VTT EXPERT SERVICES OY
PL 1001
02044 VTT
Tel. + 358 20 722 111
www.vttexpertservices.fi

Rakennusalan tuotteita koskevan jäsenvaltioiden lainsäädännön lähentämisestä 21 päivänä joulukuuta 1988 annetun neuvoston direktiivin 89/106/EEC mukaisesti ilmoitettu tuotehyväksyntälaitos

EOTAN JÄSEN
MEMBER OF EOTA

European Technical Approval ETA-13/0451

Kauppanimi: *Trade name*	**Taizhou Homer Column Shoe**
Hyväksynnän haltija: *Holder of approval*	**Taizhou Homer Hardware Manufacturing Co., Ltd** 3rd Industrial Park, Liangxu Town, Jiangcun Village, Jiangyan Taizhou City, Jiangsu CHINA
Tuotetyyppi ja sen käyttötarkoitus: *Generic type and use of construction product*	**Three-dimensional nailing plate for structural use**
Voimassaoloaika: *Validity from/to*	**25.06.2013** **24.06.2018**
Valmistuspaikka: *Manufacturing plant*	**Taizhou Homer Hardware Manufacturing Co., Ltd** 3rd Industrial Park, Liangxu Town, Jiangcun Village, Jiangyan Taizhou City, Jiangsu CHINA
Tämä hyväksyntä sisältää *This European Technical Approval contains*	
sivuja/liitteitä	35 sivua sisältäen 2 liitettä
pages/annexes	*35 pages including 2 Annexes*

I LEGAL BASIS AND GENERAL CONDITIONS

1. This European Technical Approval is issued by VTT Expert Services Ltd in accordance with:

   - Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products[1], modified by Council Directive 93/68/EEC[2] and Regulation (EC) N° 1882/2003 of the European Parliament and of the Council[3];

   - Laki rakennustuotteiden hyväksynnästä (230/2003) luvut 3 ja 10, Ympäristöministeriön asetus rakennustuotteiden hyväksynnästä 3 § sekä Ympäristöministeriön 18.12.2009 antama valtuutuspäätös (YM19/629/2009);

   - Common Procedural Rules for Requesting, Preparing and the Granting of European Technical Approvals set out in the Annex of Commission Decision 94/23/EC[4];

   - Guideline Nr 015 for European Technical Approval of Three-dimensional nailing plates.

2. VTT Expert Services Ltd is authorized to check whether the provisions of this European Technical Approval are met. Checking may take place in the manufacturing plant. Nevertheless, the responsibility for the conformity of the products to the European Technical Approval and for their fitness for the intended use remains with the holder of the European Technical Approval.

3. This European Technical Approval is not to be transferred to manufacturers or agents of manufacturer other than those indicated on page 1, or manufacturing plants other than those laid down in the context of this European Technical Approval.

4. This European Technical Approval may be withdrawn by VTT Expert Services Ltd pursuant to information by the Commission according to Article 5(1) of Council Directive 89/106/EEC.

5. Reproduction of this European Technical Approval including transmission by electronic means shall be in full. However, partial reproduction can be made with the written consent of VTT Expert Services Ltd. In this case partial reproduction has to be designated as such. Texts and drawings of advertising brochures shall not contradict or misuse the European Technical Approval.

6. The European Technical Approval is issued by the approval body in English. This version corresponds fully to the version circulated in EOTA. Translations in other languages have to be designated as such.

---

[1] Official Journal of the European Communities N° L 40, 11.2.1989, p. 12

[2] Official Journal of the European Communities N° L 220, 30.8.1993, p. 1

[3] Official Journal of the European Union N°º L 284, 31.10.2003, p. 1

[4] Official Journal of the European Communities Nº L 17, 20.1.1994, p. 34

TABLE OF CONTENTS

II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

1 Definition of product and intended use

1.1 Definition of the construction product

There are seven different types of Taizhou Homer Column Shoes: Adjustable column shoe, Multi Adjustable column shoe, Column Anchor Strap, Column Shoe type E, Column Shoe type L, Column Shoe type D and Heavy Supporting Shoe (see Figure 1). Construction and dimensions of all types of Taizhou Homer Column Shoes are given in Annex 1. Tolerance for the main dimensions of the connectors and the position of the holes is within ± 1,00 mm.

Column Anchor Straps and Column Shoes of type D are one-piece non-welded three-dimensional nailing plates manufactured by pressing of raw steel. All other Taizhou Homer Column Shoes are welded steel connectors. Heavy Supporting Shoes are welded from steel plates, Adjustable and Multi Adjustable column shoes are assembly from pressed steel plates, thread rods, nuts and steel pipes and Column Shoes of types E and L are welded from pressed steel plates and ribbed reinforcement bars. Taizhou Homer Column Shoes are hot dipped galvanized after pressing and welding.

The raw steel used in Taizhou Homer Column Shoes is hot rolled steel strip of grade S235JR according to the standard EN 10025-2 or Chinese grade Q235B in accordance with the specification GB/T 3274. The yield strength R_{eH} is at least 235 N/mm², the tensile strength R_m at least 360 N/mm² and elongation at failure A_{80} at least 19 %. The thickness of steel plate is 4,0 $\pm$ 0,5 mm, 5,0 $\pm$ 0,6 mm or 6,0 $\pm$ 0,6 mm.

The ribbed bars are hot rolled reinforcement bar of Chinese grade HRB335 according to specification GB 1499. The characteristic yield strength of ribbed bars is 335 N/mm^2. The grade of threaded rods is 4.8 according to ISO 4018 and the grade of nuts is 5 according to ISO 4034.

The column shoes are hot dipped galvanized according to EN ISO 1461:1999 with a zinc coating thickness of at least 55 µm.

1.2 Intended use

The intended use of Taizhou Homer Column Shoes is to support timber columns to concrete structures as structural connectors. The timber columns are strength graded timber according to EN 14081-1, glulam according to EN 14080 or laminated veneer lumber according to EN 14374. The characteristic density ρ_k of the timber shall not be greater than 500 kg/m³. This ETA does not cover column shoes fixed to the end grain of a timber member or to the edge face of a LVL member. Strength class of concrete shall be at least C20/25.

The upper part e.g. a U- or L-shaped plate or a vertical plate is fastened to the timber member with nails, screws, bolts or dowels. The lower part of the column a threaded rod, a tube or a plate for embedment into the support of concrete or a steel plate to be fasteners by anchor bolts to the support of concrete. The penetration length in concrete shall be at least 150 mm. The used anchor bolts shall have a separate European Technical Approval, where the lateral load-carrying capacity and withdrawal resistance for bolted steel-to-concrete connection is given.

In holes of 5 mm anchor nails or anchor screws according EN 14592 are used (see Figure 3). The diameter of these anchor nails shall be d = 4,0 mm and the profiled length at least 24 mm. The diameter of the smooth part of the anchor screws shall be d = 4,5…5,0 mm and the inner

diameter of the threaded part $d_s \geq 3{,}0$ mm. The length of the threaded part of the screw shall be at least 6*d*. In Column Anchor Straps, anchor nails of diameter $d = 6$ mm or lag screws according to EN 14592 are used. Timber parts are not pre-bored for the nails and screws of diameter $d \leq 6$ mm.

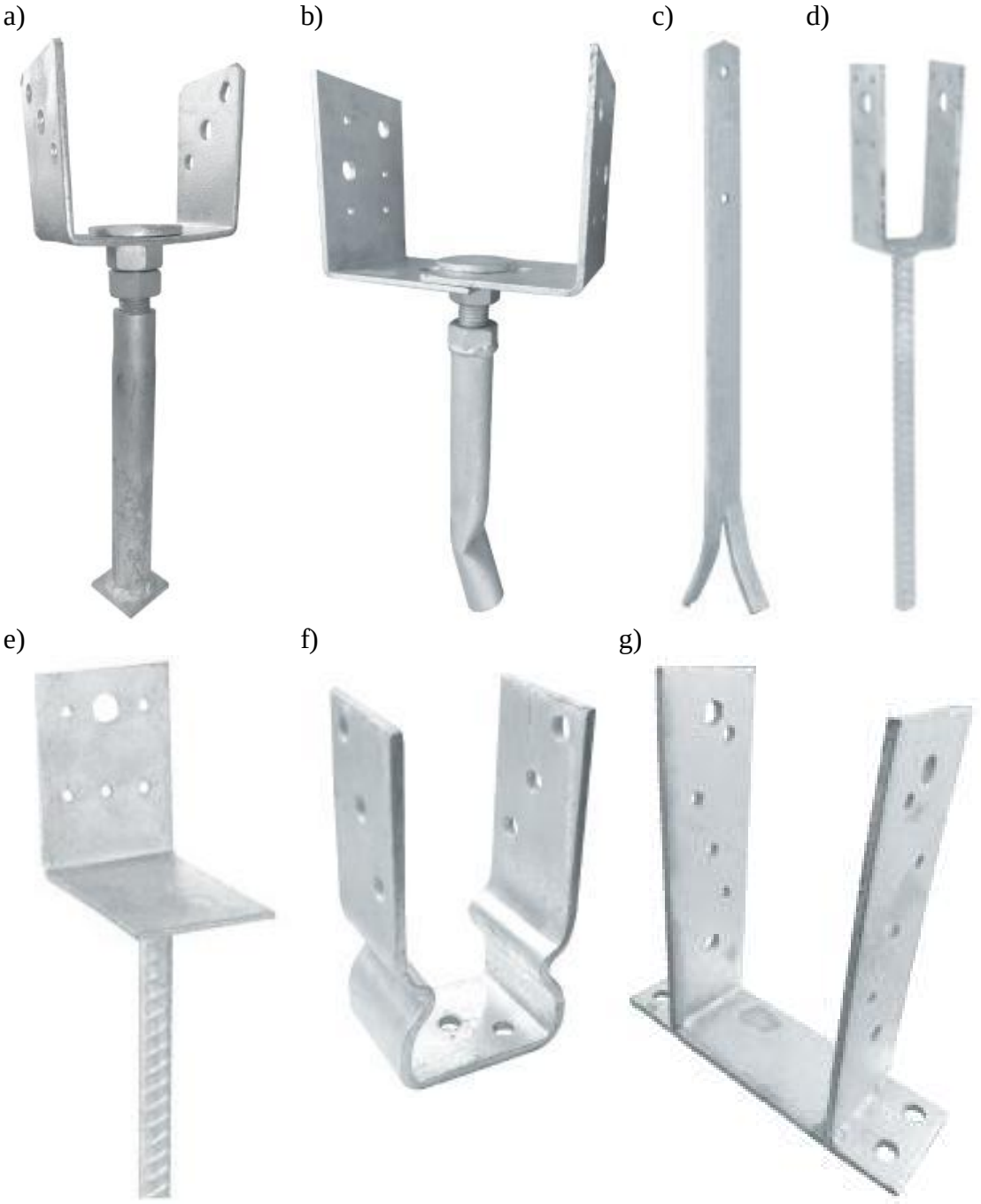


Figure 1. Different types of Column Shoes: a) Adjustable column shoe, b) Multi Adjustable column shoe, c) Column Anchor Strap, d) Column Shoe type E, e) Column Shoe type L, f) Column Shoe type D and g) Heavy Supporting Shoe.

In the holes from 7,0 to 13,5 mm of the upper part of Column Shoes bolts or lag screws according to EN 14592 are used as follows: in holes of 7 mm diameter of the fastener is 6,0 mm, in 9 mm holes 8 mm, in 10,5 and 11 mm holes 10 mm and in holes of 13 and 13,5 mm the nominal diameter of bolt or lag screws should be 12 mm. Lag screw is a shank screw where the outer thread diameter is equal to the shank diameter. Bolts are used with nuts as double or

single shear steel to timber fasteners and lag screws as single shear fasteners. For bolts and lag screws pre-drilling of timber is used according to requirements of EN 1995-1-1.

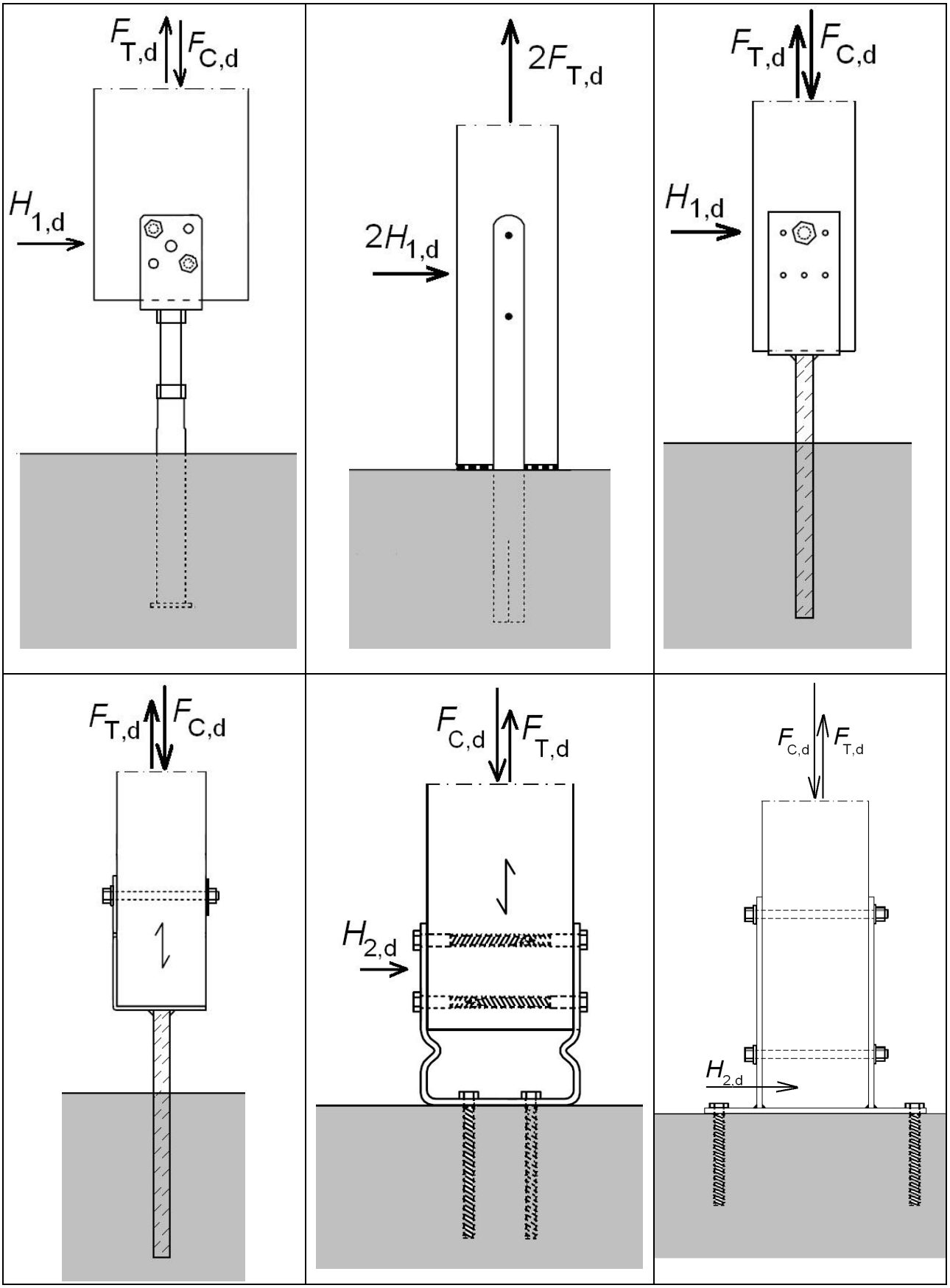


Figure 2. Typical use of Taizhou Column Shoes.

