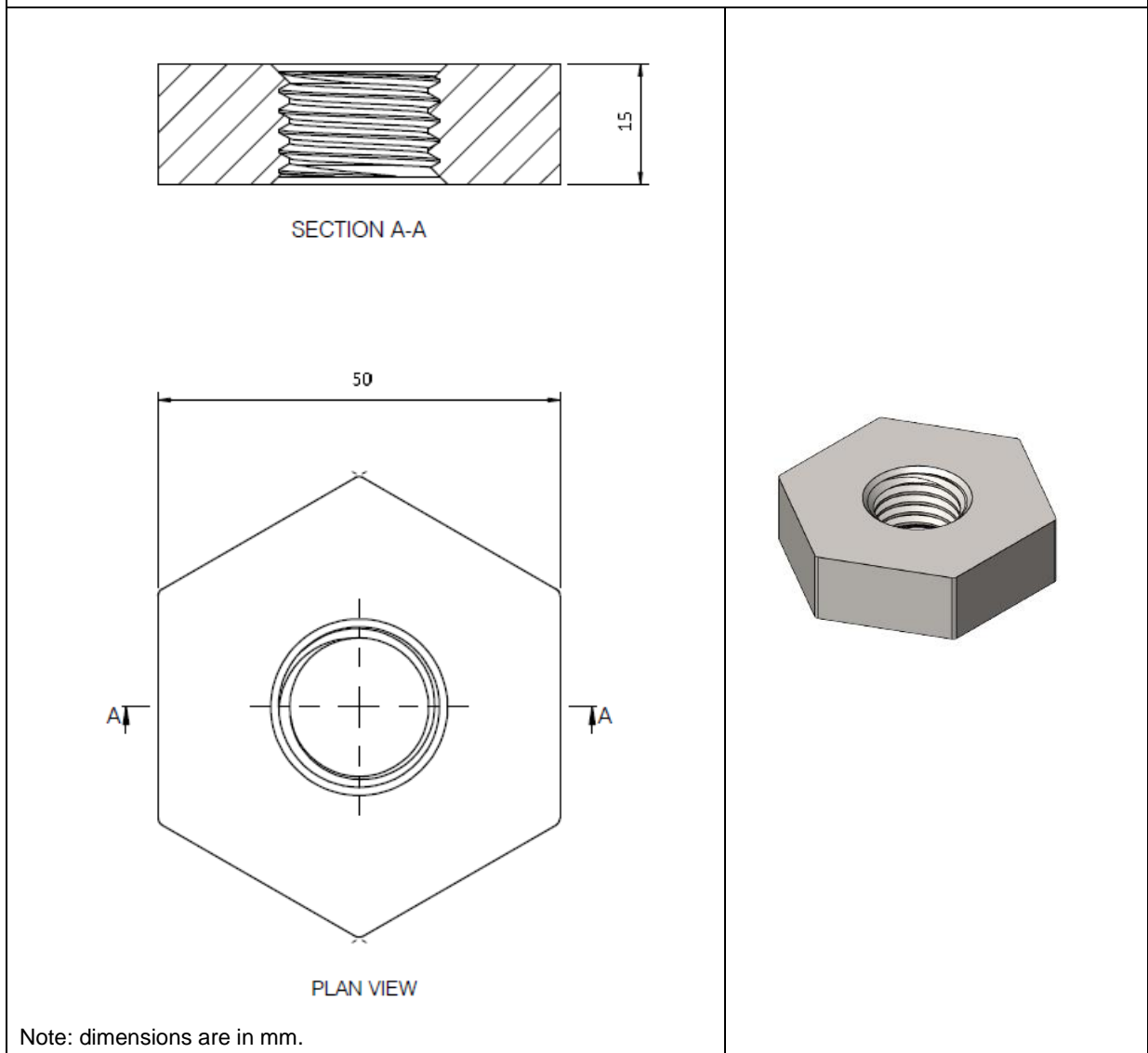
SEI connection system consists of three metallic pieces: an internally threaded upper bushing, a hexagonal nut, and an internally and externally threaded bottom sleeve.

