DAFTAR PUSTAKA

ASCE American Society of Civil Engineers. (2015). *ASCE 10-15. Design of Latticed Steel Transmission Structures*. ASCE American Society of Civil Engineers.

Bhosale, R. D., Nalawade, S. S., Swami, P., Gaikwad, P., & Patil, R. R. (2017). Study & design of jig and fixture for base frame of canopy fabrication of generator. *Academia.Edu*. https://www.academia.edu/download/53592345/IRJET-V4I5450.pdf

Budynas, R. G., & Nisbett, J. K. (2008). *Shigley's Mechanical Engineering Design* (8th ed.). McGraw-Hill Companies.

Cekdin, C., & Barlian, T. (2013). *Transmisi Daya Listrik (Fl. S. Suyantoro, Ed.)*. C.V Andi Offset.

Diah Wilujeng, A., & Hakim, R. (2020). Rancang bangun purwarupa CMM tower fixture sebagai dasar media pembelajaran GD&T. *Core.Ac.Uk*, *88*(1), 2548–9828. https://core.ac.uk/download/pdf/322535249.pdf

Fink, D., & Beaty, H. (2006). *Standard Handbook for Electrical Engineers* (15th ed.). McGraw-Hill Professional.

Fu, X., Li, H., & JX Li. (2018). Wind resistance and failure analyses of a lightning-damaged transmission tower. *Ascelibrary.Org*, *32*(1), 04017127. https://doi.org/10.1061/(ASCE)CF.1943-5509.0001121

Fu, X., Li, H. N., & Li, G. (2016). Fragility analysis and estimation of collapse status for transmission tower subjected to wind and rain loads. *Structural Safety*, *58*, 1–10. https://doi.org/10.1016/J.STRUSAFE.2015.08.002

Hoffman, E. (2004). *Jig and Fixture Design* (5th ed.). Delmar, Cengage Learning.

Joshi, P. H. (2003). *Jig and Fixture Design Manual* (2nd ed.). McGraw-Hill Professional.

Khurmi, R. S., & Gupta, J. K. (2005). *A Text Book of Machine design*. S. Chand Publishing, 2005.

Kiessling, F., Nefzger, P., Nolasco, J. F., & Kaintzyk, U. (2003). *Overhead Power Lines*. https://doi.org/10.1007/978-3-642-97879-1

Kumbhar, V., & Pandit, H. C. (2017). A review article on jigs and fixture Jayesh. https://www.semanticscholar.org/paper/A-Review-Article-on-Jigs-and-Fixture-Jayesh-Kumbhar-Pandit/0521cf3d78441c5c7ff76c42031b900335e82dc9

Lu, C., & Ou, Y. (2016). Structural analysis of lattice steel transmission towers: A Review, *2*(1), 114. https://doi.org/10.4172/2472-0437.1000114

Menteri Energi dan Sumber Daya Mineral Republik Indonesia. (2021). *Peraturan Menteri ESDM Nomor 13 Tahun 2021*. Menteri Energi dan Sumber Daya Mineral Republik Indonesia.
s://jdih.esdm.go.id/storage/document/Permen%20ESDM%20No.%2013 %20Tahun%202021.pdf

ımar, K., & Prabakaran, V. (2014). Design and fabrication testing of bined multipurpose jig and fixture. IOSR Journal of Mechanical and Civil ineering, *11*(4), 86–91. https://doi.org/10.9790/1684-11478691

Nur, R., & Suyuti, M. (2018). *Perancangan Mesin-Mesin Industri*. Deepublish.

Papailiou, K. O. (2017). *Overhead Lines*. Springer International Publishing.

PT. PLN (Persero). (2014). *Buku Pedoman Pemeliharaan Saluran Udara Tegangan Tinggi dan Ekstra Tinggi (SUTT/SUTET)*. PT. PLN (PERSERO).

Rong, Y., Huang, S., & Zhikun, H. (2005). *Advanced Computer-Aided Fixture Design*. Elsevier Academic Press.

Santoso, S., & Beaty, H. W. (2018). *Alternating-Current Power Transmission. In Standard Handbook for Electrical Engineers* (17th ed., pp. 245–349). McGraw-Hill Education.

