



New connection on: : 15-02-2018 : 17:27:48 - Last disconnection on: : 14-02-2018 : 22:14:15

V 4.0.0.44358(LP,U,linux) (Rev:43856 2017-04-27 09:03:29 +0200#(D201802)) (RPM D201802)

## Welcome to EPOQUE Rebuild under the Production Environment

[No database/cluster active] ..fi

Select a database: ..FI EPODOC

 Database: EPODOC

[EPODOC: SS 1] FLANGE AND STEEL AND JOIN AND COLUMNS

Results in EPODOC 9

[SS 2] FLANGE AND STEEL AND JOINING AND PILLARS

Results in EPODOC 5

[SS 3] JOINING AND DEVICE AND PRECAST AND REINFORCED AND CONCRETE AND COLUMNS

Results in EPODOC 7

[SS 4] /ic E04B1/21

Results in EPODOC 3.916

[SS 5] 1

Results in EPODOC 9

[SS 6] ..li



[SS 6] ..v

[EPODOC: SS 6] 2

Results in EPODOC 5

[SS 7] ..li



[SS 7] ..v

[EPODOC: SS 7] 3

Results in EPODOC 7

[SS 8] ..v

[EPODOC: SS 8]

Disconnection from EPOQUE on: 15-02-2018 17:56:45 *DISCONNECT(1005)*

Session saved. *INFO(1006)*

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New connection on: : 16-02-2018 : 17:17:09 - Last disconnection on: : 16-02-2018 : 04:22:58

V 4.0.0.44358(LP,U,linux) (Rev:43856 2017-04-27 09:03:29 +0200#(D201802)) (RPM D201802)

## Welcome to EPOQUE Rebuild under the Production Environment

[No database/cluster active] iifi

No database has been activated within this session yet.

- Use the command **..FI (CL)** in order to activate a database (cluster). *ERROR(-101007)*

[No database/cluster active] ..fi

Select a database: **..FI EPODOC**

 Database: EPODOC

[EPODOC: SS 1] Moment-connection and between and steel and column

Results in EPODOC 0

EPODOC: term 'MOMENT-CONNECTION' not found in index 'BI'. *WARNING(1)*

[SS 2] Moment and connection and between and steel and column

Results in EPODOC 55

[SS 3] DRY and JOINT\* and DEVICE and COLUMNS

Results in EPODOC 0

EPODOC: term 'JOINT\*' not found in index 'BI'. *WARNING(1)*

[SS 4] DRY and JOINT and DEVICE and COLUMNS

Results in EPODOC 16

[SS 5] DEVICE AND JOINING AND COLUMNS

Results in EPODOC 159

[SS 6] /IC E04B1/21

Results in EPODOC 3.918

[SS 7] 5 AND 6

Results in EPODOC 10

[SS 8] ..LI



1/10 © EPODOC / EPO

PN - [PT2966232T](#) T 20170503

PR - EP20140382262 20140707

AP - PT20140382262T 20140707

DT - I

CCI - [E04B1/215](#) ; [E04C5/162](#)

CUI - [E04B1/1912](#) ; [E04B1/40](#)

CQI - [E04C5/16](#)

CUA - [E04B2103/02](#)

PA - FUNDACIÓN TECNALIA RES & INNOVATION [ES]

TI - DRY JOINT **JOINING DEVICE**BETWEEN **COLUMNS** AND BEAMS OF PRECAST REINFORCED CONCRETE

2/10 © EPODOC / EPO

PN - [US2017183861](#) A1 20170629

PR - EP20140382261  
20140707; WO2015ES70497  
20150625

AP - US201515324361 20150606

DT - \*\*

CT - || R141 (A1)  
[US2724261](#) A 19551122 [ ] (RENSAA EGIL M);  
[US3572223](#) A 19710323 [ ] (VIERREGGER RALPH L);  
[US3745731](#) A 19730717 [ ] (SIMPSON M, et al);  
[US3785097](#) A 19740115 [ ] (SEYMOUR W);  
[US4295308](#) A 19811020 [ ] (KORFANTA CARL);  
[US4330970](#) A 19820525 [ ] (BONINK JOHANNES A);  
[US4781006](#) A 19881101 [ ] (HAYNES HARVEY H [US]);  
[US4938635](#) A 19900703 [ ] (RUSSELL JAMES B [GB]);  
[US2008279620](#) A1 20081113 [ ] (BERG SVEIN [NO]);  
[US2010322717](#) A1 20101223 [ ] (PAUL LARRY A [US]);  
[US2013199123](#) A1 20130808 [ ] (JUNES MARKUS [FI]);  
[US4009550](#) A 19770301 [ ]

