

Annex 8-13: Foundation Reaction Forces

Annex 8.13(1): 132kV Double Circuit Towers (Narrow Base Width) -

(Including Foundation Overload Factor 1.23)

Tower Type	Down Thrust (Along the Leg)	Uplift (Along the Leg)	Horizontal Component	
			Hx (Transverse)	Hz (Longitudinal)
	Kg	kg	kg	kg
1DL	115226	107703	772	772
1D1	190459	177936	3339	3339
1D25	264413	212986	5839	5839
1DT6 (Angle)	340720	258860	5853	5853
1DT6 (Terminal)	375471	433954	6537	6537
1DR	653454	657055	23264	15652
1DAX	423418	401070	43473	48594

Annex 8.13(2) 132kV Four Circuit Towers

(Including Foundation Overload Factor as 1.23 for 1QL and 1.35 for others)

Tower Type	Down Thrust (Along the Leg)	Uplift (Along the Leg)	Horizontal Component	
			Hx (Transverse)	Hz (Longitudinal)
	Kg	kg	kg	kg
1QL	127705	111399	4118	2449
1Q15	255355	229080	5531	4066
1Q30	306244	279876	6808	5344
1QT6 (Angle)	411063	364820	8929	7790
1QT6 (Terminal)	502180	459627	10039	8044



Annex 8.13(3.1) 230kV Double Circuit Towers-Medium Wind Zone

Sl No.	Foundation Reaction For Tower Type (with out overload factor)	Drawing No.
1	2DL	C835//DES-1/REV-E
2	2D3	C835//DES-2/REV-D
3	2D25	C835//DES-3/REV-A
4	2DT60	C835//DES-4/REV-C

Note: Strength Factor Shall be considered as per Chapter 7.

CONTRACT NO.: PGCB/KW/2012.66.436/NZTL

Dated:- 31.10.2017

Summary of maximum Foundation forces for STANDARD Tower /+1.5m/+3.9m/4.5m/6.0m/9.0m/12.0m/15.0m BE													
Sr. No	Model	Load Case	Support Joint	Origin Joint	Leg Member	Force in Leg Dir. (kN)	Residual Shear Perpendicular To Leg (kN)	Residual Shear Horizontal To Leg - Res. (kN)	Residual Shear Horizontal To Leg - Long. (kN)	Residual Shear Horizontal To Leg - Tran. (kN)	Total Long. Force (kN)	Total Tran. Force (kN)	Total Vert. Force (kN)
Foundation Forces along LEG Direction													
1	Run #8 c 835 It 2dl 15m be tower final width	LC-1 5 deg Full Trans wind-Vmax NA+C NA+	20Y	19SF0.8F94431Y	1791.377	53.208	53.474	-100.866	96.972	248.22	230.72	-1768.01	
2	Run #8 c 835 It 2dl 15m be tower final width	LC-1 5 deg Full Trans wind-Vmin NA+C NA+	20X	19SF0.8F94431X	-1646.097	52.182	52.43	99.825	-96.734	-244.64	-232.61	1624.43	
Notes													
1	Above loads are with Tower factored loads in kN without OLF for foundation design.												
2	LAST LEG SECTION = H 150°150°20												

POWER GRID COMPANY OF BANGLADESH
APPROVED

This approval is general only and does not release the manufacturer/contractor/Supplier from compliance with specification and Standards for Design, workmanship and performance as stipulated in the contract.

(Engr. Muhammad Mahmudul Islam)
Sub-Divisional Engineer (TLD)
Design & Quality Control
PGCB Ltd.

(Md. Azizul Islam Sarkar)
Executive Engineer (TLD)
Design & QC, PGCB
Dhaka, Bangladesh

(Engr. S. M. Zafrul Hasan)
Superintending Engineer (TLD)
Design & QC, PGCB, Dhaka.