Figure 3. Anchor nail and screw types to be used in holes of 5 mm of the column shoes.

For Taizhou Homer Column Shoes, the intended service classes according to EN 1995-1-1 are classes 1, 2 and. In service class 2, the anchor nails and anchor screws shall have an electroplated zinc coating according to EN ISO 2081 at least of type and thickness Fe/Zn 12c, or they shall be hot dip zinc coated according to EN ISO 1461, thickness at least 39 μm. In service class 3, the nails, screws and bolts shall have an electroplated zinc coating according to EN ISO 2081 at least of type and thickness Fe/Zn 25c, or they shall be hot dip zinc coated according to EN ISO 1461, thickness at least 49 μm.

The provisions made in this European Technical Approval are based on an assumed intended working life of the roof anchors of 50 years.[5]

2 Characteristics of product and methods of verification

ER 1 Mechanical resistance and stability

Characteristic resistance values of the column shoes are given in Annex 2. For stiffness and ductility, NPD applies.

ER 2 Safety in case of fire

The column shoes are made of materials classified to have reaction to fire class A1 according to EN 13501-1.

According to ETAG 015, resistance to fire is not relevant. Connectors shall not be used without adequate protection for connections where resistance to fire is required.

ER 3 Hygiene, health and environment

According to the declaration of the manufacturer, Taizhou Homer Column Shoes do not contain harmful or dangerous substances as defined in the EU database.

---

[5] This means that it is expected that when this working life has elapsed, the real working life may be, in normal use conditions, considerably longer without major degradation affecting the essential requirements of the works. The indications given as to the working life of a product cannot be interpreted as a guarantee given by the producer or the approval body. They should only be regarded as a means for the specifies to choose the appropriate criteria for products in relation to the expected, economically reasonable working life of the works.

In addition to the specific clauses relating to dangerous substances contained in this European Technical Approval, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the EU Construction Products Directive, these requirements need also to be complied with, when and where they apply.

ER 4 Safety in use

According to ETAG 015, not relevant.

ER 5 Protection against noise

According to ETAG 015, not relevant.

ER 6 Energy economy and heat retention

According to ETAG 015, not relevant.

Aspects of durability, serviceability and identification

Taizhou Homer Column Shoes have been assessed as having satisfactory durability and serviceability when used in timber structures when the timber species (including timbers preserved with organic solvent, boron diffusion and related preservatives) described in Eurocode 5 (EN 1995-1-1: 2004) are used and the structures are subject to the conditions defined by service classes 1, 2 and 3.

Serviceability is not relevant.

Taizhou Homer Column Shoes are identified having "TAIZHOU HOMER" stamped on each connector.

3 Evaluation and attestation of conformity and CE marking

3.1 System of attestation of conformity

According to the Decision 97/638/EC of the European Commission[6] system 2+ of the attestation of conformity applies. This system of attestation of conformity is defined as follows:

System 2+: Declaration of conformity of the product by the manufacturer on the basis of:

(a) Tasks for the manufacturer:

(1) initial type-testing of the product;
(2) factory production control;
(3) testing of samples taken at the factory in accordance with a prescribed test plan;

(b) Tasks for the approved body:

(4) certification of factory production control on the basis of:
- initial inspection of factory and of factory production control;
- continuous surveillance, assessment and approval of factory production control.

Note: Approved bodies are also referred to as "notified bodies".

[6] Official Journal of the European Communities L 268, 01/10/1997

3.2 Responsibilities

3.2.1 Tasks of the manufacturer

3.2.1.1 Factory production control

The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall insure that the product is in conformity with this European Technical Approval.

The manufacturer may only use raw materials stated in the technical documentation of this European technical approval.

The factory production control shall be in accordance with the "Control plan relating to the European Technical Approval ETA-13/0451 issued on June 25, 2013" which is part of the technical documentation of this European Technical Approval. The "control plan" is laid down in the context of the factory production control system operated by the manufacturer and deposited within VTT Expert Services Ltd[7].

The results of factory production control shall be recorded and evaluated in accordance with the provisions of the "Control Plan".

3.2.1.2 Initial type testing of the product

For initial type testing the results of the assessments, calculations and tests performed as part of the verification for the European Technical Approval shall be used unless there are changes in the production line or plant. In such cases the necessary type testing has to be agreed between VTT Expert Services Ltd and the approved body involved.

3.2.1.3 Other tasks for the manufacturer

The manufacturer shall, on the basis of a contract, involve a body which is approved for the tasks referred to in section 3.1 in the field of three-dimensional nailing plates (ETAG 015) in order to undertake the actions laid down in section 3.3. For this purpose, the "control plan" referred to in sections 3.2.1.1 and 3.2.2 shall be handed over by the manufacturer to the approved body or bodies involved.

The manufacturer shall make a declaration of conformity, stating that the construction product is in conformity with the provisions of the European Technical Approval ETA-13/0451, issued on June 25, 2013.

3.2.2 Tasks of approved bodies

The approved body (bodies) shall perform the

- initial inspection of factory and of factory production control

and

[7] The "control plan" is a confidential part of the European Technical Approval and only handed over to the approved body or bodies involved in the procedure of attestation of conformity. See section 3.2.2.

- continuous surveillance, assessment and approval of factory production control

in accordance with the provisions laid down in the “control plan”.

The approved body (bodies) shall retain the essential points of its (their) actions referred to above and state the results obtained and conclusions drawn in (a) written report (reports).

The approved certification body involved by the manufacturer shall issue an EC certificate for the factory production control stating the conformity with the provisions of this European Technical Approval.

In cases where the provisions of the European Technical Approval and its "control plan" are no longer fulfilled the certification body shall withdraw the certificate of conformity and inform VTT Expert Services Ltd without delay.

3.3 CE-Marking

The CE marking shall be affixed on each packaging of Taizhou Homer Column Shoes. The letters "CE" shall be followed by the identification number of the approved certification body, where relevant, and be accompanied by the following additional information:

- the name and address of the producer (legal entity responsible for the manufacture),
- the last two digits of the year in which the CE marking was affixed,
- the number of the EC certificate for the factory production control,
- the number of the European technical approval,
- the number of the guideline for European technical approval ETAG 015.

4 Assumptions under which the fitness of the product for the intended use was favourably assessed

4.1 Manufacturing

Taizhou Homer Column Shoes are manufactured in the factory in accordance with the provisions of this European Technical Approval as identified during the inspection of the plant by the approved body and laid down in technical documentation.

The European technical approval is issued for the product on the basis of agreed information, deposited by VTT Expert Services Ltd, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data/information being incorrect, should be notified to VTT Expert Services Ltd before the changes are introduced. VTT Expert Services Ltd will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA and if so whether further assessment or alterations to the ETA shall be necessary.

4.2 Design and installation

The fitness for use of the connection can be assumed if the construction is designed and Taizhou Homer Column Shoe is installed correctly in accordance with clause 1.2 of this ETA and Annex 2.

Provisions for the values given in Annex 2 are that the edge and end distances of the fastener used in timber members shall fulfil the minimum requirements given in EN 1995-1-1. For anchor screws, the diameter d is the effective diameter $d_{ef} = 1{,}1d_i$ where d_i is the inner diameter of the threaded part.

The post member shall be restrained against rotation.

The end of timber member shall be in contact with the bottom plate of the column shoe or the concrete support, except for Column Shoe type D, where the gap between timber end and the concrete surface may be at maximum 60 mm. The distance between timber column and the concrete support may be at maximum 150 mm with the Adjustable column shoes and 130 mm with the Multi Adjustable column shoe.

For U-shaped column shoes, the thickness of timber member may be at maximum 3 mm smaller than the inner distance of the vertical flanges of the connector.

The splitting capacity of the timber members shall be verified according to the Eurocode 5 (EN 1995-1-1).

5 Indications to the manufacturer

5.1 Packaging, transport and storage

Taizhou Homer Column Shoes shall be treated as conventional metallic building products.

5.2 Use, maintenance and repair

The manufacturer shall ensure that proper information for the use of Taizhou Homer Column Shoes is available at each delivery, including general guidance on the basis of this ETA and the specific installation plans and construction details mentioned in clause 4.2.

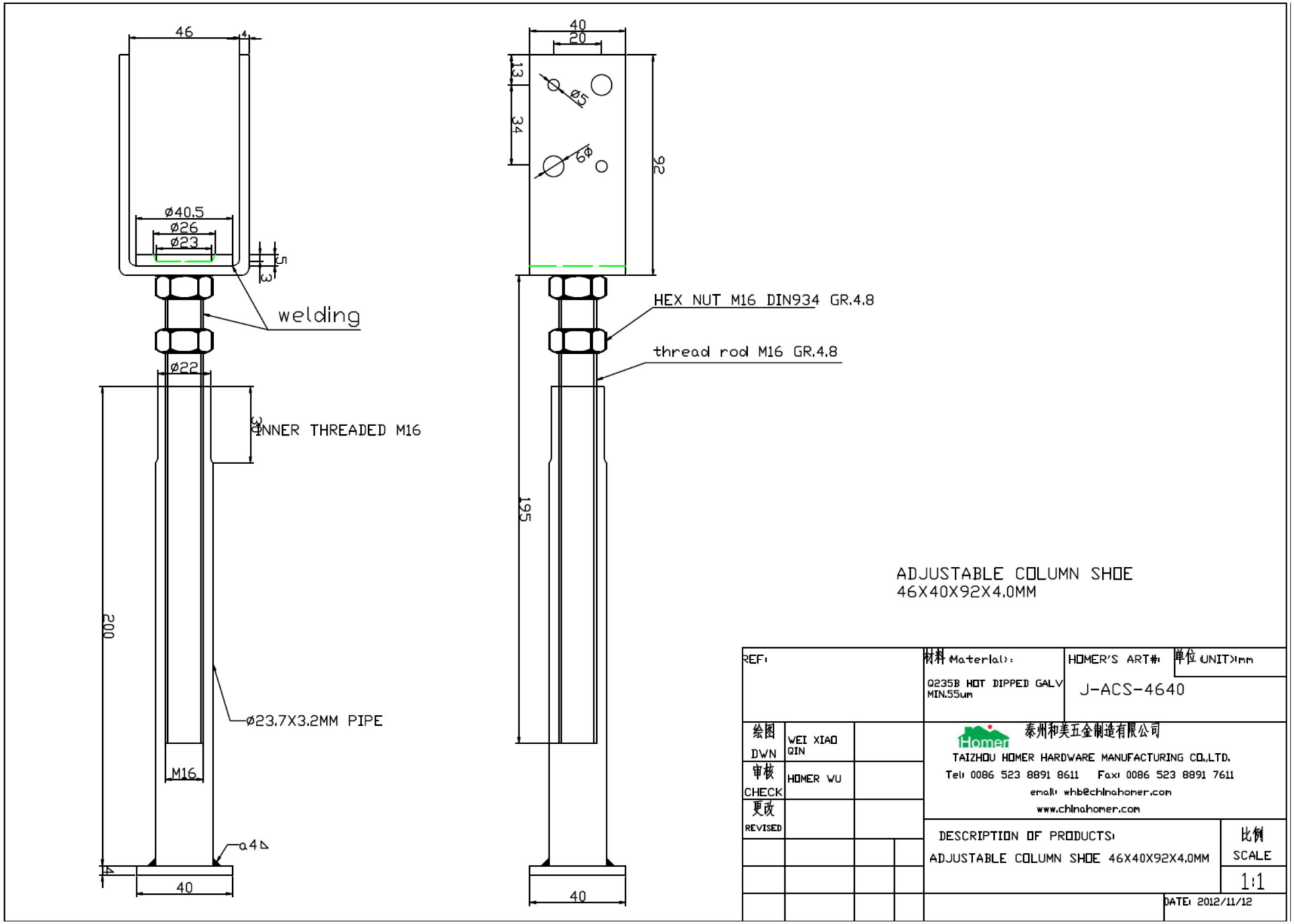
Before the installation it shall be controlled that Taizhou Homer Column Shoes are not damaged during transport or storage. Damaged connectors shall be replaced by sound ones.