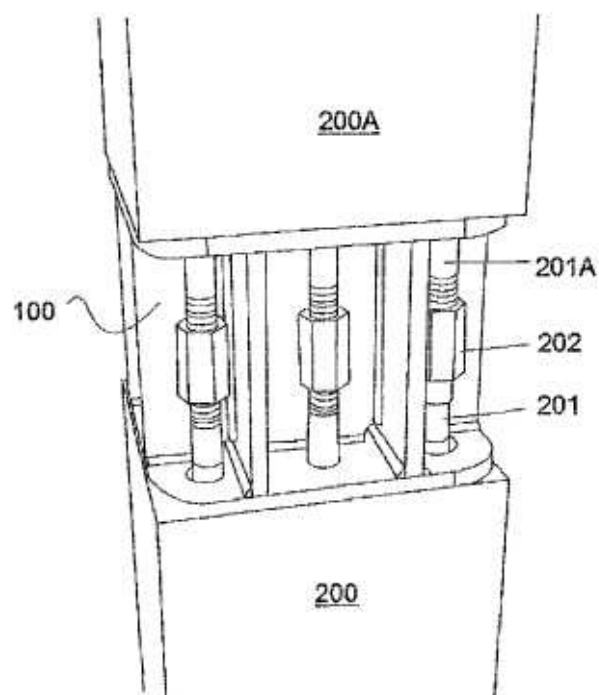


Figure 6

- ] (YOUNG FRANK EDWARD);  
[FR2367158](#) A1 19780505 [  
 ] (GRAM SA [CH]);  
[FR2417592](#) A1 19790914 [  
 ] (SILVANDER FRANK [SE]);  
[WO9310314](#) A1 19930527 [  
 ] (GLEZERMAN JOSEF [DE], et al);  
[WO2007074212](#) A1 20070705 [  
 ] (PEIKKO FINLAND OY [FI], et al);  
[EP1857602](#) A2 20071121 [  
 ] (KRUMMEL GERHARD [DE], et al)
- CCI - [E04B1/215](#) ; [E04B1/5831](#) ;  
[E04C3/22](#) ; [E04C5/165](#)
- CUI - [E04H9/025](#)
- CQI - [E04C3/34](#)
- CCA - [E04C3/36](#)
- CUA - [E04B2001/5887](#)
- PA - FUND TECNALIA RES &  
 INNOVATION [ES]
- TI - **JOINING DEVICE** FOR PRECAST  
 REINFORCED  
 CONCRETE **COLUMNS** WITH A DRY  
 JOINT
- AB - The **joining device** (100, 100')  
 comprises a first cover (1) and a  
 second cover (2), each of which  
 has a plurality of through holes  
 (3) that match up with one  
 another in position, for the ends  
 of the rebars of the **columns**  
 (200, 200A) to pass through. The  
 covers (1,2) are joined together  
 by means of, at least, two  
 transverse webs (4) and several  
 stiffener reinforcements (5,5A),  
 which are arranged in  
 perpendicular to the covers (1,2).  
 The **device** further comprises  
 connecting means (202, 203,  
 204, 205) between the ends of  
 the rebars (201,201A) of  
 the **columns** (200,200A).

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- PN - [US2017175376](#) A1 20170622
- PR - EP20140382262  
 20140707; WO2015ES70498  
 20150625
- AP - US201515324370 20150625
- DT - \*\*
- CCI - [E04B1/215](#) ; [E04C5/162](#)
- CUI - [E04B1/1912](#) ; [E04B1/40](#)
- CQI - [E04C5/16](#)
- CUA - [E04B2103/02](#)
- PA - FUND TECNALIA RES &  
 INNOVATION [ES]

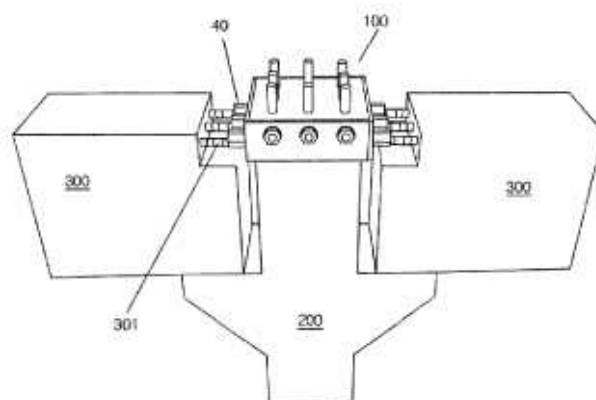


**FIG.5**

- TI - DRY JOINT **JOINING DEVICE**  
BETWEEN **COLUMNS** AND BEAMS  
OF PRECAST REINFORCED  
CONCRETE
- AB - A **joining device** (100) for precast  
reinforced concrete elements  
with a dry joint comprising a  
first group of **joining**  
reinforcements (10') arranged on  
a first plane and in parallel with  
one another, each one of  
said **joining** reinforcements (10)  
comprising one reinforcement  
(1) and two threaded ends (2).  
The **device** comprises first  
coupling means (30) for coupling  
to the **columns** (200) arranged  
between the **joining**  
reinforcements (10) and  
perpendicular to the first plane  
defined by the **joining**  
reinforcements (10) and a  
plurality of anchoring plates  
(20) arranged so as to define a  
closed frame inside of which  
the **joining** reinforcements (10)  
are arranged, and where the  
inner space defined by the  
anchoring plates (20) is filled  
with a structural filler material  
(concrete, resin, composite, etc.)  
(50). The anchoring plates (20)  
comprise a plurality of holes  
(21), at least one for each  
threaded end (2), in a position  
that matches up with the latter,  
and through which the threaded  
ends (2) remain accessible.  
The **device** comprises second  
coupling means (40) between the  
threaded ends (2) and the beam  
(300) rebars.

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- PN - [MX2017000105](#) A 20170427
- PR - EP20140382262  
20140707; WO2015ES70498  
20150625
- AP - MX20170000105 20150625
- DT - I
- CCI - [E04B1/215](#) ; [E04C5/162](#)
- CUI - [E04B1/1912](#) ; [E04B1/40](#)
- CQI - [E04C5/16](#)
- CUA - [E04B2103/02](#)
- PA - FUNDACIÓN TECNALIA RES &  
INNOVATION [ES]
- TI - DRY JOINT **JOINING DEVICE**

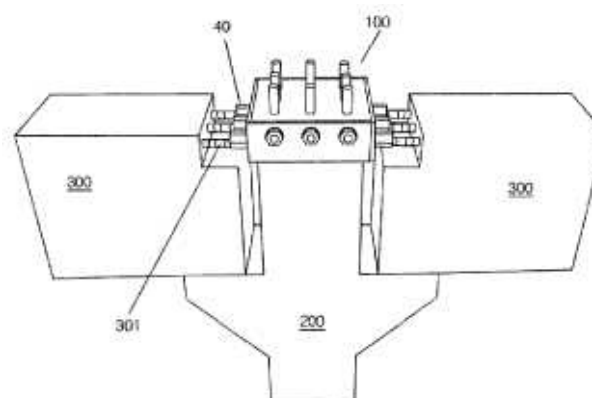


FIG.5

BETWEEN **COLUMNS** AND BEAMS  
OF PRECAST REINFORCED  
CONCRETE.

AB

- The invention relates to a connection **device** (100) for connecting prefabricated structures of reinforced concrete with dry joints, the **device** comprising a first group of connecting reinforcements (10') disposed in a first level and mutually parallel, each of the connecting reinforcements (10) comprising a reinforcement (1) and two threaded ends (2). The **device** comprises first coupling means (30) for coupling to the pillars (200), said means being disposed between the connecting reinforcements (10) and perpendicular to the first level defined by the connecting reinforcements (10), and a plurality of anchorage plates (20) disposed so as to define a closed frame inside which the connecting reinforcements (10) are disposed. The inner region defined by the anchorage plates (20) is filled with structural filler material (concrete, resin, composite, etc.) (50). The anchorage plates (20) comprise a plurality of apertures (21), at least one per threaded end (2), in positions coinciding therewith, through which apertures the threaded ends (2) are accessible. The **device** also comprises second means (40) for coupling between the threaded ends (2) and the reinforcements (300) of the beams.