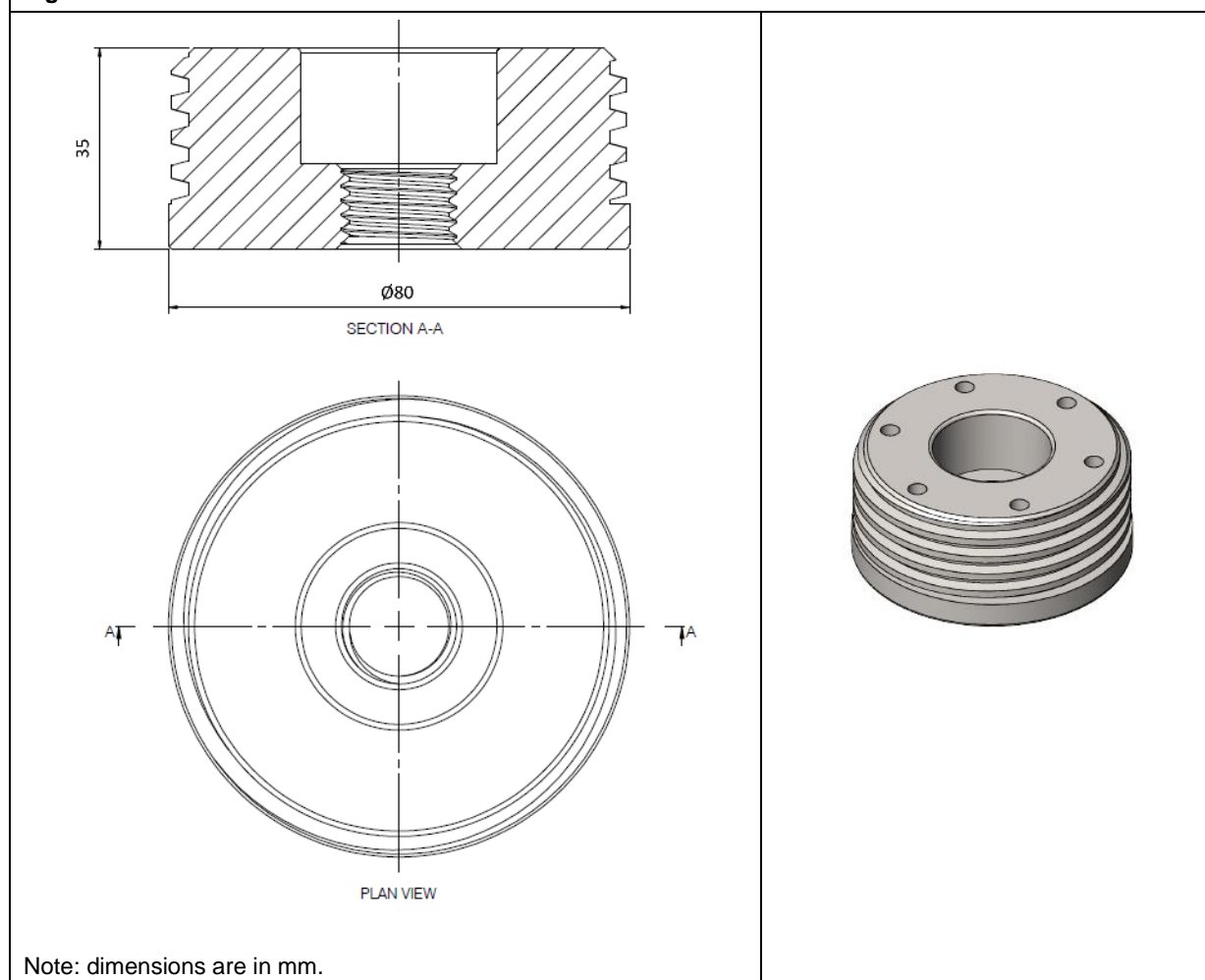
Main dimensions of the components of the SEI connection system are given in the figures below.

**Figure A.1:** Upper bushing.



**Figure A.2:** Hexagonal nut.



**Figure A.3:** Bottom sleeve.

## A.2 Materials of the SEI connection system components

Materials of SEI connection system components are given in the Table below.

Component	Material
Upper bushing	Steel grade S355 JR, J0 or J2 according to EN 10025-2, or C45 according to EN ISO 683-1.
Hexagonal nut	
Bottom sleeve	

## A.3 Installation of the SEI connection system

SEI connection system is intended to mechanically connect multiple precast concrete elements with minimum strength class C25/30.