31 JAN 2018



KEC INTERNATIONAL LTD.
TARDEO, MUMBAI-400036

FOUNDATION FORCES
FOR T.T. "2D3"

SHEET NO. 82 OF 83
DRG. NO.: C835/DES-2/REV-D

CONTRACT NO.: PGCB/K/M/2012.66.436/NZTL

Dated:- 31.10.2017

Summary of maximum Foundation forces for STANDARD Tower /+1.5m/+3.0m/4.5m/6.0m/9.0m/12.0m/15.0m/18.0m BE													
Sr. No.	Model	Load Case	Support Joint	Origin Joint	Leg Member	Force in Leg Dir. (kN)	Residual Shear Perpendicular To Leg (kN)	Residual Shear Horizontal To Leg - Res. (kN)	Residual Shear Horizontal To Leg - Long. (kN)	Residual Shear Horizontal To Leg - Tran. (kN)	Total Long. Force (kN)	Total Tran. Force (kN)	Total Vert. Force (kN)
Foundation Forces along LEG Direction													
1	Run #11 c 835 lt 2d3 18m de tower final family 3 rel LC-1 5 deg Full trans wind-Vmax NA+ C NA+		20Y	19PF0	8-94500Y	2422.027	77.409	77.876	-0.211	77.876	263.45	-341.11	-2384.63
2	Run #11 c 835 lt 2d3 18m de tower final family 3 rel LC-1 5 deg Full trans wind-Vmin NA+ C NA+		20X	19PF0	8-94500X	-2189.63	75.518	75.948	1.92	75.924	236.02	-313.86	2155.45
Notes													
1	Above loads are with Tower factored loads in kN without OLF for foundation design.												
2	LAST LEG SECTION = H 200*200*18												

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APPROVED WITH COMMENT
This approval is general only and does not release the manufacturer/contractor/supplier from compliance with specification and Standards for Design, workmanship and performance as stipulated in the contract.

MARKED IN RED INK.

(Engr. Muhammad Mahmudul Islam)
Sub-Divisional Engineer (TLD)
Design & Quality Control
PGCB Ltd.

(Engr. Md. Emdadul Hoque)
Executive Engineer
TLD & QC, PGCB, Dhaka

(Engr. S. M. Zafrul Hasan)
Superintending Engineer (TLD)
Design & QC, PGCB, Dhaka.

04 JUN 2018



COMMENT: This approval supersedes the earlier approval given vide pages letter no. 27.21.0000.411, 49.001.18.232, date: 05/04/2018.

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FOUNDATION FORCES
FOR T.T. "2D25"

SHEET NO. 231 OF 233
DRG. NO.: C835//DES-3/REV-A

CONTRACT NO.: PGCB/KW/2012.66.436/NZTL
Dated:- 31.10.2017

Summary of maximum Foundation forces for STANDARD Tower /+1.5m/+3.0m/4.5m/6.0m/9.0m BE

Sr. No.	Model	Load Case	Support Joint	Origin Joint	Leg Member	Force in Leg Dir. (kN)	Residual Shear Perpendicular To Leg (kN)	Residual Shear Horizontal To Leg - Res. (kN)	Residual Shear Horizontal To Leg - Long. (kN)	Residual Shear Horizontal To Leg - Tran. (kN)	Total Long. Force (kN)	Total Tran. Force (kN)	Total Vert. Force (kN)
1	Foundation Forces along LEG Direction												
1	Run #7 c835 lt 2d25 +9m be with red low	LC-3, 5 deg 22.5 deg diag wind-Vmax, Bt+C Bt+	11Y	0110SEFF-g68290	2857.319	54.33	54.736	7.868	54.168	401.8	-453.84	-2791.17	
2	Run #7 c835 lt 2d25 +9m be with red low	LC-321, 5 deg 22.5 deg diag wind-Vmin, Bt+C Bt+ gw interch 11X	11X	0110SEFF-g68290	-2852.851	61.57	62.137	3.743	62.024	405.04	-470.8	2785.11	
Notes													
1	Above loads are with Tower factored loads in kN without OLF for foundation design.												
2	LAST LEG SECTION = H 200*200*24												



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(Engr. Mohammad Mahmudul Islam)
Sub-Divisional Engineer (TLD)
Design & Quality Control
PGCB Ltd.