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- PN - [WO2016005632](#) A2 20160114
- PNFP - WO2016005632 A3 20160506
- PR - EP20140382262 20140707
- AP - WO2015ES70498 20150625
- DT - \*\*
- CT - [EP] ISR (A3)  
[XP002734145](#) A[XI];  
[JP2007270455](#) A 00000000 [XI];  
[JPH0427037](#) A 19920130  
[A] (SATO KOGYO)  
[A] 1  
\* abstract \*;  
[JPH06146478](#) A 19940527

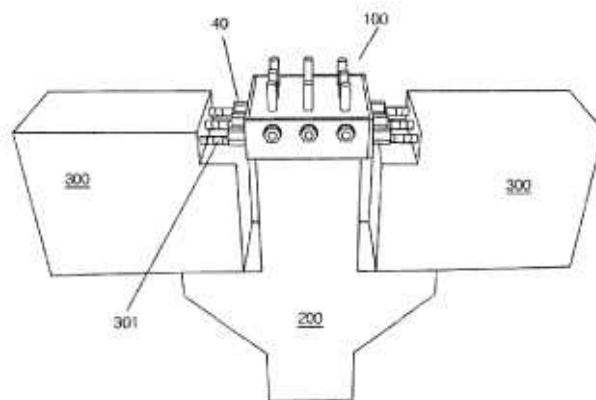


FIG.5

[A] (TAISEI CORP)  
 [A] 1  
 \* abstract \*;  
[JPH1129979](#) A 19990202  
 [A] (OHBAYASHI CORP)  
 [A] 1  
 \* abstract \*

CTNP - [EP] ISR (A3)  
 [XI] - 0, (20071018), vol. 2007,  
 no. 73, Database accession no.  
 2007-782206, XP002734145  
 & JP2007270455 A 20071018  
 (MAEDA KENSETSU KOGYO KK)  
 [X] 1-3,7,9,10,13  
 \* abstract \*  
 [I] 4-6,8,11,12,14

CCI - [E04B1/215](#) ; [E04C5/162](#)

CUI - [E04B1/1912](#) ; [E04B1/40](#)

CQI - [E04C5/16](#)

CUA - [E04B2103/02](#)

PA - (A2 A3)  
 FUNDACIÓN TECNALIA RES &  
 INNOVATION [ES]

TI - (A2)  
**DEVICE** FOR CONNECTING PILLARS  
 AND BEAMS PREFABRICATED  
 FROM REINFORCED CONCRETE  
 WITH DRY JOINTS  
 - (A3)  
 DRY JOINT **JOINING DEVICE**  
 BETWEEN **COLUMNS** AND BEAMS  
 OF PRECAST REINFORCED  
 CONCRETE

AB - (A2 A3)  
 The invention relates to a  
 connection **device** (100) for  
 connecting prefabricated  
 structures of reinforced concrete  
 with dry joints, the **device**  
 comprising a first group of  
 connecting reinforcements (10')  
 disposed in a first level and  
 mutually parallel, each of the  
 connecting reinforcements (10)  
 comprising a reinforcement (1)  
 and two threaded ends (2).  
 The **device** comprises first  
 coupling means (30) for coupling  
 to the pillars (200), said means  
 being disposed between the  
 connecting reinforcements (10)  
 and perpendicular to the first  
 level defined by the connecting  
 reinforcements (10), and a  
 plurality of anchorage plates  
 (20) disposed so as to define a  
 closed frame inside which the  
 connecting reinforcements (10)

are disposed. The inner region defined by the anchorage plates (20) is filled with structural filler material (concrete, resin, composite, etc.) (50). The anchorage plates (20) comprise a plurality of apertures (21), at least one per threaded end (2), in positions coinciding therewith, through which apertures the threaded ends (2) are accessible. The **device** also comprises second means (40) for coupling between the threaded ends (2) and the reinforcements (300) of the beams.

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PN - [EP2966232](#) A1 20160113

PNFP - EP2966232 B1 20170125

- EP2966232 B8 20170802

PR - EP20140382262 20140707

AP - EP20140382262 20140707

DT - \*; Rep

CT - || STSE (A1)

[XP002734145](#) A[XI];

[JP2007270455](#) A 00000000 [XI];

[JPH0427037](#) A 19920130

[A] (SATO KOGYO)

[A] 1

\* abstract \*;

[JPH06146478](#) A 19940527

[A] (TAISEI CORP)

[A] 1

\* abstract \*;

[JPH1129979](#) A 19990202

[A] (OHBAYASHI CORP)

[A] 1

\* abstract \*

CTNP - || STSE (A1)

[XI] - 0, (20071018), vol. 2007, no. 73, Database accession no.

2007-782206, XP002734145

& JP2007270455 A 20071018

(MAEDA KENSETSU KOGYO KK)

[X] 1-3,7,9,10,13

\* abstract \*

[I] 4-6,8,11,12,14

CCI - [E04B1/215](#) ; [E04C5/162](#)

CUI - [E04B1/1912](#) ; [E04B1/40](#)

CQI - [E04C5/16](#)

CUA - [E04B2103/02](#)

PA - (A1 B1)

FUNDACIÓN TECNALIA RES & INNOVATION [ES]

- (B8)

FUNDACIÓN TECNALIA RES &

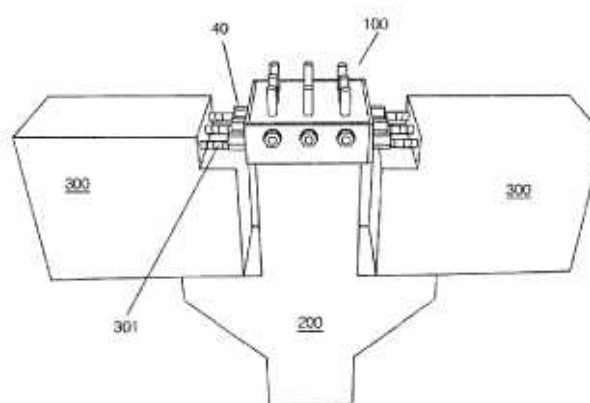


FIG.5

INNOVATION [ES]

- TI - (A1 B1 B8)  
Dry joint **joining device** between **columns** and beams of precast reinforced concrete
- AB - (A1)  
A **joining device** (100) for precast reinforced concrete elements with a dry joint comprising a first group of **joining** reinforcements (10') arranged on a first plane and in parallel with one another, each one of said **joining** reinforcements (10) comprising one reinforcement (1) and two threaded ends (2). The **device** comprises first coupling means (30) for coupling to the **columns** (200) arranged between the **joining** reinforcements (10) and perpendicular to the first plane defined by the **joining** reinforcements (10) and a plurality of anchoring plates (20) arranged so as to define a closed frame inside of which the **joining** reinforcements (10) are arranged, and where the inner space defined by the anchoring plates (20) is filled with a structural filler material (concrete, resin, composite, etc.) (50). The anchoring plates (20) comprise a plurality of holes (21), at least one for each threaded end (2), in a position that matches up with the latter, and through which the threaded ends (2) remain accessible. The **device** comprises second coupling means (40) between the threaded ends (2) and the beam (300) rebars.