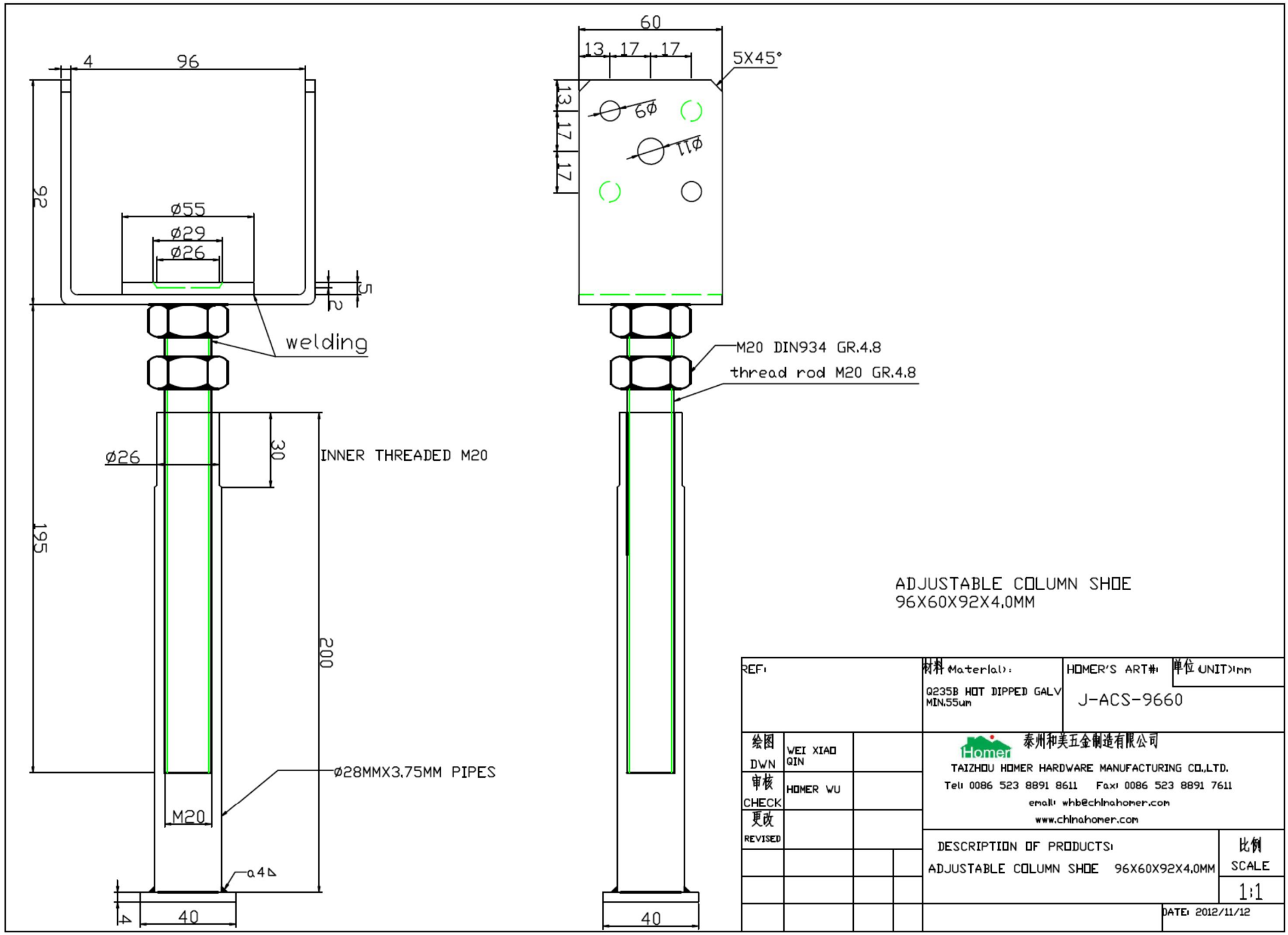
On behalf of VTT Expert Services Ltd

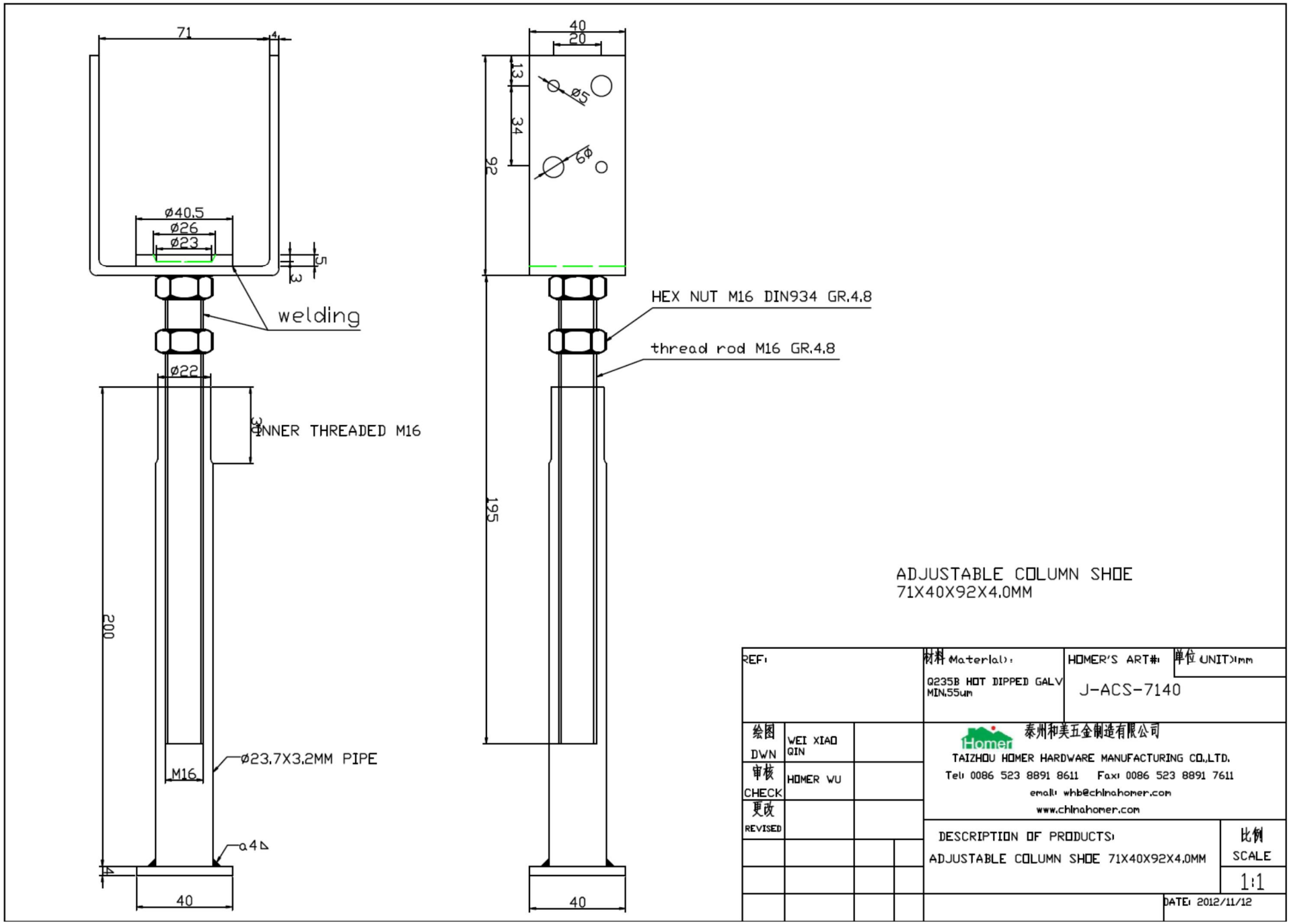
Espoo, 25.06.2013

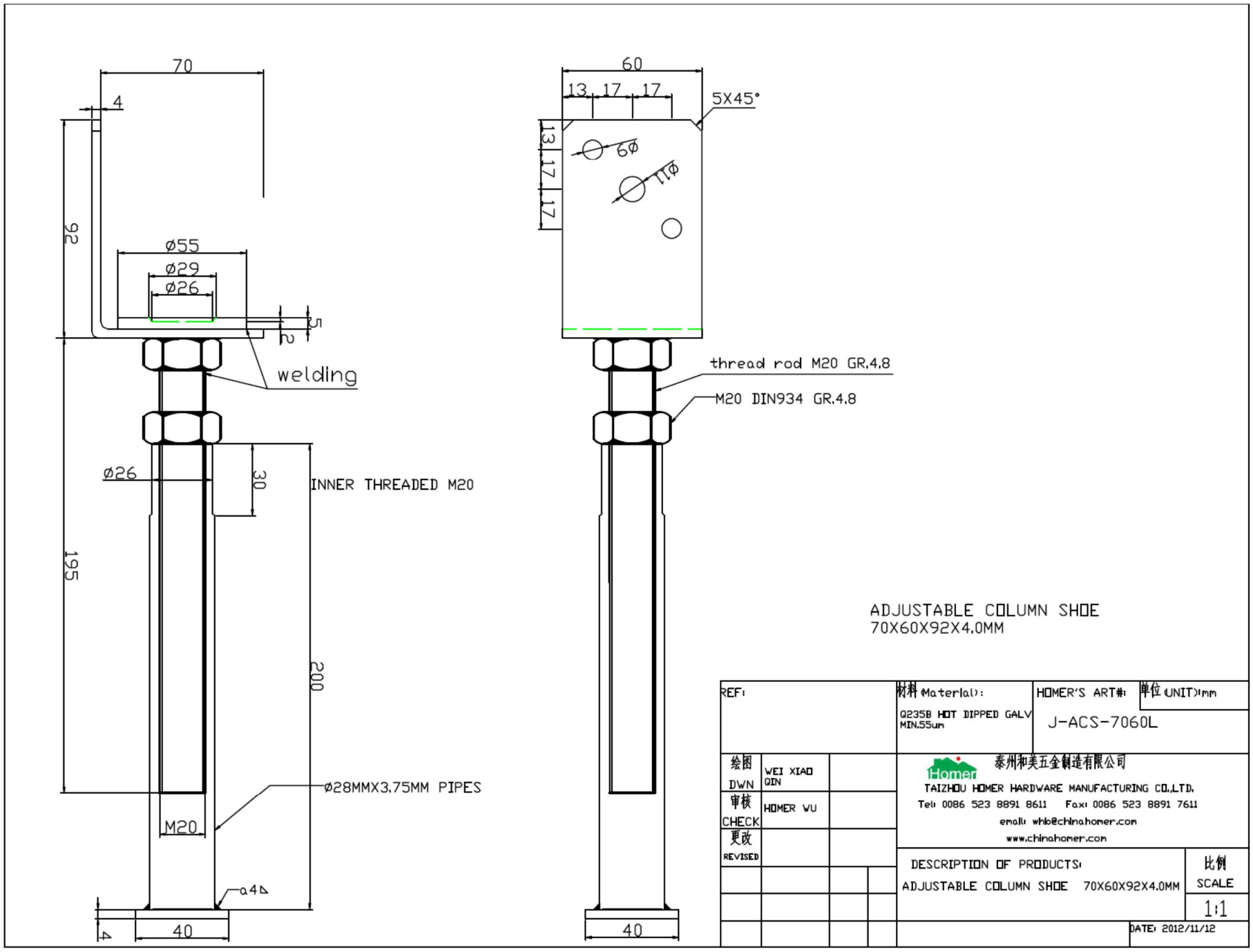
Liisa Rautiainen
Assessment Manager

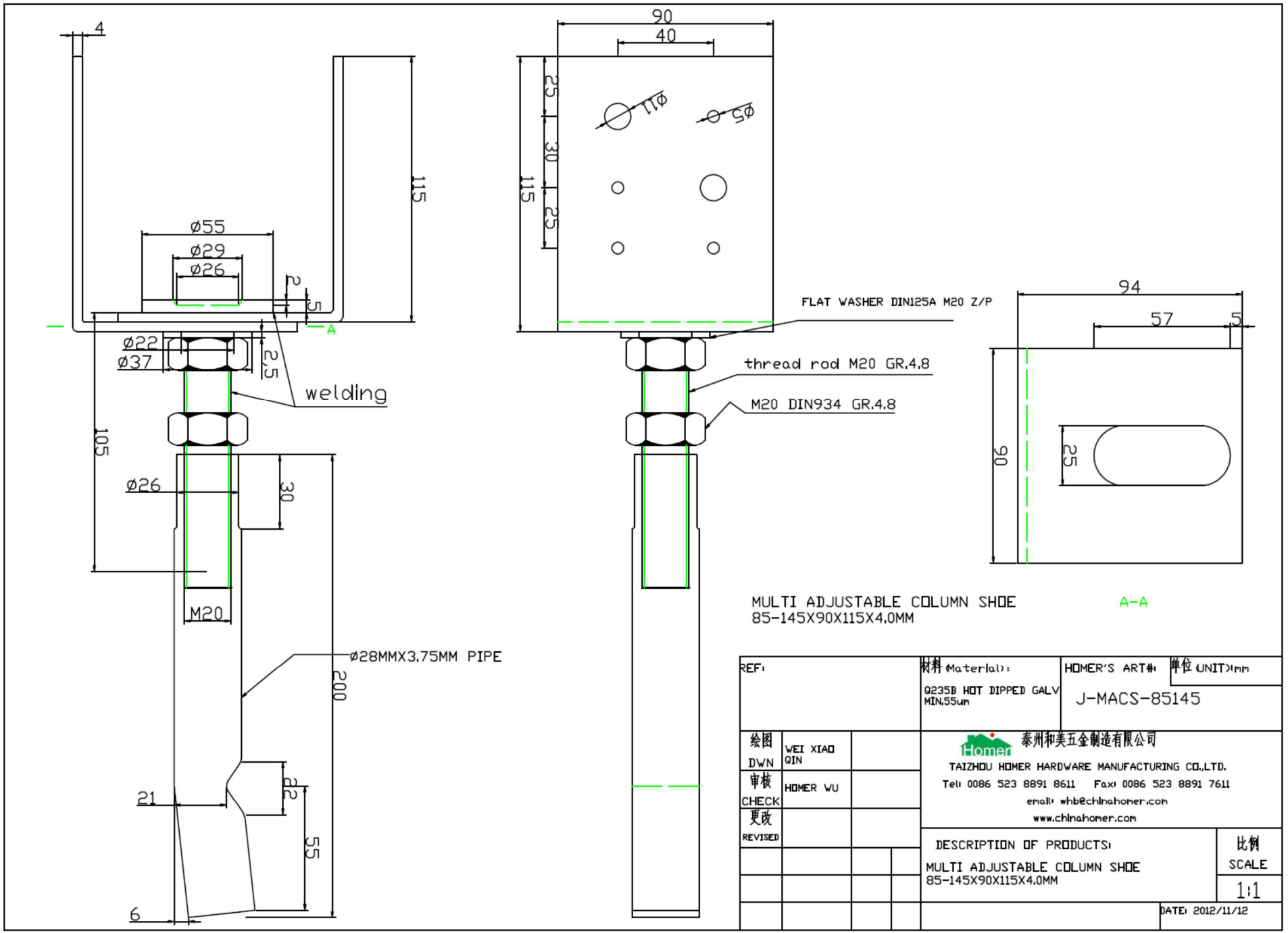
Ari Kevarinmäki
Leading Expert

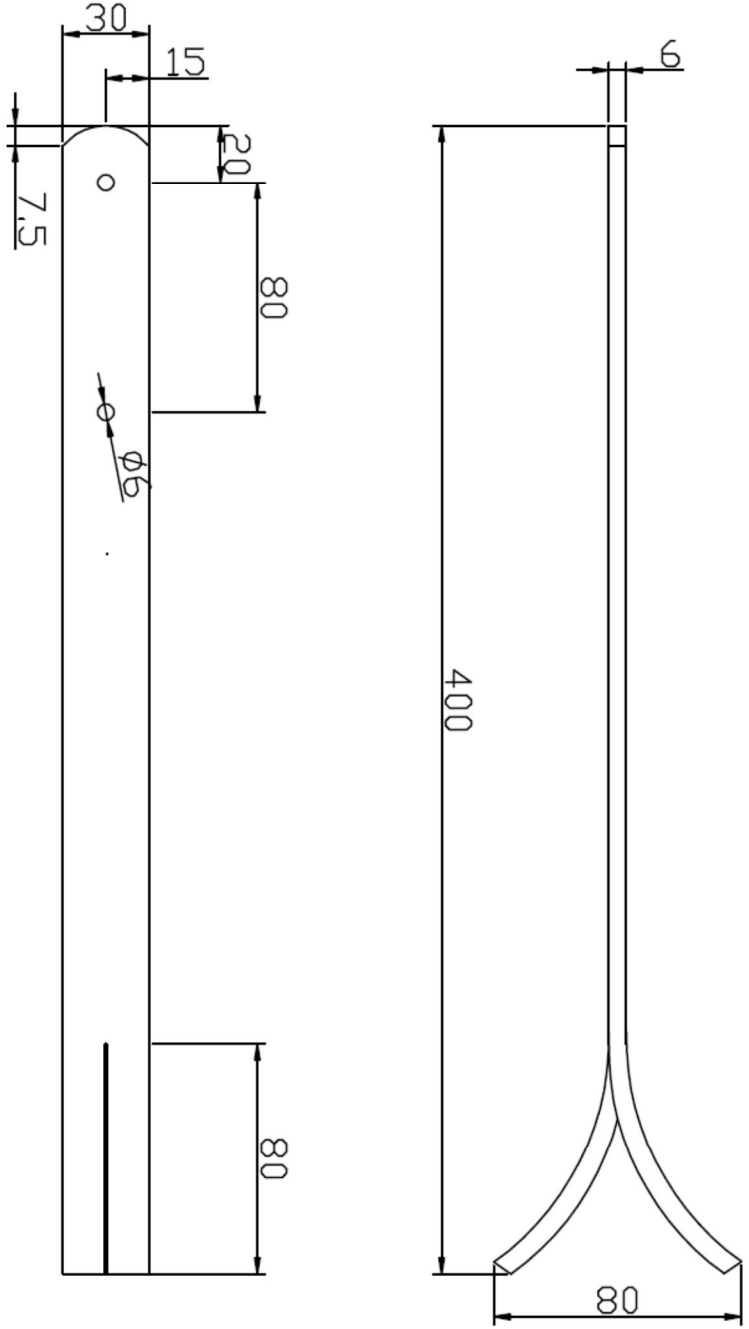

46
4
ø40.5
ø26
ø23
5
3
welding
ø22
30
INNER THREADED M16
200
ø23.7X3.2MM PIPE
M16
4
40
40
20
13
34
62
ø5
ø9
HEX NUT M16 DIN934 GR.4.8
thread rod M16 GR.4.8
195
40
ADJUSTABLE COLUMN SHOE
46X40X92X4.0MM
REF:
材料 Material):
Q235B HOT DIPPED GALV MIN.55um
HOMER'S ART#:
J-ACS-4640
单位 UNIT):mm
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ADJUSTABLE COLUMN SHOE 46X40X92X4.0MM
比例 SCALE
1:1
DATE: 2012/11/12