Sofyan, M., Dian Purnama, D., & Rokhman, A. (2018). Perilaku struktur tower transmisi tipe suspension terhadap beban angin. *Stt-Pln.e-Journal.Id*, *7*(1), 2356–1491. https://stt-pln.e-journal.id/forummekanika/article/view/90

Sumargo, Djihad, A., Setiawan, I., & Arief Mulyadi, D. (2008). Structural respond analysis of monopole telecommunication tower 120 m subject to design wind load with 10 years return period at Meteorology and Geophysics Station, Semarang. *Dinamika Teknik Sipil*, *8*(1), 72–81.

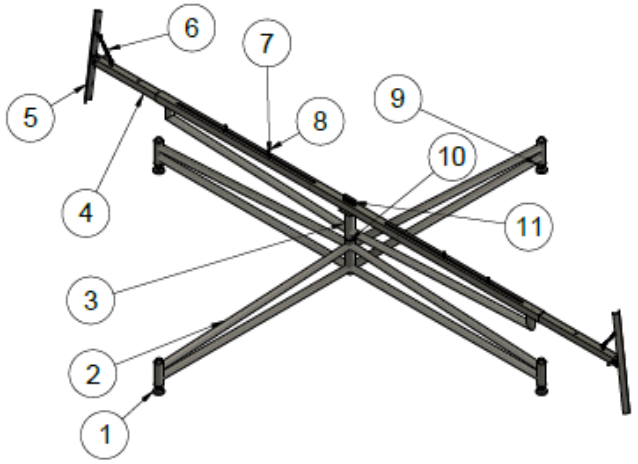
Urugal, A. C. (2015). *Mechanical Design of Machine Components.* (2nd ed.). London: CRC Press.

Wantouw, F., & Mandagi, R. J. M. (2014). Risk management of high voltage powerline (SUTT) 150 kv development project in Lopana-Teling. *Jurnal Ilmiah Media Engineering*, *4*(4), 2087–9334.

LAMPIRAN

Lampiran 1. Gambar desain alat *stub setting fixture*

Parts List				
Item	Qty	Part Number	Description	Material
1	4	Adjustment Legs		Steel
2	1	Bottom Frame		Steel
3	1	Top Frame		Steel
4	2	Alignment Arm		Steel
5	2	Stub Fixture		Steel
6	2	Turnbuckle		Steel
7	6	Mur M22X2.5 Penahan Alignment Arm		Steel
8	6	Baut Penahan Alignment Arm M22x2.5 Panjang 200 mm		Steel
9	4	Mur M60X5.5		Steel
10	1	As Connector		Steel
11	1	Spirit Level Digital		Steel



Dept.	Technical reference	Created by	Approved by
		Muhammad Reza Buanaputra	
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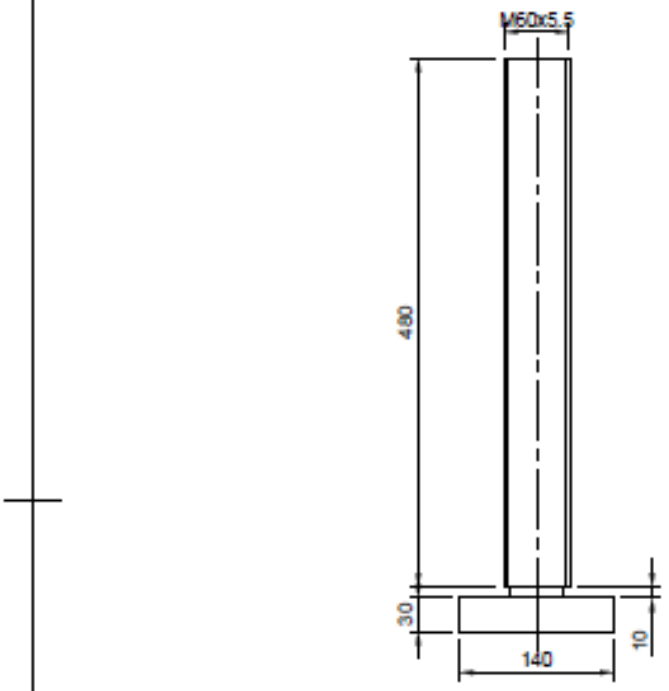
			Skala 1:70
		Title	DWG No.
		Part List	
			Rev. / Date of issue / Sheet: 1/1