PN - [EP2966236](#) A1 20160113  
 PR - EP20140382261 20140707  
 AP - EP20140382261 20140707  
 DT - \*; Rep  
 CT - || STSE (A1)  
       [FR2367158](#) A1 19780505  
       [XI] (GRAM SA [CH])  
       [X] 1,9,11  
       \* page 2, lines 8-30; figures 3, 4  
       \*  
       [I] 2-8,10,12;  
       [DE7624523U](#) U1 19770915  
       [A] (DYCKERHOFF & WIDMANN  
       AG [DE])  
       [A] 1,8  
       \* abstract \*;  
       [WO2012056101](#) A1 20120503  
       [A] (PEIKKO GROUP OY [FI], et al)  
       [A] 1,8  
       \* abstract \*;  
       [US4295308](#) A 19811020  
       [XI] (KORFANTA CARL)  
       [X] 1,3,5,6,9,11  
       \* column 2, line 42 - column 3,  
       line 18; figures 1-3 \*  
       [I] 2,4,7,8,10,12;  
       [KR101228012B](#) B1 20130214  
       [I] (KH HOUSING SOLUTIONS CO  
       LTD [KR], et al)  
       [I] 1-12  
       \* figures 1-23 \*  
 CCI - [E04B1/215](#) ; [E04B1/5831](#) ;  
       [E04C3/22](#) ; [E04C5/165](#)  
 CUI - [E04H9/025](#)  
 CQI - [E04C3/34](#)  
 CCA - [E04C3/36](#)  
 CUA - [E04B2001/5887](#)  
 PA - FUNDACIÓN TECNALIA RES &  
       INNOVATION [ES]  
 TI - **Joining device** for precast  
       reinforced concrete **columns** with  
       a dry joint  
 AB - The **joining device** (100, 100')  
       comprises a first cover (1) and a  
       second cover (2), each of which  
       has a plurality of through holes  
       (3) that match up with one  
       another in position, for the ends  
       of the rebars of the **columns**  
       (200, 200A) to pass through. The  
       covers (1,2) are joined together  
       by means of, at least, two  
       transverse webs (4) and several  
       stiffener reinforcements (5,5A),  
       which are arranged in  
       perpendicular to the covers (1,2).  
       The **device** further comprises

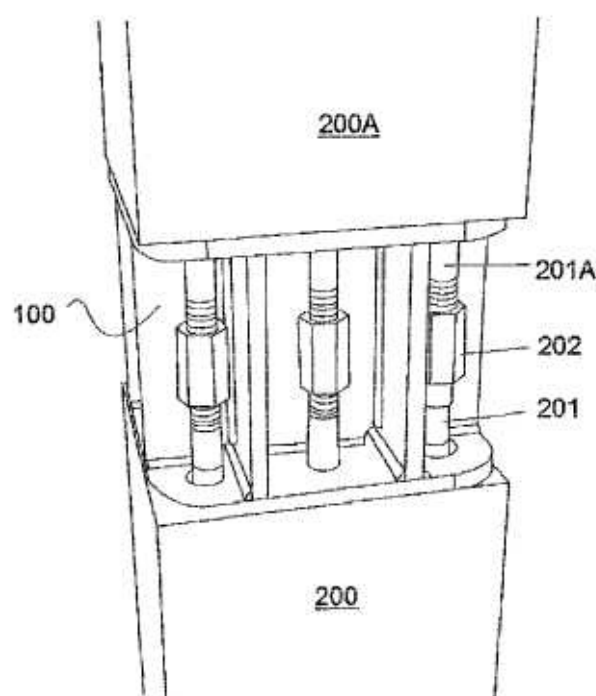


Figure 6

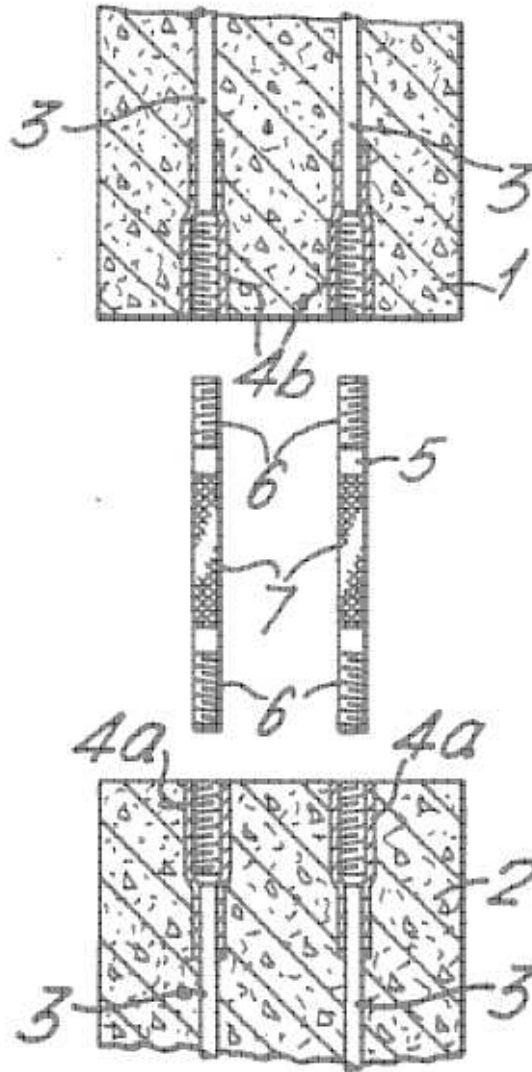
connecting means (202, 203, 204, 205) between the ends of the rebars (201,201 A) of the **columns** (200,200A).

**8/10** © EPODOC / EPO

- PN - [JP2011069195](#) A 20110407
- PR - JP20110000497 20110105
- AP - JP20110000497 20110105
- DT - I
- FI - E04B1/21&A; E04B1/58&503A; E04B2/56&643A; E04H9/02&301
- FT - 2E002/EB13; 2E002/FA04; 2E002/FB02; 2E002/HB00; 2E002/MA12; 2E125/AA04; 2E125/AA14; 2E125/AA54; 2E125/AB12; 2E125/AC02; 2E125/AE02; 2E125/AG03; 2E125/AG13; 2E125/AG28; 2E125/BA41; 2E125/EA33; 2E139/AA01; 2E139/AC19; 2E139/AC28; 2E139/BD02
- PA - SUMITOMO MITSUI CONSTR CO LTD; OHBAYASHI CORP
- TI - COLUMN-TO-BEAM JOINT STRUCTURE FOR BUILDING, BUILDING AND **JOINING** METHOD
- AB - PROBLEM TO BE SOLVED: To provide a column-to-beam joint structure, which reduces fieldwork by entirely omitting cast-in-place concrete operation in column-to-beam joints, and beam-to-beam joints in the column-to-beam joint structure, and to provide a building and a **joining** method.
- SOLUTION: In the column-to-beam joint structure 4, a PCa-made horizontal structure 7 is horizontally mounted on PCa-made **columns** 3. A column joint 6 is directly joined to the PCa-made column 3 of the lower floor in a column-to-beam joint 8, and girders 5 are directly joined to each other in a beam-to-beam joint 9 located between adjacent PCa-made **columns**. All operation points of cast-in-place concrete are eliminated by at least one of a first means for connecting the PCa-made horizontal structure by a steel-frame member, a second means for mutually **joining** beams in a beam-to-beam joint through a damping **device**, and a third means for providing an earthquake-resistant wall between the PCa-made **columns** in a direction orthogonal to the beams.
- COPYRIGHT: (C)2011,JPO&INPIT

