

รายละเอียดคุณลักษณะเฉพาะ (Specification)  
สเปคอ้างอิง เลขที่ RHDW-011/2556

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สเปคอ้างอิงของ กฟภ.		กลุ่ม ปอ.กบญ.ฉ.2 พัสดุรอง 603/2564			
เลขที่	Item	รายการที่	รายการ	จำนวนซื้อ	หน่วย
RHDW-011/2556	81	15	รหัสพัสดุ 1020440112 เหล็กคอน เคเบิลอากาศทางโค้ง	3,188	อัน

**Invitation to Bid No. :**

**Specification No. : RHDW-011/2556**

**C Material, equipment, and specifications for OVERHEAD LINE HARDWARE**

**C1 General material and packing instructions**

Additional to the general instructions, the following shall be observed :

**1a Scope**

These specifications cover line hardware for overhead line construction.

**1b Standard**

The overhead line hardware shall be in accordance with the latest TIS, VDE Regulations, DIN, and PEA Drawings attached to these specifications, or equivalent.

**1c Principal requirement**

The overhead line hardware shall be marked with manufacturer's name or trademark, except full thread double arming bolts, full thread stubbing bolts, and washers.

All ferrous materials shall be galvanized after manufacturing. Method of galvanizing and thickness of coating shall be according to the attached Table "THICKNESS OF ZINC COATING". Free samples shall be supplied on request. The samples will not be returned.

**1d Packing**

Each item should be packed in suitable packages in sets or pieces of 10, 50, 100, or that specified in Table "Packing Details for Overhead Line Hardware" (see page 3 of 3).

The gross weight of each package should not exceed 40 kg.

If there are several packages, the number of package shall be stamped on each package or each tag, as follows :

package number / total number of packages.

**C2 Material and packing data to be given by bidder**

**2a** For each item offered, the following details shall be submitted with the bid :

Catalogue number.

Description of materials used for the component parts.

Surface finishing of the component parts.

Zinc coating in  $\text{g/m}^2$  or  $\mu\text{m}$  ( $1 \mu\text{m} = 0.001 \text{ mm}$ ).

Minimum breaking strength in kgf.

Weight in kg/set or piece.

**2b** For each item offered, a detail drawing with dimensions in mm shall be submitted with the bid.

**2c Packing details**

Packing method.

Number of sets or pieces in each package.

Dimensions of each package in cm.

Gross weight of each package in kg (should not exceed 40 kg).

Net weight of each package in kg.

Number of packages.

If several packages are contained in one big case, further details are required :

Number of packages in each case.

Dimensions of each case in cm.

Gross weight of each case in kg.

Number of cases.

Table

Packing Details for Overhead Line Hardware

PEA Material No.	Quantity Per Package	Packing Method
00120004, 01000103	18	Bundle
01200001, 01200002	20	Bundle
01010100, 01200004, 01200005	50	Bundle
01200007	150 (15 per layer)	Bundle
01110200, 01110201, 01140000, 01170001, 01180001	150	Sack
01110202, 01110203	100	Sack
01110204, 01110205, 01140001, 01140002	75	Sack
01110206, 01110207, 01110208, 01110401, 01120000, 01120001, 01120002, 01130000, 01130001, 01130002, 01140003	50	Sack
01180100, 01180201	500	Sack
01180301	5,000	Sack
02440102	30	Sack
02440103	60	Sack



# PROVINCIAL ELECTRICITY AUTHORITY

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### PACKING DETAIL

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### Addendum

This addendum is made to be a part of specifications it's attached.

1. Replace the packing detail only for the specific items in the specifications by the packing detail specified in **Table A1** below:

**Table A1: Packing Detail**

Item	Equipment	PEA's material No.	Packing method	Quantity per package/case	Number of packages/cases per pallet
<b>Connectors and cable accessories:</b>					
1	Hot line bail clamp (hot line stirrup clamp), for main aluminium conductor size 25 mm <sup>2</sup> to 50 mm <sup>2</sup>	1-02-033-0000	Sealed package	40	49
2	Hot line protected thread clamp for main aluminium conductor size 25 mm <sup>2</sup> to 50 mm <sup>2</sup>	1-02-033-0100	Sealed package	50	100
3	Hot line protected thread clamp for main aluminium conductor size 50 mm <sup>2</sup> to 120 mm <sup>2</sup>	1-02-033-0101	Sealed package	50	50
4	Compression splicing sleeve, full tension, for aluminium conductor size 50 mm <sup>2</sup>	1-02-040-0002	Suitable package	100	100
5	Compression splicing sleeve, full tension, for aluminium conductor size 95 mm <sup>2</sup>	1-02-040-0004	Suitable package	50	100
6	Compression splicing sleeve, full tension, for aluminium conductor size 185 mm <sup>2</sup>	1-02-040-0007	Suitable package	30	50
7	Compression splicing sleeve, full tension, for aluminium conductor size 400 mm <sup>2</sup>	1-02-040-0009	Suitable package	30	50
8	Compression splicing sleeve, partial tension, for aluminium conductor size 50 mm <sup>2</sup>	1-02-041-0002	Suitable package	100	100
9	Terminal connector (lug), compression type, for aluminium conductor size 185 mm <sup>2</sup>	1-02-041-0106	Suitable package	50	50
10	Pin terminal, for aluminium conductor size 50 mm <sup>2</sup>	1-02-042-0400	Suitable package	50	100
<b>Overhead line hardware:</b>					
11	Angle steel crossarm, size 150x100x12 mm, length 4,500 mm	1-00-012-0002	Bundle	10	-
12	Channel steel crossarm, size 100x50x5 mm, length 4,200 mm	1-01-000-0103	Bundle	20	-
13	Channel steel crossarm, size 100x50x5 mm, length 4,500 mm	1-01-000-0104	Bundle	20	-
14	Channel steel crossarm, size 150x75x6 mm, length 2,800 mm	1-01-000-0300	Bundle	20	-
15	Channel steel crossarm, size 150x75x6.5 mm, length 4,000 mm	1-01-000-0301	Bundle	20	-



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Item	Equipment	PEA's material No.	Packing method	Quantity per package/case	Number of packages/cases per pallet
16	Channel steel beam, size 150x75x6.5 mm, length 4,500 mm	1-01-000-0302	Bundle	20	-
17	Channel steel beam, size 150x75x6.5 mm, length 6,000 mm	1-01-000-0303	Bundle	20	-
18	Channel steel beam, size 150x75x6.5 mm, length 2,500 mm	1-01-000-0304	Bundle	20	-
19	Channel steel crossarm, size 150x75x9 mm, length 3,000 mm	1-00-012-0004	Bundle	20	-
20	Angle steel beam, size 65x65x6 mm, length 1,000 mm	1-01-001-0000	Bundle	100	-
21	Bolt, machine, M 16 x 170 mm	1-01-011-0201	Sack	100	56
22	Bolt, machine, M 16 x 300 mm	1-01-011-0204	Sack	80	56
23	Bolt, machine, M 16 x 350 mm	1-01-011-0205	Sack	80	56
24	Bolt, machine, M 16 x 450 mm	1-01-011-0207	Sack	40	56
25	Bolt, machine, M 16 x 500 mm	1-01-011-0208	Sack	40	50
26	Bolt, machine, M 16 x 600 mm	1-01-011-0209	Sack	40	50
27	Bolt, machine, hexagon head, M 16 x 75 mm	1-01-011-0400	Sack	200	56
28	Bolt, machine, hexagon head, M 16 x 550 mm	1-01-011-0401	Sack	40	50
29	Bolt, machine, hexagon head, M 16 x 600 mm	1-01-011-0402	Sack	40	50
30	Bolt, machine, hexagon head, M 16 x 650 mm	1-01-011-0403	Sack	30	50
31	Bolt, double arming, full thread, M 16 x 450 mm	1-01-012-0001	Sack	40	50
32	Bolt, double arming, full thread, M 16 x 500 mm	1-01-012-0002	Sack	40	50
33	Bolt, double arming, full thread, M 16 x 550 mm	1-01-012-0003	Sack	40	50
34	Bolt, double arming, full thread, M 16 x 600 mm	1-01-012-0004	Sack	40	50
35	Bolt, double arming, full thread, M 16 x 650 mm	1-01-012-0005	Sack	30	50
36	Bolt, double arming eye, M 16 x 450 mm	1-01-013-0001	Sack	40	56
37	Bolt, double arming eye, M 16 x 500 mm	1-01-013-0002	Sack	40	50
38	Bolt, double arming eye, M 16 x 650 mm	1-01-013-0005	Sack	30	50
39	Bolt, round eye, M 16 x 200 mm	1-01-014-0001	Sack	80	56
40	Bolt, round eye, M 16 x 250 mm	1-01-014-0002	Sack	80	56
41	Bolt, round eye, M 16 x 300 mm	1-01-014-0003	Sack	50	56
42	Bolt, oval eye, M 16 x 150 mm	1-01-015-0000	Sack	80	56
43	Bolt, oval eye, M 16 x 200 mm	1-01-015-0001	Sack	80	56
<b>Insulators and accessories:</b>					
44	Insulator, pin-post type, TIS 1251, Type 56/57-2	1-03-001-0101	Export package	2	30
45	Clevis-eye	1-03-014-0000	Suitable package	40	56
46	Ball-clevis, ANSI Type K	1-03-014-0001	Suitable package	30	56



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Item	Equipment	PEA's material No.	Packing method	Quantity per package/case	Number of packages/cases per pallet
47	Ball-hook, ANSI Type B	1-03-014-0002	Suitable package	40	56
48	Ball-clevis, ANSI Type B	1-03-014-0005	Suitable package	40	56
<b>Surge arresters:</b>					
49	LV surge arrester, 480 V, 5 kA	1-04-000-0300	Suitable package	100	5
<b>Meters:</b>					
50	Watt-hour meter, 15(45) A, 3-phase 4-wire	1-06-005-0107	Suitable corrugate-paper package	50	-
51	Watt-hour meter, 30(100) A, 3-phase 4-wire	1-06-005-0108	Suitable corrugate-paper package	50	-

2. Sacks used for packing equipment shall have enough durability and shall be made of hemp rope.
3. Bundle packing shall be using galvanized steel wires with diameter not less than 4 mm.
4. Pallets supplied to PEA shall have dimension not more than 1.1 m x 1.1 m (Width x Length) and the total height after containing the packages/cases shall be less than 1.5 m.