4
96
92
ø55
ø29
ø26
2
5
welding
ø26
30
INNER THREADED M20
195
200
ø28MMX3.75MM PIPES
M20
4
40
60
13 17 17
5X45°
13
17
17
6ø
11ø
M20 DIN934 GR.4.8
thread rod M20 GR.4.8
40
ADJUSTABLE COLUMN SHOE
96X60X92X4.0MM
REF:
材料 Material):
Q235B HOT DIPPED GALV MIN.55um
HOMER'S ART#:
J-ACS-9660
单位 UNIT):mm
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ADJUSTABLE COLUMN SHOE 96X60X92X4.0MM
比例 SCALE
1:1
DATE: 2012/11/12


71
4
ø40.5
ø26
ø23
5
3
welding
ø22
30
INNER THREADED M16
200
M16
ø23.7X3.2MM PIPE
ø4
4
40
40
20
13
34
92
ø5
ø6
HEX NUT M16 DIN934 GR.4.8
thread rod M16 GR.4.8
195
ADJUSTABLE COLUMN SHOE
71X40X92X4.0MM
REF:
材料 Material):
Q235B HOT DIPPED GALV MIN.55um
HOMER'S ART#:
J-ACS-7140
单位 UNIT):mm
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ADJUSTABLE COLUMN SHOE 71X40X92X4.0MM
比例 SCALE
1:1
DATE: 2012/11/12


70
4
92
ø55
ø29
ø26
5
2
welding
ø26
30
INNER THREADED M20
195
200
ø28MMX3.75MM PIPES
M20
4
40
60
13 17 17
5X45°
13
17
17
6ø
11ø
thread rod M20 GR.4.8
M20 DIN934 GR.4.8
40
ADJUSTABLE COLUMN SHOE
70X60X92X4.0MM
REF:
材料 Material:
Q235B HOT DIPPED GALV MIN.55um
HOMER'S ART#:
J-ACS-7060L
单位 UNIT:mm
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ADJUSTABLE COLUMN SHOE 70X60X92X4.0MM
比例 SCALE
1:1
DATE: 2012/11/12


4
115
ø55
ø29
ø26
2
5
A
ø22
ø37
2,5
welding
105
ø26
30
M20
ø28MMX3.75MM PIPE
200
21
d2
55
6
90
40
25
30
25
115
ø11
ø5
FLAT WASHER DIN125A M20 Z/P
thread rod M20 GR.4.8
M20 DIN934 GR.4.8
94
57
5
90
25
MULTI ADJUSTABLE COLUMN SHOE
85-145X90X115X4.0MM
A-A
REF:
材料 Material):
Q235B HOT DIPPED GALV MIN.55um
HOMER'S ART#:
J-MACS-85145
单位 UNIT):mm
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
MULTI ADJUSTABLE COLUMN SHOE
85-145X90X115X4.0MM
比例 SCALE
1:1
DATE: 2012/11/12



COLUMN ANCHOR STRAP
30X400X6.0MM

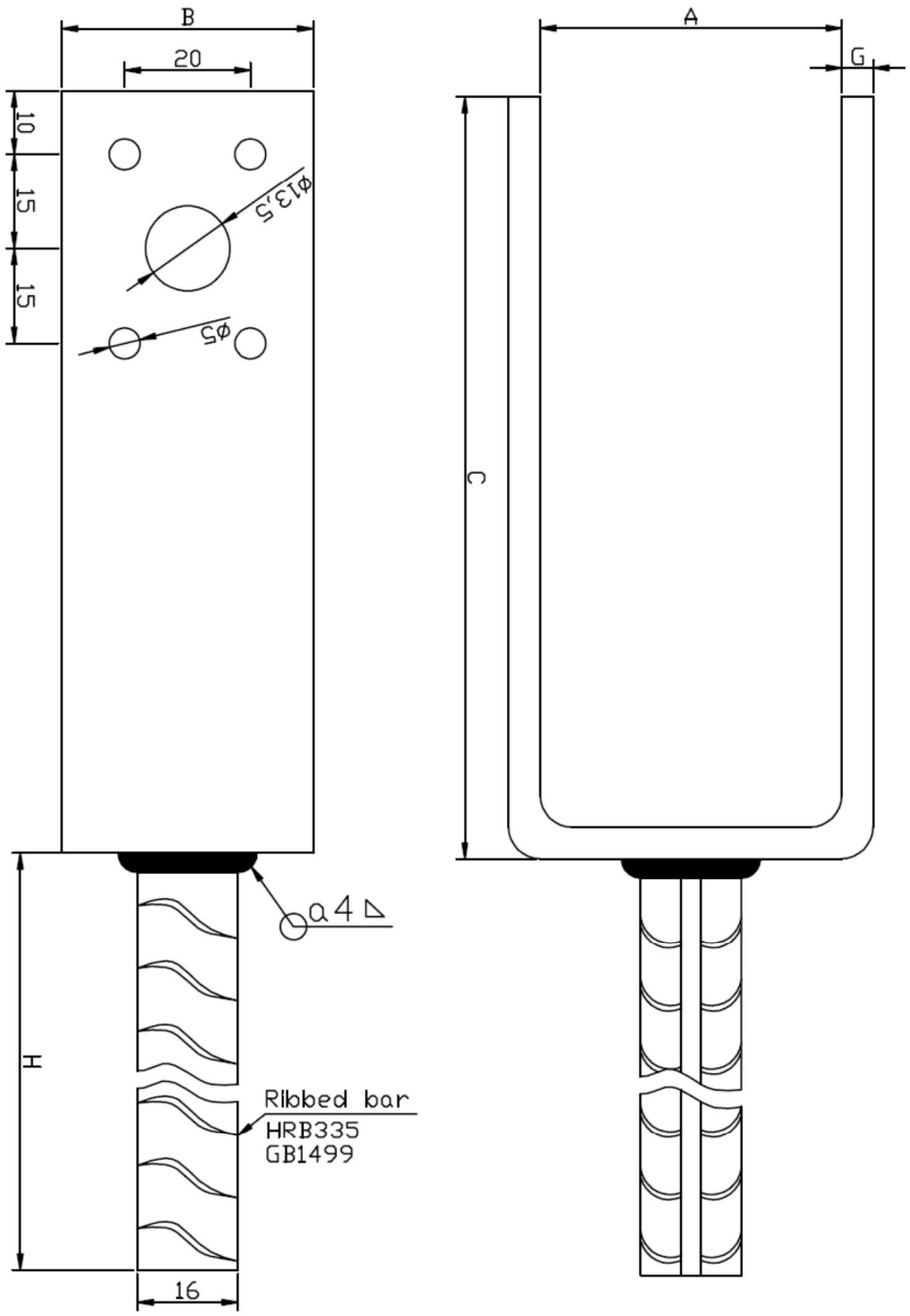
REF:		材料(Material): Q235B HOT DIPPED GALV MIN.55um	HOMER'S ART#: J-CAS-400 / 单位(UNIT):mm
绘图 DWN	WEI XIAO QIN		
审核 CHECK	HOMER WU		
更改 REVISED			

泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com

DESCRIPTION OF PRODUCTS: COLUMN ANCHOR STRAP 30X400X6.0MM

比例 SCALE 1:1

DATE: 2012/09/28



	A	B	C	G	H
J-CSE-4840	48	40	121	5	250
J-CSE-7340	73	40	121	4	250
J-CSE-5040	50	40	100	4	200
J-CSE-7540	75	40	90	4	200

REF:

材料 Material): Q235B HOT DIPPED GALV MIN. 55UM

HOMER'S ART#: J-CSE-4840-7540

单位 UNIT): mm

绘图 DWN: WEI XIAO QIN

审核 CHECK: HOMER WU

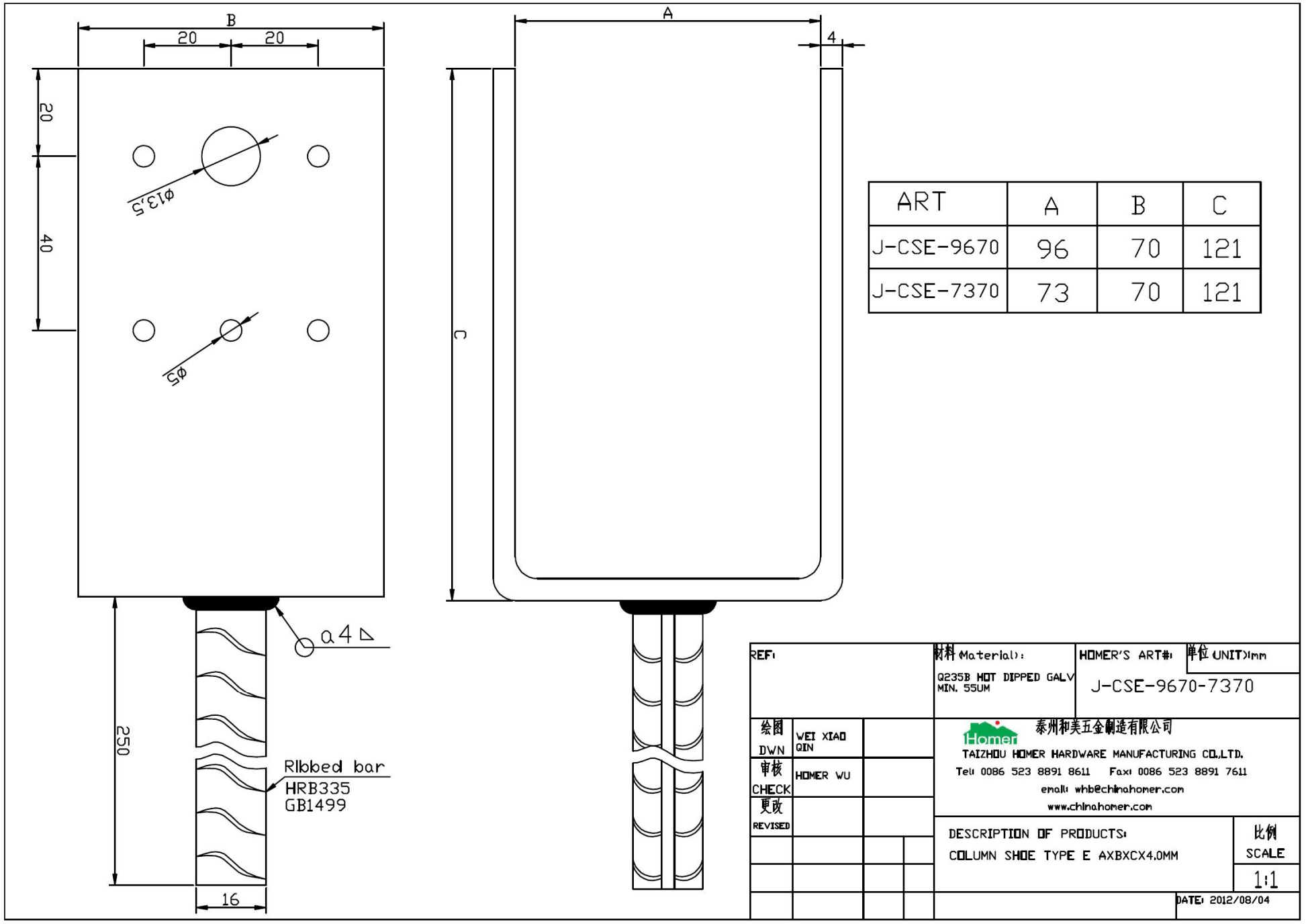
更改 REVISED:

泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com

DESCRIPTION OF PRODUCTS:
COLUMN SHOE TYPE E AXBXCXGMM

比例 SCALE: 1:1

DATE: 2012/08/04



ART	A	B	C
J-CSE-9670	96	70	121
J-CSE-7370	73	70	121

REF:

材料 Material): Q235B HOT DIPPED GALV MIN. 55UM

HOMER'S ART#: J-CSE-9670-7370

单位 UNIT):mm

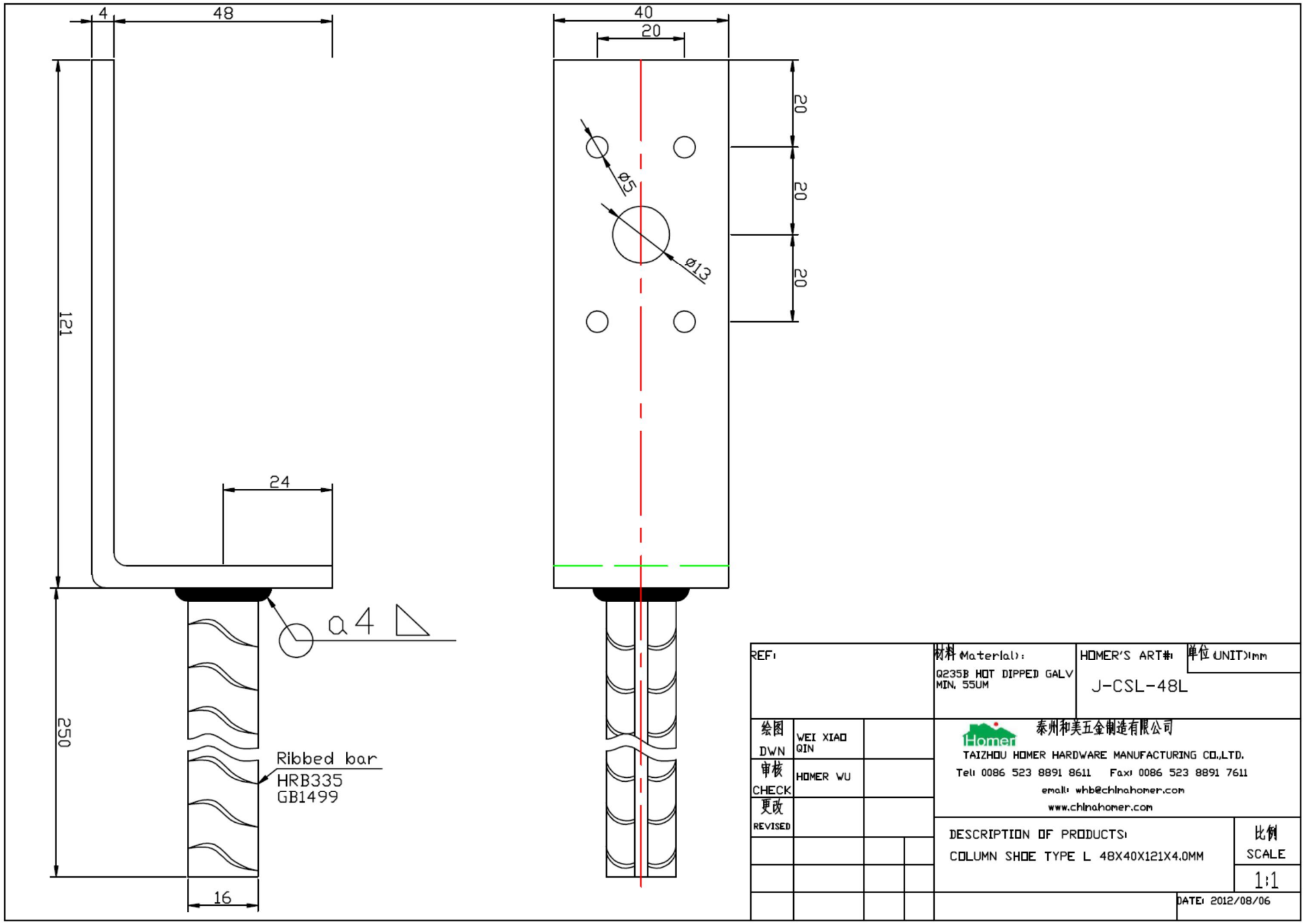
绘图 DWN	WEI XIAO QIN	
审核 CHECK	HOMER WU	
更改 REVISED		

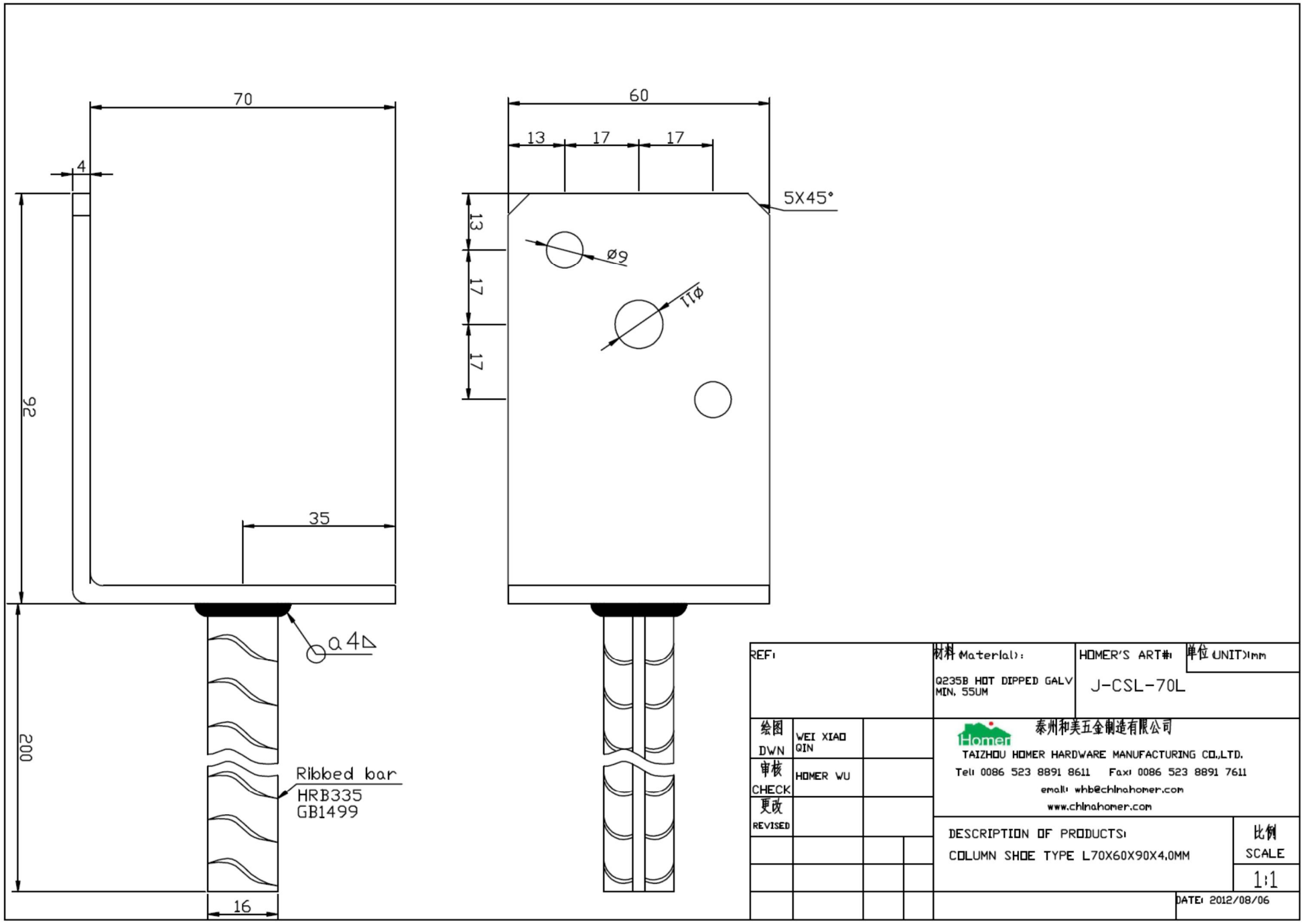
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com

DESCRIPTION OF PRODUCTS:
COLUMN SHOE TYPE E AXBXCX4.0MM

比例 SCALE 1:1

DATE: 2012/08/04


4
48
40
20
121
20
20
20
ø5
ø13
24
a4
250
Ribbed bar
HRB335
GB1499
16
REF:
材料 Material:
Q235B HOT DIPPED GALV MIN, 55UM
HOMER'S ART#:
单位 UNIT):mm
J-CSL-48L
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
COLUMN SHOE TYPE L 48X40X121X4.0MM
比例 SCALE
1:1
DATE: 2012/08/06



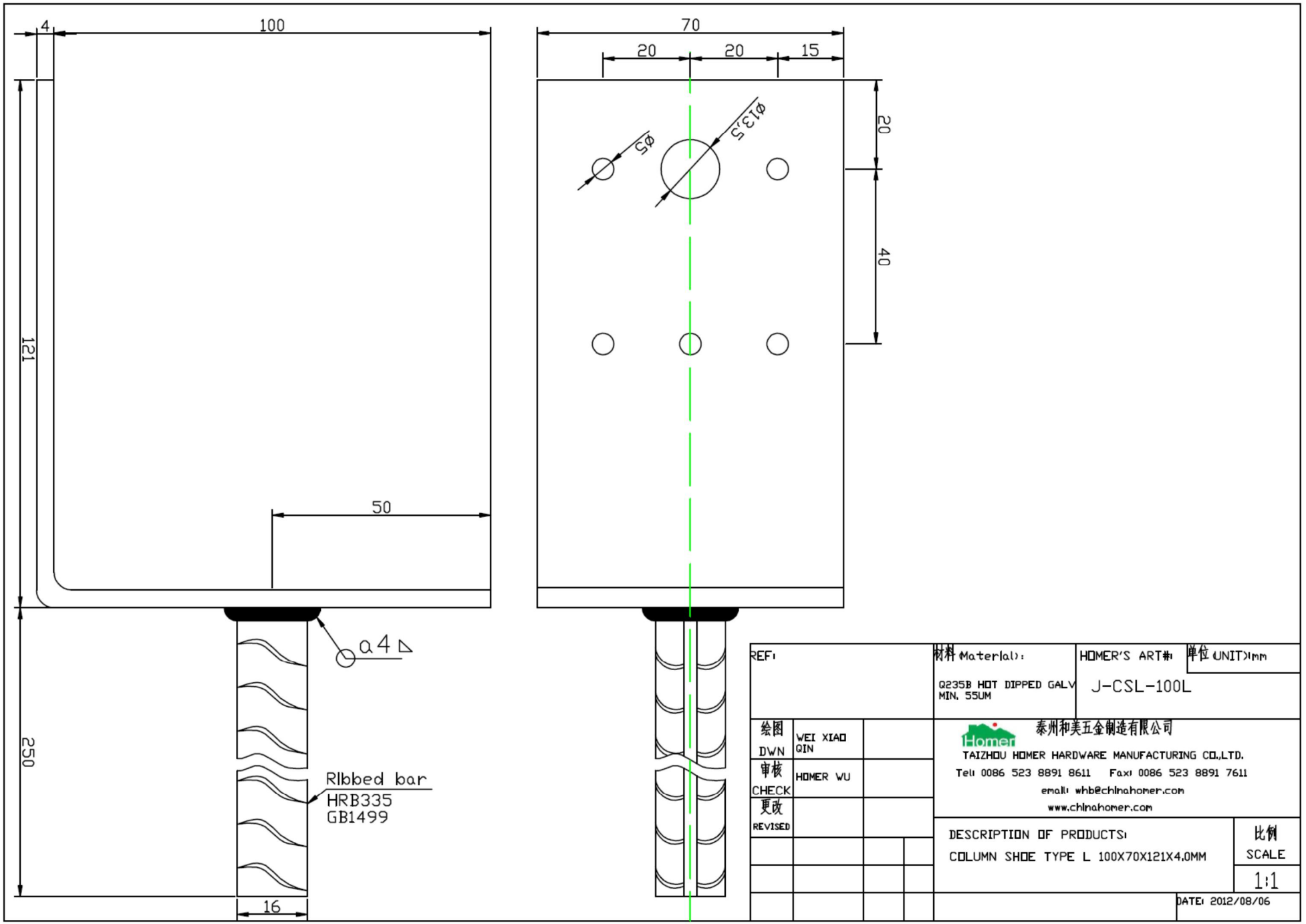
REF:	材料 Material): Q235B HOT DIPPED GALV MIN, 55UM	HOMER'S ART#: J-CSL-70L	单位 UNIT):mm
绘图 DWN	WEI XIAO QIN		
审核 CHECK	HOMER WU		
更改 REVISED			

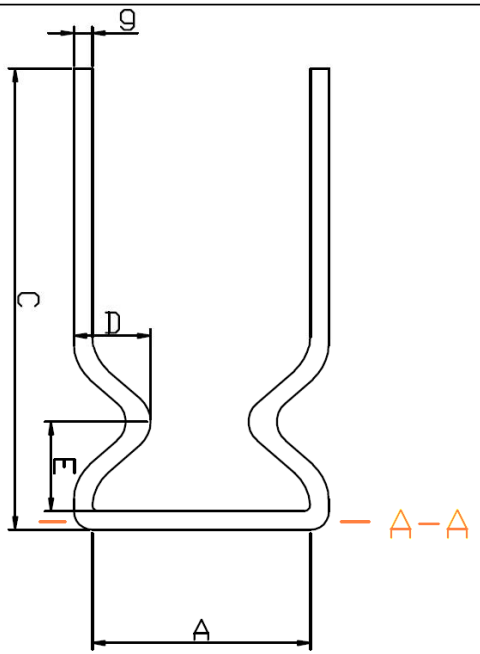
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com

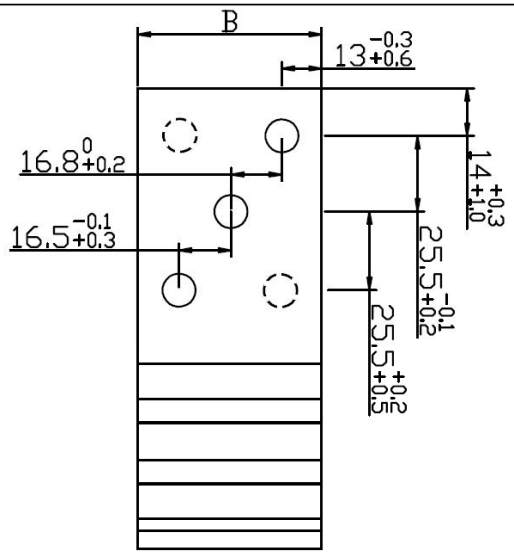
DESCRIPTION OF PRODUCTS:
COLUMN SHOE TYPE L70X60X90X4.0MM

比例 SCALE 1:1

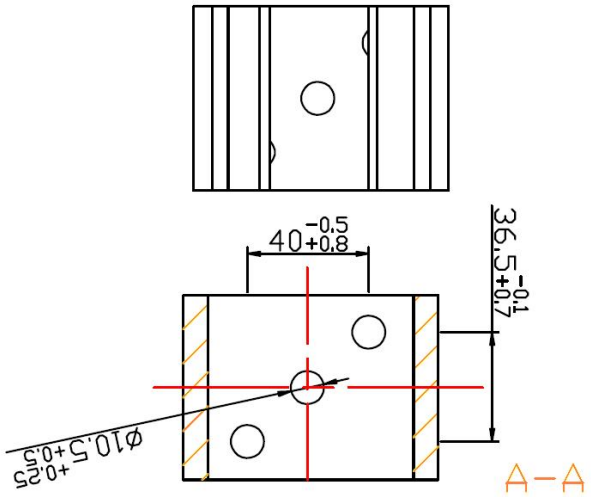
DATE: 2012/08/06

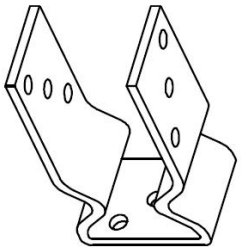

4
100
70
20
20
15
121
50
250
16
20
40
ø13.5
ø5
a4
Ribbed bar
HRB335
GB1499
REF:
材料 Material):
Q235B HOT DIPPED GALV MIN. 55UM
HOMER'S ART#:
J-CSL-100L
单位 UNIT):mm
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
COLUMN SHOE TYPE L 100X70X121X4.0MM
比例 SCALE
1:1
DATE: 2012/08/06





	A	B	C	D	E	9	Hole Nrs.
J-CSD-71	71	60	150	18	40	5.0	9
J-CSD-81	81	60	150	18	40	5.0	9
J-CSD-91	91	60	150	18	40	5.0	9
J-CSD-101	101	60	150	18	40	5.0	9
J-CSD-121	121	60	150	18	40	5.0	9