**9/10** © EPODOC / EPO

PN - [US4099360](#) A 19780711  
 PR - GB19750020185 19750513  
 AP - US19760686450 19760513  
 DT - \*\*  
 CT - [FR708726](#) A []; [DE962932](#) C [];  
[DE2205772](#) A1 []; [GB452520](#) A [  
 ];  
[GB689167](#) A []; [US2724261](#) A [];  
[US3300943](#) A []; [US3562979](#) A [  
 ];  
[US3613325](#) A []; [US3737955](#) A [  
 ];  
[US3867805](#) A []; [US3916592](#) A [  
 ]  
 CCI - [E04B1/21](#) ; [E02D5/523](#) ;  
[E04C5/165](#)  
 PA - CCL SYSTEMS LTD  
 TI - Method and **device** for **joining**  
 concrete bodies and method of  
 constructing a multi-story  
 building  
 AB - A method of erecting multi-story  
 buildings by **joining** spaced  
 elongated vertical **columns** of  
 concrete. The method comprises  
 providing a screw threaded  
 metal socket in the face of each  
 column to be connected. The  
 socket of one column has a  
 thread opposite in direction to  
 that of the socket in the other  
 column. One column is disposed  
 over the other with the mouth of  
 the sockets aligned. An elongated  
 coupling, having an external  
 threaded portion at each end,  
 with the thread at one portion  
 being opposite to the direction of  
 the thread in the other portion  
 and including an intermediate  
 portion having a grip surface, is  
 disposed between the sockets  
 and rotated via its grip surface  
 while the **columns** are spaced so  
 as to simultaneously screw the  
 threaded portions into the  
 corresponding sockets by a  
 sufficient distance to adjust the  
 spacing between the sockets  
 such that the upper column  
 remains spaced above the lower  
 column but supported thereon by  
 the connection between the  
 sockets and the coupling, with  
 the spacing between the sockets  
 being defined by the length of the  
 intermediate portion of the  
 coupling.



10/10 © EPODOC / EPO

PN - [JP2008031838](#) A 20080214  
PNFP - JP4834634B B2 20111214  
PR - JP20070245253 20070921  
AP - JP20070245253 20070921  
DT - I  
FI - E04B1/21&B; E04B1/21&D; E04B1/58&503B; E04B1/58&507A  
FT - 2E125/AA04; 2E125/AA14; 2E125/AA54; 2E125/AB12; 2E125/AC02; 2E125/AE02;  
2E125/AE07; 2E125/AE13; 2E125/AG03; 2E125/AG04; 2E125/BA01; 2E125/CA90  
PA - (A)  
SUMITOMO MITSUI CONSTR CO LTD; OHBAYASHI CORP  
TI - (A)  
COLUMN-BEAM **JOINING** STRUCTURE OF BUILDING, BUILDING AND **JOINING** METHOD  
AB - (A)  
PROBLEM TO BE SOLVED: To provide a column-beam **joining** structure, a building and  
a **joining** method, capable of reducing work at site, by eliminating the whole cast-in  
place concrete work in a column-beam **joining** part and a beam **joining** part of the  
column-beam **joining** structure.  
- SOLUTION: In this column-beam **joining** structure 4, a PCa horizontal structure 7 is  
installed in the horizontal direction on a PCa column 3. A connection part 6 for the  
column is directly joined to the PCa column 3 of the lower floor by the column-  
beam **joining** part 8, and mutual girders 5 are directly joined by the beam **joining** part 9  
positioned between the adjacent PCa **columns**. A cast-in-place concrete work is wholly  
eliminated by at least one means of a first means of connecting the PCa horizontal  
structure by a steel frame member, a second means of **joining** the mutual beams via a  
vibration control **device** by the beam **joining** part and a third means of arranging an  
aseismic wall in the direction orthogonal to the beams between the PCa **columns**.  
- COPYRIGHT: (C)2008,JPO&INPIT

[SS 8] ..V

[EPODOC: SS 8] PD JP6146478

Results in EPODOC 0

EPODOC: term 'PD JP6146478' not found in index 'BI'. WARNING(1)

