सत्यमेव जयते

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण

(सड़क परिवहन एवं राजमार्ग मंत्रालय, भारत सरकार)

NATIONAL HIGHWAYS AUTHORITY OF INDIA

(Ministry of Road Transport and Highways, Govt. of India)

क्षेत्रीय कार्यालय / REGIONAL OFFICE

ई-6/47, स्मृति परिसर, सांईबोर्ड के पास, अरेरा कॉलोनी, भोपाल (म.प्र.)-462016

E-6/47, Smriti Parisar, Near Sai Board, Arera Colony, Bhopal (M.P.)-462016

दूरभाष/Phone: 0755-2426638, फैक्स/Fax: 0755-2426698, ई-मेल/E-mail ID: robhopal@nhai.org

NHAI/RO-MP/PIU-BPL/MPPTPL/Amrawad Kala/2025/54085 Date - 05.05.2025

Invitation of Public Comments

Sub: 4-Laning of Shahganj bypass end to Badi (Package-IV) of NH-146B from design Km. 102.000 to Km. 142.357 (Design length 40.357 Km) under NH (O) in the state of Madhya Pradesh on Hybrid Annuity Mode - Permission of overhead crossing at Chainage 135+635 by 132kv transmission line near village-Amrawad Kala -**Public Comment- Reg.**

Ref: PD, PIU Bhopal e-file no. 280971.

1. PD, PIU Bhopal, NHAI vide e-file note dated 30.04.2025 has submitted the proposal for Permission of overhead crossing at Chainage 135+635 by 132KV Transmission line near village-Amrawad Kala.

2. As per Ministry vide OM No. RW/NH-33044 S&R (R) dated 22.11.2016, the application shall be put out in public domain for 30 days for seeking claims and objections (on ground of public inconvenience, safety and general public interest).

3. Accordingly, the public comments are hereby invited on the above proposal (copy of application enclosed) for seeking claims and objections within 30 days (i.e. by **06.06.2025**) on public portal {i.e. website of MoRTH (www.morth.nic.in)} beyond which no comments will be considered. The address of comments inviting authority is as under:

The Highway Administrator
O/o Regional Officer,
National Highways Authority of India
E-6/47, Smriti Parisar, Near Sai Board
Arera Colony, Bhopal (MP) - 462016
E-mail ID: robhopal@nhai.org

4. This is being issued with the approval of Regional Officer cum Highway Administration.

05/05/2025
(Paras Bansal)
Manager (T)

Copy to:

(i) Web Admin, NHAI-HQ-with request for uploading on the NHAI website.
(ii) The Senior Technical Director, NIC, Transport Bhawan, New Delhi-110001 for uploading on Ministry's Website.
(iii) The Project Director, NHAI, PIU- Bhopal (M.P.) for information.
(iv) MP Power Transmission Package-I Ltd., New Delhi (Email: info@mpptpl.com).

Check List

For Overhead Badi - Shahganj Road Crossing by 132 kV DCSS Badi - Shahganj Transmission Line.

Sl.No.	Description	As Per Site.	Remarks
1	National Highway No.	Proposed NH	
2	Crossing Name	132 kV DCSS Badi - Shahganj Transmission Line	
3	Crossing Chainage	135+635	
4	System Of Supplay (i.e .Volatage) Frequency ,no of Phases whether	132 kV , 3 phases	
5	Position Of Tower	AP5:- N- 2543415.993, E-200309.104 AP5A:- N- 2543409.012, E- 200153.260	
6	Normal Span at PANTHER Conductor	325	
7	Maximum Sag at Normal Span	7.611	
8	Crossing Span	156	
9	Preceding Span with Loc.	205 of loc. 4/6 to AP 5	
10	Succeeding Span with Loc.	310 of AP 5A to Loc. 5A/1	
11	Hight Of Structure Above Ground And Below Ground Separately.	AP 5:- Hight above ground= 34.5m, Below ground = 3m. AP 5A:- Hight above ground= 34.5m, Below ground = 3m.	
12	Sag Of PANTHER Condouctor Size 30/3 .0mm AL+7/3 .0mm STEEL.		
13	Clearance Over Road	16.3	
14	Height of Lower Conductor Over Ground Level at Loc.	AP 5(DD+6):- 19.86 AP 5A(DD+6):- 19.86	
15	Hight/Difference of Lower Conductor from level of SH/NH at Loc.	AP 5(DD+6):- 1.638 AP 5A(DD+6):- 1.882	
16	Angle of Road Crossing	84°42'3"	
17	Distance From SH/NH Boundary From Centre Of Tower.	NA Proposed NH	
18	Prendicular Distance from Center of Tower to Centre of Road	AP 5:- 85.0m. AP 5A:- 70.0m.	
19	Protection of Assembly Line	Earthing in Both Tower.	
20	Foundation Type	.....	
21	No.Of Stay Required	NA	
22	Min factor of Safety	....	
23	Size Of Power Counductor	Size 30/3 .0mm AL+7/3 .0mm STEEL.DI -21.00mm,Weight-0974/kg/m	
24	Size of Earth Wire/OPGW	Eart Wire 9.45mm,Weight=0.428/Kg/m,OPGW-12.22 mm.Dia Weight-0.451/kg/m	
25	Two Legs Of Tower Earthed	As per specification	
26	Plain paper Digram	Profile Enclosed	
27	Earthing	Spike Type	

Tanmay Patra
Surveyor
MEIL

Akshaya Kumar Pradhan
General Manager
MPPT PKG-1 LTD

Manager (Tech.)
NHAI, PIU-Bhopal

Shailesh Mishra
Sr. Manager Projects
MPPT PKG-1 LTD.

CHECK-LIST

Guidelines for project Directors for processing the proposal for Overhead Transmission line crossing at Ch. 135+635 on Badi-Shahganj road (NH-146B) in the land along National Highways vested with NHAI.

Relevant circulars of Ministry of Road Transport and Highways

1) Circular No. NH-III/P/66/76 dated 18/19.11.1976.
2) Circular No. RW/NH-III/P/66/76 dated 11.5.1982.
3) Circular No. RW/NH-11037/1/86/DOI (ii) dated 28.7.1993.
4) Circular No. RW/NH-11037/1/86/DOI dated 19.1.1995.
5) Circular No. RW/NH-34066/2/95/S&R dated 25.10.1999.
6) Circular No. RW/NH-34066/7/2003 S&R(B) dated 17.9.2003.
7) NHAI's circular No. NHAI/OEC/2k/Vol II dated 7.11.2000, which includes the comprehensive guidelines and draft license agreement by private party in the land along National Highway vested with NHAI.
8) Circular No. RW/NH-33044/27/2000-S&R (R) dated 21.3.2006. It is regarding the modification of previous Ministry circular enhancing the amount of performance bank Guarantee @ Rs 50/- per route meter in place of earlier rate of Rs 25/- per route meter.
9) Circular No. RW/NH-33044/29/2015/S&R (R) dated 22.11.2016.

Check list for getting approval for Overhead Transmission line crossing at Ch. 135+635 on Badi-Shahganj road (NH-146B) on NH land.

The permission for Overhead Transmission Line Crossing shall be considered for approval/ rejection based on the Ministry Circulars mentioned as above.

S.NO	Item	Information/Status	Remarks
1	General Information		
1.1	Name and Address of the Applicant/ Agency	MP Power Transmission Package-1 Ltd., New Delhi	
1.2	National Highway Number	146 B	
1.3	State	M.P.	
1.4	Location	Badi (Village - Amrawad Kalan)	
1.5	(Chainage in KM)	135+635	
1.6	Length in Meters (Crossing span)	156	
1.7	Width of available ROW	60	
	(a) Left side from center line towards increasing chainage/Km direction	30	
	(b) Right side from center line towards increasing chainage/Km direction	30	
1.8	Proposal to lay underground utility.	NA	
	(a)Left side from center line towards increasing chainage/Km direction	NA	
	(b)Right side from center line towards increasing chainage/Km direction	NA	
1.9	Proposal to acquire land	NA	
	(a) Left side from center line.	NA	
	(b) Right side from center line.	NA	
1.10	Whether Proposal is in the same side where land is not to be acquired	NA	
	If not then where to lay the cable.	NA	

Akshaya Kumar Pradhan
General Manager
M.P. Power Transmission Package-1 Limited

Manager (Tech.)
NHAI, PIU-Bhopal

1.11	Details of already laid services , if any, along the proposed route	No	
1.12	Number of existing lanes (2/4/6/8 lanes)	2- Lanes	
1.13	Proposed Number of lanes (2 lanes with paved shoulders/4/6/8 lanes)	4- Lanes	
1.14	Services road existing or not If yes then which side	No	
	(a) Left side from center line.	No	
	(b) Right side from center line.	No	
1.15	Proposed service road	No	
	(a) Left side from center line.	No	
	(b) Right side from center line.	No	
1.16	Whether proposal to lay underground cable pipeline is after the service road or between the service road and main carriageway.	NA	
1.17	Whether carrying underground cable pipeline has been proposed on highway bridges. If yes then mention the methodology proposed for the same.	NA	
1.18	Whether carrying of underground cable pipeline has been proposed on parapet/any part of the bridges. If yes then mention the methodology proposed for the same.	NA	
1.19	If crossing of the road involved	Yes Overhead Crossing	
	If yes, it shall be either encased in pipes or through structure or conduits specially built for that purpose at the expenses of the agency owning the line.	1 nos 132 kv overhead crossing on NH-146B at Ch. 135+635	
	(a) Whether existing drainage structures are allowed to carry underground cable pipeline.	NA	
	(b) Is it on a line normal to NH, if No Mention angle of crossing	84°42'03"	
	(c) What is the distance of crossing the underground cable pipeline pipelines from the existing structures. Crossings shall not be too near the existing structures on the National Highway, the minimum distance being 15 meter.	NA	
	(d) The casing pipe (or conduit pipe in the case of electric cable) carrying the utility line shall be of steel , cast iron, or reinforced cement concrete and have adequate strength and be large enough to permit ready withdrawal of the carrier pie/cable. Mention type of casing.	NA	
	(e) Ends of the casing/conduit pipe shall be sealed from the outside, so that it does not act as a drainage path.	NA	
	(f) The casing/ conduit pipe should, as minimum extend from the drain to drain in cuts and toe of slope in the fills.	NA	
	(g) The top of the casing/conduit pipe should be at least 1.2 meter below the surface of the road subject to being at least 0.3 meter below the drain inverts. Mention the proposed details.	NA	
	(h) Mention the methodology proposed for the crossing of road for the proposed underground cable pipeline. Crossing shall be by boring method (HDD)[Trench –less Technology] especially where the existing road pavement is of cement concrete or dense bituminous concrete type.	NA	
	(i) The casing /conduit pipe shall be installed with an even bearing throughout its length and in such a manner as to prevent the formation of a waterway along it.	NA	
2	Document/ Drawings to be enclosed with the proposal.		
2.1	Cross section showing the size of trench for open trenching method (Is it normal size of 1.2m deep x0.3m wide)	NA	

