

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
10 March 2022 (10.03.2022)



(10) International Publication Number
WO 2022/050907 A1

(51) International Patent Classification:

E04B 1/04 (2006.01) *E04B 1/38* (2006.01)
E04B 1/24 (2006.01) *E04C 5/01* (2006.01)

(21) International Application Number:

PCT/TH2021/000047

(22) International Filing Date:

20 August 2021 (20.08.2021)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

2001005013 03 September 2020 (03.09.2020) TH

(71) Applicant: SAHAVIRIYA STEEL INDUSTRIES PUBLIC CO., LTD. [TH/TH]; 28/1 Prapawit Building, 2nd-3rd

Floors, Surasak Road, Silom, Bangrak, Bangkok, 10500 (TH).

(72) Inventors: **SUTTITAM, Nuttapon**; 1331/3 Nonrat Uthit Road, Mahachai Sub-district, Mueang Samut Sakhon District, Samut Sakhon, Samut Sakhon, Postal Code: 74000 (TH). **TONGSRIPANICH, Wisan**; 18/114 Soi Suk-sawat 30 Intersection 8-2, Bang Pakok Subdistrict, Ratchaburana District, Bangkok, Postal Code: 10140 (TH). **SORTHANANUSAK, Pawit**; 76/5 Moo 5, Amphorn Place Village, Soi 2, Surasak, Subdistrict, Sriracha District, Chonburi, Postal Code: 20110 (TH). **EIAMSONGSAK, Pradya**; 117 Soi Thoetthai 49, Pakklong Phasi Charoen Subdistrict, Phasi Charoen District, Bangkok, Postal Code: 10160 (TH). **SORNSADANG, Thanabodin**; 16/102 Moo 5, Huai Kapi Sub-district, Mueang Chonburi, District, Chonburi, Postal Code: 20000 (TH).

(54) Title: CONNECTION SYSTEM BETWEEN HOLLOW STRUCTURAL STEEL COLUMNS AND POST-TENSIONED CONCRETE SLABS

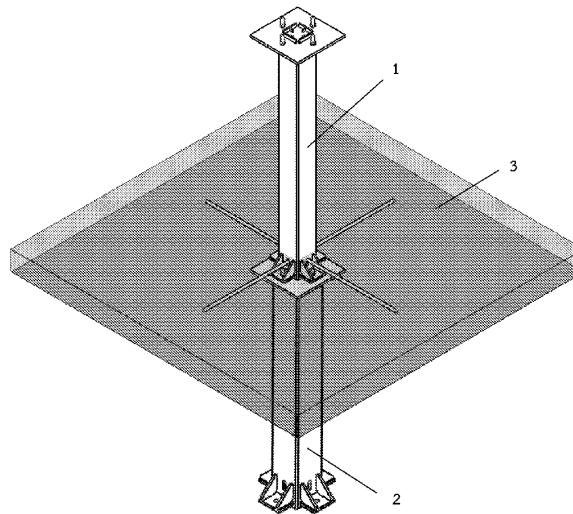


Figure 1

(57) Abstract: The connection system between hollow structural steel columns and post-tensioned concrete slabs is a state-of-the-art innovation for the multi-story building construction with post-tensioned or reinforced concrete flat slab. This connection system enables the adjustability for the constructors to manually adjust the elevation and plumbness of upper column leading to high construction quality. The connection system can be divided into two main parts: the male connection at the top of the lower column and the female connection at the base of the upper column. The male connection was designed to support post-tensioned concrete slab and enhance the punching shear resistance of post-tensioned concrete slab. The female connection primarily provides continuity to post-tensioned concrete slabs and also increase punching shear capacity for the male connection. These two main parts will then be connected together by tightening the fixing nuts along with inserting the additional steel reinforcements through the openings in both directions (x and y).

[Continued on next page]



WO 2022/050907 A1

(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, IT, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *of inventorship (Rule 4.17(iv))*

Published:

- *with international search report (Art. 21(3))*

Eventually, the completed connection system will perform integrally connecting the upper and lower hollow structural steel columns, as well as providing the continuity for post-tensioned concrete slabs.