REF:

材料 Material): Q235B HOT DIPPED GALV MIN.55um

HOMER'S ART: J-CSD-71-121

单位 UNIT): mm

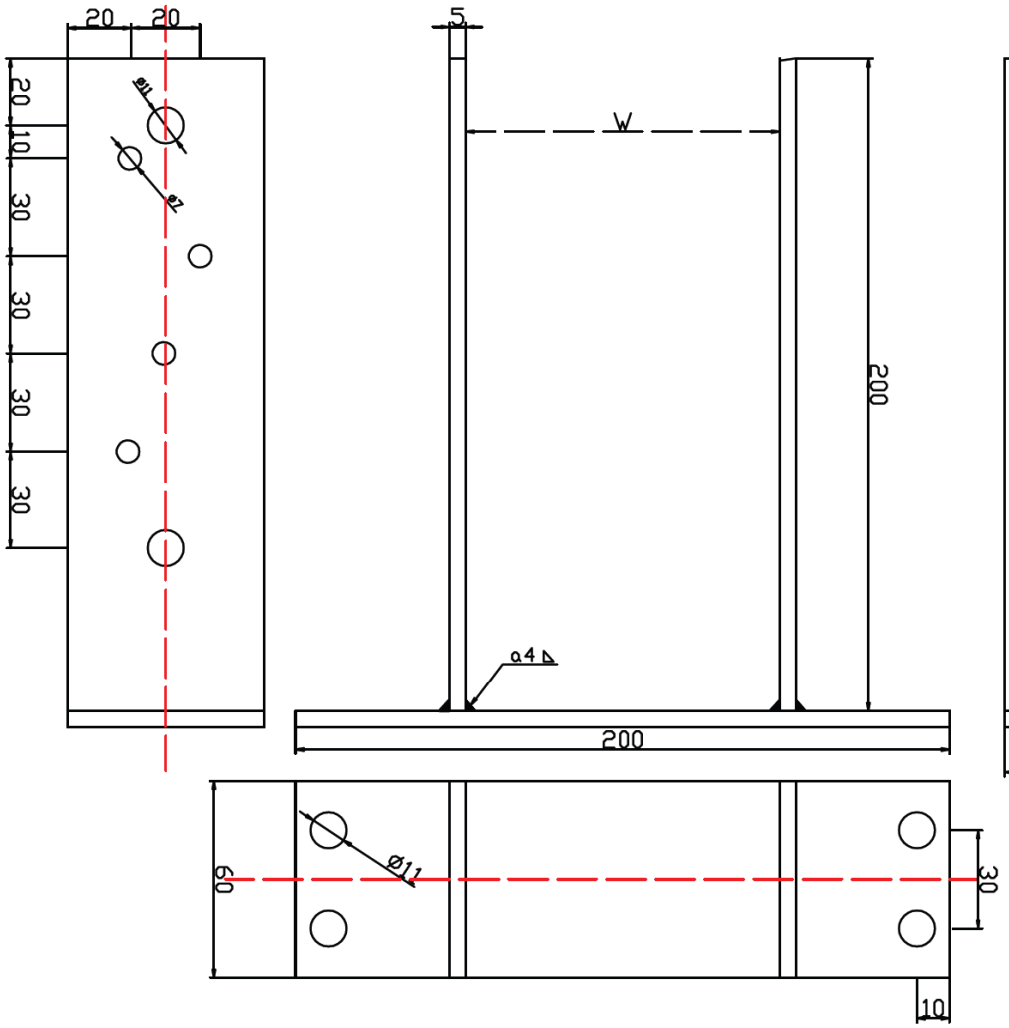
绘图 DWN	WEI XIAO QIN		
审核 CHECK	HOMER WU		
更改 REVISED			

泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com

DESCRIPTION OF PRODUCTS:
COLUMN SHOE TYPE D AXBXCX5.0MM

比例 SCALE 1:1

DATE: 2012/11/11



HOMER'S CODE	W
J-SS-071	71
J-SS-075	75
J-SS-091	91
J-SS-096	96
J-SS-101	101
J-SS-081	81

HEAVY SUPPORTING SHOES'TT'SHAPED
WX200X60X5.0MM

REF:		材料 Material): Q235B HOT DIPPED GALV MIN.55um	HOMER'S ART#: J-SS-71-101 / 单位 UNIT):mm
绘图 DWN	WEI XIAO QIN		
审核 CHECK	HOMER WU		
更改 REVISED			

泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com

DESCRIPTION OF PRODUCTS:
HEAVY SUPPORTING SHOES'TT'SHAPED
WX200X60X5.0MM

比例 SCALE 1:1

DATE: 2012/08/06

ANNEX 2. MECHANICAL PROPERTIES OF TAIZHOU HOMER COLUMN SHOES

1 General

1.1 Design capacity

The connection capacities are given in this ETA as characteristic values X_{Rk}. The design value X_{Rd} shall be calculated as follows:

$$X_{v,Rd} = \frac{k_{mod} X_{v,Rk}}{\gamma_M} \quad (1)$$

$$X_{w,Rd} = \frac{k_{mod} X_{w,Rk}}{\gamma_M} \quad (2)$$

$$X_{s,Rd} = \frac{X_{s,Rk}}{\gamma_{M0}} \quad (3)$$

$$X_{c,Rd} = \frac{X_{c,Rk}}{\gamma_{Mc}} \quad (4)$$

where

k_{mod} is the modification factor according to Eurocode 5 taking into account the effect of the duration of the load and moisture content of timber,

γ_M is the partial factor for the resistance of connections according to the relevant National annex of EN 1995-1-1,

γ_{M0} is the partial safety factor for the yield strength of steel according to the relevant National annex of EN 1993-1-1 and

γ_{Mc} is the partial safety factor for the concrete according to the relevant National annex of EN 1992-1-1.

1.2 Lateral load-carrying capacity of fasteners

The characteristic load-carrying capacity for nails and screws of diameter $d \leq 6$ mm should be taken as the minimum value found from the following expression:

$$F_{v,Rk} = \min \begin{cases} f_{h,k} t_1 d & \text{(a)} \\ f_{h,k} t_1 d \left[\sqrt{2 + \frac{4 M_{y,k}}{f_{h,k} d\, t_1^2}} - 1 \right] + \frac{F_{ax,k}}{4} & \text{(b)} \\ 2{,}3 \sqrt{M_{y,k} f_{h,k} d} + \frac{F_{ax,k}}{4} & \text{(c)} \end{cases} \quad (5)$$

where the penetration length of fastener in timber $t_1 = L - t$, when L is the length of fastener and t is the thickness of steel plate, d is the nominal diameter of nail or the effective diameter of screw = 1,1di, when di is the inner diameter of threaded part of screw, $M_{y,k}$ is the characteristic yield moment of the fastener determined according to standards EN 14952 and EN 409, $F_{ax,k}$ is

the characteristic withdrawal capacity of the fastener with a limitation of term $F_{ax,k}/4$ at maximum to 1/3 with nails and to 1/2 with screws from the load-carrying capacity $F_{v,Rk}$ and the characteristic embedding strength

$$f_{h,k} = 0{,}082\rho_k d^{-0{,}3} \qquad \text{N/mm}^2 \tag{6}$$

where ρ_k is the characteristic density of timber.

The characteristic load-carrying capacity for bolts per shear plane per fastener in double shear connections should be taken as the minimum value found from the following expression

$$F_{v,Rk} = \min \begin{cases} 0{,}5\, f_{h,k} t_2 d & \text{(a)} \\ 1{,}15\sqrt{2M_{y,k}\, f_{h,k} d} + \dfrac{F_{ax,k}}{4} & \text{(b)} \end{cases} \tag{7}$$

where

t_2 is the thickness of timber member,
d is the diameter of bolt,
$M_{y,k}$ is the characteristic yield moment of bolt,
$F_{ax,k}$ is the characteristic axial tension or pull-through capacity of the bolt with a limitation of term $F_{ax,k}/4$ at maximum to 1/5 from the load-carrying capacity $F_{v,Rk}$ and
$f_{h,\alpha,k}$ is the characteristic embedding strength calculated as follows:

$$f_{h,\alpha,k} = \frac{f_{h,0,k}}{k_{90}\sin^2\alpha + \cos^2\alpha} \tag{8}$$

$$f_{h,0,k} = 0{,}082(1 - 0{,}01d)\rho_k \qquad \text{N/mm}^2 \tag{9}$$

where

$$k_{90} = \begin{cases} 1{,}35 + 0{,}15d & \text{for softwoods} \\ 1{,}30 + 0{,}15d & \text{for LVL} \\ 0{,}90 + 0{,}15d & \text{for hardwoods} \end{cases} \tag{10}$$

and

$f_{h,0,k}$ is the characteristic embedding strength parallel to grain, in N/mm^2;
ρ_k is the characteristic density of timber, in kg/m^3;
α is the angle of the load to the grain;
d is the diameter of bolt, in mm.

The characteristic load-carrying capacity for the bolts and lag screws per fastener in single shear connections with a thin steel plate ($t \leq d$) should be taken as the minimum value found from the following expression

$$F_{v,Rk} = \min \begin{cases} 0{,}4\, f_{h,\alpha,k} t_1 d & \text{(a)} \\ 1{,}15\sqrt{2M_{y,k}\, f_{h,\alpha,k} d} + \dfrac{F_{ax,k}}{4} & \text{(b)} \end{cases} \tag{11}$$

where

t_1 is thickness of timber member in case of bots or the penetration length of screw in timber,
d is the nominal diameter of the fastener, when the smooth shank penetrates into timber member by not less than 4d; otherwise d = 1,1di, when d_i is the inner diameter of threaded part of the screw,
$M_{y,k}$ is the characteristic yield moment of the fastener according to EN 14952,
$F_{ax,k}$ is the characteristic withdrawal capacity of the screw with a limitation of term $F_{ax,k}/4$ at maximum to 1/5 with bots and to 1/2 with lag screws from the load-carrying capacity $F_{v,Rk}$ and
$f_{h,\alpha,k}$ is the characteristic embedding strength calculated by expression (8).

2 Load-carrying capacity of Adjustable and Multi Adjustable column shoe connections

The Adjustable column shoes are used as a timber column connection cast in concrete and subjected to the vertical and horizontal forces presented in Figures A2.1 and A2.2. For the L-shaped connector J-ACS-7060L, any horizontal force in direction $H_{2,d}$ is not allowed.

The end of timber member should be in contact with the bottom plate the connector. The penetration length in concrete shall be at least 150 mm. The distance between the column end and the concrete foundation may be at maximum 150 mm for the Adjustable column shoes and 130 mm for the Multi Adjustable connector as presented in Figures A2.1 and A2.2.

The following design conditions shall be fulfilled for the Adjustable and Multi Adjustable column shoe connections:

$$F_{T,d} \le F_{T,s,Rd} \tag{12}$$

$$F_{C,d} \le F_{C,w,Rd} \tag{13}$$

$$\left(\frac{F_{T,d}}{F_{T,v,Rd}}\right)^2 + \left(\frac{H_{1,d}}{H_{1,v,Rd}}\right)^2 \le 1 \tag{14}$$

$$\frac{F_{C,d}}{F_{C,s,Rd}} + \frac{\sqrt{H_{1,d}^2 + H_{2,d}^2}}{H_{s,Rd}} \le 1 \tag{15}$$

The characteristic values for the connector capacities $F_{T,s,Rk}$, $F_{C,s,Rk}$ and $H_{s,Rk}$ are presented in Table A2.1.

The characteristic compression capacity of timber member should be calculated as:

$$F_{C,w,Rk} = A_c \cdot f_{c,0,k} \tag{16}$$

where

$f_{c,0,k}$ is the characteristic compression strength of timber member parallel to the grain and
A_c is the contact area presented in Table A2.1.

The characteristic tension force capacity of the connection according to the lateral load-carrying capacity of fasteners should be calculated as:

$$F_{T,v,Rk} = n \cdot m \cdot F_{v,Rk} \tag{17}$$

where

$F_{v,Rk}$ is the characteristic load-carrying capacity of the fastener per shear plane parallel to the grain calculated by the actual equation (5), (7) or (11),
n is number of fasteners and
m is number of shear planes; m=2 for bolts in U-shaped connector, in all other cases m=1.

The characteristic horizontal force capacity of the connection according to the lateral load-carrying capacity of fasteners should be calculated as:

$$H_{1,v,Rk} = n \cdot m \cdot F_{v,Rk} \quad (18)$$

where $F_{v,Rk}$ is the characteristic load-carrying capacity of the fastener per shear plane perpendicular to the grain calculated by the actual equation (5), (7) or (11) and symbols n and m are the same as in expression (17).

Table A2.1 Adjustable and Multi Adjustable column shoes - article numbers, nominal dimensions and characteristic capacities $F_{T,s,Rk}$, $F_{C,s,Rk}$ and $H_{s,Rk}$. A_c is the contact area between timber end and the connector.

Art. No.	Size (mm)	$F_{T,s,Rk}$ (kN)	$F_{C,s,Rk}$ (kN)	$H_{s,Rk}$ (kN)	A_c (mm^2)
J-ACS-4640	46x40x4.0	13,6	24,8	0,43	1288
J-ACS-9660	96x60x4.0	13,9	39,6	0,83	2376
J-ACS-7140	71x40x4.0	13,6	24,8	0,43	1288
J-ACS-7060L	70x60x4.0	1,14	39,6	0,83	2376
J-MACS-85145	85-125x90x4.0	5,6	41,8	0,86	2376

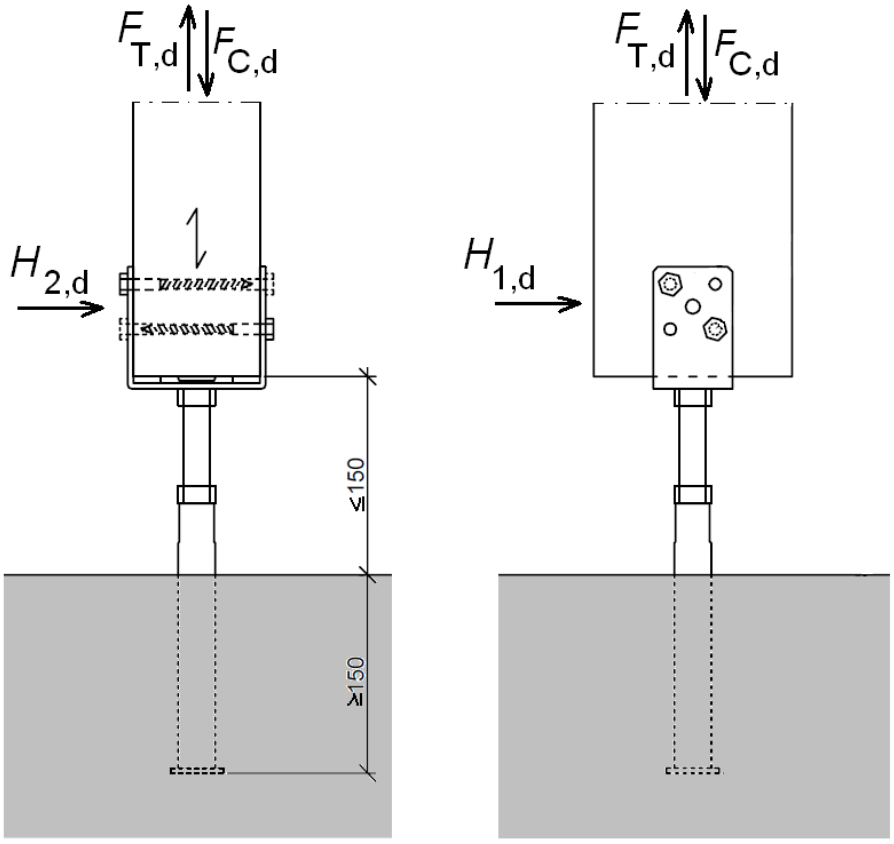


Figure A2.1 Use of Adjustable column shoe and the definition of forces.