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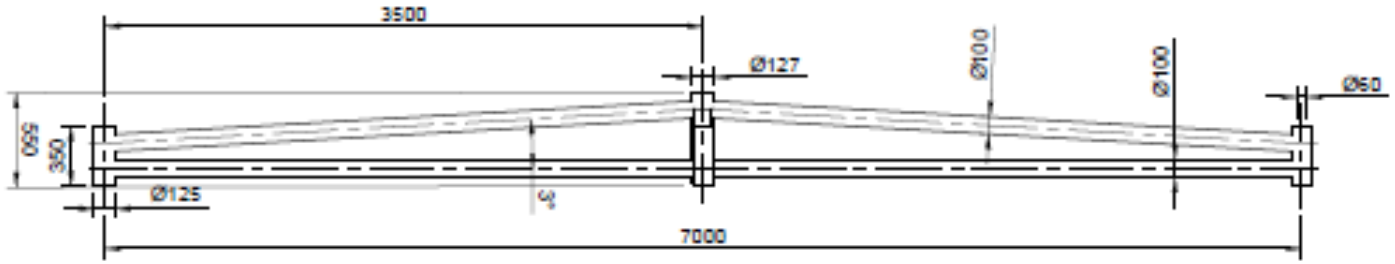
		Title: Adjustment Leg	DWG No.: 1
			Rev. / Date of issue / Sheet: 1/1



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		Title	DWG No.
		Bottom Frame	2
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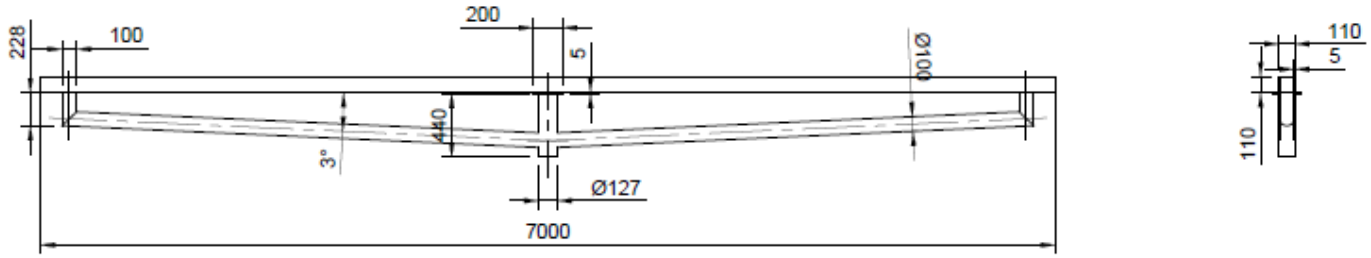

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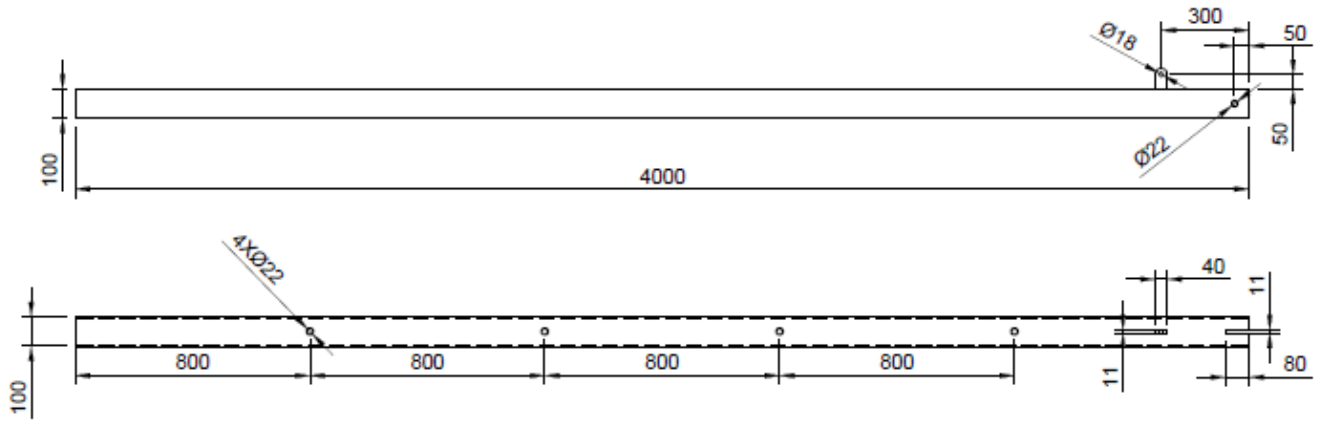
		Title	DWG No.
		Top Frame	3
			Rev. / Date of issue / Sheet: / / 1/1