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NHAI, PIU-Bhopal

	(i) Should not be greater than 60 cm wider than the outer diameter of the pipe.	NA	
	(ii) Located as close to the extreme edge of the right-of-way as possible but not less than 15 meter from the centre-lines of the nearest carriageway.	NA	
	(iii) Shall not be permitted to run along the National Highways when the road formation is situated in double cutting. Nor shall these be laid over the existing culverts and bridges.	NA	
	(iv)These should be so laid that their top is at least 0.6 meter below the ground level so as not to obstruct drainage of the road land.	NA	
2.2	Cross section showing the size of pit and location of cable for HDD method.	NA	
2.3	Alignment plan on project plan & profile showing Overhead cable electrical line, chainage, width of ROW, distance of proposed Overhead cable electrical line from the edge of ROW, important mile stone, intersections, cross drainage works etc.	Yes	
2.4	Methodology for laying/crossing of Overhead cable electrical line.	Yes	
2.4.1	Open Trenching method. (May be allowed in utility corridor only where pavement is neither cement concrete nor dense bituminous concrete type. IF yes, What is the Methodology of refilling of trench?	NA	
	(a) The trench width should be at least 30 cm, but not more than 60cm wider than the outer diameter of the pipe.	NA	
	(b) For filling of the trench, bedding shall be to a depth of not less than 30 cms. It shall consist of granular material free of lumps, clods and cobbles and graded to yield a firm surface without sudden change in the bearing value. Unsuitable soil and rock edged should be excavated and replaced by selected material.	NA	
	(c) The backfill shall be completed in two steps (i) side fill to the level of the top to the pipe and (ii) overfill to the bottom of the road crust.	NA	
	(d) The side fill shall consist of granular material laid in 15 cm layers each consolidated by mechanical tampering and controlled addition of moisture to 95% of the Proctors' density. Over fill shall be compacted to the same density as the material that had been removed. Consolidation my saturation or pending will not be permitted.	NA	
	(e) The road crust shall be built to the same strength as the existing crust on either side of the trench. Care shall be taken to avoid the formation of a dip at the trench.	NA	
	(f) The excavation shall be protected by flagman, signs and barricades, and red lights during night hours.	Yes	
	(g) If required, a diversion shall be constructed at the expenses of agency owning the utility line.	NA	
2.4.2	Horizontal Directional Drilling (HDD) Method	NA	
2.4.3	Methodology for laying of underground cable pipeline through CD works and method of laying. In cases where the carrying of underground cable pipeline on the bridge becomes inescapable.	NA	
3	**Draft License Agreement signed by two witnesses.**	Yes, enclosed with proposal To be	
4	Performance bank Guarantee in favour of NHAI has to be obtained @ Rs 50/- per running meter (parallel to NH) and Rs 1,00,000/- per	Yes, obtained as per NHAI guideline	

Akshaya Kumar Pradhan
General Manager
M/s Power Transmission Bhopal Limited

	crossing of NH, for a period of one year initially (extendable if required till satisfactory completion of work)as a security for ensuring/making good the excavated trench for laying the underground cable Pipeline ducts by proper filling and compaction, clearing Debris/loose earth produced due to execution of trenching at least 50m away from the edge of the right of way. No payment shall be payable by the NHAI to the license for clearing debris/loose earth. Performance BG as per above is to be obtained.	To be	
4.1	Confirmation of BG has been obtained or not as per NHAI guidelines.	Yes, obtained as per NHAI guideline	
5	**Affidavit/ Undertaking from the Applicant for the following are to be furnished.**		
5.1	Not to Damage to other utility, if damaged then pay the losses either to NHAI or to the concerned agency.	Yes, covered in Agreement	
5.2	For renewal of bank Guarantee	Yes, if required	
5.3	For confirming all standard condition of Ministry Circulars and NHAI's guidelines.	Yes, confirming as per NHAI guidelines	
5.4	For shifting of underground cable Pipeline as and when required by NHAI at their own cost.	Yes, if required	
5.5	For shifting of underground cable Pipeline due to 4/6 lanning. Widening of NH	Yes, if required	
5.6	For indemnity against all damages and claims.	NA	
5.7	For traffic movement during laying off for shifting of underground cable Pipeline due to 4/6 lanning. Widening of NH pipe line to be managed by the applicant.	Yes, if required	
5.8	If any claim is raised by the Concessionaire the same has to be paid by the applicant.	Yes, if required	
5.9	Prior approval of the NHAI shall be obtained before undertaking any work if installation, shifting or repairs, or alterations to the For shifting of underground cable Pipeline due to 4/6 lanning. Widening of NH line/ any other utility located in the national highway right-of- ways.	Yes	
5.10	Expenditure, if any, incurred by NHAI for repairing any damage caused to the national Highway by the laying, maintenance or shifting of the For shifting of underground cable Pipeline due to 4/ 6 lanning. Widening of line at NH will be borne by the applicant agency owning the line.	NA	
5.11	If the NHAI considers it necessary in future to move the utility line for any work of improvement or repairs to the road, it will be carried out as desired by the NHAI at the cost of the agency owning the utility line within a reasonable time (not exceeding 60 days) of the intimation given.	NA	
5.12	Certificate from the applicant in the following format	NA	
	(i)Laying of Underground cable pipe line will not have any deleterious effects on any of the bridge components and roadway safety for traffic.	NA	
	(ii)"We do undertake that I will relocate service road/approach road/utilities at my own cost notwithstanding the permission granted within such time as will be stipulated by NHAI" for future four/ six-lanning or any other development.	NA	
6	Who will sign the agreement on behalf of Overhead Transmission line agency?	General Manager, M.P. Power	

Akshaya Kumar Pradhan
General Manager
M.P. Power Transmission Package-1 Limited

Manager (Tech.)
NHAI, PIU-Bhopal

		Transmission Package-1 Ltd.	
	Power of Attorney to sign the agreement is available or not.	Yes	
7	The project director, will submit the following Certificates.		
7.1	Certificate for proposal for confirming of all standard condition issued vide Ministry of road transport and highways circular No. RWINH-33044/29/201S/S&R(R) dated 22.11.2016	Yes	
7.2	Certificate from PD in the following format	NA	
	(i)" it is certified that any other location of the underground cable pipeline would be extremely difficult and unreasonable costly and the installation of underground cable pipeline within ROW will not adversely affect the design, stability & traffic safety of the highway nor likely future improvement such as widening of the carriageway, easing of curve etc."		
	(ii)For 4/6-lanning	4-lane	
	(a)Where feasibility is available "I do certify that there will be no hindrance to proposed four/six-lanning based on the feasibility report considering proposed structure at the said location".		
	(b)In case feasibility report is not available "I do certify that sufficient ROW is available at site for accommodating proposed four/ six-lanning".		
8	If NH section proposed to be taken up by NHAI on BOT basis- a clause is to be inserted in the agreement." The permitted Highway on which licensee has been granted the right to lay pipeline duct has also been granted as a right of way to the concessionaire under the [Overhead Transmission line Crossing Section at Km 135+635 of NH No: 146B build, operate and transfer basis] and therefore, the licensee shall honor the same."		
9	Who will supervise the work of laying/crossing of Overhead Transmission line	M.P. Power Transmission Package-1 Ltd.	
	(a) On behalf of the Applicant	GM, MP Power Transmission Package-1 Ltd.	
	(b) On behalf of NHAI	Project Director, NHAI, PIU, Bhopal	
10	Who will ensure that the defects in road portion after laying of underground cable pipeline are corrected and if not corrected then what action will be taken		
	(a) On behalf of the Applicant	GM, MP Power Transmission Package-1 Ltd.	
	(b) On behalf of NHAI	Project Director, NHAI, PIU, Bhopal	
11	Who will pay the claims for damages done/disruption in working of concessionaire if asked by the Concessionaire?		
	On behalf of the Applicant		
12	A certificate from PD that he will enter the proposed permission in the register of records of the permissions in the prescribed Performa (copy enclosed)	NA	

Manager (Tech.)
NHAI, PIU-Bhopal

Akshaya Kumar Pradhan
General Manager
M.P. Power Transmission Package-1 Limited

13	If any previous approval is accorded for laying of underground cable pipeline then photocopy of register of records of permissions accorded as maintained by PD then copy is enclosed.	NA	
14	Name of Highway authority of NHAI/PWD/BRO	NHAI	
15	Highway Administration address	NHAI, PIU, Bhopal	

General Manager,
M.P. Power Transmission Package-1 Ltd.

Manager (Tech.)
NHAI, PIU-Bhopal

परियोजना निदेशक
Project Director
रा रा रा.प परि.क्रिया इकाई भोपाल
NHAI PIU-Bhopal (M.P.)

NAME OF PROJECT :- (Element No: 7) 132kV DCSS BaDi - Shahganj Transmission Line

NAME OF CLIENT :- M.P.POWER TRANSMISSION PKG-1 LIMITED

TOWER SCHEDULE

Sl. No	Twr No.	Tower Type	Deviation Angle (DMS)	Span (m)	Section Length (m)	Wind Span (m)	Adjacent Span			Weight Span (Cold)			Weight Span (Hot)			UTM Coordinate		Major Crossings / Remarks
							Left	Right	Total	Left	Right	Total	Left	Right	Total	Easting	Northing	
1	4/6	DA+6				248.5	292	205	497	147.6	98.6	246.2	146.9	100.3	247.2	200460.572	2543554.234	
				205														
2	AP 5	DD+6	40°59'55"RT		1995	180.5	205	156	361	106.4	82.7	189.2	104.7	80.7	185.4	200309.104	2543415.993	
				156														**Proposed NH Baro Sahhganj, 33kV line**
3	AP 5A	DD+6	39°11'08"LT		156	233	156	310	466	73.3	187.5	260.8	75.3	173.4	248.7	200153.260	2543409.012	
				310														Cart track, Fencing
32 4	5A/1	DA+3				309.5	310	309	619	122.5	160.7	283.2	136.6	158.0	294.6	199921.983	2543202.587	

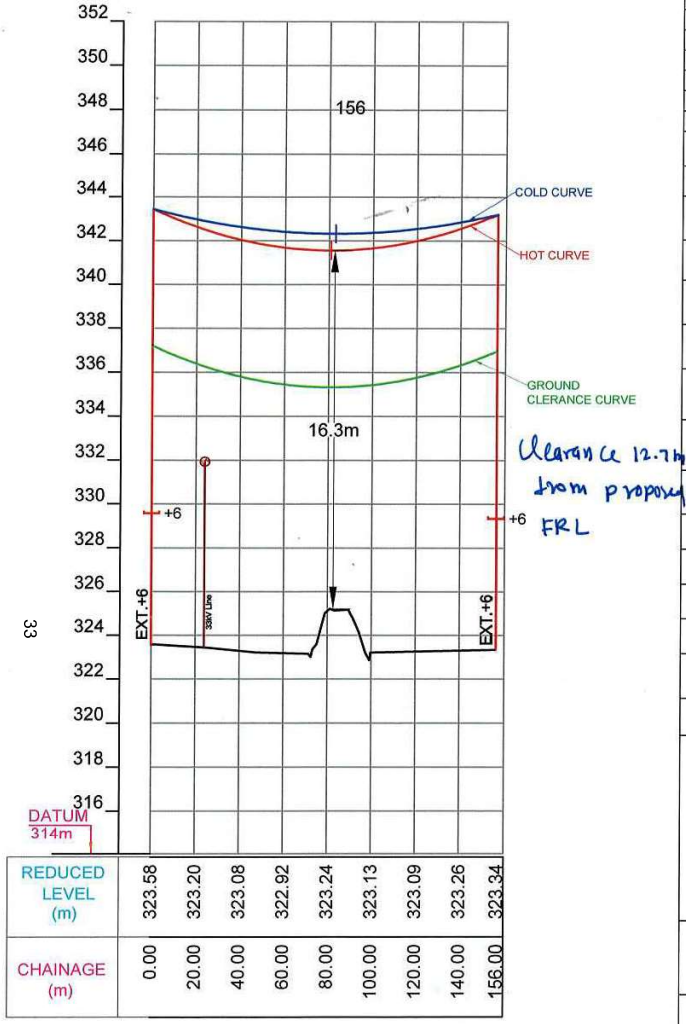
Tanmay Patra
Surveyor
MEIL

Shailesh Mishra
Sr. Manager Projects
MPPT PKG-1 LTD.