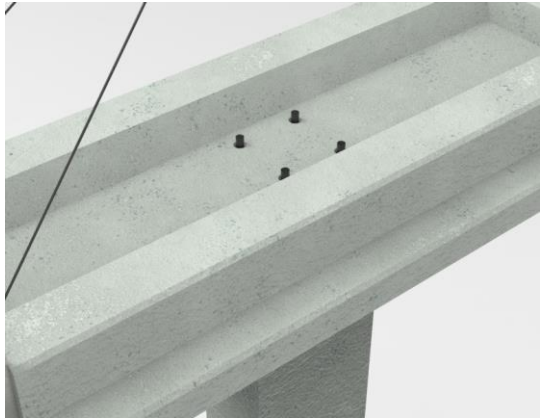

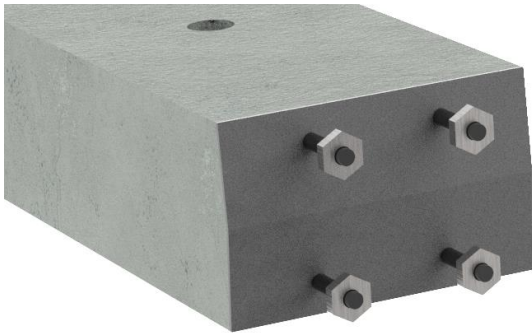
Concrete members at the connection ends must have anchored protruding M20 threaded steel bars of minimum strength class 10.9 according to EN ISO 898-1. The number of threaded bars per joint is typically 4. Figures below are referred to a multiple joint between a lower precast concrete column with 4 protruding



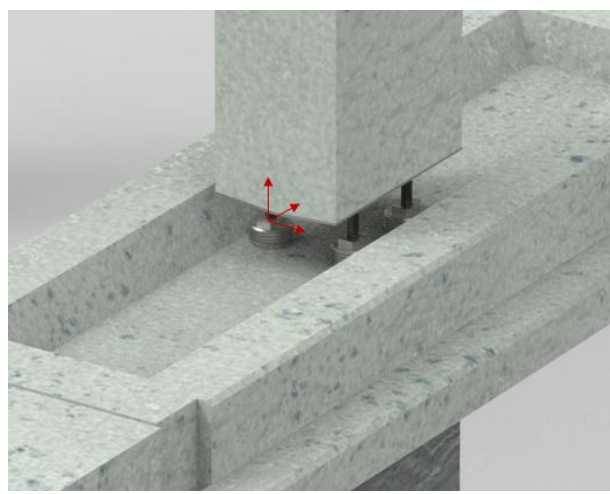
threaded bars, a precast concrete beam, and an upper precast concrete column with 4 protruding threaded bars.

The installation of SEI connection system is completed in accordance with the following steps:

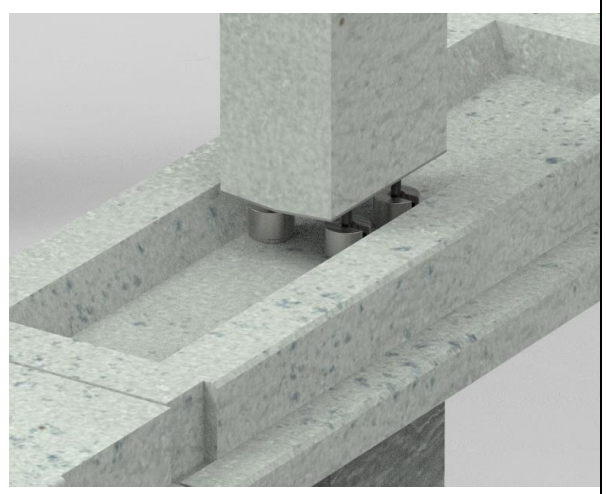
- 1) The precast concrete beam which contains 4 holes is mounted on the lower precast concrete column, so the protruding steel threaded bars of the column pass through the beam (see figures A.4 and A.5 below).
- 2) Bottom sleeves of the SEI connection system are threaded to the protruding steel bars of the lower precast concrete column (see Figure A.6 below). The beam is now connected to the lower column.
- 3) Hexagonal nuts are threaded to the protruding M20 threaded steel bars of the upper precast concrete column (see Figure A.7). The hexagonal nuts must be completely threaded to the bars.
- 4) The upper precast concrete column is placed onto the bottom sleeves with the hexagonal nuts resting directly on the bottom sleeves (see Figure A.8). The upper column is levelled and adjusted to final position using the hexagonal nuts.
- 5) The upper bushings of the SEI connection system are laterally inserted and manually tightened. The connection system is now clamped (see Figure A.9).
- 6) The joint is filled with concrete poured on site. The SEI connection system becomes completely embedded in concrete. (see Figure A.10).

<p><b>Figure A.4:</b> Lower concrete column with protruding threaded bars.</p>	<p><b>Figure A.5:</b> Beam mounted on the bottom concrete column.</p>
	
<p><b>Figure A.6:</b> Bottom sleeves of SEI connection system fixed to the protruding threaded SEI bars of the bottom concrete column.</p>	<p><b>Figure A.7:</b> Hexagonal nuts are threaded to the upper precast column protruding bars.</p>
	

**Figure A.8:** The threaded bars with hexagonal nuts from the upper precast concrete column are placed and levelled onto the bottom sleeves.



**Figure A.9:** The upper bushing is installed, allowing the tensile force transmission among the threaded bars of the connected precast elements.



**Figure A.10:** Finally, onsite concrete is poured leaving the SEI connection system completely embedded in concrete.