[SS 9] BEAM AND ROD AND JOINING

Results in EPODOC 227

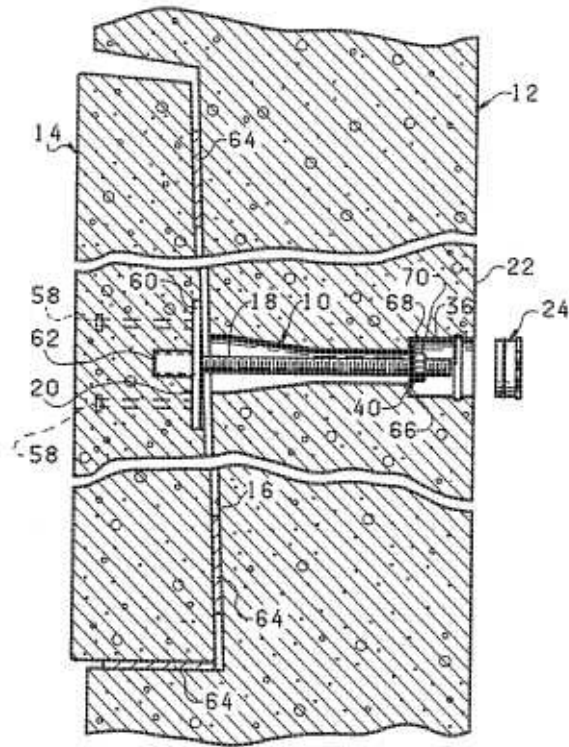
[SS 10] 6 AND 9

Results in EPODOC 6

[SS 11] ..LI



PN - [US5386675](#) A 19950207  
 PR - US19930087643 19930712  
 AP - US19930087643 19930712  
 DT - \*  
 CT - [US1714987](#) A []; [US1765664](#) A [  
       ];  
       [US1798468](#) A []; [US3237357](#) A [  
       ];  
       [US3566560](#) A []; [US3703748](#) A [  
       ];  
       [US3712014](#) A []; [US3733757](#) A [  
       ];  
       [US3762027](#) A []; [US4141190](#) A [  
       ];  
       [US4368606](#) A [  
 CTNP - [ ] High Concrete Structures,  
           Inc. Exterior Spandrel/Column  
           Drawing, Apr. 15, 1991  
 CCI - [E04B1/215](#)  
 PA - HIGH IND INC [US]  
 TI - Concrete **beam** connection sleeve  
 AB - A concrete **beam** connector  
       sleeve has a tubular plastic body  
       with a large dimensional end  
       portion, a funnel portion **joining**  
       the end portion, a **rod** guide  
       portion **joining** the funnel  
       portion, a bolting step **joining**  
       the **rod** guide portion and a large  
       dimension portion at the end of  
       the sleeve away from the  
       opposite end of the sleeve. The  
       sleeve is cast in a cement  
       column with the large dimension  
       portion opening into a spandrel-  
       supporting recess and the other  
       large dimension portion opening  
       into the opposite side of the  
       column. A threaded **rod** mounted  
       in a spandrel seated in the  
       recess extends through the  
       interior of the sleeve and past  
       the bolting step. A nut threaded  
       onto the end of the **rod** secure  
       the spandrel in place on the  
       column.



2/6 © EPODOC / EPO

PN - [JPH06146478](#) A 19940527  
 PR - JP19920298785 19921109  
 AP - JP19920298785 19921109  
 DT - I  
 FI - E04B1/21&B; E04B2/02; E04C1/32; E04C5/18&101  
 FT - 2E164/BA25; 2E164/CA02; 2E164/CA33; 2E164/CA39  
 PA - TAISEI CORP  
 TI - **BEAM ROD JOINING** METHOD OF RC COLUMN/**BEAM** PANEL ZONE

AB - PURPOSE: To join **beam** bars to a column by means of grout fixation using an RC lamination method in which the joint parts of **beam** bars in a panel zone are bundled. CONSTITUTION: The lower half 10b of a grout box is placed fast on the head of an RC column, and an RC **beam** 20 stretching in the X-direction has a downward facing bent step part 23 at the protruding end part 22 of a bottom bar 21. An RC **beam** 30 in the Y-direction has an upward facing bent step part 33 at the protruding end part 32 of the bottom bar 31, and the bottom **rod** 21 end part 22 is detained with a groove 12x provided in the grout box. Then the bottom **rod** 31 end part 32 is detained with a groove 12y in the grout box. and they are placed intersecting three-dimensionally, and then the upper half 10a of the grout box is placed upon the lower half 10b followed by coupling together using a bolt 50 and nut 51. This grout box 10 of consolidated structure is sealed with a sealing material, and a grouting material is injected from a grout port 13. According to this method, there is no problem in execution of works and the quality, and no high precision is required for the position management of the joint part of **beam rod**.

3/6 © EPODOC / EPO

PN - [JPH10110471](#) A 19980428  
 PR - JP19960267529 19961008  
 AP - JP19960267529 19961008  
 DT - I  
 FI - E04B1/16&G; E04B1/21&B  
 PA - OHBAYASHI CORP  
 TI - **BEAM CONNECTION STRUCTURE OF CONCRETE POLE**  
 AB - PROBLEM TO BE SOLVED: To install and position a pole, and to simplify combination with **beam** main reinforcements by integrally preparing a reinforcing body into a steel plate frame, sideways penetrating the steel plate frame by a plurality of **beam** main-reinforcement connecting rods and uniting the **beam** main reinforcements at the projecting end of the steel plate frame through couplers. SOLUTION: A connection unit 3 is positioned and arranged around pole main reinforcements 2 projected from the upper section of the RC-constructed pole 1, and the insides and outsides of projecting ends from a steel plate frame 4 of each connecting **rod** 7 and **beam** main reinforcements are connected firmly. Consequently, the pole 1 and a **beam** are joined completely by disposing forms around a connection section under the constrained state of the end sections of the **beam** and placing concrete. The cross section of the steel plate frame 4 is formed in the same shape as a hoop, and the arrangement of the hoops in the connection sections can be omitted at that time. As a result, the assembling properties and the workability of **joining** with the **beam** are improved in the **beam** connection structure of the concrete pole 1, and a constraining effect to the **beam** under a finished state is ensured. Accordingly, the shearing strength of **joining** sections is increased, and the extraction of **beam** main reinforcements can be prevented.

4/6 © EPODOC / EPO

PN - [JPH0893051](#) A 19960409  
 PR - JP19940235164 19940929  
 AP - JP19940235164 19940929  
 DT - I  
 FI - E04B1/21&D; E04B1/38; E04B1/56; E04B1/58&503C  
 FT - 2E125/AA04; 2E125/AA14; 2E125/AB00; 2E125/AB12; 2E125/AC02; 2E125/AC03; 2E125/AC04; 2E125/AC07; 2E125/AG03; 2E125/AG04; 2E125/AG25; 2E125/AG27; 2E125/AG28; 2E125/AG41; 2E125/AG57; 2E125/BA55; 2E125/BB01; 2E125/BB02; 2E125/BB16; 2E125/BB22; 2E125/BB37; 2E125/BC05; 2E125/BD01; 2E125/BE02; 2E125/BE07; 2E125/BE08; 2E125/BF04; 2E125/CA03; 2E125/CA06; 2E125/CA09; 2E125/CA14; 2E125/CA82; 2E125/EA12; 2E125/EA14; 2E125/EA16; 2E125/EA17; 2E125/EA33  
 PA - HAZAMA GUMI

TI - HIGH STRENGTH BOLT **JOINING** STRUCTURE OF **BEAM**

AB - PURPOSE: To form a **joining** part in a high quality and save energy in the welding works by extending each **beam** main **rod** from each end face of two precast concrete **beam** members to be joined together, furnishing a band on each **beam** main **rod**, installing a fixing plate over the two bands, and **joining** the fixing plate with the bands using a high strength bolt. CONSTITUTION: Bottom bars 2 are extended from the **joining** end faces 1a of PCa **beam** members 1, each of which is formed by welding a band 3 to the bottom bars 2 is suspended by a lifting machine and is put down so as to be mating with the end face 1a of another PCa **beam** member 1 whose one end has already been secured to a column member, etc. Bands are welded to these **joining** end faces 1a, 1a, and a fixing plate is installed between the bottom rods 2 as set over between the two bands 3, wherein the arrangement should be such that bolts holes 4 in the fixing plate are mating with the bolt holes 4 in the bands 3. The bands 3 are joined with the fixing plate using high strength bolt, and a concrete form is set around this **beam joining** part, followed by placing of concrete.