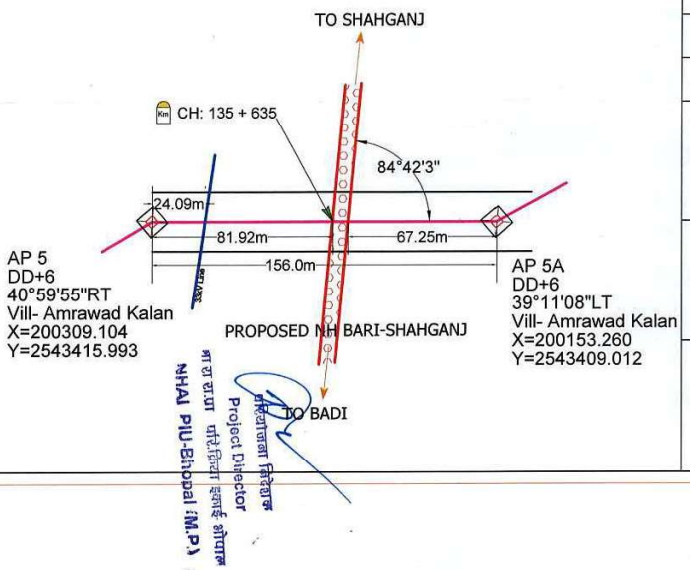
Akshaya Kumar Pradhan
General Manager
MPPT PKG-1 LTD

AP 5
DD+6
X=200309.104
Y=2543415.993
Bottom ht=19.86 ele=323.58
Tower Height= 34.50
Wind Span (m) = 180.5
Weight Span (Cold)=189.2
L :-106.4 + R:- 82.7
Weight Span (Hot)=185.3
L :-104.7 + R:- 80.7

AP 5A
DD+6
X=200153.260
Y=2543409.012
Bottom ht=19.86 ele=323.34
Tower Height= 34.50
Wind Span (m) = 233
Weight Span (Cold)=260.8
L :-73.3 + R:- 187.5
Weight Span (Hot)=248.7
L :-75.3 + R:- 173.4



REDUCED LEVEL (m)	323.58	323.20	323.08	322.92	323.24	323.13	323.09	323.26	323.34
CHAINAGE (m)	0.00	20.00	40.00	60.00	80.00	100.00	120.00	140.00	156.00



TOWER SPOTING DATA -WIND ZONE-4 (47M/SEC)

Basic Span	325 M
Conductor Type	PANTHER
Overall Diameter	21.00 mm
Cross Section Area	261.500(Sqmm)
Unit weight	0.974 kg/m
Modulus of Elasticity	8.16E+05 Kgf/Sqcm
Coef of Thermal Expansion	1.78E-05
Temp. Range	-5°-32°-85°
Max. Sag Hot (85°)	7.611 m
Max . Sag Cold (-5°)	3.06 m
Sag Error	0.15
Max Tension Hot (85°)	1690.0 Kgs
Max . Tension Cold (-5°)	2986.0 Kgs
Minimum Ground Clearence Require+Sag Error	6.1 m+0.15 m= 6.25 m
Way Leave Clearence (Eitger Side)	13.5 m
Minimum Vertical Clearence for Rail Line Crossing	15.56 m
Minimum Vertical Clearance for Power Line Crossing	3.05 m
WIND ZONE	4 (47M/SEC)

LEGEND

GROUND FEATURE	PLAN	ELEVATION
TAR ROAD/METAL ROAD		
CART TRACK (MUD)		
RIVER/CANAL/POND		
RAILWAY LINE		
LT LINE		
11 KV LINE		
33 KV LINE		
HOT CURVE		
COLD CURVE		
GROUND CLERANCE		
SUSPENSION TOWER		
TENSION TOWER		
WELL/BORE/PH/TEMPLE	WELL BORE PUMP HOUSE	TEMPLE

Horizontal Scale 200m. 180 160 140 120 100 80 60 40 20 00 20
1 cm = 20m.

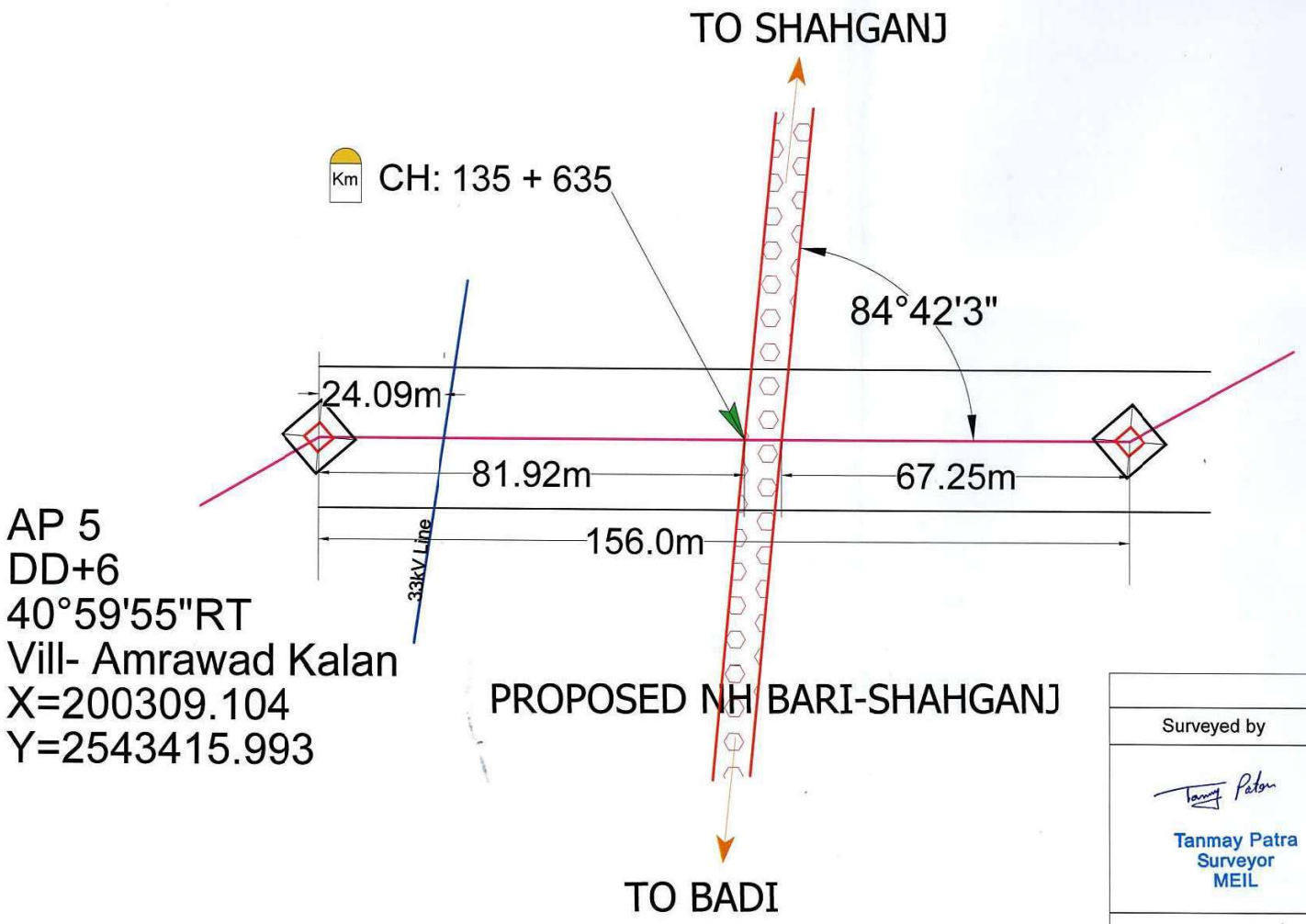
Vertical Scale 20m. 18 16 14 12 10 8 6 4 2 00
1 cm = 2m.

Client	M.P. POWER TRANSMISSION PKG-1 LTD
Project	(ELEMENT NO: 7) 132 kV DCSS Badi-Shahganj Transmission Line
Section :	AP5 to AP 5A (Length =156 m)

	FOR M. P. P. T. PKG-1 L.	FOR NHAI
Surveyed by	Tanmay Patra Surveyor MEIL	Manager (Tech.) NHAI, PIU-Bhopal
Checked by	Shailesh Mishra Sr. Manager Projects MPPT PKG-1 LTD.	
Submitted by	Akshaya Kumar Pradhan General Manager MPPT PKG-1 LTD	

NHAI PIU-Bhopal (M.P.)
Project Director

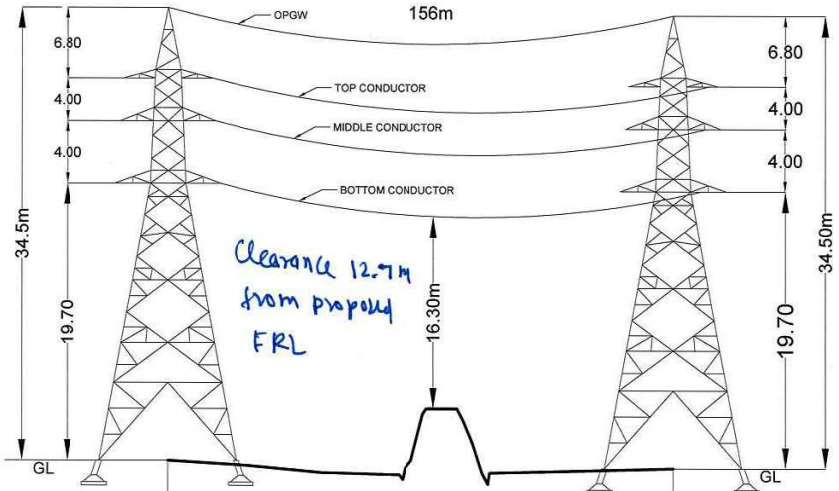
SLD OF 132 kV DCSS BADI - SHAHGANJ TRANSMISSION LINE CROSSING OVERHEAD PROPOSED NATIONAL HIGHWAY- (BADI - SHAHGANJ)