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C3 Schedule of detailed requirement

Item	PEA Material No.	Quantity	Description
1	01200001 (1010200001)		Brace, flat, for crossarm, of flat steel 30x6x760 mm, see Drawing No. K 31-09063.
2	01200002 (1010200002)		Ditto as Item 1, but 40x6x1,000 mm, see Drawing No. K 31-09063.
3	01200003 (1010200003)		Ditto as Item 1, but 50x10x1,950 mm, see Drawing No. SA2-015/39005.
4	01200004 (1010200004)		Brace, alley arm, of angle steel, 40x40x5 mm, 2,120 mm long, see Drawing No. K 31-09064.
5	01200005 (1010200005)		Ditto as Item 4, but 50x50x6 mm, 2,350 mm long, see Drawing No. K 31-09064.
6	01200007 (1010200007)		Brace, for crossarm, of hot-rolled equal angle steel, 50x50x6 mm, 1,800 mm wide, 450 mm drop, hot-dip galvanized not less than 50 micrometer, see Drawing No. SB1-015/22014.
7	01110000 (1010110000)		Bolt, machine, of mild steel, square head, similar to DIN 601, M 8, 25 mm long, length of thread 22 mm, complete with one (1) square nut, see Drawing No. 150-015/140367.
8	01110101 (1010110101)		Ditto as Item 7, but M 12, 50 mm long, length of thread 40 mm, see Drawing No. 150-015/140367.
9	01110200 (1010110200)		Ditto as Item 7, but M 16, 130 mm long, length of thread 35 mm, see Drawing No. K31-09072.
10	01110201 (1010110201)		Ditto as Item 7, but M 16, 170 mm long, length of thread 50 mm, see Drawing No. K31-09072.
11	01110202 (1010110202)		Ditto as Item 7, but M 16, 200 mm long, length of thread 50 mm, see Drawing No. K31-09072.



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Item	PEA Material No.	Quantity	Description
12	01110203 (1010110203)		Ditto as Item 7, but M 16, 250 mm long, length of thread 75 mm, see Drawing No. K31-09072.
13	01110204 (1010110204)		Ditto as Item 7, but M 16, 300 mm long, length of thread 75 mm, see Drawing No. K31-09072.
14	01110205 (1010110205)		Ditto as Item 7, but M 16, 350 mm long, length of thread 75 mm, see Drawing No. K31-09072.
15	01110206 (1010110206)		Ditto as Item 7, but M 16, 400 mm long, length of thread 100 mm, see Drawing No. K31-09072.
16	01110207 (1010110207)		Ditto as Item 7, but M 16, 450 mm long, length of thread 100 mm, see Drawing No. K31-09072.
17	01110208 (1010110208)		Ditto as Item 7, but M 16, 500 mm long, length of thread 150 mm, see Drawing No. K31-09072.
18	01110209 (1010110209)		Ditto as Item 7, but M 16, 600 mm long, length of thread 200 mm.
19	01110300 (1010110300)		Ditto as Item 7, but M 20, 350 mm long, length of thread 100 mm.
20	01110301 (1010110301)		Ditto as Item 7, but M 20, 400 mm long, length of thread 100 mm, see Drawing No. SB1-015/22017.
21	01110302 (1010110302)		Ditto as Item 7, but M 20, 450 mm long, length of thread 100 mm, see Drawing No. SB1-015/22017.
22	01110303 (1010110303)		Ditto as Item 7, but M 20, 550 mm long, length of thread 150 mm, see Drawing No. SB1-015/22017.
23	01110400 (1010110400)		Bolt, machine, of mild steel, hexagon head, similar to DIN 601. M 16, 75 mm long, length of thread 75 mm: complete with one (1) hexagon nut, one (1) lock nut, and two (2) round washers, similar to DIN 555, DIN 936, and DIN 126 respectively; see Drawing No. SA2-015/39019.

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Item	PEA Material No.	Quantity	Description
24	01110401 (1010110401)		Bolt, machine, of mild steel, hexagon head, similar to DIN 601, M 16, 550 mm long, length of thread 150 mm; complete with one (1) hexagon nut, one (1) lock nut, and two (2) round washers, similar to DIN 555, DIN 936, and DIN 126 respectively; see Drawing No. S 01-015/18035 .
25	01110402 (1010110402)		Ditto as Item 24, but M 16, 600 mm long, length of thread 150 mm, see Drawing No. S01-015/18035 .
26	01110403 (1010110403)		Ditto as Item 24, but M 16, 650 mm long, length of thread 150 mm, see Drawing No. SA2-015/39019 .
27	01120000 (1010120000)		Bolt, double arming, full thread, of mild steel, M 16, 400 mm long, complete with four (4) square nuts, see Drawing No. K31-09069
28	01120001 (1010120001)		Ditto as Item 27, but M 16, 450 mm long, see Drawing No. K31-09069.
29	01120002 (1010120002)		Ditto as Item 27, but M 16, 500 mm long, see Drawing No. K31-09069.
30	01120003 (1010120003)		Ditto as Item 27, but M 16, 550 mm long.
31	01120004 (1010120004)		Ditto as Item 27, but M 16, 600 mm long, see Drawing No. K31-09069.
32	01120005 (1010120005)		Ditto as Item 27, but M 16, 650 mm long.
33	01130000 (1010130000)		Bolt, double arming eye, of mild steel, forged round eye having 22 mm diameter hole, M 16, 400 mm long, length of thread 350 mm; complete with three (3) square nuts, minimum breaking strength not less than 5,000 kgf; see Drawing No. S 01-015/17007 .
34	01130001 (1010130001)		Ditto as Item 33, but M 16, 450 mm long, length of thread 400 mm, see Drawing No. S 01-015/17007.

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Item	PEA Material No.	Quantity	Description
35	01130002 (1010130002)		Ditto as Item 33, but M 16. 500 mm long, length of thread 450 mm, see Drawing No. S 01-015/17007.
36	01130003 (1010130003)		Ditto as Item 33, but M 16. 600 mm long, length of thread 550 mm, see Drawing No. S 01-015/17007.
37	01130004 (1010130004)		Ditto as Item 33, but M 16. 550 mm long, length of thread 500 mm, see Drawing No. S 01-015/17007.
38	01130005 (1010130005)		Ditto as Item 33, but M 16. 650 mm long, length of thread 600 mm, see Drawing No. S 01-015/17007.
39	01140000 (1010140000)		Bolt, round eye, of mild steel, forged round eye having 22 mm diameter hole, M 16, 100 mm long, length of thread 75 mm; complete with two (2) square nuts, minimum breaking strength not less than 5,000 kgf, see Drawing No. S 01-015/19041.
40	(1010140004)		Ditto as Item 39, but M 16. 150 mm long, length of thread 100 mm, see Drawing No. SA2-015/39018 .
41	01140001 (1010140001)		Ditto as Item 39, but M 16, 200 mm long, length of thread 150 mm, see Drawing No. S 01-015/19041 .
42	01140002 (1010140002)		Ditto as Item 39, but M 16, 250 mm long, length of thread 200 mm, see Drawing No. S 01-015/19041 .
43	01140003 (1010140003)		Ditto as Item 39, but M 16, 300 mm long, length of thread 250 mm, see Drawing No. S 01-015/19041 .



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Item	PEA Material No.	Quantity	Description
44	01150000 <u>(1010150000)</u>		Bolt, oval eye, forged steel, M 16, 150 mm long, length of thread 100 mm, complete with one (1) square nut, minimum breaking strength not less than 6,500 kgf, see Drawing No. SBI-015/22018.
45	01150001 <u>(1010150001)</u>		Ditto as Item 44, but M 16, 200 mm long, length of thread 150 mm, see Drawing No. SBI-015/22018.
46	01150002 <u>(1010150002)</u>		Ditto as Item 44, but M 16, 350 mm long, length of thread 150 mm, see Drawing No. SBI-015/22018.
47	01150100 <u>(1010150100)</u>		Ditto as Item 44, but M 20, 350 mm long, length of thread 150 mm, minimum breaking strength not less than 12,000 kgf, see Drawing No. SBI-015/22019.
48	01150101 <u>(1010150101)</u>		Ditto as Item 44, but M 20, 450 mm long, length of thread 200 mm, minimum breaking strength not less than 12,000 kgf, see Drawing No. SBI-015/22019.
49	01160000 <u>(1010160000)</u>		Bolt, stubbing, full thread, of mild steel, M 24, 600 mm long, complete with four (4) square nuts and two (2) flat washers 72x72x6 mm, 26 mm diameter hole.
50	01160001 <u>(1010160001)</u>		Ditto as Item 49, but M 24, 800 mm long.
51	01160002 <u>(1010160002)</u>		Ditto as Item 49, but M 24, 1,000 mm long.
52	01160003 <u>(1010160003)</u>		Ditto as Item 49, but M 24, 1,250 mm long.
53	01160004 <u>(1010160004)</u>		Ditto as Item 49, but M 24, 1,600 mm long.
54	01180001 <u>(1010180001)</u>		Nut, eye, of mild steel, similar to DIN 582, forged eye 35 mm in diameter, thread for bolt M 16, minimum breaking strength not less than 5,000 kgf, see Drawing No. S 01-015/16004.
55	01180002 <u>(1010180002)</u>		Eyelet, according to NEMA standards or equivalent, minimum breaking strength not less than 8,320 kgf, see Drawing No. SBI-015/22028.

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Item	PEA Material No.	Quantity	Description
56	01180003 (1010180003)		Nut, eye, thimble, forged steel, thread for bolt M 16, minimum breaking strength not less than 6,500 kgf, see Drawing No. SBI-015/22029.
57	01180004 (1010180004)		Ditto as Item 56, but thread for bolt M 20, minimum breaking strength not less than 8,200 kgf, see Drawing No. SBI-015/22029.
58	01180100 (1010180100)		Washer, square, flat, of steel, according to Table 6 of TIS 258, nominal size 16 ( $18 \begin{smallmatrix} +0.7 \\ 0 \end{smallmatrix}$ mm diameter hole), 52x52x4.5 mm.
59	01180101 (1010180101)		Ditto as Item 58, but nominal size 20 ( $22 \begin{smallmatrix} +0.8 \\ 0 \end{smallmatrix}$ mm diameter hole), 62 x 62 x 6 mm.
60	01180102 (1010180102)		Ditto as Item 58, but nominal size 24 ( $26 \begin{smallmatrix} +0.8 \\ 0 \end{smallmatrix}$ mm diameter hole), 72 x 72 x 6 mm.
61	01180103 (1010180103)		Ditto as Item 58, but nominal size 12 ( $14 \begin{smallmatrix} +0.7 \\ 0 \end{smallmatrix}$ mm diameter hole), 40 x 40 x 3.2 mm.
62	01180200 (1010180200)		Washer, square, curved, of mild steel, dimensions 50x50x5 mm, 18 mm diameter hole, see Drawing No. K 31-09073.
63	01180201 (1010180201)		Ditto as Item 62, but dimensions 60 x 60 x 5 mm, 22 mm diameter hole, see Drawing No. K31-09073.
64	01180300 (1010180300)		Washer, lock, of spring steel, according to Table 1 of TIS 259, nominal size 12 ( $12.2 \begin{smallmatrix} +0.6 \\ 0 \end{smallmatrix}$ mm diameter hole), 21.5 mm maximum outside diameter, 3.0 mm minimum thick.
65	01180301 (1010180301)		Ditto as Item 64, but nominal size 16 ( $16.2 \begin{smallmatrix} +0.8 \\ 0 \end{smallmatrix}$ mm diameter hole), 28.0 mm maximum outside diameter, 4.0 mm minimum thick.