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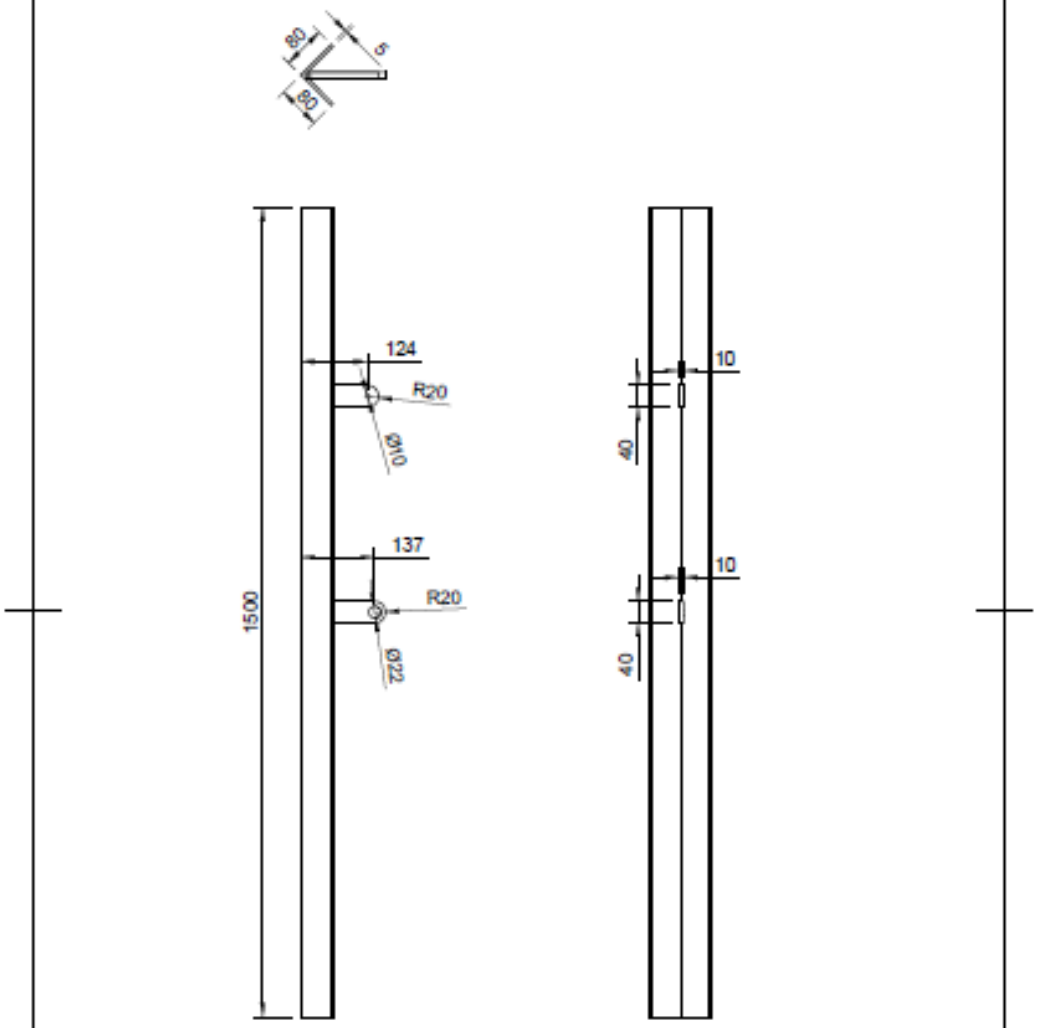
		Title: Alignment Arm	DWG No.: 4
			Rev. / Date of issue / Sheet: 1/1