AP 5
DD+6
40°59'55"RT
Vill- Amrawad Kalan
X=200309.104
Y=2543415.993

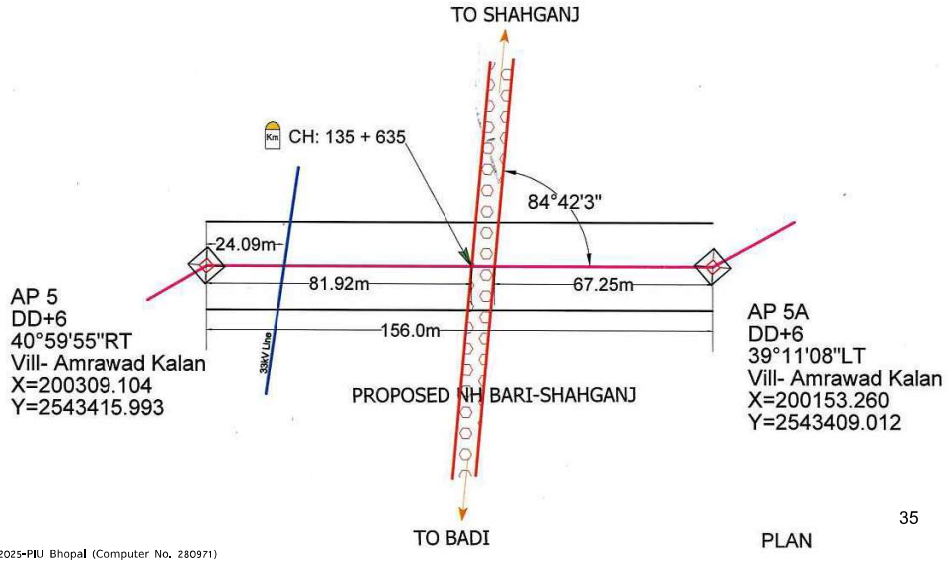
AP 5A
DD+6
39°11'08"LT
Vill- Amrawad Kalan
X=200153.260
Y=2543409.012

FOR M. P. P. T. PKG-1 L.		
Surveyed by	Checked by	Submitted by
Tanmay Patra Surveyor MEIL	Shailesh Mishra Sr. Manager Projects MPPT PKG-1 LTD.	Akshaya Kumar Pradhan General Manager MPPT PKG-1 LTD
FOR NHAI		
Manager (Tech.) NHAI, PIU-Bhopal	परियोजना निदेशक Project Director रा.रा.रा.प्रा. परियोजना इकाई भोपाल NHAI PIU-Bhopal (M.P.)	



REDUCED LEVEL (m)	323.58	323.20	323.08	322.92	323.24	323.13	323.09	323.26	323.34
CHAINAGE (m)	0.00	20.00	40.00	60.00	80.00	100.00	120.00	140.00	156.00

ELEVATION



PLAN

TOWER SPOTING DATA -WIND ZONE-4 (47M/SEC)	
Basic Span	325 M
Conductor Type	PANTHER
Overall Diameter	21.00 mm
Cross Section Area	261.500(Sqmm)
Unit weight	0.974 kg/m
Modulus of Elasticity	8.16E+05 Kgf/Sqcm
Coef of Thermal Expansion	1.78E-05
Temp. Range	-5°-32°-85°
Max. Sag Hot (85°)	7.611 m
Max . Sag Cold (-5°)	3.06 m
Sag Error	0.15
Max Tension Hot (85°)	1690.0 Kgs
Max . Tension Cold (-5°)	2986.0 Kgs
Minimum Ground Clearence Require+Sag Error	6.1 m+0.15 m= 6.25 m
Way Leave Clearence (Eitger Side)	13.5 m
Minimum Vertical Clearence for Rail Line Crossing	15.56 m
Minimum Vertical Clearance for Power Line Crossing	3.05 m
WIND ZONE	4 (47M/SEC)

PROPOSAL OF PROPOSED NH CROSSING IN BETWEEN LOCATION AP5 - AP5A & CH: 135 + 635

CLIENT	M.P. POWER TRANSMISSION PKG-1 LTD
PROJECT	ELEMENT NO: 7 132 KV DCSS Badi - SHAHGANJ Transmission Line
DRAWING TITLE	PLAN & VERTICAL CLEARANCE DRAWING OF PROPOSED NH CROSSING DIVISION : BADI - SHAHGANJ SECTION : AP5 - AP5A

FOR M. P. P. T. PKG-1 L.

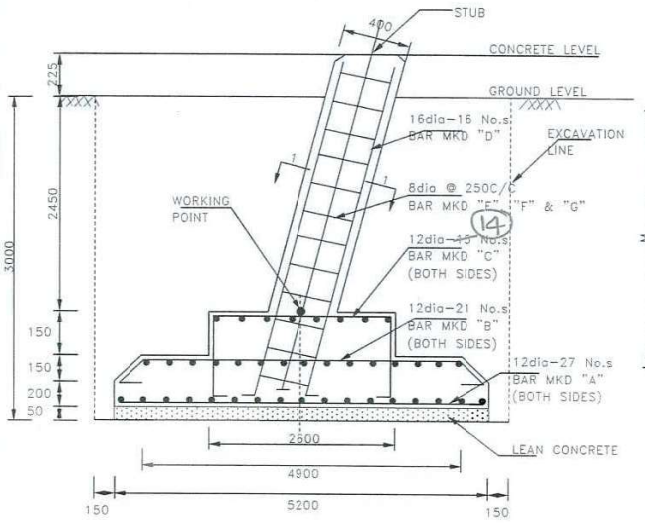
Surveyed by	Checked by	Submitted by
Tanmay Patra Surveyor MEIL	Shailesh Mishra Sr. Manager Projects MPPT PKG-1 LTD.	Akshaya Kumar Pradhan General Manager MPPT PKG-1 LTD

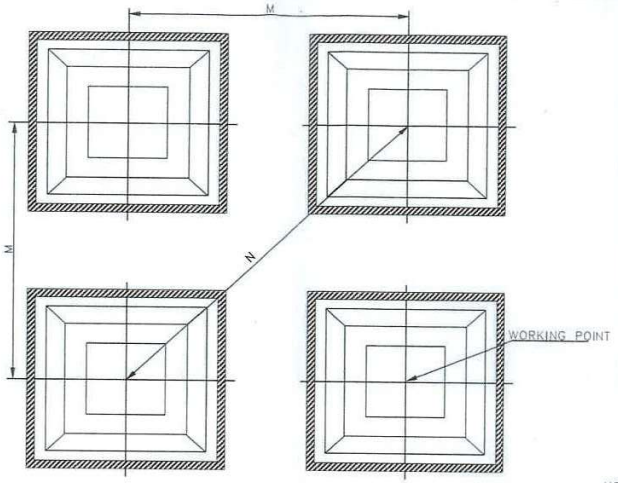
FOR NHAI

Manager (Tech.)
NHAI, PIU-Bhopal

Project Director
NHAI PIU-Bhopal (M.P.)

000024





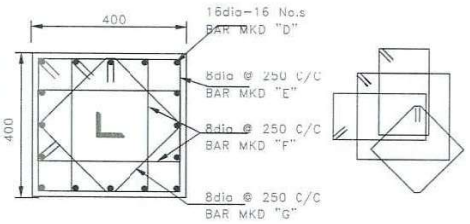
EXCAVATION PLAN AT WORKING POINT LEVEL

BAR BENDING SCHEDULE

MARK No.	SKETCH	LENGTH MM	DIA MM	NOS BARS/ FDN	UNIT WT KG/M	WT / FDN KG	WT / TWR KG
A	5100	5100	12	54	0.888	244.6	978.24
B	100 4800 100	5284	12	42	0.888	197.1	788.28
C	400 2500 100	3500	12	36 28	0.888	93.24	372.96 343.67
D	350 3180	3530	16	16	1.58	89.24	356.96
E	300 300 300	1350	8	14	0.395	7.47	29.88
F	300 158	1066	8	28	0.395	11.79	47.16
G	459	946	8	14	0.395	5.23	20.92

TOTAL WEIGHT OF STEEL REQUIRED IN KG = 2594.4

2565.11

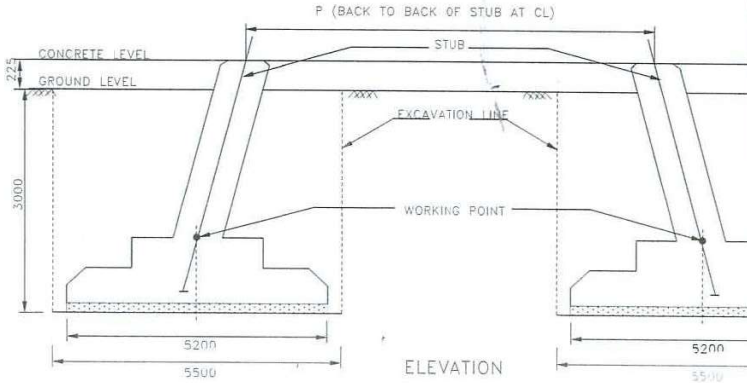


SECTION 1–1

TOWER SLOPE TAN ALPHA : 0.186313868

LEVEL	STUB	P	M	N
NT–4.5MBE	HT 130*10	6494	7419	10492
NT		8171	9096	12864
NT+3MBE		9289	10214	14445
NT+6MBE		10407	11332	16026

NOTES:
1.DRAWING NOT TO SCALE AND WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
2.ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED
3.REINFORCED BAR USED FE500 CONFORMING TO IS 1786–1985
4.MIX PROPERTIES CONFORMING TO IS 456–2000
5.CONCRETE MIX USED GRADE M20 AS PER SPECIFICATION UNLESS OTHERWISE STATED.
6.LEAN CONCRETE MIX 1:3:6.
7.CLEAR COVER TO THE MAIN REINFORCEMENT BARS SHALL BE 50MM FOR CHIMNEY & 50MM FOR FOOTING SLAB
8.WHENEVER NECESSARY TO CLEAR STUB AND CLEAT ,STIRRUPS AND BARS ARE TO BE ADJUSTED AT SITE.
9.THIS FOUNDATION DRAWING IS FOLLOWED ALONG WITH APPROVED STUB TEMPLATE DRAWING.
10.STUB SHALL BE HELD ACCURATELY IN LINE & LEVEL BEFORE CONCRETING
11.WORKING POINT IS THE POINT WHERE CG OF STUB COINCIDES WITH THE CENTER OF TOP PLAN OF TOP PAD
12.FOR SPLICING, LAP LENGTH TO BE PROVIDED AS 57D. D=DIA OF LARGER BAR.
13.LAPPING OF BARS SHALL BE SUITABLY STAGGERED AND IN NO CASE MORE THAN 50% BARS SHALL BE LAPPED AT ANY SECTION.