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Item	PEA Material No.	Quantity	Description
66	01180302 <u>C1010180302</u>		Ditto as Item 64, but nominal size 20 ( $20.2 \begin{smallmatrix} +0.8 \\ 0 \end{smallmatrix}$ mm diameter hole), 33.8 mm. maximum outside diameter, 5.1 mm minimum thick.
67	01180303 <u>C1010180303</u>		Ditto as Item 64, but nominal size 24 ( $24.5 \begin{smallmatrix} +1.0 \\ 0 \end{smallmatrix}$ mm diameter hole), 40.3 mm. maximum outside diameter, 5.9 mm minimum thick.
68	01050000 <u>C1010050000</u>		Pipe, steel, nominal size 20 ( $26.9 \pm 0.4$ mm outside diameter), wall thickness not less than 2.27 mm, 100 mm long, without thread on both ends, hot-dip galvanized not less than 65 $\mu$ m ; or pipe from galvanized steel pipe, Type 2, in accordance with TIS 277 shall be accepted.
69	01050002 <u>C1010050002</u>		Ditto as Item 68, but 150 mm long.
70	01000100 <u>C1010000100</u>		Alley arm, of channel steel, 100x50x5 mm, 2,250 mm long, see Drawing No. SB1-015/31004.
71	00120004 <u>C1000120004</u>		Crossarm, of channel steel, 150x75x9 mm, 3,000 mm long, see Drawing No. SA2-015/39005.
72	01000400 <u>C1010000400</u>		Channel steel beam, according to Table 4 of TIS 1227, with : Nominal size : 200 x 80 x 7.5 mm Length : 1,000 mm Punched holes/slots, and fabricated as shown in Drawing No. SA2-015/23010.
73	01010000 <u>C1010010000</u>		Angle steel beam, according to Table 2 of TIS 1227, with : Nominal size : 65x65x6 mm Length : 1,000 mm Punched holes/slots, and fabricated as shown in Drawing No. SA2-015/23009.



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Item	PEA Material No.	Quantity	Description
74	01030102 (1010030102)		Plate, steel double arming, 12x100 mm, 760 mm long. see Drawing No. SA2-015/28002.
75	03140011 (1030140011)		Thimble clevis, pressed steel, minimum breaking strength not less than 900 kgf, see Drawing No. S01-015/19058.
76	03140013 (1030140013)		Plate spacer, of mild steel, minimum ultimate strength not less than 16,500 kgf, see Drawing No. SB1-015/22042.
77	01030002 (1010030002)		Plate, steel, 6x100 mm, 450 mm long. see Drawing No. SB1-015/22015.
78	01030100 (1010030100)		Plate, steel, double arming, 12x100 mm, 650 mm long, see Drawing No. SB1-015/22016.
79	02440102 (1020440102)		Clamp, guy, triple bolt, suitable for steel stranded wire 50-95 mm <sup>2</sup> , see Drawing No. SA2-015/23024.
80	02440103 (1020440103)		Link for cable spacer, 9.0 mm diameter steel round bar, see Drawing No. SA2-015/23024.
81	02440112 (1020440112)		Bracket, of channel steel, 100x50x5 mm, for aerial cable corner support, see Drawing No. SA2-015/56006 .
82	01000106 (1010000106)		Crossarm, of channel steel, according to Table 4 of TIS 1227, with : Nominal size : 100 x 50 x 5 mm Length : 2,500 mm Punched holes, and fabricated as shown in Drawing No. SA2-015/39025.

Invitation to Bid No. :

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C3 Schedule of detailed requirement

Item	PEA Material No.	Quantity	Description
83	01000201 (010000201)		Ditto as Item 82, but Nominal size : 125 x 65 x 6 mm Length : 3,000 mm Punched holes, and fabricated as shown in Drawing No. SA4-015/39025.
84	01110404 (0101010404)		Bolt, machine, of mild steel, hexagon head, similar to DIN 601, M 16, 50 mm long, length of thread 40 mm ; complete with one (1) hexagon nut, and two (2) round washers, similar to DIN 555, and DIN 126 respectively; see Drawing No. SA2-015/40001.
85	02200106 (020200106)		Vibration damper, dumbbells type (stockbridge), for overhead ground wire diameter range 9.0 - 10.0 mm (Steel stranded wire 50 mm <sup>2</sup> ), approximate total weight 1.6 kg (3.5 pounds).
86	02200107 (020200107)		Vibration damper, dumbbells type (stockbridge), for conductor diameter range 27.0 - 29.0 mm (ACSR conductor 380/50 mm <sup>2</sup> ), approximate total weight 7.3 kg (16 pounds).
			<p><b>Note :</b></p> <ol style="list-style-type: none"> <li>1. Pitches of steel bolts and nuts shall be according to the attached "Nominal Thread Diameters and Pitches of Steel Bolts and Nuts".</li> <li>2. Dimensions and tolerances of M 16 machine bolts shall be as specified in the attached "Dimensions and Tolerances of M 16 Machine Bolts".</li> <li>3. ONLY threads of steel bolt and nut shall meet acceptance tests specified in the attached "Acceptance Tests for Threads of Steel Bolt, Anchor Rod, and Nut".</li> </ol>



Invitation to Bid No.

Specification No.: RHDW-011/2556

C4 Price schedule

Manufacturer :

Trade-mark :

Country of Origin:

Bidder :

Bid No. :

Date :

Item	PEA Material No.	Catalogue No.	Description	Quantity	Unit Cost (See details & conditions attached)	Total Cost (See details & conditions attached)
1	01200001 C1010200001		Brace, flat, for crossarm, of flat steel 30x6x760 mm.			
2	01200002 C1010200002		Ditto as Item 1, but 40x6x1,000 mm.			
3	01200003 C1010200003		Ditto as Item 1, but 50x10x1,950 mm.			
4	01200004 C1010200004		Brace, alloy arm, of angle steel, 40x40x5 mm, 2,120 mm long.			
5	01200005 C1010200005		Ditto as Item 4, but 50x50x6 mm, 2,350 mm long.			
6	01200007 C1010200007		Brace, for crossarm, of hot-rolled equal angle steel, 50x50x6 mm, 1,800 mm wide, 450 mm drop, hot-dip galvanized not less than 50 micrometer, see Drawing No. SB1-015/22014			
7	01110000 C1010110000		Bolt, machine, M 8x 25 mm, complete with one (1) square nut.			
8	01110101 C1010110101		Ditto as Item 7, but M 12x 50 mm			
9	01110200 C1010110200		Ditto as Item 7, but M 16x130 mm			

Invitation to Bid No.

Specification No. : RHDW-011/2556

C4 Price schedule

Manufacturer :

Trade-mark :

Country of Origin:

Bidder :

Bid No. :

Date :

Item	PEA Material No.	Catalogue No.	Description	Quantity	Unit Cost (See details & conditions attached)	Total Cost (See details & conditions attached)
10	01110201 <u>C1010110201</u>		Ditto as Item 7, but M 16x170 mm			
11	01110202 <u>C1010110202</u>		Ditto as Item 7, but M 16x200 mm			
12	01110203 <u>C1010110203</u>		Ditto as Item 7, but M 16x250 mm			
13	01110204 <u>C1010110204</u>		Ditto as Item 7, but M 16x300 mm			
14	01110205 <u>C1010110205</u>		Ditto as Item 7, but M 16x350 mm			
15	01110206 <u>C1010110206</u>		Ditto as Item 7, but M 16x400 mm			
16	01110207 <u>C1010110207</u>		Ditto as Item 7, but M 16x450 mm			
17	01110208 <u>C1010110208</u>		Ditto as Item 7, but M 16x500 mm			
18	01110209 <u>C1010110209</u>		Ditto as Item 7, but M 16x600 mm			
19	01110300 <u>C1010110300</u>		Ditto as Item 7, but M 20x350 mm			
20	01110301 <u>C1010110301</u>		Ditto as Item 7, but M 20x400 mm			

Invitation to Bid No.

Specification No.: RHDW-011/2556

C4 Price schedule

Manufacturer :

Trade-mark :

Country of Origin :

Bidder :

Bid No. :

Date :

Item	PEA Material No.	Catalogue No.	Description	Quantity	Unit Cost (See details & conditions attached)	Total Cost (See details & conditions attached)
21	01110302 <del>C1010110302</del>		Ditto as Item 7, but M 20x450 mm .			
22	01110303 <del>C1010110303</del>		Ditto as Item 7, but M 20x550 mm .			
23	01110400 <del>C1010110400</del>		Bolt, machine, hexagon head, M 16x75 mm; complete with one (1) hexagon nut, one (1) lock nut, and two (2) round washers .			
24	01110401 <del>C1010110401</del>		Bolt, machine, hexagon head, M 16x550 mm; complete with one (1) hexagon nut, one (1) lock nut, and two (2) round washers .			
25	01110402 <del>C1010110402</del>		Ditto as Item 24, but M 16x600 mm .			
26	01110403 <del>C1010110403</del>		Ditto as Item 24, but M 16x650 mm .			
27	01120000 <del>C1010120000</del>		Bolt, double arming, M 16x400 mm, complete with four (4) square nuts.			
28	01120001 <del>C1010120001</del>		Ditto as Item 27, but M 16x450 mm .			
29	01120002 <del>C1010120002</del>		Ditto as Item 27, but M 16x500 mm .			
30	01120003 <del>C1010120003</del>		Ditto as Item 27, but M 16x550 mm .			

Invitation to Bid No.

Specification No.: RHDW-011/2556

C4 Price schedule

Manufacturer :

Trade-mark :

Country of Origin:

Bidder :

Bid No. :

Date :

Item	PEA Material No.	Catalogue No.	Description	Quantity	Unit Cost (See details & conditions attached)	Total Cost (See details & conditions attached)
31	01120004 <u>C1010120004)</u>		Ditto as Item 27, but M 16x600 mm.			
32	01120005 <u>C1010120005)</u>		Ditto as Item 27, but M 16x650 mm.			
33	01130000 <u>C1010130000)</u>		Bolt, double arming forged round eye, 16x400 mm, complete with three (3) square nuts, minimum breaking strength .....			
			kgf.			
34	01130001 <u>C1010130001)</u>		Ditto as Item 33, but M 16x450 mm, minimum breaking strength .....			
			kgf.			
35	01130002 <u>C1010130002)</u>		Ditto as Item 33, but M 16x500 mm, minimum breaking strength .....			
			kgf.			
36	01130003 <u>C1010130003)</u>		Ditto as Item 33, but M 16x600 mm, minimum breaking strength .....			
			kgf.			