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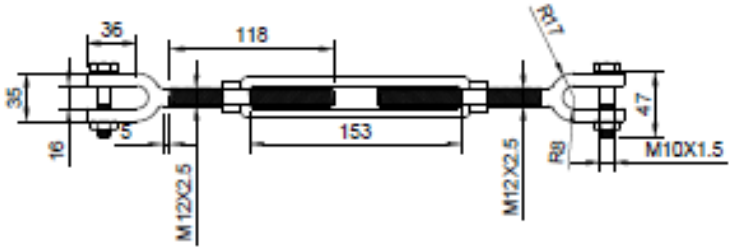
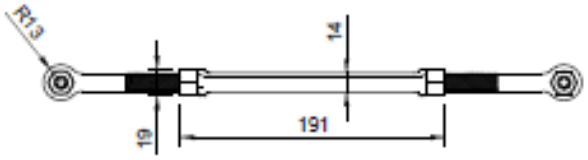
		Title: Stub Fixture	DWG No.: 5
			Rev. / Date of issue / Sheet: 1/1





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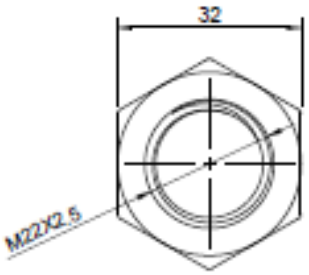

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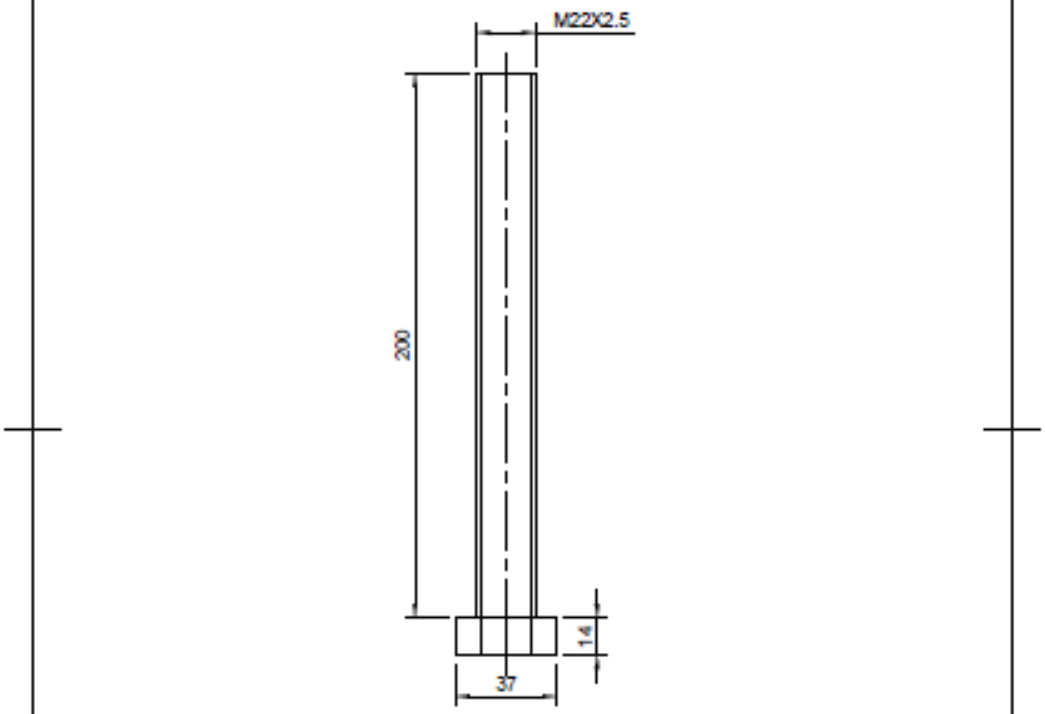
		Title	DWG No.
		Mur M22X2.5 Penahan Alignment Arm	7
			Rev. / Date of issue / Sheet: 1/1