ELEVATION

Date:- 24/07/2023
अनुमोदित/APPROVED
सुधार के साथ अनुमोदित
Approved With Correction
द्वारा जाँचा गया
Checked by
द्वारा अनुमोदित
Approved by
अभिकल्प एवं परामर्श प्रकोष्ठ
Design & Consultancy Cell
टावर परीक्षण केंद्र/Tower Testing Station
यांत्रिक इंजीनियरी प्रभाग
Mechanical Engineering Division
केन्द्रीय विद्युत अनुसंधान संस्थान
Central Power Research Institute
बंगलूरु/Bengaluru-560 080

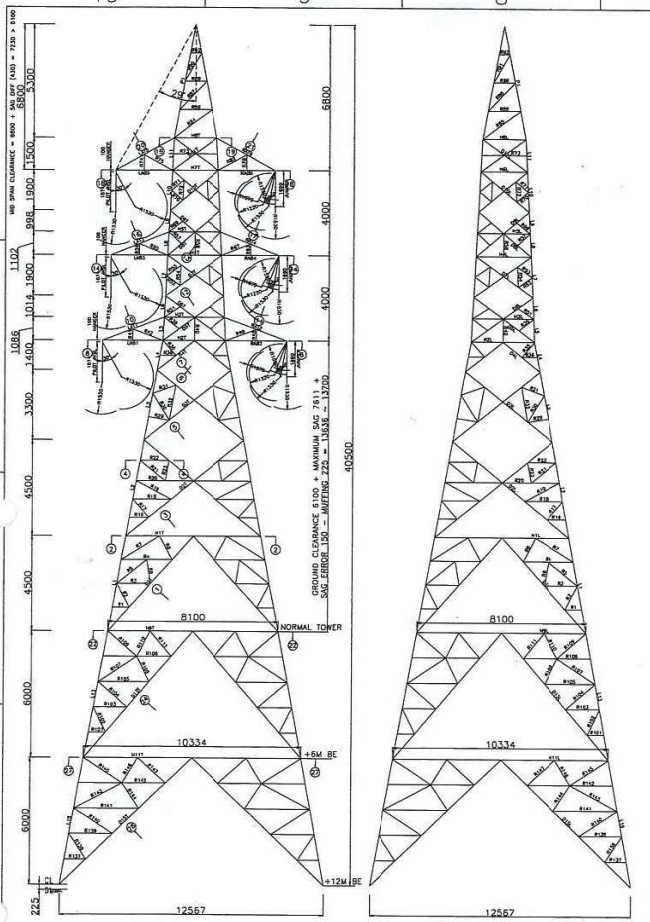
QUANTITIES PER TOWER

PCC 1:3:6	=	5.4	Cu.M
RCC M20	=	42.76	Cu.M
EXCAVATION	=	363.00	Cu.M
REINFORCEMENT	=	2594.40	Kg

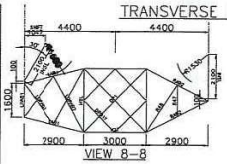
2565.11

REV	DESCRIPTION	DATE
0	First Issue	15-06-23

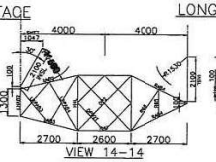
CLIENT	M E I L
CONTRACTOR	MEGHA ENGINEERING AND INFRASTRUCTURE LIMITED
PROJECT	132KV D/C LINE IN MP (TBCB)
DRG. TITLE	FOUNDATION DRAWING OF TOWER TYPE DD UPTO 6MTR BODY EXTENSION FOR WET BLACK COTTON SOILS
DRG NO.	DTPL/MEIL/132KV/MP/TBCB/DD+6/FDN/WBC/2
SCALE	NTS SIZE: A3 SHEET NO. 1 OF 1 REV: 0