Invitation to Bid No.

Specification No.: RHDW-011/2556

C4 Price schedule

Manufacturer :

Trade-mark :

Country of Origin:

Bidder :

Bid No. :

Date :

Item	PEA Material No.	Catalogue No.	Description	Quantity	Unit Cost (See details & conditions attached)	Total Cost (See details & conditions attached)
37	01130004 <u>C1010130004</u>		Ditto as Item 33, but M 16x550 mm, minimum breaking strength ..... kgf.			
38	01130005 <u>C1010130005</u>		Ditto as Item 33, but M 16x650 mm, minimum breaking strength ..... kgf.			
39	01140000 <u>C1010140000</u>		Bolt, forged round eye, M 16x100 mm, complete with two (2) square nuts, minimum breaking strength ..... kgf.			
40	<u>C1010140001</u>		Ditto as Item 39, but M 16x150 mm, minimum breaking strength ..... kgf.			
41	01140001 <u>C1010140001</u>		Ditto as Item 39, but M 16x200 mm, minimum breaking strength ..... kgf.			
42	01140002 <u>C1010140002</u>		Ditto as Item 39, but M 16x250 mm, minimum breaking strength ..... kgf.			

Invitation to Bid No.

Manufacturer :

Specification No. : RHDW-011/2556

Trade-mark :

Country of Origin :

C4 Price schedule

Bidder :

Bid No. :

Date :

Item	PEA Material No.	Catalogue No.	Description	Quantity	Unit Cost (See details & conditions attached)	Total Cost (See details & conditions attached)
43	01140003 <del>C1010140003</del>		Ditto as Item 39, but M 16x300 mm, minimum breaking strength ..... kgf.			
44	01150000 <del>C1010150000</del>		Bolt, oval eye, M 16x150 mm, complete with one (1) square nut, minimum breaking strength ..... kgf.			
45	01150001 <del>C1010150001</del>		Ditto as Item 44, but M 16x200 mm, minimum breaking strength ..... kgf.			
46	01150002 <del>C1010150002</del>		Ditto as Item 44, but M 16x350 mm, minimum breaking strength ..... kgf.			
47	01150100 <del>C1010150100</del>		Ditto as Item 44, but M 20x350 mm, minimum breaking strength ..... kgf.			
48	01150101 <del>C1010150101</del>		Ditto as Item 44, but M 20x450 mm, minimum breaking strength ..... kgf.			
49	01160000 <del>C1010160000</del>		Bolt, stubbing, full thread, M 24x600 mm, complete with four (4) square nuts and two (2) flat washers.			

Invitation to Bid No.

Specification No.: RHDW-011/2556

C-4 Price schedule

Manufacturer :

Trade-mark :

Country of Origin:

Bidder :

Bid No. :

Date :

Item	PEA Material No.	Catalogue No.	Description	Quantity	Unit Cost (See details & conditions attached)	Total Cost (See details & conditions attached)
50	01160001 <u>C1010160001</u>		Ditto as Item 49, but M 24x800 mm.			
51	01160002 <u>C1010160002</u>		Ditto as item 49, but M 24x1,000 mm.			
52	01160003 <u>C1010160003</u>		Ditto as Item 49, but M 24x1,250 mm.			
53	01160004 <u>C1010160004</u>		Ditto as Item 49, but M 24x1,600 mm.			
54	01180001 <u>C1010180001</u>		Nut, forged eye M 16, minimum breaking strength .....			
55	01180002 <u>C1010180002</u>		Eyelet, minimum breaking strength .....			
56	01180003 <u>C1010180003</u>		Nut, eye, thimble, minimum breaking strength .....			
57	01180004 <u>C1010180004</u>		Ditto as Item 56, minimum breaking strength .....			
58	01180100 <u>C1010180100</u>		Washer, square, flat, nominal size 16.			
59	01180101 <u>C1010180101</u>		Ditto as Item 58, but nominal size 20.			
60	01180102 <u>C1010180102</u>		Ditto as Item 58, but nominal size 24.			
61	01180103 <u>C1010180103</u>		Ditto as Item 58, but nominal size 12.			

Invitation to Bid No.

Specification No.: RHDW-011/2556

C4 Price schedule

Manufacturer:

Trade-mark:

Country of Origin:

Bidder:

Bid No.:

Date:

Item	PEA Material No.	Catalogue No.	Description	Quantity	Unit Cost (See details & conditions attached)	Total Cost (See details & conditions attached)
62	01180200 <del>C1010190200</del>		Washer, square, curved 50x50x5 mm, 18 mm diameter hole.			
63	01180201 <del>C1010190201</del>		Ditto as Item 62, but 60x60x5 mm, 22 mm diameter hole.			
64	01180300 <del>C1010190300</del>		Washer, lock, nominal size 12.			
65	01180301 <del>C1010190301</del>		Ditto as Item 64, but nominal size 16.			
66	01180302 <del>C1010190302</del>		Ditto as Item 64, but nominal size 20.			
67	01180303 <del>C1010190303</del>		Ditto as Item 64, but nominal size 24.			
68	01050000 <del>C1010050000</del>		Pipe, steel, nominal size 20, 100 mm long.			
69	01050002 <del>C1010050002</del>		Ditto as Item 68, but 150 mm long.			
70	01000100 <del>C1010000100</del>		Alley arm, of channel steel, 100x50x5 mm, 2,250 mm long.			
71	00120004 <del>C1000120004</del>		Crossarm, of channel steel, 150x75x9 mm, 3,000 mm long.			
72	01000400 <del>C1010000400</del>		Channel steel beam, nominal size 200x80x7.5 mm, 1,000 mm long.			
73	01010000 <del>C10100010000</del>		Angle steel beam, nominal size 65x65x6 mm, 1,600 mm long.			
74	01030102 <del>C10100030102</del>		Plate, steel, double arming, 12x100 mm, 760 mm long.			



Invitation to Bid No.  
 Specification No.: RHDW-011/2556  
 C4 Price schedule

Manufacturer  
 Trade-mark:  
 Country of Origin:  
 Bidder:  
 Bid No. :  
 Date :

Item	PEA Material No.	Catalogue No.	Description	Quantity	Unit Cost (See details & conditions attached)	Total Cost (See details & conditions attached)
75	03140011 <u>C103010011</u>		Thimble clevis, pressed steel, minimum breaking strength ..... kgf.			
76	03140013 <u>C103010013</u>		Plate spacer, of mild steel, minimum breaking strength ..... kgf.			
77	01030002 <u>C1010030002</u>		Plate, steel, 6x100 mm, 450 mm long.			
78	01030100 <u>C1010030100</u>		Plate, steel, double arming, 12x100 mm, 650 mm long.			
79	02440102 <u>C102040102</u>		Clamp, guy, triple bolt, suitable for steel stranded wire 50-95 mm <sup>2</sup>			
80	02440103 <u>C102040103</u>		Link for cable spacer, 9.0 mm diameter steel round bar			
81	02440112 <u>C102040112</u>		Bracket, of channel steel, 100x50x5 mm, for aerial cable corner support.			
82	01000106 <u>C101000106</u>		Crossarm, of channel steel, nominal size 100 x 50 x 5 mm, 2,500 mm long.			
83	01000201 <u>C101000201</u>		Crossarm, of channel steel, nominal size 125 x 65 x 6 mm, 3,000 mm long.			
84	01110404 <u>C1010110404</u>		Bolt, machine, hexagon head, M 16 x 50 mm; complete with one (1) hexagon nut, and two (2) round washers.			

Invitation to Bid No.  
 Specification No. : RHDW-011/2556  
 C4 Price schedule

Manufacturer :  
 Trade-mark :  
 Country of Origin:  
 Bidder :  
 Bid No. :  
 Date :

Item	PEA Material No.	Catalogue No.	Description	Quantity	Unit Cost (See details & conditions attached)	Total Cost (See details & conditions attached)
85	02200106 <u>C1020200106</u>		Vibration damper, dumbbells type (stockbridge), for overhead ground wire diameter range 9.0 - 10.0 mm (Steel stranded wire 50 mm <sup>2</sup> ), approximate total weight 1.6 kg ( 3.5 pounds ).			
86	02200107 <u>C1020200107</u>		Vibration damper, dumbbells type (stockbridge), for conductor diameter range 27.0 - 29.0 mm (ACSR conductor 380/50 mm <sup>2</sup> ), approximate total weight 7.3 kg ( 16 pounds ).			

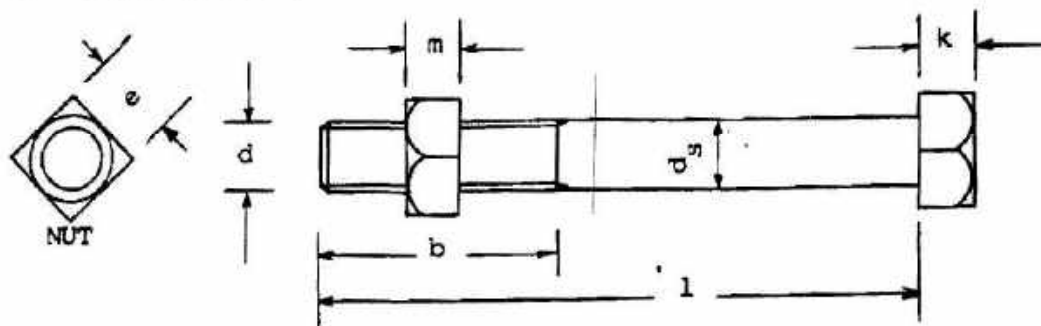
**TABLE THICKNESS OF ZINC COATING**

STEEL CATEGORY/MATERIAL	STEEL THICKNESS RANGE (mm)	MINIMUM AVERAGE COATING THICKNESS (µm)
<b>EASTENERS :</b> - BOLT, PIN, NUT, LOCK NUT : - UP TO M 10 - OVER M 10 - WASHER, LOCKWASHER	- - < 4.76 4.76 - 6.35	43 53 43 53
- ANCHOR ROD	-	80
<b>CASTINGS :</b> - SOCKET EYE, SOCKET CLEVIS, STRAIN CLAMP, etc.,	-	86
<b>FORGED ARTICLES :</b> - BALL HOOK, Y CLEVIS BALL, BALL CLEVIS, BALL EYE, CLEVIS EYE, ANCHOR SHACKLES, etc.,	-	56
<b>STRUCTURAL SHAPE :</b> - STEEL CHANNEL, STEEL ANGLE, CROSSARM STEEL, BAYONET, GROUND ROD, etc.,	< 1.6 < 3.2 3.2 - 6.4 > 6.4	45 65 85 100
<b>STRIP :</b> - BRACE, GUY THIMBLE, GUY GUARD, RACK, CLEVIS, STEEL BRACKET, PLATE STEEL, SPACER PLATE, etc.,	< 1.6 < 3.2 < 4.8 4.8 - 6.4 > 6.4	45 65 75 85 100
<b>PIPE :</b>	≥ 3.2	75