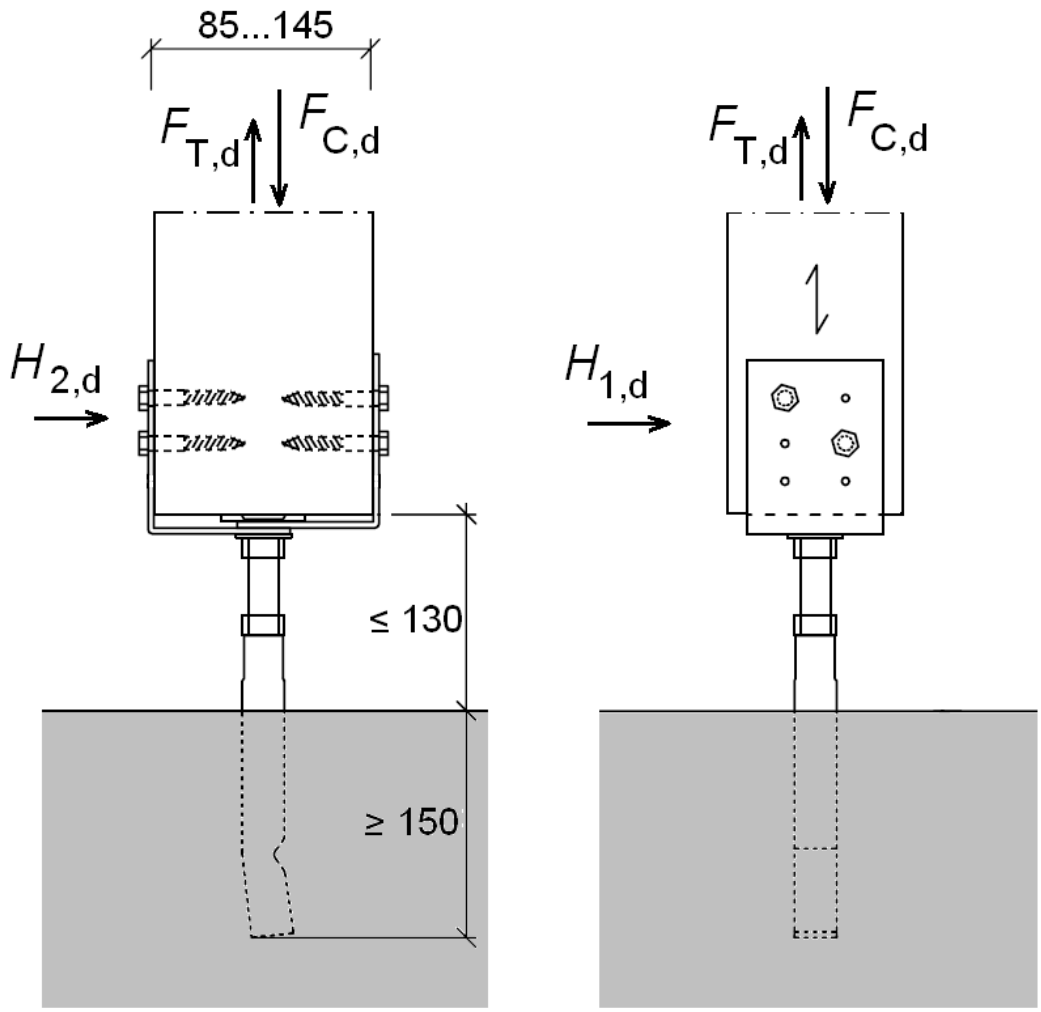


Figure A2.2 Use of Multi Adjustable column shoe and the definition of forces.

3 Load-carrying capacity of Column Anchor Strap connection

Column Anchor Strap is used in the timber column connection cast in concrete, where the connector is loaded by a vertical tension force $F_{T,d}$ and/or a horizontal force $H_{1,d}$ parallel to the width direction of the connector as presented in Figure A2.3. Normally two straps per column are used on the opposite sides of the column.

The end of timber member should be in contact with the basement for that no compression would appear in the straps. The penetration length in concrete shall be at least 150 mm. For non-reinforced concrete foundation, the minimum edge distances of concrete presented in Figure A2.3 shall be fulfilled. Two anchor nails or lag screws of diameter 6 mm are used in each strap connector.

The following design conditions shall be fulfilled for the Column Anchor Strap connections:

$$F_{T,d} \leq F_{T,c,Rd} \tag{19}$$

$$\sqrt{F_{T,d}^2 + H_{1,d}^2} \leq F_{T,v,Rd} \tag{20}$$

$$H_{1,d} \leq H_{s,Rd} \tag{21}$$

The characteristic values for the connector capacities $F_{T,c,Rk}$ and $H_{s,Rk}$ are presented in Table A2.2. The characteristic connection resistance $F_{T,v,Rk}$ is calculated according to the lateral load-carrying capacity of fasteners

$$F_{T,v,Rk} = 2F_{v,Rk} \tag{22}$$

where $F_{v,Rk}$ is the characteristic load-carrying capacity per the fastener calculated by expression (5).

Table A2.2 Column Anchor Strap - article number, nominal dimensions and characteristic capacities $F_{T,c,Rk}$ and $H_{s,Rk}$.

Art. No.	Size (mm)	$F_{T,c,Rk}$ (kN)	$H_{s,Rk}$ (kN)
J-CAS-400	30x400x6.0	26,8	1,5

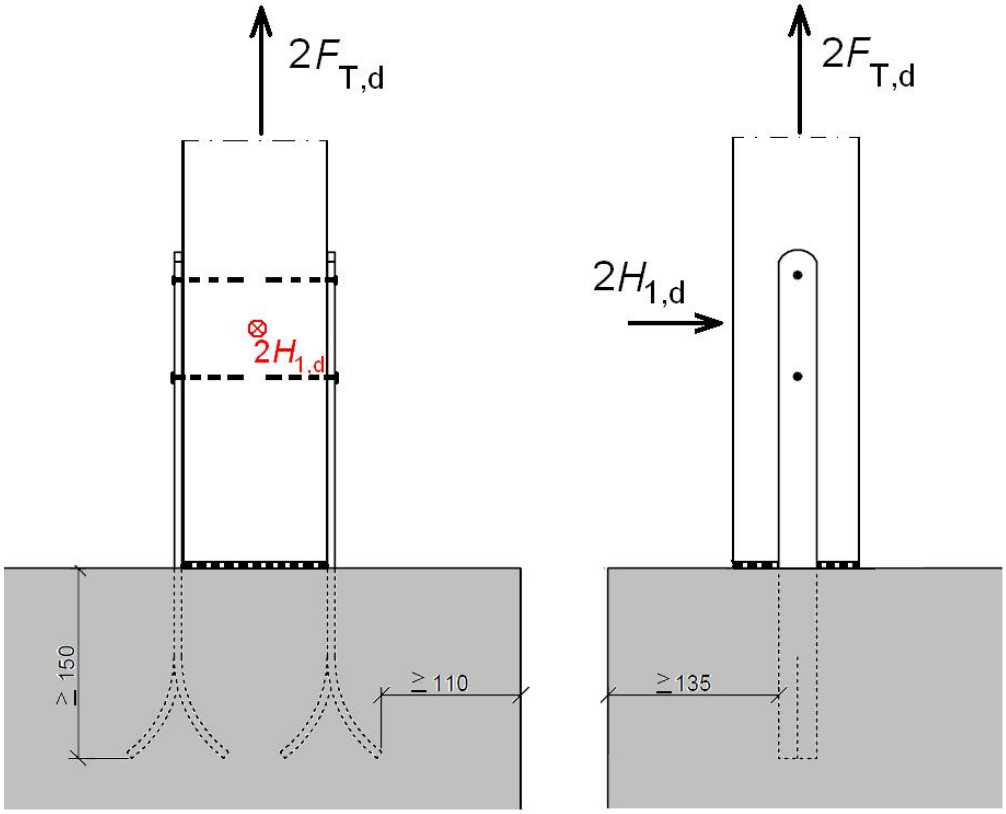


Figure A2.3 Use of Column Anchor Straps and the definition of forces.

4 Load-carrying capacity of Column Shoe type E connection

The Column Shoes of type E are used in the timber column connections cast in concrete and subjected to the vertical and horizontal forces presented in Figure A2.4. The end of timber member shall be in contact with the bottom plate of the connector. The penetration length in concrete shall be at least 150 mm.

The design conditions (12) – (15) shall be fulfilled for the Column Shoe type E connections using the values of characteristic capacities and contact areas presented in Table A2.3. The characteristic connection resistances $F_{T,v,Rk}$ and $H_{1,v,Rk}$ are calculated according to the expressions (17) and (18).

Table A2.3 Column Shoes of type E - article numbers, nominal dimensions and characteristic capacities $F_{T,s,Rk}$, $F_{C,s,Rk}$ and $H_{s,Rk}$. A_c is the contact area between timber end and the connector.

Art. No.	Size (mm)	$F_{T,s,Rk}$ (kN)	$F_{C,s,Rk}$ (kN)	$H_{s,Rk}$ (kN)	A_c (mm^2)
J-CSE-4840	48x40x121x5/16x250	8,7	41,0	0,69	1920
J-CSE-7340	73x40x121x4/16x250	8,7	41,0	0,69	2920
J-CSE-9670	96x70x121x4/16x250	8,7	41,0	0,67	6720
J-CSE-7370	73x70x121x4/16x250	8,7	41,0	0,67	5110
J-CSE-5040	50x40x100x4/16x200	8,7	41,0	1,08	2000
J-CSE-7540	75x40x90x4/16x200	8,7	41,0	1,17	3000

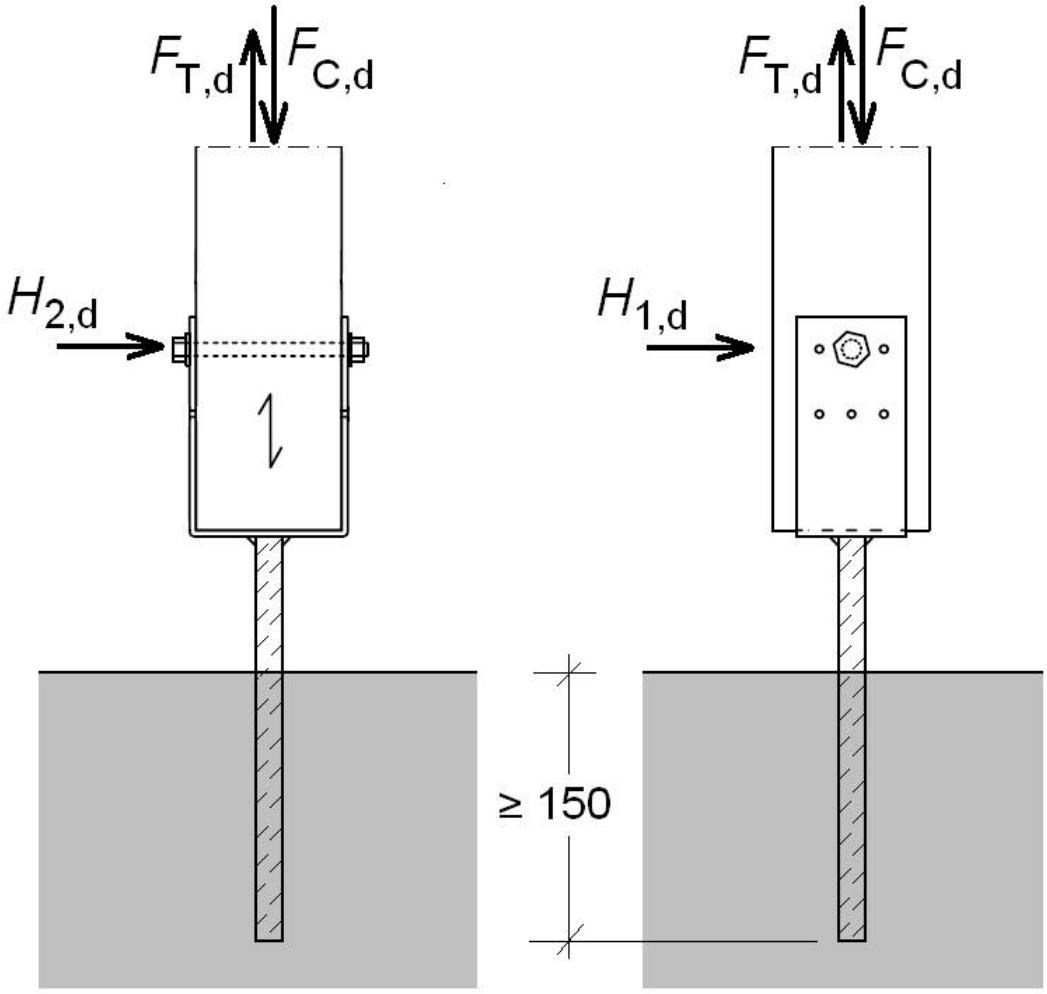


Figure A2.4 Use of Column Shoe type E and the definition of forces.

5 Load-carrying capacity of Column Shoe type L connection

The Column Shoes of type L are used in the timber column connections cast in concrete and subjected to the vertical and horizontal forces presented in Figure A2.5. The end of timber member shall be in contact with the bottom plate of the connector. The penetration length in concrete shall be at least 150 mm.

The following design conditions shall be fulfilled for the Column Shoe type L connections:

$$F_{T,d} \leq F_{T,s,Rd} \tag{23}$$

$$F_{C,d} \leq F_{C,w,Rd} \tag{24}$$

$$\left(\frac{F_{T,d}}{F_{T,v,Rd}}\right)^2 + \left(\frac{H_{1,d}}{H_{1,v,Rd}}\right)^2 \leq 1 \tag{25}$$

$$\frac{F_{C,d}}{F_{C,s,Rd}} + \frac{H_{1,d}}{H_{s,Rd}} \leq 1 \tag{26}$$

The characteristic values for the connector capacities $F_{T,s,Rk}$, $F_{C,s,Rk}$ and $H_{s,Rk}$ are presented in Table A2.4. The characteristic connection resistances $F_{T,v,Rk}$ and $H_{1,v,Rk}$ are calculated according to the expressions (17) and (18). The characteristic compression capacity of timber member $F_{C,w,Rk}$ should be calculated according to expression (16) using the values of contact area presented in Table A2.4.