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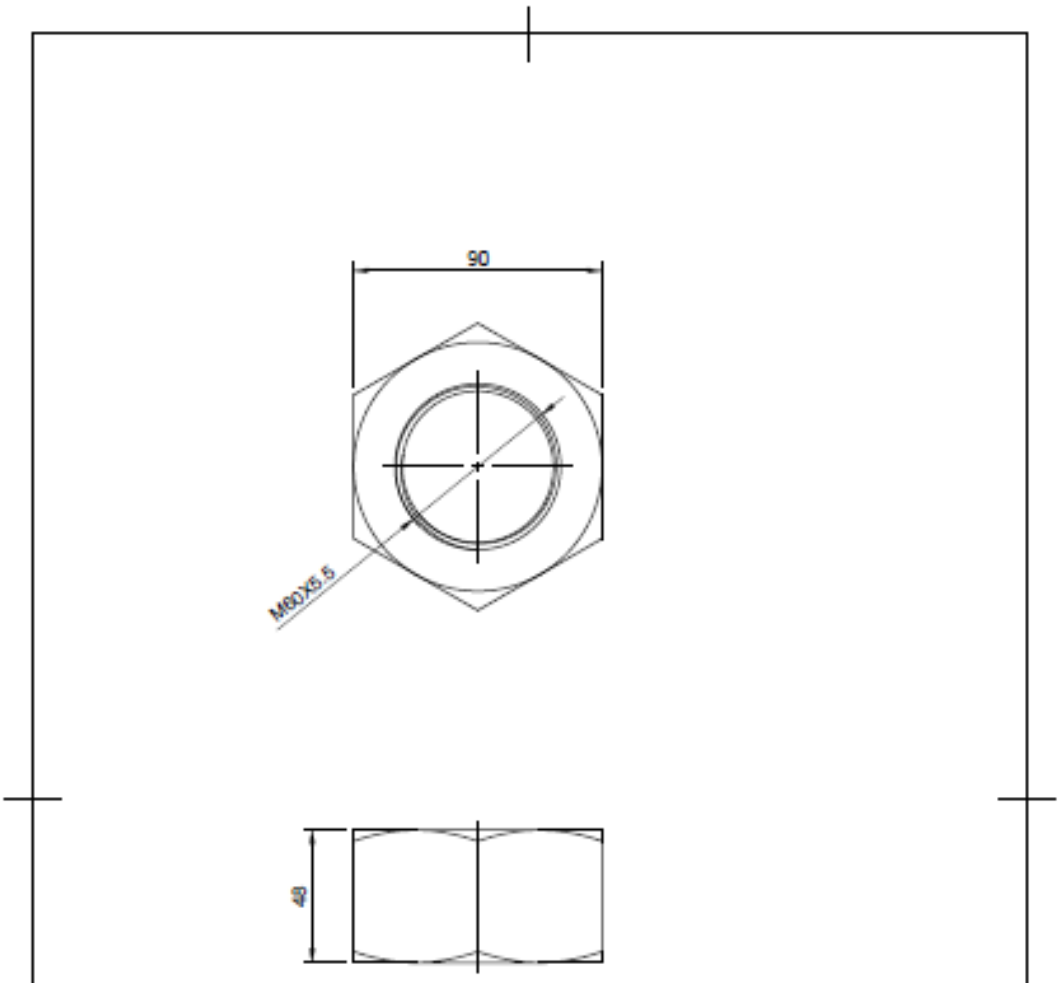
		Document type:	Document status: Skala 1:2
		Title: Baut Penahan Alignment Arm M22x2.5 Panjang 200 mm	DWG No.: 8
			Rev. / Date of issue / Sheet: 1/1



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		Title	DWG No.
		Mur M60X5.5	9
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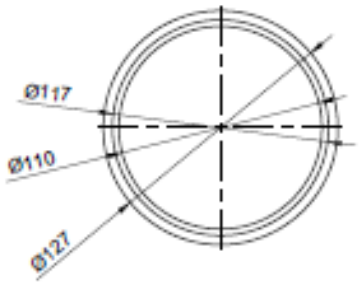

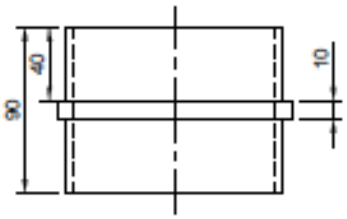

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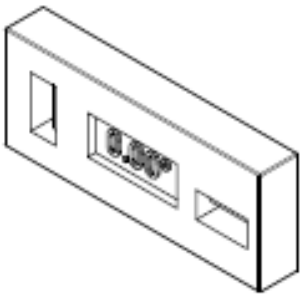
		Document type	Document status: Skala 1:3
		Title: As Connector	DWG No.: 10
			Rev. / Date of issue / Sheet: 1/1



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		Document type	Document status
			Skala 1:3
		Title	DWG No.
		Spirit Level Digital	11
			Rev. / Date of issue / Sheet: 1/1