5/6 © EPODOC / EPO

PN - [JPH0441830](#) A 19920212

PR - JP19900146363 19900606

AP - JP19900146363 19900606

DT - I

FI - E04B1/21&B

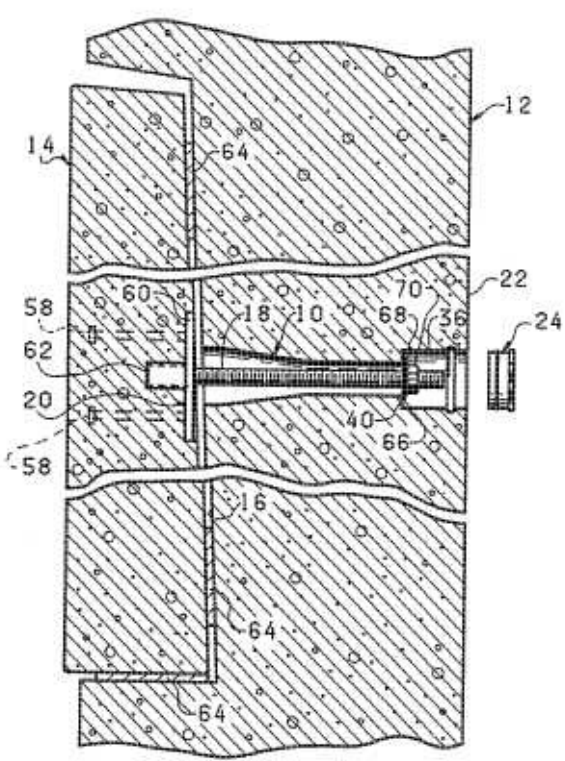
PA - TAISEI CORP

TI - REINFORCING BAR **JOINING** METHOD

AB - PURPOSE: To ensure **joining** of reinforcing bars by fitting a sack nut or a lock nut on either or both of threaded parts at the tip of **beam** main **rod**, adjusting the spacing between main rods, and fastening with the lock nut after welding of the nut to the **beam** main **rod** or the nuts with each other. CONSTITUTION: A precast concrete pillar A and **beam** B are placed in place, and each sack nut 5 is fitted on a **beam** main **rod** 1 and welded (w) to **beam** main rods 2 at optimum spacing, and lock nuts 6 are fastened and the sack nuts 5 are fixed. Grout material 7 is poured fully in the nuts 5, and the gaps between the nuts 6 and **beam** main rods 2 are filled, and thus the **beam** main rods 1, 2 are joined. The nuts 5, 6 are fitted both the **beam** main rods 1, 2, and the nuts 5 are rotated relative to the **beam** main rods 1, 2. When the optimum spacing is obtained, the nuts 5 are welded, and the nuts 5 are filled with the grout material 7. Thereby the two groups of main rods can be adjusted into a specified spacing required to perform welding.

6/6 © EPODOC / EPO

|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PN   | - <a href="#">CA2100834</a> A1 19950113                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| PNFP | - CA2100834 C 19970902                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| PR   | - US19930087643 19930712                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| AP   | - CA19932100834 19930719                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| DT   | - I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| CCI  | - <a href="#">E04B1/215</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| PA   | - (A1 C)<br>HIGH IND INC [US]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| TI   | - (A1 C)<br>Concrete <b>Beam</b> Connection Sleeve                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| AB   | - (C)<br>A concrete <b>beam</b> connector sleeve has a tubular plastic body with a large dimensional end portion, a funnel portion <b>joining</b> the end portion, a <b>rod</b> guide portion <b>joining</b> the funnel portion, a bolting step <b>joining</b> the <b>rod</b> guide portion and a large dimension portion at the end of the sleeve away from the opposite end of the sleeve. The sleeve is cast in a cement column with the large dimension portion opening into a spandrel-supporting recess and the other large dimension portion opening into the opposite side of the column. A threaded <b>rod</b> mounted in a spandrel seated in the recess extends through the interior of the sleeve and past the bolting step. A nut threaded onto the end of the <b>rod</b> secure the spandrel in place on the column. |



[SS 11] ..V

[EPODOC: SS 11] JOINING AND COUPLER AND PILLAR

Results in EPODOC 3

[SS 12] ..V

[EPODOC: SS 12] PILLAR AND BEAM AND JOINING AND STRUCTURE

Results in EPODOC 99

[SS 13] 6 AND 12

Results in EPODOC 6

[SS 14] ..LI



1/6 © EPODOC / EPO

PN - [KR101711102B](#) B1 20170228  
PR - KR20150161238 20151117  
AP - KR20150161238 20151117  
DT - I  
CT - || STSE (B1)  
[KR101009753B](#) B1 20110119 [ ] (DONGHAENG CO LTD [KR]);  
[KR101384609B](#) B1 20140411 [ ] (LEE BYUNG HEE [KR], et al);  
[KR101490808B](#) B1 20150206 [ ] ;  
[KR101549417B](#) B1 20150902 [ ] (SAMPYO ENG & CONSTR LTD [KR])  
PA - SEN VEX CO LTD [KR]  
TI - PC Form **structure** for end of PC **beam**  
AB - The present invention relates to a form **structure** for an end of a PC **beam** to pour concrete outside a steel frame bracket when constructing the PC **beam** mounted on a **pillar** by the steel frame bracket and, more specifically, relates to a form **structure** for an end of a PC **beam** which is lightweight to facilitate installation, improve safety, and minimize a crane process. The form **structure** for the end of the PC **beam** whose upper portion is opened to pour concrete outside of the steel frame bracket of the PC **beam** mounted on one side of a **pillar** by the steel frame bracket comprises: a first support frame disposed vertically and horizontally in a longitudinal direction outside the steel frame bracket; a second support frame formed in a Z-bar with opposite flange directions, wherein a flange on one side is mounted on one side outside the first support frame in a perpendicular direction; a T-shaped form formed shorter than the steel frame bracket to be mounted outside a flange on the other side of the second support frame; a **joining** plate mounted on an outer surface of a **joining** portion of the T-shaped form and the PC **beam** by a bolt; and a plurality of mounting angles to mount the T-shaped form and a side of the **pillar** by bolt-mounting.