NOTE : THICKNESS OF COATING OF SPECIMENS SHALL BE MEASURED WITH A MAGNETIC MEASURING INSTRUMENT "MICROTTEST" OR "ELECTROMAGNETIC COATING THICKNESS GAUGE"

Dimensions and Tolerances of M 16 machine bolts

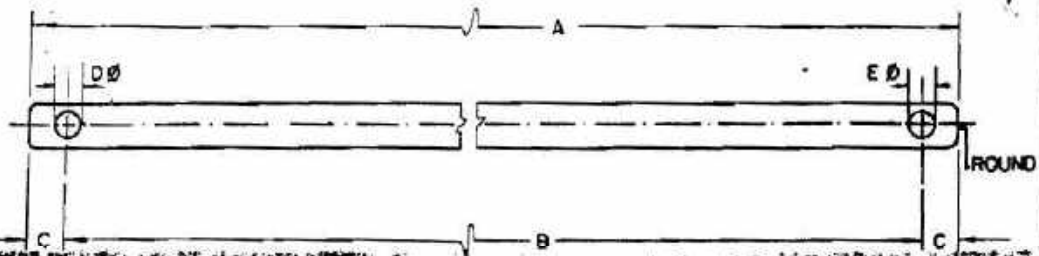
M 16 machine bolts shall have dimensions and tolerances as specified in the table below :



PEA Mat.No.	Machine Bolt Size	Dimensions in mm (Tolerances in mm)					
		$d_s$	$l$	$b$	$k$	$e$	$m$
01110200	M 16x130	16 (+ 0.95) (- 0.70)	130 (+ 5) (- 0)	35 (+ 6) (- 0)	10.5 (+2.0) (-0.9)	26 or 24 (+ 0) (- 0.8)	13 (± 0.9)
01110201	M 16x170	16 (+ 0.95) (- 0.70)	170 (+ 3) (- 2)	50 (+ 6) (- 0)	10.5 (+2.0) (-0.9)	26 or 24 (+ 0) (- 0.8)	13 (± 0.9)
01110202	M 16x200	16 (+ 0.95) (- 0.70)	200 (+ 3) (- 2.3)	50 (+ 6) (- 0)	10.5 (+2.0) (-0.9)	26 or 24 (+ 0) (- 0.8)	13 (± 0.9)
01110203	M 16x250	16 (+ 0.95) (- 0.70)	250 (+ 5) (- 2.3)	75 (+ 8) (- 0)	10.5 (+2.0) (-0.9)	26 or 24 (+ 0) (- 0.8)	13 (± 0.9)
01110204	M 16x300	16 (+ 0.95) (- 0.70)	300 (+ 5) (- 2.6)	75 (+ 8) (- 0)	10.5 (+2.0) (-0.9)	26 or 24 (+ 0) (- 0.8)	13 (± 0.9)
01110205	M 16x350	16 (+ 0.95) (- 0.70)	350 (+ 5) (- 2.85)	75 (+ 8) (- 0)	10.5 (+2.0) (-0.9)	26 or 24 (+ 0) (- 0.8)	13 (± 0.9)
01110206	M 16x400	16 (+ 0.95) (- 0.70)	400 (+ 5) (- 2.85)	100 (+ 8) (- 0)	10.5 (+2.0) (-0.9)	26 or 24 (+ 0) (- 0.8)	13 (± 0.9)
01110207	M 16x450	16 (+ 0.95) (- 0.70)	450 (+ 7) (- 3.15)	100 (+ 8) (- 0)	10.5 (+2.0) (-0.9)	26 or 24 (+ 0) (- 0.8)	13 (± 0.9)
01110208	M 16x500	16 (+ 0.95) (- 0.70)	500 (+ 7) (- 3.15)	150 (+ 8) (- 0)	10.5 (+2.0) (-0.9)	26 or 24 (+ 0) (- 0.8)	13 (± 0.9)

Note : Thread length ( $b$ ) is measured from the end of the bolt to the last thread of nut entering.

# PRELIMINARY

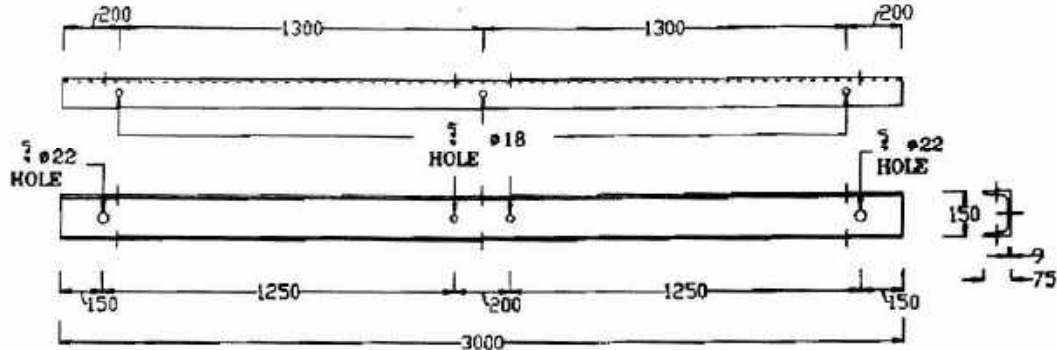


วัสดุ MAT. NO.	ขนาด DIMENSIONS IN MM.					วัสดุ, หมายเหตุ MATERIAL, SURFACE FINISHING, REMARKS
	A	B	C	D <sup>Ø</sup>	E <sup>Ø</sup>	
01200001	760	707	265	18	18	เหล็กแผ่น 30x6 เหล็กแผ่น FLAT IRON 30x6, MILD STEEL HOT GALV.
01200002	1000	950	25	18	18	เหล็กแผ่น 40x6 เหล็กแผ่น FLAT IRON 40x6, MILD STEEL HOT GALV.

<b>GERMAN ADVISORY TEAM</b>		<b>PROVINCIAL ELECTRICITY AUTHORITY</b>	
มาตรฐาน SCALE 1:5 FOR G. A. T.	วันที่ DATE 20/9/66 FOR P. E. A. Dwn. by <i>Bunriep</i>	เหล็กประกอบเฟือง 01 คอข่าย, รั้วคอกข่าย, ไลน์, วัสดุขึ้นทวนคอกข่าย, ขดเหล็ก, วัสดุขึ้นทวนคอกข่าย	
		BRACE, FLAT, FOR CROSS-ARM 01 CROSS ARMS, BRACES, ANCHORS, GUYING MATERIALS, STEEL WIRE, CLAMPS FOR STEEL WIRE.	
		K 31	09063
		SHEET NO. 1 OF 1	

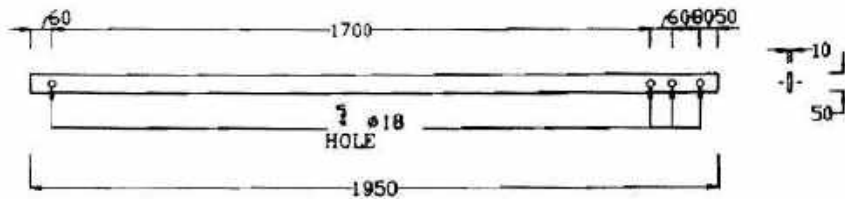
# PRELIMINARY

MAT. NO. 00120004



คอนสายแบบเหล็กทรงรางน้ำ  
CROSSARM, STEEL CHANNEL

MAT. NO. 01200003



เหล็กประกบกับคอนสาย  
BRACE, FLAT, FOR CROSSARM

**NOTE:**

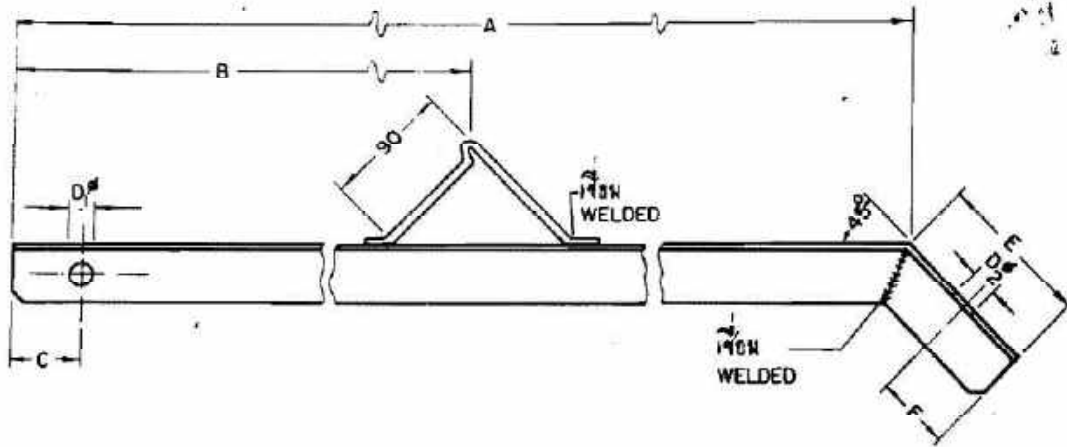
1. ALL DIMENSIONS ARE IN mm.
  2. STEEL CHANNEL ACCORDING TO TABLE 6 OF TIS 116 \*
  3. BRACE, FLAT ACCORDING TO TABLE 1 OF TIS 55
  4. HOT-DIP GALVANIZED
- \* CHANGE TO TIS 1227 TABLE 4

กองวิศวกรรมไฟฟ้าและเครื่องกล ฝ่ายวิศวกรรม	การไฟฟ้าส่วนภูมิภาค	ใช้แทนแบบ ทุกแทนโดยแบบ
ผู้เขียน ผู้สำรวจ วิศวกร หัวหน้าแผนก ผู้อำนวยการกอง ผู้อำนวยการฝ่าย	ผู้ว่าการ คอนสายแบบเหล็กทรงรางน้ำ ขนาด 150x75x9 มม. ยาว 3.00 ม. และเหล็กประกบกับคอนสาย ขนาด 50x10x1.950 มม.	เขียนเสร็จวันที่ 20 ก.พ. 39 แก้แบบวันที่ มิติเป็น มิลลิเมตร มาตราส่วน -
รองผู้ว่าการ	CROSSARM, STEEL CHANNEL, 150x75x9 mm, 3.00 m LONG AND BRACE, FLAT, FOR CROSSARM, 50x10x1.950 mm	แบบเลขที่ SA2-015/39005 แผ่นที่ 1 ของจำนวน 1 แผ่น



\* 2:03 สวิตช์ไฟฟ้า 10 2

การประกอบเหล็ก 3103  
ASSEMBLY NO.