Lampiran 2. Gambar *setting stub*


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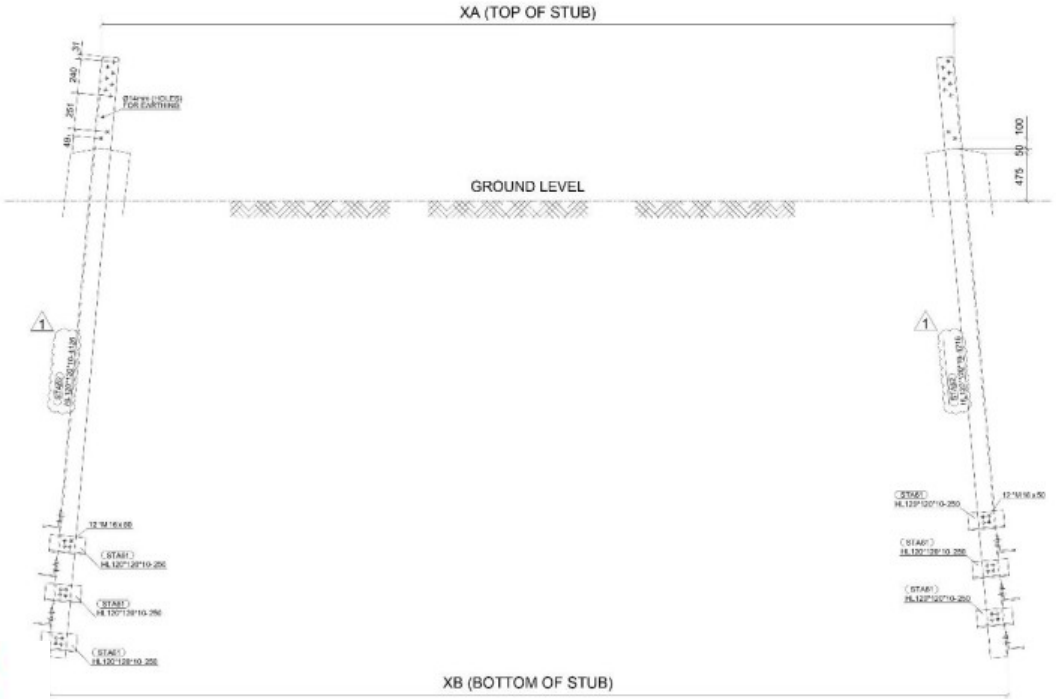
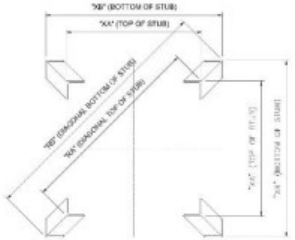
TOWER TYPE AA6	LENGTH	XA	XB	RA	RB
BASIS + 0.00 m	4126	5400.40	6136.66	7637.32	8678.83
BASIS + 3.00 m	4126	5940.16	6676.62	8400.65	9442.16
BASIS + 6.00 m	4126	6479.92	7216.38	9163.99	10205.50
BASIS + 9.00 m	4126	7019.70	7756.16	9927.35	10968.86
BASIS + 12.00 m	4126	7559.45	8295.92	10690.67	11732.20
BASIS + 15.00 m	4126	8099.25	8835.72	11454.07	12495.59





SLOPE ANGLE ON SECTION = 5.120°
SLOPE ANGLE ON DIAGONAL = 7.251°

PT. PLN (PERSERO)
UIP SULAWESI BAGIAN SELATAN

PT. DANUSARI MITRA SEJAHTERA

SUTT 150kV 2x7KMRA ANDOLO – KASIPUTE SEC.I

DMS-150KV-AA6-15

TOWER 150 kV DOUBLE TYPE AA6
SETTING STUB

PREPARED : MND
CHECKED BY : DY
APPROVED BY : SLS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Lampiran 3. Tabel *tensile requirements* material A36

Plates, Shapes,[B] and Bars:	
Tensile strength, ksi [MPa]	58–80 [400–550]
Yield point, min, ksi [MPa]	36 [250][C]
Plates and Bars[D,E]:	
Elongation in 8 in. [200 mm], min, %	20
Elongation in 2 in. [50 mm], min, %	23
Shapes:	
Elongation in 8 in. [200 mm], min, %	20
Elongation in 2 in. [50 mm], min, %	21[B]

[A] See Specimen Orientation under the Tension Tests section of Specification A 6/A 6M.

[B] For wide flange shapes over 426 lb/ft [634 kg/m], the 80 ksi [550 MPa] maximum tensile strength does not apply and a minimum elongation in 2 in. [50 mm] of 19 %, applies.