Table A2.4 Column Shoes of type L - article numbers, nominal dimensions and characteristic capacities $F_{T,s,Rk}$, $F_{C,s,Rk}$ and $H_{s,Rk}$. A_c is the contact area between timber end and the connector.

Art. No.	Size (mm)	$F_{T,s,Rk}$ (kN)	$F_{C,s,Rk}$ (kN)	$H_{s,Rk}$ (kN)	A_c (mm^2)
J-CSL-48L	48x40x121x4/16x250	1,07	41,0	0,74	1920
J-CSL-70L	70x60x90x4/16x200	1,14	41,0	1,20	4200
J-CSL-100L	100x70x121x4/16x250	0,95	41,0	0,67	7000

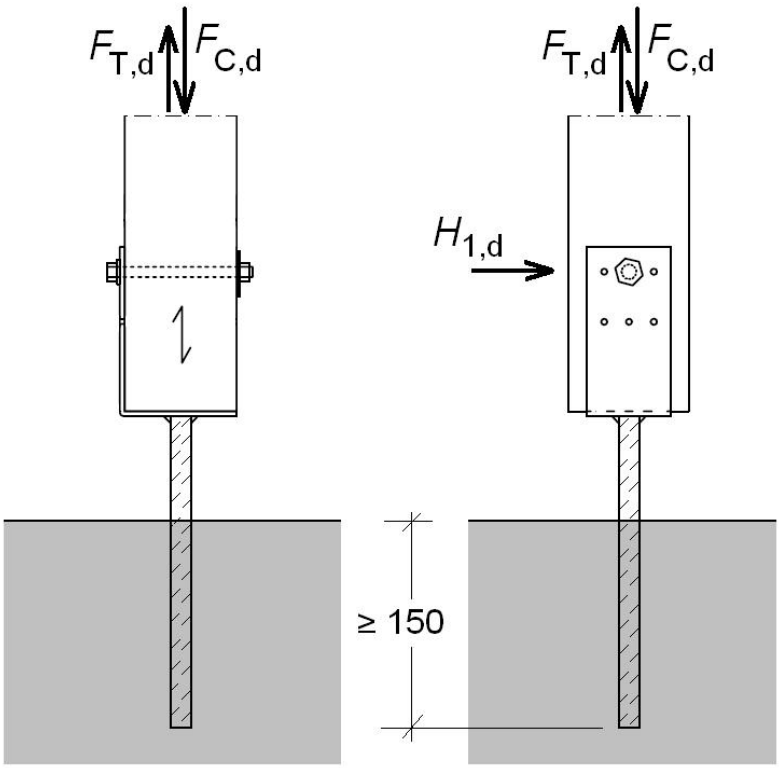


Figure A2.5 Use of Column Shoe type L and the definition of forces.

6 Load-carrying capacity of Column Shoe type D connection

Column Shoe type D is used as a timber column connector fixed to the timber member by lag screws or a bolt and to the concrete support by anchor bolts and subjected to the vertical and horizontal forces presented in Figure A2.6. At least two anchor bolts should be used symmetrically in the attachment to the concrete. The distance between the end of timber member and concrete support may be at maximum 60 mm.

The following design conditions shall be fulfilled for the Column Shoe type D connections:

$$F_{T,d} \leq \min(F_{T,s,Rd}; F_{T,v,Rd}; F_{T,c,Rd}) \quad (27)$$

$$F_{C,d} \leq \min(F_{C,s,Rd}; F_{T,v,Rd}) \quad (28)$$

$$H_{1,d} \leq \min(H_{1,s,Rd}; H_{1,v,Rd}; H_{c,Rd}) \quad (29)$$

$$H_{2,d} \leq \min(H_{2,s,Rd}; H_{c,Rd}) \quad (30)$$

and for the combination of forces the following conditions shall be satisfied

$$\left(\frac{\max(F_{T,d}; F_{C,d})}{F_{T,v,Rd}}\right)^2 + \left(\frac{H_{1,d}}{H_{1,v,Rd}}\right)^2 \leq 1 \quad (31)$$

$$\frac{F_{T,d}}{F_{T,c,Rd}} + \frac{\sqrt{H_{1,d}^2 + H_{2,d}^2}}{H_{c,Rd}} \leq 1 \quad (32)$$

$$\frac{F_{T,d}}{F_{T,s,Rd}} + \frac{H_{1,d}}{H_{1,s,Rd}} \leq 1 \quad (33)$$

$$\frac{F_{C,d}}{F_{C,s,Rd}} + \frac{H_{2,d}}{H_{2,s,Rd}} \leq 1 \quad (34)$$

The characteristic values for the connector capacities $F_{T,s,Rk}$, $F_{C,s,Rk}$, $H_{1,s,Rk}$ and $H_{2,s,Rk}$ are presented in Table A2.5. The characteristic axial capacity of anchor bolts $F_{T,c,Rk}$ and the lateral load-carrying capacity of anchor bolts $H_{c,Rk}$ are determined according to the ETA of the anchor bolts. The characteristic connection resistances $F_{T,v,Rk}$ and $H_{1,v,Rk}$ are calculated according to the expressions (17) and (18).

Table A2.5 Column Shoes of type D - article numbers, nominal dimensions and characteristic capacities $F_{T,s,Rk}$, $F_{C,s,Rk}$, $H_{1,s,Rk}$ and $H_{2,s,Rk}$.

Art. No.	Size (mm)	$F_{T,s,Rk}$ (kN)	$F_{C,s,Rk}$ (kN)	$H_{1,s,Rk}$ (kN)	$H_{2,s,Rk}$ (kN)
J-CSD-71	71x150x60x5,0	6,2	30,5	17,2	1,26
J-CSD-81	81x150x60x5,0	4,9	30,5	17,2	1,26
J-CSD-91	91x150x60x5,0	4,0	30,5	17,2	1,26
J-CSD-101	101x150x60x5,0	3,4	30,5	17,2	1,26
J-CSD-121	121x150x60x5,0	2,6	30,5	17,2	1,26

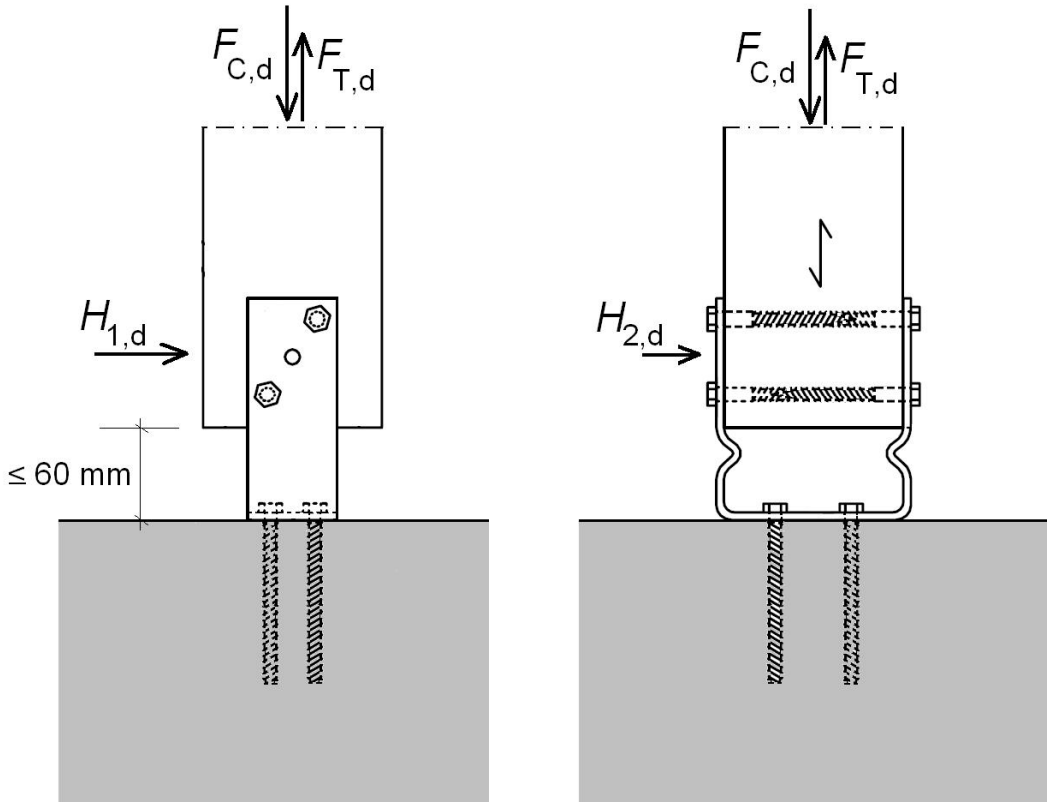


Figure A2.6 Use of Column Shoe type L and the definition of forces.

7 Load-carrying capacity of Heavy Supporting Shoe connection

The Heavy Supporting Shoe is used as a timber column connector fixed to the timber member by lag screws or bolts and to the concrete basement by anchor bolts and subjected to the vertical and horizontal forces presented in Figure A.2.7. At least two anchor bolts should be used symmetrically in the attachment to the concrete. The timber end should be contact with the bottom plate of the connector.

The following design conditions shall be fulfilled for the Heavy Supporting Shoe connections:

$$F_{T,d} \leq \min(F_{T,s,Rd}; F_{T,v,Rd}; F_{T,c,Rd}) \quad (35)$$

$$F_{C,d} \leq F_{C,w,Rd} \quad (36)$$

$$H_{1,d} \leq \min(H_{1,s,Rd}; H_{1,v,Rd}; H_{c,Rd}) \quad (37)$$

$$H_{2,d} \leq \min(H_{2,s,Rd}; H_{c,Rd}) \quad (38)$$

and for the combination of forces the following conditions shall be satisfied

$$\left(\frac{F_{T,d}}{F_{T,v,Rd}}\right)^2 + \left(\frac{H_{1,d}}{H_{1,v,Rd}}\right)^2 \leq 1 \quad (39)$$

$$\frac{F_{T,d}}{F_{T,c,Rd}} + \frac{\sqrt{H_{1,d}^2 + H_{2,d}^2}}{H_{c,Rd}} \leq 1 \quad (40)$$

$$\left(\frac{H_{1,d}}{H_{1,s,Rd}}\right)^2+\left(\frac{H_{2,d}}{H_{2,s,Rd}}\right)^2\le 1 \qquad (41)$$

The characteristic values for the connector capacities $F_{T,s,Rk}$, $H_{1,s,Rk}$ and $H_{2,s,Rk}$ are presented in Table A2.6. The characteristic axial capacity of anchor bolts $F_{T,c,Rk}$ and for the lateral load-carrying capacity of anchor bolts $H_{c,Rk}$ are determined according to the ETA of the anchor bolts. The characteristic connection resistances $F_{T,v,Rk}$ and $H_{1,v,Rk}$ are calculated according to the expressions (17) and (18). The characteristic compression capacity of timber member $F_{C,w,Rk}$ should be calculated according to expression (16) using the values of contact area presented in Table A2.6.

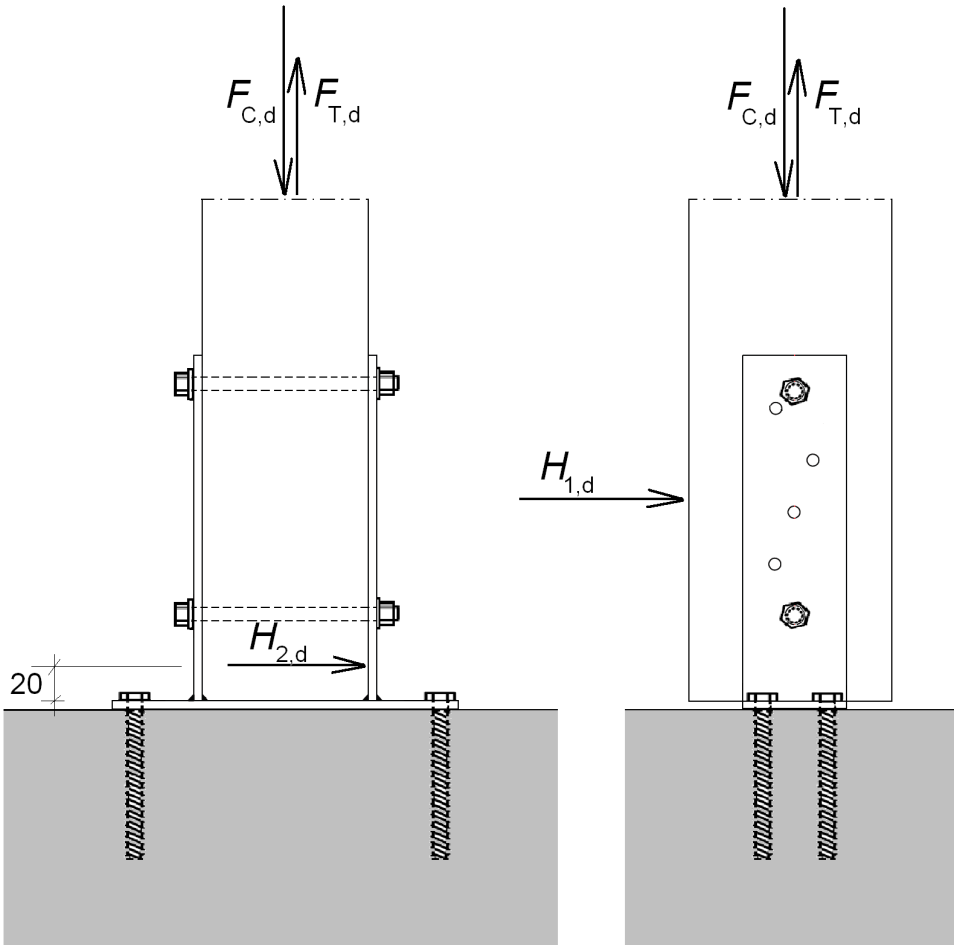


Figure A2.7 Use of Heavy Supporting Shoe and the definition of forces.

Table A2.6 Heavy Supporting Shoes - article numbers, nominal dimensions and characteristic capacities $F_{T,s,Rk}$, $H_{1,s,Rk}$ and $H_{2,s,Rk}$. A_c is the contact area between timber end and the connector.

Art. No.	Size (mm)	$F_{T,s,Rk}$ (kN)	$H_{1,s,Rk}$ (kN)	$H_{2,s,Rk}$ (kN)	A_c (mm^2)
J-SS-71	71x200x60x5,0	2,6	16,9	3,4	4260
J-SS-75	75x200x60x5,0	2,7	16,9	3,4	4500
J-SS-81	81x200x60x5,0	2,9	16,9	3,4	4860
J-SS-91	91x200x60x5,0	3,3	16,9	3,4	5460
J-SS-96	96x200x60x5,0	3,5	16,9	3,4	5760
J-SS-101	101x200x60x5,0	3,7	16,9	3,4	6060