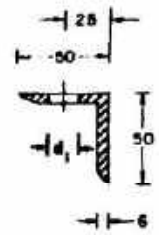
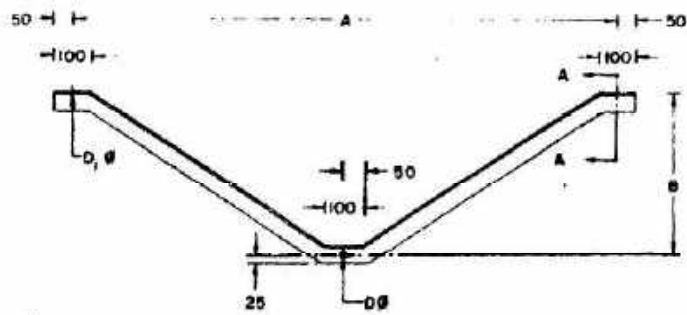


PRELIMINARY

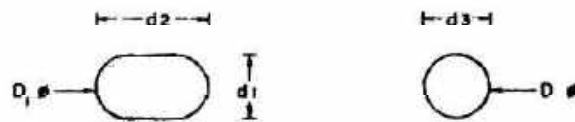
วัสดุเหล็ก MAT.NO.	ขนาด DIMENSIONS MM.							วัสดุเหล็ก, หมายเหตุ MAT. SURFACE FINISHING, REMARKS
	A	B	C	D <sub>1</sub>	D <sub>2</sub>	E	F	
01200004	2120	1000	50	18	18	100	50	เหล็กฉาก 40x40x5 มม. ก้อนเหล็ก 30x6 มม. เหล็กแบน 30x6 มม. ตามมาตรฐาน 30-37-0210 BRACE: ANGLE IRON 40X40X5 MM. FOOT STEP: FLAT IRON 30X6 MM. MILD STEEL 37-37, HOT GALV. <del>ACC TO VDE 0210</del> AFTER FABRICATION.
01200005	2350	1000	50	18	18	100	50	เหล็กฉาก 50 x 50 x 6 มม. ก้อนเหล็ก 30x6 มม. เหล็กแบน 30x6 มม. ตามมาตรฐาน 30-37-0210. BRACE: ANGLE IRON 50X50X6MM. FOOT STEP: FLAT IRON 30X6MM. MILD STEEL 37-37, HOT GALV. <del>ACC TO VDE 0210</del> AFTER FABRICATION

GERMAN ADVISORY TEAM - PROVINCIAL ELECTRICITY AUTHORITY

ขนาด SCALE 1:5	วันที่ DATE 20/9/66	เหล็กประกอบ 01 ก้อนเหล็ก, ก้อนเหล็ก, 30x6, 30x6, 30x6, 30x6, เหล็กแบน
FOR G. A.	FOR P. E. A. Draw. by <i>Benriap</i>	BRACE, ALLEY ARM 01 CROSS-ARMS, BRACES, ANCHORS, GUYING MATERIAL, STEEL WIRE
<i>4-10-66</i>	<i>Benriap</i>	K 31
		09064
		SHEET NO. 1 OF 1



SECTION A-A



HOLE DIMENSIONS

วัสดุเหล็ก MAT. NO.	ขนาด เส้น DIMENSIONS IN		NR. mm		วัสดุและผิวหน้าผิว MATERIAL, SURFACE FINISHING
	A	B	Dφ (d3)	Dφ (d1 x d2)	
01200006	1,500	440	18	18 X 30	เหล็กฉากเท่ากัน ขนาดเส้น 50 X 50 X 6 มม. ตาม มอก. 86 ตามข้อกำหนดมาตรฐาน มอก. 86 ANGLE STEEL, EQUAL ANGLES 50 X 50 X 6 mm ACC. T.S. 86 HOT DIP GALV. ACC. TO PEA STANDARD
01200007	1,800	450	18	18 X 30	

Handwritten notes in Thai script, including a signature and the date 20.11.22.

เหล็กฉากเท่ากัน 50 X 50 X 6 มม.

BRACE, ANGLE STEEL 50 X 50 X 6 mm

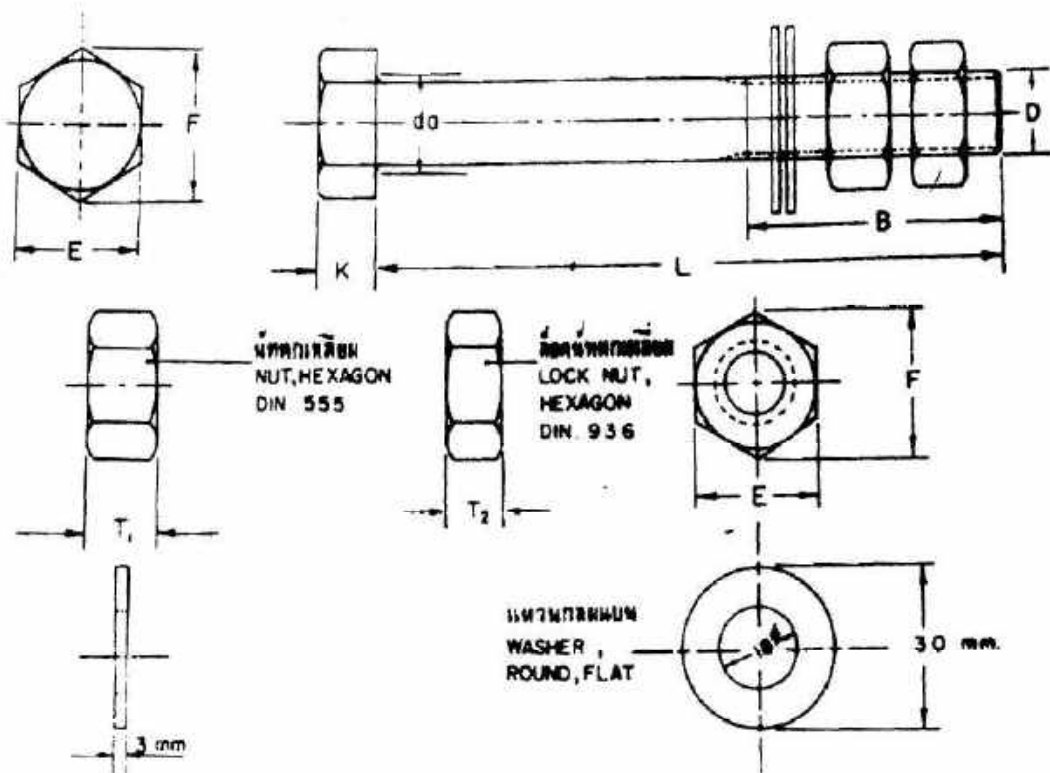
20.11.22

NR. 1, 2, 1, 4, 1, 20

SBI-015/22014



# PRELIMINARY



วัสดุเลขที่ MAT. NO	มิติ DIMENSIONS						มม mm			น้ำหนัก (กก) BREAKING STRENGTH (kgf.)	น้ำหนัก กก./100พม WEIGHT kg./100 Pcs	วัสดุ มาตรฐาน MATERIAL, SURFACE FINISHING
	D	L	B	K	E	F	do, max	T <sub>1</sub>	T <sub>2</sub>			
01110400	16	75	75	10	24	27.7	19.2	13	8	8,000		เหล็กกล้า ชุบสังกะสี ตาม มาตรฐาน ASTM A307 STEEL  HOT DIP GAL- VANIZED ACC. TO PEA. STANDARD.
01110403	16	650	150	10	24	27.7	19.2	13	8	8,000		

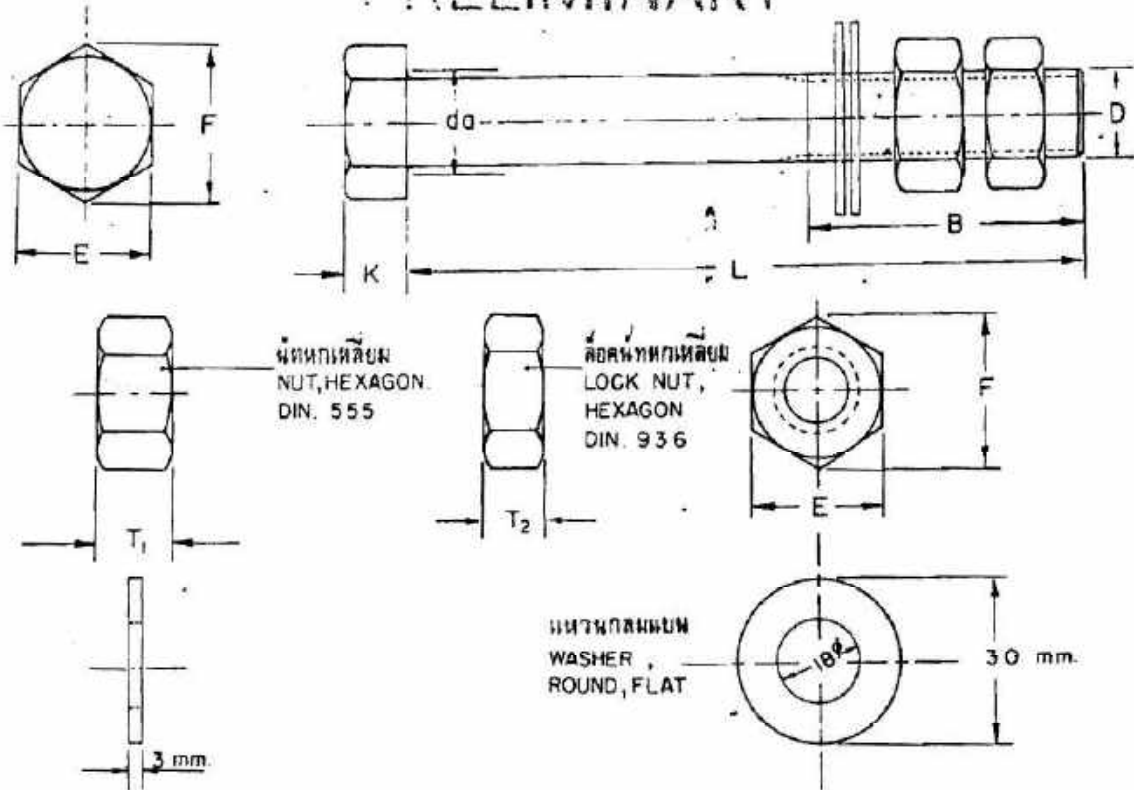
กองวิศวกรรมไฟฟ้าและเครื่องกล ฝ่ายวิศวกรรม การไฟฟ้าส่วนภูมิภาค