[C] Yield point 32 ksi [220 MPa] for plates over 8 in. [200 mm] in thickness.

[D] Elongation not required to be determined for floor plate.

[E] For plates wider than 24 in. [600 mm], the elongation requirement is reduced two percentage points. See elongation requirement adjustments under the Tension Tests section of Specification A 6/A 6M.

Source: ASTM A36: *Standard Spesification for Carbon Structural Steel. American Society for Testing Material*

Lampiran 4. *Breaking strength of turnbuckles* (ASTM F 1145 – 92)

NOTE 1—1 in. = 25.4 mm.
NOTE 2—1 lb = 0.45 kg.

Size, Nominal Outside Diameter of Thread, in.	Strength Breaking, min, lbf (N)				Recommended Working Loads, lbf (N)			
	Type I, Grade 1		All Others		Type I, Grade 1		All Others	
	Jaw, Eye, or Stub End Pulls	Hook End Pulls	Jaw, Eye, or Stub End Pulls	Hook End Pulls	Jaw, Eye, or Stub End Pulls	Hook End Pulls	Jaw, Eye, or Stub End Pulls	Hook End Pulls
¼	2 500 (11)	1 500 (7)	1 550 (7)	1 050 (5)	500 (2)	300 (1.3)	310 (1.4)	210 (0.9)
5/16	3 500 (16)	2 500 (11)	2 700 (12)	1 650 (7.3)	700 (3)	500 (2.2)	540 (2.4)	330 (1.5)
⅜	5 200 (23)	3 500 (16)	4 100 (18)	2 300 (10)	1 040 (4.6)	700 (3.1)	820 (3.6)	460 (2)
½	9 000 (40)	5 200 (23)	7 550 (34)	3 700 (16.4)	1 800 (8)	1 040 (8)	1 500 (7)	740 (3.3)
⅝	13 500 (60)	8 000 (36)	12 100 (54)	5 400 (24)	2 700 (12)	1 600 (7.1)	2 400 (11)	1 080 (4.8)
¾	20 000 (89)	10 000 (44)	18 100 (81)	7 500 (33)	4 000 (18)	2 000 (9)	3 600 (16)	1 500 (7)
⅞	29 000 (129)	12 000 (53)	25 100 (112)	10 000 (44)	5 800 (26)	2 400 (11)	5 000 (22)	2 000 (9)
1	38 000 (169)	14 500 (64)	33 100 (147)	12 800 (57)	7 600 (34)	2 900 (13)	6 600 (29)	2 560 (11.4)
1¼	60 000 (267)	23 000 (102)	53 600 (238)	20 600 (92)	12 000 (53)	4 600 (20)	10 700 (48)	4 120 (18.3)
1⅜	72 000 (320)	29 000 (129)	63 400 (282)	24 300 (108)	14 400 (64)	5 800 (26)	12 600 (56)	4 860 (22)
1½	85 000 (378)	36 000 (160)	77 700 (345)	29 300 (130)	17 000 (76)	7 200 (32)	15 500 (69)	5 860 (26.1)
1¾	115 000 (511)	...	105 000 (467)	...	23 000 (102)	...	21 000 (93)	...
2	150 000 (667)	...	138 000 (614)	...	30 000 (133)	...	27 600 (122)	...
2¼	197 000 (876)	...	181 000 (805)	...	39 400 (175)	...	36 200 (161)	...
2½	242 000 (1076)	...	223 000 (992)	...	48 400 (215)	...	44 600 (198)	...
2¾	304 000 (1352)	...	277 000 (1232)	...	60 800 (270)	...	55 400 (246)	...
3	350 000 (1556)	...	337 000 (1499)	...	70 000 (311)	...	67 400 (300)	...
3¼	400 000 (1779)	...	400 000 (1779)	...	80 000 (356)	...	80 000 (356)	...
3½	475 000 (2112)	...	475 000 (2113)	...	95 000 (423)	...	95 000 (423)	...
3¾	550 000 (2446)	...	550 000 (2446)	...	110 000 (489)	...	110 000 (489)	...
4	635 000 (2824)	...	635 000 (2824)	...	127 000 (565)	...	127 000 (565)	...

Source: Standard Specification for Turnbuckles, Swaged, Welded, Forged ASTM Designation: F 1145 – 92