2/6 © EPODOC / EPO

PN - [JPH0366850](#) A 19910322  
PR - JP19890202866 19890807  
AP - JP19890202866 19890807  
DT - I  
FI - E04B1/20&G; E04B1/21&B  
PA - FUJITA CORP  
TI - COLUM/**BEAM JOINING** METHOD IN PRECAST CONCRETE **STRUCTURE**  
AB - PURPOSE:To reduce the construction costs by furnishing a PC **pillar** at its top with a cavity with the top face and side faces opened, folding each exposed strip into the cavity, fitting the end strip of a PC **beam** in the cavity, and placing concrete after arranging reinforcements. CONSTITUTION:A cavity 1 with the top face and side faces opened is furnished at the top of a PC **pillar** A, and each strip 3 exposed by this opening is severed in the center and folded into the cavity. A **beam** bottom strip 6 of a PC **beam** B is fitted in the cavity 1, and this **beam** B is supported by a bracket 2. Then reinforcing strips 7 are arranged, and concrete is placed to consolidate the **pillar** A with **beam** B. The PC method is also applied to installing a **beam** to a place with level difference. This reduces concrete placing at site to lead to enhancement of the efficiency.

3/6 © EPODOC / EPO

PN - [JPH0366849](#) A 19910322  
PNFP - JP2757030B B2 19980525  
PR - JP19890202865 19890807  
AP - JP19890202865 19890807  
DT - I  
FI - E04B1/20&G; E04B1/21&B

PA - (A)  
FUJITA CORP

TI - (A)  
COLUM/**BEAM JOINING** METHOD IN PRECAST CONCRETE **STRUCTURE**

AB - (A)  
PURPOSE:To reduce the construction costs by furnishing a PC **pillar** at its top with a cavity with the top face and side faces opened, folding each exposed stripe into the cavity, fitting the end stripe of a PC **beam** in the cavity, and placing concrete after arranging reinforcements. CONSTITUTION:A cavity 1 with the top face and side faces opened is furnished at the top of a PC **pillar** A, and each strip 3 exposed by this opening is severed in the center and folded into the cavity. A **beam** bottom strip 6 of a PC **beam** B is fitted in the cavity 1, and this **beam** B is supported by a bracket 2. Then reinforcing strips 7 are arranged, and concrete is placed to consolidate the **pillar** A with **beam** B. The PC method is also applied to installing a **beam** to a place with level difference. This reduces concrete placing at side to lead to enhancement of the efficiency.

4/6 © EPODOC / EPO

PN - [JPH0343531](#) A 19910225

PNFP - JP2772400B B2 19980702

PR - JP19890177812 19890710

AP - JP19890177812 19890710

DT - I

FI - E04B1/16&B; E04B1/16&K; E04B1/21&B; E04C5/06

FT - 2E164/CA15; 2E164/CA25; 2E164/CA33

PA - (A)  
SHIMIZU CONSTRUCTION CO LTD

TI - (A)  
**PILLAR AND PC BEAM JOINING STRUCTURE**

AB - (A)  
PURPOSE:To shorten working period by fixedly welding the bottom reinforcing bars for a PC **beam** projected from the **joining** surface of a **pillar** to the bottom reinforcing bars projected from the end of the PC **beam** with a **joining** plate. CONSTITUTION:The reinforcing bars 11 projected from a **pillar** 10 so as to be used as the bottom reinforcing bars of a PC **beam** 20 are joined to the bottom reinforcing bars 21 projected from the end 22 of the PC **beam** 20 with a **joining** plate 30. Further, the length l of reinforcing bars 11, 21 projected from the **joining** surface of **pillar** 10 or from the end 22 of the **beam** 20 is made to be approximately 5 times of the diameter of the reinforcing bars 11, 21 plus the clearance c. And cotters are provided to the **joining** surface 12 and to the end 22 for preventing the displacement of the **beam** 20. Thus, working labor can be reduced.

5/6 © EPODOC / EPO

PN - [JPH0427037](#) A 19920130

PNFP - JPH0819716B B2 19960228

PR - JP19900131725 19900521

AP - JP19900131725 19900521

DT - I

FI - E04B1/21&B

PA - (A)  
SATO KOGYO

TI - (A)  
METHOD FOR **JOINING** PRECAST REINFORCED CONCRETE **PILLAR** WITH **BEAM**

AB - (A)  
PURPOSE:To improve **beam** main reinforcement fixing performance with an extremely simple **structure** by hanging and tying anchor plates on and to a plate to be tied without arranging through bars, etc., and **joining** a **beam** to the head section of a **pillar**.

CONSTITUTION: A plate 13 to be tied which is to be hang on and tied to anchor plates 11 fixed to exposed end sections of **beam** main reinforcements 7-10 when beams 2 and 3 are put on a **pillar** 1 are arranged inside **pillar** main reinforcements 5 at the head section of the **pillar** 1. Recessed sections 14 in which the **beam** main reinforcements 7-10 are put when the anchor plates 11 are hang on and tied to the plate 13 are provided to each side of the plate 13 and reinforcing bars 15 are arranged in grid for reinforcement. By hanging and tying the anchor plates 11 on and to such plate 13 to be tied, beams 2 and 3 are joined to the head section of the **pillar** 1 and the **beam** main reinforcements 7-10 of the beams 2 and 3 facing each other are coupled with each other without arranging through bars, etc. Therefore, the arranging **structure** of the **beam** main reinforcements can be simplified extremely.

6/6 © EPODOC / EPO

PN - [JP2000291134](#) A 20001017

PR - JP19990095540 19990401

AP - JP19990095540 19990401

DT - I

FI - E04B1/04&J; E04B1/21&B

PA - SHIMIZU CONSTRUCTION CO LTD

TI - JOINT **STRUCTURE** OF PRECAST MEMBER

AB - PROBLEM TO BE SOLVED: To improve the strength of a joint part and a **structure** by filling a space between precast members with the fiber reinforced hardening material for bonding in the joint **structure** formed of precast members such as pillars, beams and walls made of the precast concrete. SOLUTION: Each **joining** surface of a **pillar** 1 and a **beam** 2 respectively made of the precast concrete is formed with a recessed part 3 with the predetermined space so as to form a rugged surface 4 (irregularity). Both the **joining** surfaces formed with the rugged surface 4 are faced to each other with the predetermined space, and a space between them is filled with the filling material (fiber reinforced hardening material) 5 for **joining**. Furthermore, a pre-stress steel bar 6 is arranged so as to pass through the **pillar** 1 and the **beam** 2, and a fixing tool 7 is fixed to the ends thereof, and the predetermined precast is led in. With this **structure**, weight of a **structure** such as a **pillar**, a **beam** and a wall formed of the precast member can be reduced, and proof stress and durability thereof are improved.

[SS 14] ..V

[EPODOC: SS 14]