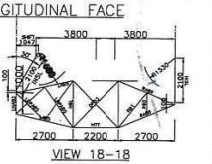
TRANSVERSE FACE



VIEW 8–8

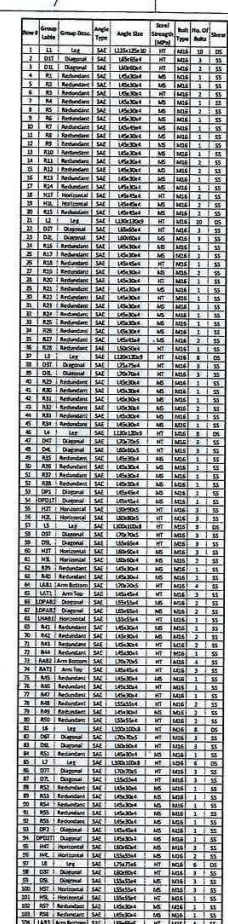


VIEW 14–14

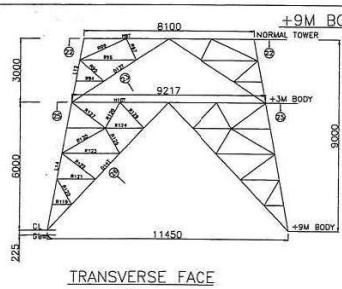


VIEW 18–18

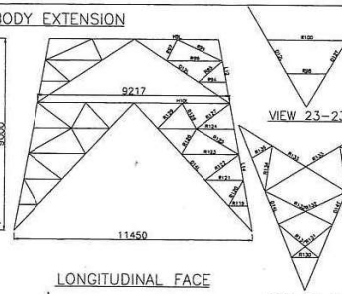
LONGITUDINAL FACE



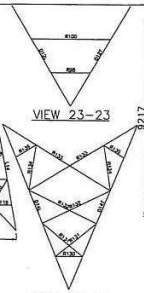
+9M BODY EXTENSION



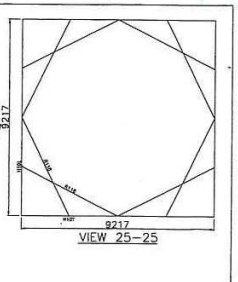
TRANSVERSE FACE



LONGITUDINAL FACE



VIEW 23–23



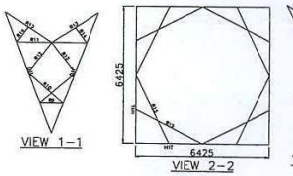
VIEW 25–25

VIEW 26–26

Row #	Group Lable	Group Desc.	Angle Type	Angle Size	Steel Strength (MPa)	Bolt Type	No. Of Bolts	Shear
1	L1	Leg	SAE	L125×125×10	HT	M16	10	DS
2	D1T	Diagonal	SAE	L80×80×6	HT	M16	3	SS
3	D1L	Diagonal	SAE	L80×80×6	HT	M16	3	SS
4	R1	Redundant	SAE	L45×30×4	MS	M16	1	SS
5	R2	Redundant	SAE	L45×30×4	MS	M16	1	SS
6	R3	Redundant	SAE	L45×30×4	HT	M16	2	SS
7	R4	Redundant	SAE	L45×30×4	MS	M16	1	SS
8	R5	Redundant	SAE	L45×30×4	MS	M16	1	SS
9	R6	Redundant	SAE	L45×30×4	MS	M16	1	SS
10	R7	Redundant	SAE	L45×45×4	MS	M16	1	SS
11	R8	Redundant	SAE	L45×30×4	MS	M16	1	SS
12	R9	Redundant	SAE	L45×30×4	MS	M16	1	SS
13	R10	Redundant	SAE	L45×30×4	MS	M16	1	SS
14	R11	Redundant	SAE	L45×30×4	MS	M16	1	SS
15	R12	Redundant	SAE	L45×30×4	MS	M16	1	SS
16	R13	Redundant	SAE	L45×30×4	MS	M16	1	SS
17	R14	Redundant	SAE	L45×30×4	MS	M16	1	SS
18	H1T	Horizontal	SAE	L45×45×4	HT	M16	2	SS
19	H1L	Horizontal	SAE	L45×45×4	MS	M16	2	SS
20	R15	Redundant	SAE	L45×30×4	MS	M16	1	SS
21	L2	Leg	SAE	L130×130×8	HT	M16	10	DS
22	D2T	Diagonal	SAE	L80×80×6	HT	M16	3	SS
23	D2L	Diagonal	SAE	L80×80×6	MS	M16	3	SS
24	R16	Redundant	SAE	L45×30×4	MS	M16	1	SS
25	R17	Redundant	SAE	L45×30×4	MS	M16	1	SS
26	R18	Redundant	SAE	L45×45×4	HT	M16	2	SS
27	R19	Redundant	SAE	L45×30×4	MS	M16	1	SS
28	R20	Redundant	SAE	L45×30×4	HT	M16	1	SS
29	R21	Redundant	SAE	L45×30×4	MS	M16	1	SS
30	R22	Redundant	SAE	L45×30×4	HT	M16	1	SS
31	R23	Redundant	SAE	L45×30×4	MS	M16	1	SS
32	R24	Redundant	SAE	L45×30×4	MS	M16	1	SS
33	R25	Redundant	SAE	L45×30×4	MS	M16	1	SS
34	R26	Redundant	SAE	L45×30×4	MS	M16	2	SS
35	R27	Redundant	SAE	L45×30×4	MS	M16	1	SS
36	R28	Redundant	SAE	L50×50×4	HT	M16	1	SS
37	L3	Leg	SAE	L130×130×8	HT	M16	8	DS
38	D3T	Diagonal	SAE	L75×75×6	HT	M16	3	SS
39	D3L	Diagonal	SAE	L70×70×6	HT	M16	3	SS
40	R29	Redundant	SAE	L45×30×4	MS	M16	1	SS
41	R30	Redundant	SAE	L45×30×4	MS	M16	1	SS
42	R31	Redundant	SAE	L45×30×4	MS	M16	1	SS
43	R32	Redundant	SAE	L45×30×4	MS	M16	1	SS
44	R33	Redundant	SAE	L45×30×4	MS	M16	1	SS
45	R34	Redundant	SAE	L45×30×4	MS	M16	1	SS
46	L4	Leg	SAE	L130×130×8	HT	M16	8	DS
47	D4T	Diagonal	SAE	L70×70×6	HT	M16	3	SS
48	D4L	Diagonal	SAE	L80×80×6	HT	M16	3	SS
49	R35	Redundant	SAE	L45×30×4	MS	M16	1	SS
50	R36	Redundant	SAE	L45×30×4	MS	M16	1	SS
51	R37	Redundant	SAE	L45×30×4	MS	M16	1	SS
52	R38	Redundant	SAE	L45×30×4	MS	M16	1	SS
53	DP1	Diagonal	SAE	L45×45×4	MS	M16	2	SS
54	DP2T	Diagonal	SAE	L45×45×4	MS	M16	2	SS
55	H2T	Horizontal	SAE	L50×50×5	HT	M16	3	SS
56	H2L	Horizontal	SAE	L80×80×5	HT	M16	3	SS
57	L5	Leg	SAE	L100×100×8	HT	M16	8	DS
58	D5T	Diagonal	SAE	L75×75×5	HT	M16	3	SS
59	D5L	Diagonal	SAE	L50×50×4	HT	M16	3	SS
60	H3T	Horizontal	SAE	L80×80×4	MS	M16	3	SS
61	H3L	Horizontal	SAE	L80×80×4	MS	M16	2	SS
62	R39	Redundant	SAE	L45×30×4	MS	M16	1	SS
63	R40	Redundant	SAE	L45×30×4	MS	M16	1	SS
64	LA1	Arm Bottom	SAE	L70×70×5	HT	M16	4	SS
65	LAT1	Arm Top	SAE	L45×45×4	HT	M16	3	SS
66	LDPAR2	Diagonal	SAE	L50×50×4	MS	M16	2	SS
67	LDPAR1	Diagonal	SAE	L50×50×4	MS	M16	2	SS
68	LAA1	Horizontal	SAE	L45×45×4	HT	M16	3	SS
69	R41	Redundant	SAE	L45×30×4	MS	M16	3	SS
70	R42	Redundant	SAE	L45×30×4	MS	M16	2	SS
71	R43	Redundant	SAE	L45×30×4	HT	M16	2	SS
72	R44	Redundant	SAE	L45×30×4	HT	M16	1	SS
73	RA2	Arm Bottom	SAE	L70×70×5	HT	M16	4	SS
74	RAT2	Arm Top	SAE	L50×45×4	HT	M16	3	SS
75	R45	Redundant	SAE	L45×30×4	MS	M16	1	SS
76	R46	Redundant	SAE	L45×30×4	HT	M16	1	SS
77	R47	Redundant	SAE	L45×30×4	HT	M16	1	SS
78	R48	Redundant	SAE	L45×30×4	MS	M16	1	SS
79	R49	Redundant	SAE	L45×30×4	MS	M16	2	SS
80	R50	Redundant	SAE	L50×45×4	HT	M16	2	SS
81	L6	Leg	SAE	L100×100×8	HT	M16	8	DS
82	D6T	Diagonal	SAE	L70×70×5	HT	M16	3	SS
83	D6L	Diagonal	SAE	L50×50×4	HT	M16	3	SS
84	R51	Redundant	SAE	L45×30×4	MS	M16	1	SS
85	L7	Leg	SAE	L100×100×8	HT	M24	6	DS
86	D7T	Diagonal	SAE	L70×70×5	HT	M16	3	SS
87	D7L	Diagonal	SAE	L50×50×4	HT	M16	3	SS
88	R52	Redundant	SAE	L45×45×4	MS	M16	1	SS
89	R53	Redundant	SAE	L45×30×4	MS	M16	1	SS
90	R54	Redundant	SAE	L45×30×4	MS	M16	1	SS
91	R55	Redundant	SAE	L45×30×4	MS	M16	1	SS
92	R56	Redundant	SAE	L45×30×4	MS	M16	1	SS
93	DP3	Diagonal	SAE	L45×45×4	MS	M16	2	SS
94	DP2UT	Diagonal	SAE	L45×30×3	MS	M16	2	SS
95	H4T	Horizontal	SAE	L45×45×4	HT	M16	2	SS
96	H4L	Horizontal	SAE	L50×50×4	MS	M16	2	SS
97	L8	Leg	SAE	L75×75×6	HT	M16	6	DS
98	D8T	Diagonal	SAE	L50×50×4	HT	M16	3	SS
99	D8L	Diagonal	SAE	L50×50×4	MS	M16	3	SS
100	H5T	Horizontal	SAE	L50×50×4	HT	M16	3	SS
101	H5L	Horizontal	SAE	L50×50×4	MS	M16	3	SS
102	R57	Redundant	SAE	L45×30×4	MS	M16	1	SS
103	R58	Redundant	SAE	L45×30×4	MS	M16	1	SS
104	LA3	Arm Bottom	SAE	L80×80×5	HT	M16	4	SS
105	LAT3	Arm Top	SAE	L45×45×4	HT	M16	3	SS
106	LDPAR3	Diagonal	SAE	L50×50×4	MS	M16	2	SS
107	LDPAR4	Diagonal	SAE	L50×50×4	MS	M16	2	SS
108	LHA52	Horizontal	SAE	L45×45×4	MS	M16	2	SS
109	R59	Redundant	SAE	L45×30×4	MS	M16	1	SS
110	R60	Redundant	SAE	L45×30×4	MS	M16	1	SS
111	R61	Redundant	SAE	L45×30×4	MS	M16	1	SS
112	R62	Redundant	SAT	L45×30×4	MS	M16	1	SS
113	RAA4	Arm Bottom	SAE	L50×50×4	HT	M16	4	SS
114	RAT4	Arm Top	SAE	L45×45×4	HT	M16	3	SS
115	R63	Redundant	SAE	L45×30×4	MS	M16	1	SS
116	R64	Redundant	SAE	L45×30×4	HT	M16	1	SS
117	R65	Redundant	SAE	L45×30×4	HT	M16	1	SS
118	R66	Redundant	SAE	L45×30×4	HT	M16	1	SS
119	R67	Redundant	SAE	L45×30×4	MS	M16	2	SS
120	R68	Redundant	SAT	L50×50×4	HT	M16	1	SS
121	L9	Leg	SAE	L130×130×8	HT	M16	8	DS
122	D9T	Diagonal	SAE	L50×50×4	HT	M16	3	SS
123	D9L	Diagonal	SAE	L50×50×4	HT	M16	3	SS

Row #	Group Lable	Group Desc.	Angle Type	Angle Size	Steel Strength (MPa)	Bolt Type	No. Of Bolts	Shear
124	R69	Redundant	SAE	L45×30×4	MS	M16	1	SS
125	L10	Leg	SAE	L75×75×6	HT	M16	4	DS
126	D10T	Diagonal	SAE	L60×60×4	HT	M16	3	SS
127	D10L	Diagonal	SAE	L50×50×4	HT	M16	3	SS
128	DP3S	Diagonal	SAE	L50×50×4	MS	M16	2	SS
129	H6L	Horizontal	SAE	L50×50×4	MS	M16	1	SS
130	R27	Redundant	SAE	L75×75×6	HT	M16	1	SS
131	R70	Redundant	SAE	L45×30×4	MS	M16	3	SS
132	R71	Redundant	SAE	L45×30×4	MS	M16	3	SS
133	R72	Redundant	SAE	L45×30×4	MS	M16	1	SS
134	L11	Leg	SAE	L80×80×5	HT	M16	4	DS
135	D11T	Diagonal	SAE	L50×50×4	HT	M16	3	SS
136	D11L	Diagonal	SAE	L50×50×4	MS	M16	2	SS
137	DP3	Diagonal	SAE	L50×50×4	MS	M16	2	SS
138	H4T	Horizontal	SAE	L70×70×6	HT	M16	2	SS
139	H4L	Horizontal	SAE	L70×70×6	HT	M16	3	SS
140	R29	Redundant	SAE	L45×45×4	MS	M16	3	SS
141	LAR1	Arm Bottom	SAE	L50×45×5	HT	M16	4	SS
142	LAT3	Arm Top	SAE	L50×50×4	HT	M16	3	SS
143	LDPAR5	Diagonal	SAE	L50×50×4	MS	M16	2	SS
144	LDPAR6	Diagonal	SAE	L50×50×4	MS	M16	2	SS
145	LHA51	Horizontal	SAE	L45×45×4	MS	M16	2	SS
146	R74	Redundant	SAE	L45×30×4	MS	M16	1	SS
147	R75	Redundant	SAE	L45×30×4	MS	M16	1	SS
148	R76	Redundant	SAE	L45×30×4	MS	M16	1	SS
149	R77	Redundant	SAE	L45×30×4	MS	M16	1	SS
150	RA3R	Arm Bottom	SAE	L45×45×5	HT	M16	4	SS
151	RA7R	Arm Top	SAE	L50×50×4	HT	M16	3	SS
152	R78	Redundant	SAE	L45×30×4	MS	M16	1	SS
153	R79	Redundant	SAE	L45×30×4	MS	M16	1	SS
154	R80	Redundant	SAE	L45×30×4	MS	M16	1	SS
155	R81	Redundant	SAE	L50×50×4	HT	M16	2	SS
156	R82	Redundant	SAE	L45×30×4	MS	M16	2	SS
157	R83	Redundant	SAE	L45×45×4	MS	M16	2	SS
158	R84	Redundant	SAE	L45×45×4	MS	M16	2	SS
159	R85	Redundant	SAE	L45×45×4	MS	M16	2	SS
160	R86	Redundant	SAE	L45×45×4	MS	M16	2	SS
161	R87	Redundant	SAE	L45×45×4	MS	M16	2	SS
162	R88	Redundant	SAE	L45×30×4	MS	M16	1	SS
163	R89	Redundant	SAE	L45×30×4	MS	M16	1	SS
164	R90	Redundant	SAE	L45×30×4	MS	M16	1	SS
165	R91	Redundant	SAE	L45×30×4	MS	M16	1	SS
166	R92	Redundant	SAE	L45×30×4	MS	M16	1	SS
167	R93	Redundant	SAE	L45×30×4	MS	M16	1	SS
168	H9T	Horizontal	SAE	L50×50×4	MS	M16	1	SS
169	H9L	Horizontal	SAE	L50×50×4	MS	M16	3	SS
170	R59	Redundant	SAE	L80×80×4	HT	M16	1	SS
171	L13	Leg	SAE	L130×130×8	HT	M16	10	DS
172	D13T	Diagonal	SAE	L75×75×5	MS	M16	3	SS
173	D13L	Diagonal	SAE	L75×75×5	MS	M16	2	SS
174	R101	Redundant	SAE	L45×30×4	MS	M16	1	SS
175	R102	Redundant	SAE	L45×30×4	MS	M16	1	SS
176	R103	Redundant	SAE	L45×30×4	HT	M16	1	SS
177	R104	Redundant	SAE	L45×30×4	MS	M16	2	SS
178	R105	Redundant	SAE	L50×50×4	HT	M16	1	SS
179	R106	Redundant	SAE	L50×50×4	MS	M16	2	SS
180	R107	Redundant	SAE	L45×45×4	MS	M16	2	SS
181	R108	Redundant	SAE	L45×45×4	MS	M16	2	SS
182	R109	Redundant	SAE	L45×45×4	MS	M16	1	SS
183	R110	Redundant	SAE	L45×30×4	MS	M16	1	SS
184	R111	Redundant	SAE	L45×30×4	MS	M16	1	SS
185	R112	Redundant	SAE	L45×30×4	MS	M16	1	SS
186	R113	Redundant	SAE	L45×30×4	MS	M16	2	SS
187	R114	Redundant	SAE	L45×30×4	MS	M16	2	SS
188	R115	Redundant	SAE	L45×30×4	MS	M16	2	SS
189	R116	Redundant	SAE	L45×30×4	MS	M16	2	SS
190	R117	Redundant	SAE	L45×30×4	MS	M16	1	SS
191	H12T	Horizontal	SAE	L50×50×4	HT	M16	3	SS
192	H12L	Horizontal	SAE	L55×55×4	MS	M16	3	SS
193	R118	Redundant	SAE	L80×80×5	MS	M16	1	SS
194	L13	Leg	SAE	L140×140×10	HT	M20	10	DS
195	D13T	Diagonal	SAE	L70×70×6	HT	M16	2	SS
196	T19L	Diagonal	SAE	L70×70×6	MS	M16	2	SS
197	R119	Redundant	SAE	L45×30×4	MS	M16	1	SS
198	R120	Redundant	SAE	L45×30×4	MS	M16	1	SS
199	R121	Redundant	SAE	L45×30×4	MS	M16	1	SS
200	R122	Redundant	SAE	L45×30×4	MS	M16	1	SS
201	R123	Redundant	SAE	L45×30×4	MS	M16	2	SS
202	R124	Redundant	SAE	L50×50×4	MS	M16	2	SS
203	R125	Redundant	SAE	L45×45×4	MS	M16	2	SS
204	R126	Redundant	SAE	L45×45×4	MS	M16	1	SS
205	R127	Redundant	SAE	L45×45×4	MS	M16	2	SS
206	R128	Redundant	SAE	L45×45×4	MS	M16	2	SS
207	R129	Redundant	SAE	L45×45×4	MS	M16	2	SS
208	R130	Redundant	SAE	L45×45×4	MS	M16	2	SS
209	R131	Redundant	SAE	L45×45×4	MS	M16	2	SS
210	R132	Redundant	SAE	L45×45×4	MS	M16	2	SS
211	R133	Redundant	SAE	L45×45×4	MS	M16	2	SS
212	R134	Redundant	SAE	L45×45×4	MS	M16	2	SS
213	R135	Redundant	SAE	L45×45×4	MS	M16	2	SS