ฉบับที่ 1  
วันที่ 1 ต.ค. 2539

สลักเกลียว หัวหกเหลี่ยม เอ็ม 16  
BOLT, MACHINE, HEXAGON M. 16

แบบที่ SA2-015/99019  
วันที่ 1 ของจำนวน 1 แผ่น

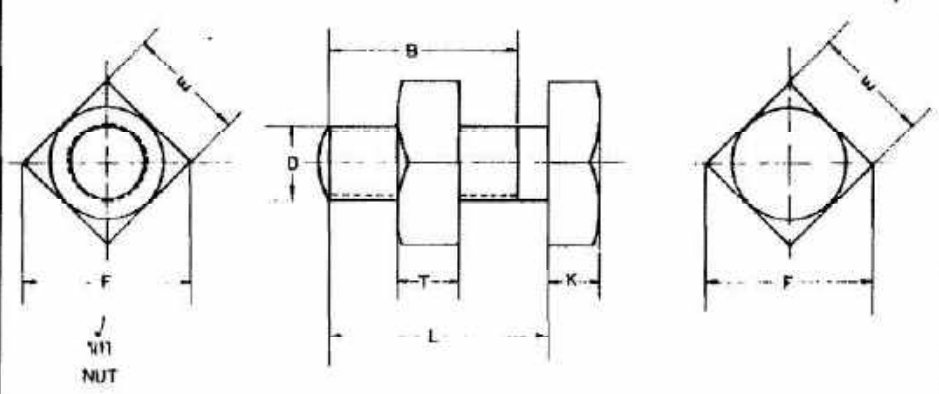
# PRELIMINARY



วัสดุเลขที่ MAT. NO	มิติ DIMENSIONS IN						มม. mm			แรงปรีคลาย (กก.) BREAKING STRENGTH (kg.f)	น้ำหนัก กก./100ชิ้น WEIGHT kg./100Pcs	วัสดุ มาตรฐาน MATERIAL, SURFACE FINISHING
	D	L	B	K	E	F	da, max.	T <sub>1</sub>	T <sub>2</sub>			
												เหล็กกล้า
												อบสังกะสี ตาม มาตรฐานของ กพท STEEL
01110401	16	550	150	10	24	27.7	19.2	13	8	8,000		HOT DIP GAL- VANIZED ACC. TO PEA. STANDARD.
01110402	16	600	150	10	24	27.7	19.2	13	8	8,000		

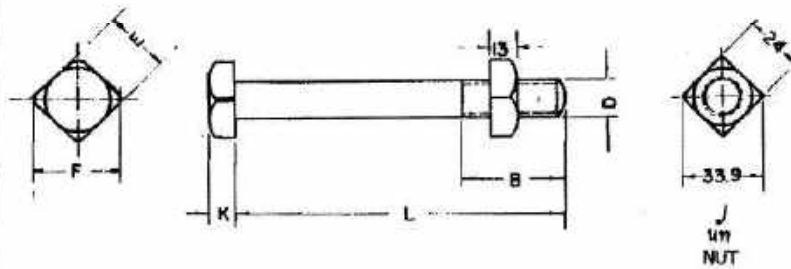
กองวิศวกรรม	การไฟฟ้าส่วนภูมิภาค	ใช้คนแบบ.....
ผู้เขียน <i>[Signature]</i>	ผู้กำกับ <i>[Signature]</i>	ถูกแก้ไขโดย.....
ผู้ตรวจสอบ <i>[Signature]</i>	1-2-01-18	เขียนโดยวันที่ ๑๕.๐๕.๖๕
หัวหน้าแผนก <i>[Signature]</i>	สลักเกลียว หัวหกเหลี่ยม 16	แก้ไขวันที่ ๑๕.๐๕.๖๕
ผู้อำนวยการกอง <i>[Signature]</i>	BOLT, MACHINE, HEXAGON M.16	มีดัดกัน.....ม.ม.
รองผู้อำนวยการ <i>[Signature]</i>		มาตรฐาน.....
		แบบเลขที่ SOI-015/18035
		หน้า.....

REVISIONS



วัสดุ MAT. NO.	ขนาด DIMENSION IN MM.							น้ำหนัก Kg/100 pcs	วัสดุ, สีผิว, หมายเหตุ MATERIAL, SURFACE FINISHING, REMARKS
	D	L	B	K	E	F	T		
01110000	M8	25	22	5.5	13	18.4	6.5		วัสดุ : สแตนเลสชนิด 4-6 ตาม ทศ 171 มาตรฐานอุตสาหกรรม ไทย. STEEL, PROPERTY CLASS 4-6 TO TIS. 171 HOT DIP GALV. ACC. TO PEA. STANDARD.
01110100	M12	35	30	8	19	26.9	9.5		
01110101	M12	50	40	8	19	26.9	9.5		

ชื่อโครงการ/งาน	การไฟฟ้าส่วนภูมิภาค	ผู้ควบคุมงาน	
วันที่	วันที่ 3/10/19	ชื่อผู้ควบคุมงาน	
สถานที่	02 สังกัด กว.เขต ๖	ตำแหน่ง	
ชื่อผู้จัดทำ	BOLT, MACHINE	หมายเลข	150-015/140397
ชื่อผู้ตรวจสอบ	02 BOLT, HARDWARE, STRAIN & SUSPENSION	ชื่อผู้ตรวจสอบ	



MATERIAL NO.	DIMENSIONS IN MM						WEIGHT kg/100 Pcs.	MATERIAL, SURFACE FINISHING, REMARKS.
	D	L	B	K	E	F		
01110200	M16	130	35	10.5	24	32	~ 24.4	วัสดุที่ใช้ 4-6 สเปค. 171 STEEL, PROPERTY CLASS 4-6 ACC. TO T.S. 171 HOT DIP GALV. ACC TO P.E.A. STANDARD.
01110201	M16	170	50	10.5	24	32	~ 32.4	
01110202	M16	200	50	10.5	24	32	~ 40.2	
01110203	M16	250	75	10.5	24	32	~ 48	
01110204	M16	300	75	10.5	24	32	~ 56	
01110205	M16	350	75	10.5	24	32	~ 63.8	
01110206	M16	400	100	10.5	24	32	~ 71.6	
01110207	M16	450	100	10.5	24	32	~ 79.6	
01110208	M16	500	150	10.5	24	32	~ 87.6	

หมายเหตุ: ถ้าหากไม่ระบุไว้เป็นอย่างอื่น  
 สลักเกลียวจะประกอบกับ  
 สลักน๊อตเหลี่ยม

NOTE: IF NOT OTHERWISE INDICATED  
 THE MACHINE BOLT IS FITTED  
 WITH ONE SQUARE NUT

GERMAN ADVISORY TEAM -- PROVINCIAL ELECTRICITY AUTHORITY

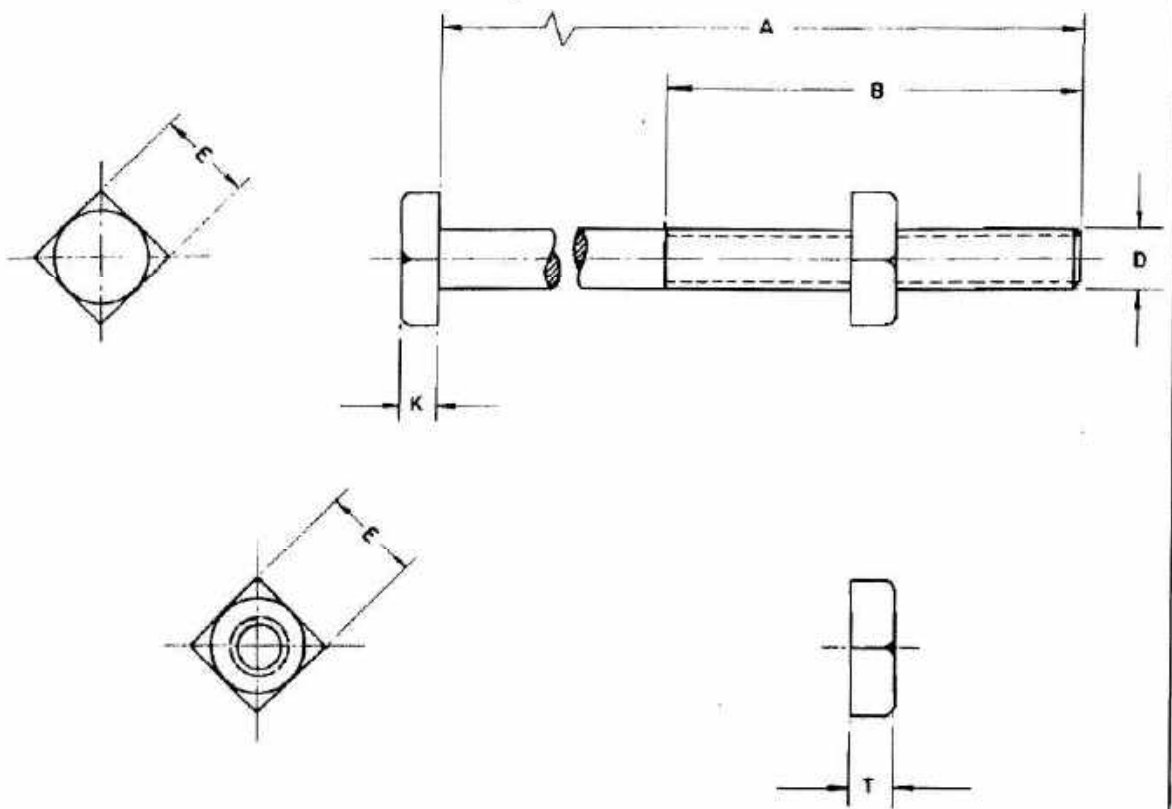
SCALE 1:25  
 DATE 22/9/66

FOR P. E. A.  
 Draw. by [Signature]  
 21-10-66

สลักเกลียว  
 02 สลักเกลียว: เกรตมีดและสายหม้อแปลง

BOLT, MACHINE  
 02 BOLTS, HARDWARE, STRAIN & SUSPENSION

K 31 09072 SHEET NO. 1 OF 1



วัสดุเลขที่ MATERIAL NUMBER	ขนาด DIMENSIONS						น้ำหนัก กก./100 ชิ้น WEIGHT kg./100 Pcs.	วัสดุและผิวหน้า MATERIAL & SURFACE FINISHING
	D	A	B	K	E	T		
01110301	M.20	400	100	13	30	16	เหล็กกล้าคาร์บอนเกรด 4.6 ตาม ทศ. 171 ชุบสังกะสีไฟฟ้าตามมาตรฐาน STEEL, PROPERTY CLASS 4.6 ACC. TO TIS. 171 HOT DIP GALV. ACC. TO PEA. STANDARD.	
01110302	M.20	450	100	13	30	16		
01110303	M.20	550	150	13	30	16		

4/15/22  
 17/04/22  
 22/04/22

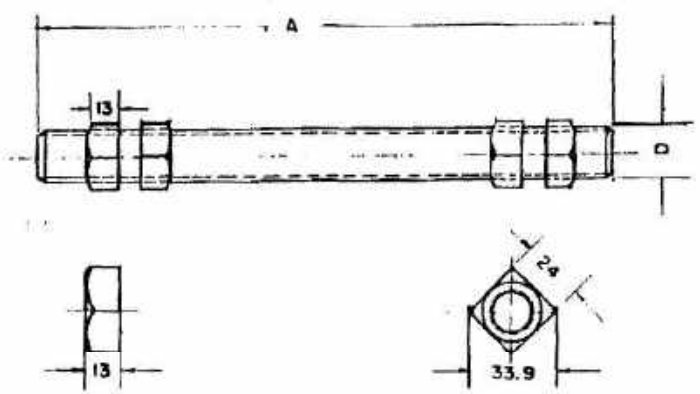


ลดทศ. 10N. 20 UN.