(Engr. S. M. Zafrul Hasan)
Superintending Engineer (TLD)
Design & QC, PGCB, Dhaka.

14 JUN 2018

KEC INTERNATIONAL LTD.
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FOUNDATION FORCES
FOR T.T. "2DT60"

SHEET NO. 222
DRG. NO.: C835/DES-4/REV-C

CONTRACT NO.: PGCB/KFW/2012.66.436/NZTL
Dated:- 31.10.2017

Summary of maximum Foundation forces for STANDARD Tower /+1.5m/+3.0m/4.5m/6.0m/9.0m BE

Sr. No.	Model	Load Case	Support Joint	Origin Joint	Leg Member	Force in Leg Dir. (kN)	Residual Shear Perpendicular To Leg (kN)	Residual Shear Horizontal To Leg - Res. (kN)	Residual Shear Horizontal To Leg - Long. (kN)	Residual Shear Horizontal To Leg - Tran. (kN)	Total Long. Force (kN)	Total Tran. Force (kN)	Total Vert. Force (kN)
Foundation Forces along LEG Direction													
1	Run #12 c835 tt 2d160 +9m be with red low	LC-3.5 deg 22.5 deg diag wind-Vmax BI+60 deg C BI+	11Y	10SF0.8 968434Y	4341.254	72.237	72.913	7.755	72.5	69.203	654.96	-735.21	-4228.74
2	Run #12 c835 tt 2d160 +9m be with red low	LC-3.5 deg 22.5 deg diag wind-Vmin BI+60 deg C BI+	11X	10SF0.8 968434Y	-4100.538	69.402	69.983	10.418	154.752	186.013	615.62	-695.24	3994.71
3	Run #7 c835 tt 2d160 +0m be with red low	LC-11.5 deg Full trans wind Eccentric load -Vmin NA+0 deg 110Y	110Y	APF0.74 967380Y	-647.798	241.922	241.969	154.752	186.013		653.89	-735.21	-4228.07
4	Run #7 c835 tt 2d160 +0m be with red low	LC-11.5 deg Full trans wind Eccentric load -Vmin NA+0 deg 110Y	110Y	APF0.74 967380Y	-647.798	241.922	241.969	154.752	186.013		-673.27	-695.5	-4093.88
Foundation Forces along Global (Vertical)													
Direction													
1	Run #7 c835 tt 2d160 +9m be with red low	LC-3.5 deg 22.5 deg diag wind-Vmax BI+60 deg C BI+	11Y								654.96	-735.21	-4228.74
2	Run #7 c835 tt 2d160 +9m be with red low	LC-3.5 deg 22.5 deg diag wind-Vmin BI+60 deg C BI+	11X								615.62	-695.24	3994.71
3	Run #7 c835 tt 2d160 +9m be with red low	LC-3.5 deg 22.5 deg diag wind-Vmax BI+60 deg C BI+	11Y								653.89	-735.21	-4228.07
4	Run #7 c835 tt 2d160 +9m be with red low	LC-11.5 deg Full trans wind-Vmin BI+0 deg 11m gw int.C BI+	11S								-673.27	-695.5	-4093.88

Notes

- Above loads are with Tower factored loads in kN without OLF for foundation design.
- LAST LEG SECTION = H 250 250 28

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(Engr. Muhammad Mahmudul Islam)
Sub-Divisional Engineer (TLD)
Design & Quality Control
PGCB Ltd.

(Engr. Md. Emdadul Haque)
Executive Engineer
TLD & QC, PGCB, Dhaka

(Engr. S. M. Zaiful Hasan)
Superintending Engineer (TLD)
Design & QC, PGCB, Dhaka

03 DEC 2018