VIEW 1–1



VIEW 2–2

VIEW 3–3

VIEW 4–4

VIEW 5–5

VIEW 6–6

VIEW 7–7

VIEW 12–12

VIEW 13–13

VIEW 10–10

VIEW 11–11

VIEW 16–16

VIEW 17–17

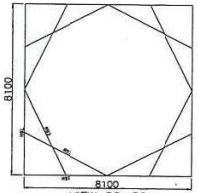
VIEW 20–20

VIEW 21–21

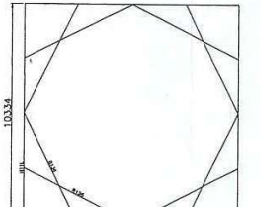
VIEW 28–28

VIEW 24–24

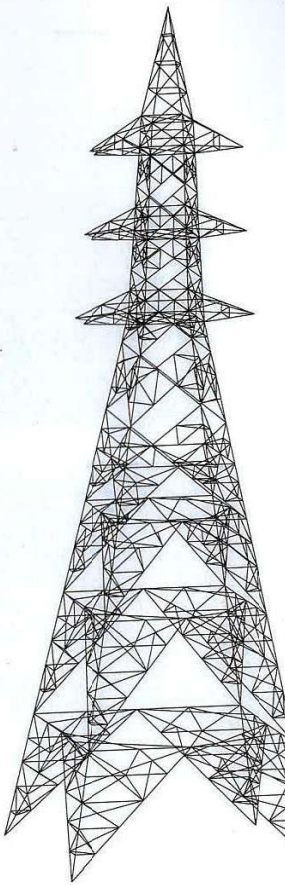
VIEW 19–19



VIEW 22–22



VIEW 27–27



3D ISOMETRIC VIEW

NOTES:

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. TOWER IS DESIGNED FOR BASIC WIND SPEED OF 47M/SEC (WZ–4), TERRAIN CATEGORY:2 AND RELIABILITY:1.
3. TOWER IS DESIGNED AS PER
   3.1. WIND LOADING STANDARD – IS:802(PART–1,SEC–1),2015
   3.2. DESIGN STANDARD – IS:802(PART–1,SEC–2),2016
4. IN SHEAR COLUMN, SS INDICATES SINGLE SHEAR AND DS INDICATES DOUBLE SHEAR
5. MATERIALS
   5.1. MILD STEEL(MS) – IS–2062–2011(E250)
   5.2. HIGH TENSION STEEL(HT) – IS–2062–2011(E350)
   5.3. BOLTS & NUT–16 DIA–GRADE 5.6 (IS:12427)
6. CL INDICATES CONCRETE LEVEL
7. GL INDICATES GROUND LEVEL
8. ALL WIDTHS ARE CG TO CG AND HEIGHTS ARE CLEAR HEIGHTS.
9. STUB SECTION L110×110×8H.
10. (T) AND (L) DENOTES TRANSVERSE AND LONGITUDINAL FACES RESPECTIVELY.
11. ALL MEMBERS ARE GALVANIZED AS PER SPECIFICATIONS

REV.	DESCRIPTION	DATE
1	AS PER CPRI COMMENTS	23–05–2023
0	FIRST SUBMISSION	04–05–2023

OWNER: MP POWER TRANSMISSION PKG–1 LTD

OWNER'S CONSULTANT:

DEGI TRANS PRIVATE LIMITED

408, B–BLOCK, KUSHAL TOWERS
KHAIRATABAD, HYDERABAD, TELANGANA – 500004
EMAIL : INFO@DEGITRANS.COM
PHONE : 040 4851 6688
WEBSITE : WWW.DEGITRANS.COM

PROJECT	132KV D/C LINE IN MP (TBCB)
DRG.TITLE	132KV TENSION TOWER TYPE "DD" (30°–60° Dev) & DE (0°–15° Dev) CLEARANCE AND SINGLE LINE DIAGRAM
DRG.NO.	DTPL–MEIL–132KV–MP–TBCB–DD–002
SCALE	NTS
SIZE:	A1
SHEET NO.	1 OF 1
REV.	1

Tools Required For one Stringing Gang

Stringing Tools & Equipments details for 132KV D/C					
Sl No	Name	Item Description	Unit	Required Qty	
				1 TSE Gang	1 Manual Gang
1	Pilot Wire	Pilot Wire - 24 mm	Kms	8	
2		Pilot Wire Connector - 24 mm(36T)	Nos	12	
3		Pilot Wire Mounting Stand	Nos	2	
4	Articulator joint	Articulator Joints 15 T (With Head Board)	Nos	2	2
5		Articulator Joints 10 T (with Pilot wire Socks)	Nos	8	4
6		Articulator Joints 5 T(For Lefty)	Nos	8	
7		Articulator Joints 5 T (With Earth Wire)	Nos	10	
8	Pulley	Equalizer Pulley 10 T	Sets	6	2
9		Double Sheave Pulley 5T Cap	Nos	8	2
10		Single Sheave Pulley 5T Cap Open Type	Nos	22	18
11		Single Sheave Pulley 5T Cap Closed Type	Nos	33	18
12		Four Sheave/Six Sheave Pulley Block	Sets	16	10
13	Aerial Rollers	Five Sheave Aerial Rollers (Rob)	Nos	60	24
14		Aerial Rollers for Earth Wire	Nos	30	8
15		MARKING ROLLER	Nos		
16	Lifting jacks	Conductor Drum Lifting Jacks (Manual) - 10T	Sets	8	2
17		E/W Drum Lifting Jacks (Manual)	Sets	1	1
18	Socks	Both End Open Conductor Socks for ACSR	Nos	8	4
19		One End Open Socks with eye for ACSR	Nos	8	4
20		Earth wire socks	Sets	2	2
21	Head board	Head Board for Quad Conductor	Sets	2	
22	Turn buckle	Turn Buckles 10t Cap	Nos	22	6
23		Turn Buckles 5t Cap	Nos	0	12

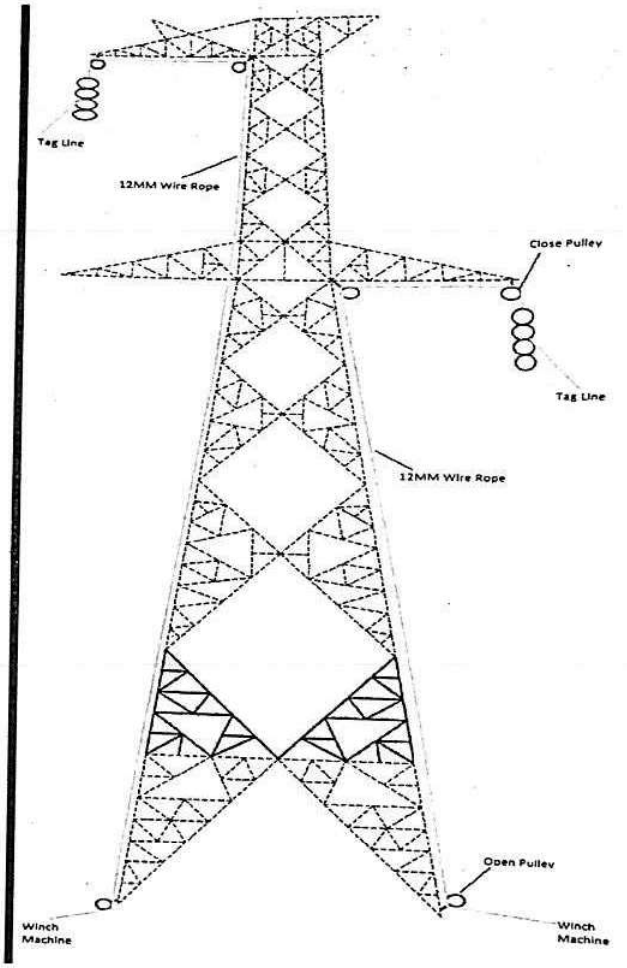
24		Automatic Clamp For BERSIMIS	Nos	12	4
25		Come along Clamp (Bolted) For BERSIMIS	Nos	72	60
26		Automatic Clamp For Earth wire - 7/3.66 mm	Nos	4	2
27		Sag Winch 10t Capacity (manual)	Nos	4	4
28		Hydraulic Conductor Cutter	Nos	2	2
29		125T Cap. Hydra Jnt Compressor (manual)	Nos	2	2
30		Die set for BERSIMIS (Aluminum)	Sets	4	2
31		Die set for BERSIMIS (Steel)	Sets	4	2
32		Die set for 7/3.66mm Earth wire (Aluminum)	Sets	4	2
33		Die set for 7/3.66mm Earth wire (steel)	Sets	4	2
34	D' Shackle	D' Shackles 15T/17T Cap	Nos	28	15
35		D' Shackles 10T Cap	Nos	144	15
36		D' Shackles 8.5 T Cap	Nos	60	
37		D' Shackles 5T Cap	Nos	40	60
38		D' Shackles 3T Cap	Nos	0	
39	Steel wire rope	16mm steel wire ropes slings - 3m	Nos	0	
40		18mm steel wire ropes slings - 1m	Nos	0	0
41		12mm Steel Wire Rope Fibre Coated	Kms	5	3
42		16mm Steel Wire Rope Fibre Coated	Kms	0	2
43		18mm Steel Wire Rope Fibre Coated	Kms	3	0.2
44		20 mm Steel Wire Rope Fibre Coated	Kms	2	
45	PP ROPE	P.P. Rope - 12mm Dia (220mt)	Bundle	1	2
46		P.P. Rope - 16mm Dia (220mt)	Bundle	2	14
47		P.P. Rope - 18mm Dia (220mt)	Bundle	6	6
48		P.P. Rope - 24mm Dia (220mt)	Bundle	1	2
49	Others	Ground rollers	Nos	12	6
50		PULLING&LIFTING MACHINE (HOOK CHUCK) 5 T	Nos	2	1
51		Earth Wire Flat Clamp -	Nos	8	8
52		Midspan Joint Protector Sleeve	Nos	12	8
53		Turn Table E/W - 5 Ton Cap.	Nos	1	1
54		Spacer Cycle for Quad	Sets	3	3
55		5- ROLLER	NOS	4	
56		Dynamometer 10 ton	NOS	1	1
57		Anchor block ISMC 400	NOS		
58		COME LONG CLAMP BOLTED E/W -7/3.66	NOS	4	4
59		3 Bolted Clamp(12 MM Wire)	NOS	15	
60		Bolted Clamp (18 MM Wire)		4	For Back Stay