15.04.22  
 15.04.22

BOLT, MACHINE M. 20 mm

SB1-05/2017

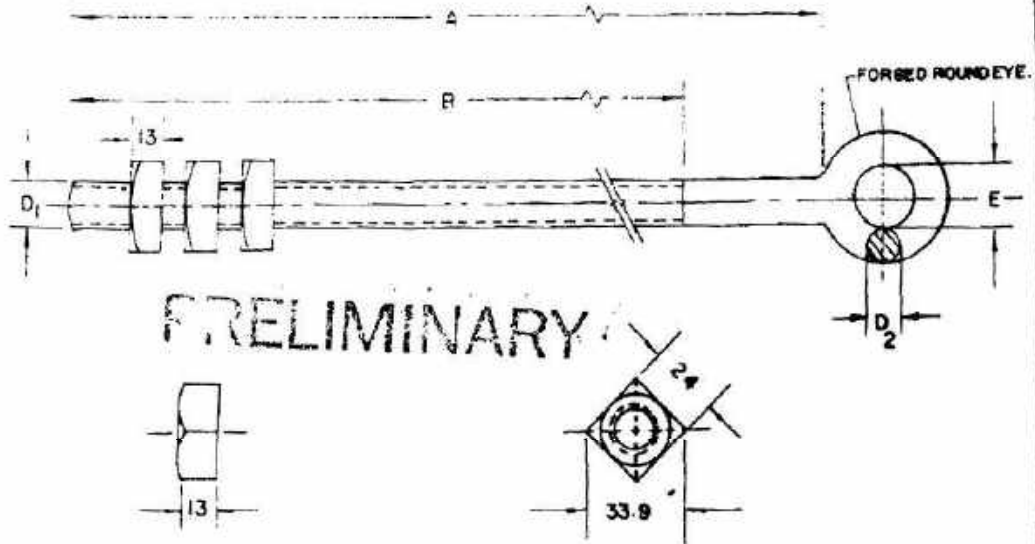


MATERIAL MAT. NO.	DIMENSIONS IN MM.		WEIGHT kg/100 PIECES	MATERIAL, SURFACE FINISHING, REMARKS
	D	A		
01120000	M 16	400	~ 69.2	STEEL, PROPERTY CLASS 4.6 ACC. TO TIS. 171 HOT DIP GALV. ACC. TO PEA. STANDARD.
01120001	M 16	450	~ 77.0	
01120002	M 16	500	~ 85.0	
01120004	M 16	600	~	

หมายเหตุ: วัสดุที่ระบุไว้เป็นของใหม่  
หรือที่ผ่านการตรวจสอบแล้ว  
แล้วเท่านั้น

NOTE: IF NOT OTHERWISE INDICATED THE  
DOUBLE ARMING BOLT IS FITTED  
WITH FOUR SQUARE NUTS.

GERMAN ADVISORY TEAM - PROVINCIAL ELECTRICITY AUTHORITY		
SCALE 1:5, 1:2.5 FOR G. A. T.	DATE 22/9/66 FOR P. E. A. Dwn. by <i>Kinany</i>	ชื่อผลิตภัณฑ์ 02 ผลิตภัณฑ์, วัสดุอุปกรณ์สายเคเบิล
<i>[Signature]</i> 22/9/66	<i>[Signature]</i> 30/9/66	BOLT, DOUBLE ARMING 02 BOLTS, HARDWARE, STRAIN & SUSPENSION.
		K 31      09069      SHEET NO. 1 OF 1



วัสดุ MAT. NO.	ขนาด DIMENSION IN MM					แรงฉีก กก. BREAKING STRENGTH (kgf)	น้ำหนัก กก. 100 ฟุต WEIGHT kg/100ft	วัสดุ MATERIAL, SURFACE FINISHING
	D <sub>1</sub>	A	B	E	D <sub>2</sub>			
01130000	M 16	400	350	22	12	5000	≈ 68	เหล็กกล้า งานดึงกะทัดรัดมาตรฐาน STEEL HOT DIP GALV. ACC. TO PEA STANDARD
01130001	M 16	450	400	22	12	5000	≈ 107	
01130002	M 16	500	450	22	12	5000	≈ 145	
01130003	M 16	600	550	22	12	5000	*	
01130004	M 16	550	500	22	12	5000		
01130005	M 16	650	600	22	12	5000		

หมายเหตุ

กำหนดการขึ้นรูป  
สลักเกลียวทรงกลมประเภท  
หน้าสี่เหลี่ยม 3 ตัว

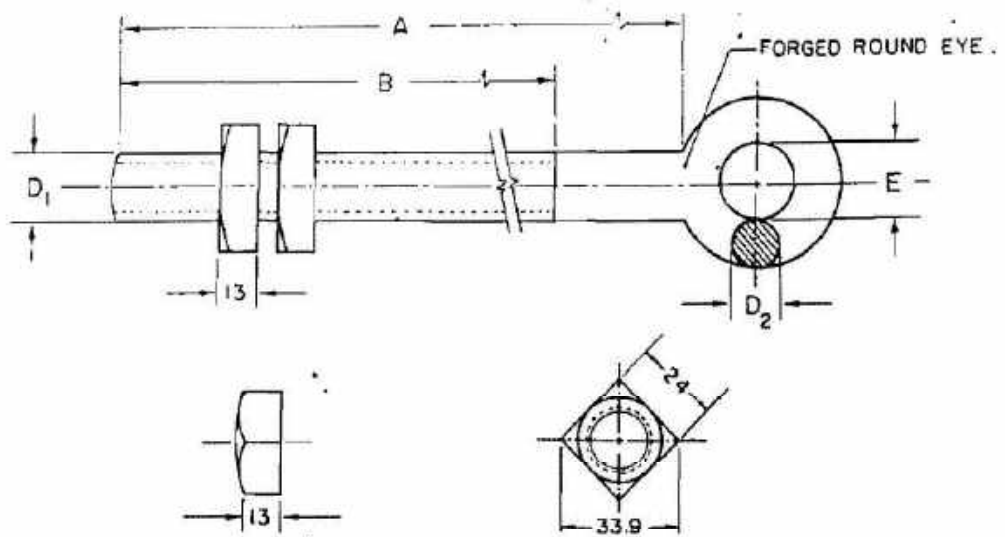
NOTE:

IF NOT OTHERWISE INDICATED THE  
DOUBLE ARMING BOLT, ROUND EYE,  
IS FITTED WITH THREE SQUARE NUTS

กองวิศวกรรม	การไฟฟ้าส่วนภูมิภาค	ใช้ตามแบบ K31-09070
ผู้เขียน <i>Spoke</i>	ผู้ทำการ <i>Spoke</i>	ถูกอนุมัติโดยแบบ
ผู้สำรวจ		เขียนเสร็จวันที่ 20.5.17
วิศวกร <i>HC</i>	สลักเกลียว, ทรงกลม	นักแบบวันที่
หัวหน้าแผนก		ผลิตเป็น มม
ผู้อำนวยการกอง	BOLT, DOUBLE ARMING, ROUND EYE.	มาตรฐาน 1:2.5
รองผู้อำนวยการฝ่ายเทคนิค		พจนานุกรม S01-015/1700E
		แผ่นที่ 1 ของจำนวน 1 แผ่น



# PRELIMINARY



วัสดุเลขที่ MAT. NO.	มิติ DIMENSION IN mm.					แรงปรลัย กก. BREAKING STRENGTH (kgf.)	น้ำหนัก กก./๑๐๐ชิ้น WEIGHT kg/100 Pcs.	วัสดุ ผิวผิว MATERIAL, SURFACE FINISHING
	D <sub>1</sub>	A	B	E	D <sub>2</sub>			
01140000	M16	100	75	22	12	5,000	≈ 17	เหล็กกล้า
								อาจสังกะสีตามมาตรฐาน ของ กพ.ก.
01140001	M16	200	150	22	12	5,000	≈ 34	STEEL
01140002	M16	250	200	22	12	5,000	≈ 42.5	HOT DIP GALV. ACC. TO PEA. STANDARD
01140003	M16	300	250	22	12	5,000	≈ 51	

หมายเหตุ : ตัวทากในระบุไว้เป็นอย่างอื่น  
สลักเกลียวทรงกลมประกอบด้วย  
นัทสี่เหลี่ยม 2 ตัว

NOTE : IF NOT OTHERWISE INDICATED  
THE BOLT, ROUND EYE, IS  
FITTED WITH TWO SQUARE NUTS.

กองวิจัยและทดสอบ	การไฟฟ้าส่วนภูมิภาค		ใช้แบบฉบับ.....
ผู้เขียน <i>วิเศษ ๒๐๖๕</i>	ผู้ตรวจ <i>วิเศษ ๒๐๖๕</i>	27 ก.ย. ๕๙	ถูกแก้ไขแบบ.....
ผู้ร่าง <i>วิเศษ ๒๐๖๕</i>	01140000 - สลักเกลียว ทรงกลม		เดือน.วันที่ 10/9/19
ผู้ดำเนินการ <i>วิเศษ ๒๐๖๕</i>	01140003		แก้ไข.....
รวมรายการผ่านเทคนิค	01140000 - BOLT, ROUND EYE		ชนิดเป็น.....
	01140003		ภาค.....
			แบบ.คร. SOI-015/19041
			แผ่นที่ 1 ของจำนวน 1 แผ่น