61		Pilot Clamp	NoS	2	Tighten.
62	P&M				
63		Hydraulic Joint Compressor 120 Ton - Tesmec	Nos	2	1
64		TSE Machine 16/15 Ton Set	Set	1	0
		winch m/c	Nos	2	2

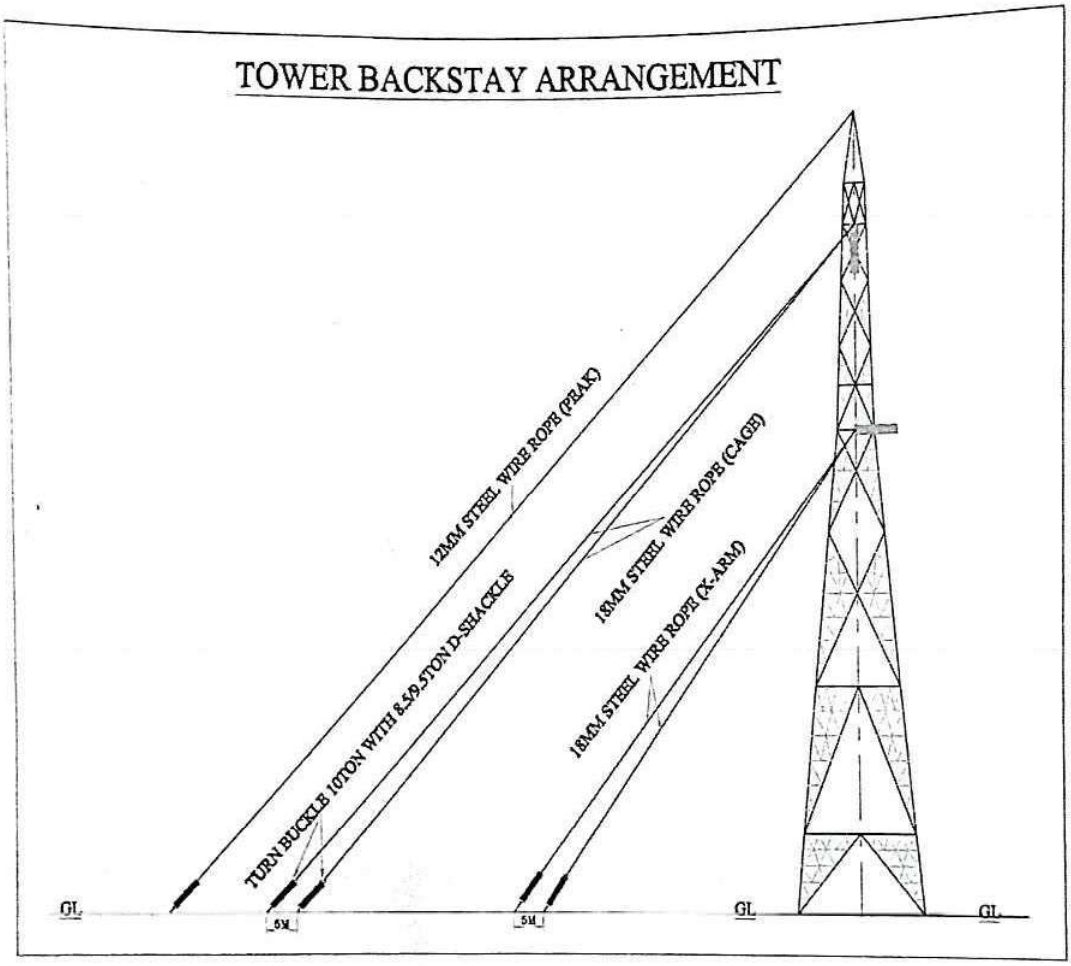
Insulator Hoisting Arrangement-(Drawing B)

1. Assemble the insulators as per drawing with all Hardware fittings.
2. First of all connect the Arial roller with insulator on ground.
3. The connection should be fully tight.
4. Ensure that nobody will stay under the sustained load.
5. Double lanyard safety belt (Small Hook) should be used by fitters and both lanyards should be anchored properly.

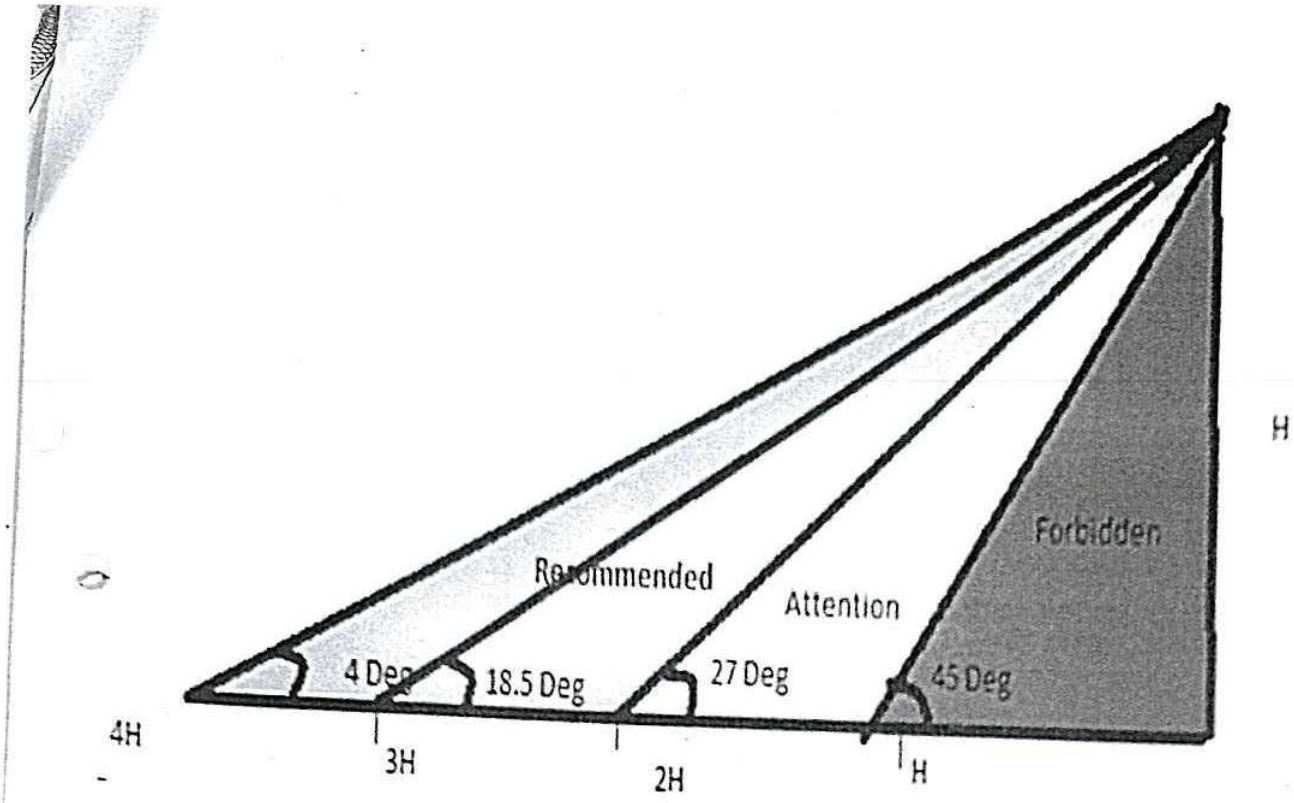
Loading & Unloading of Conductor Drum by Pick & Carry **Drawing (A)**



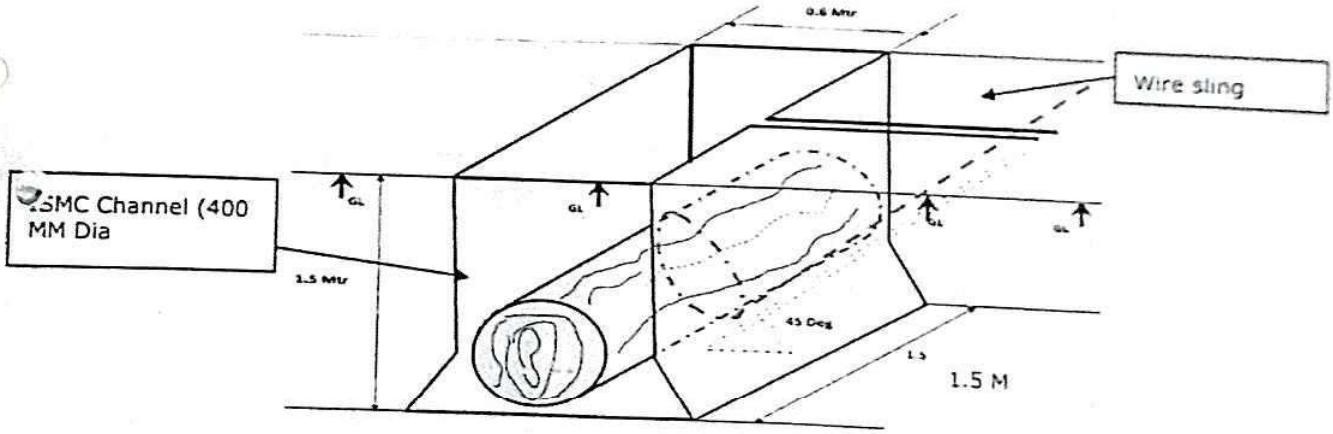
Insulator Hoisting Arrangement **Drawing (B)**



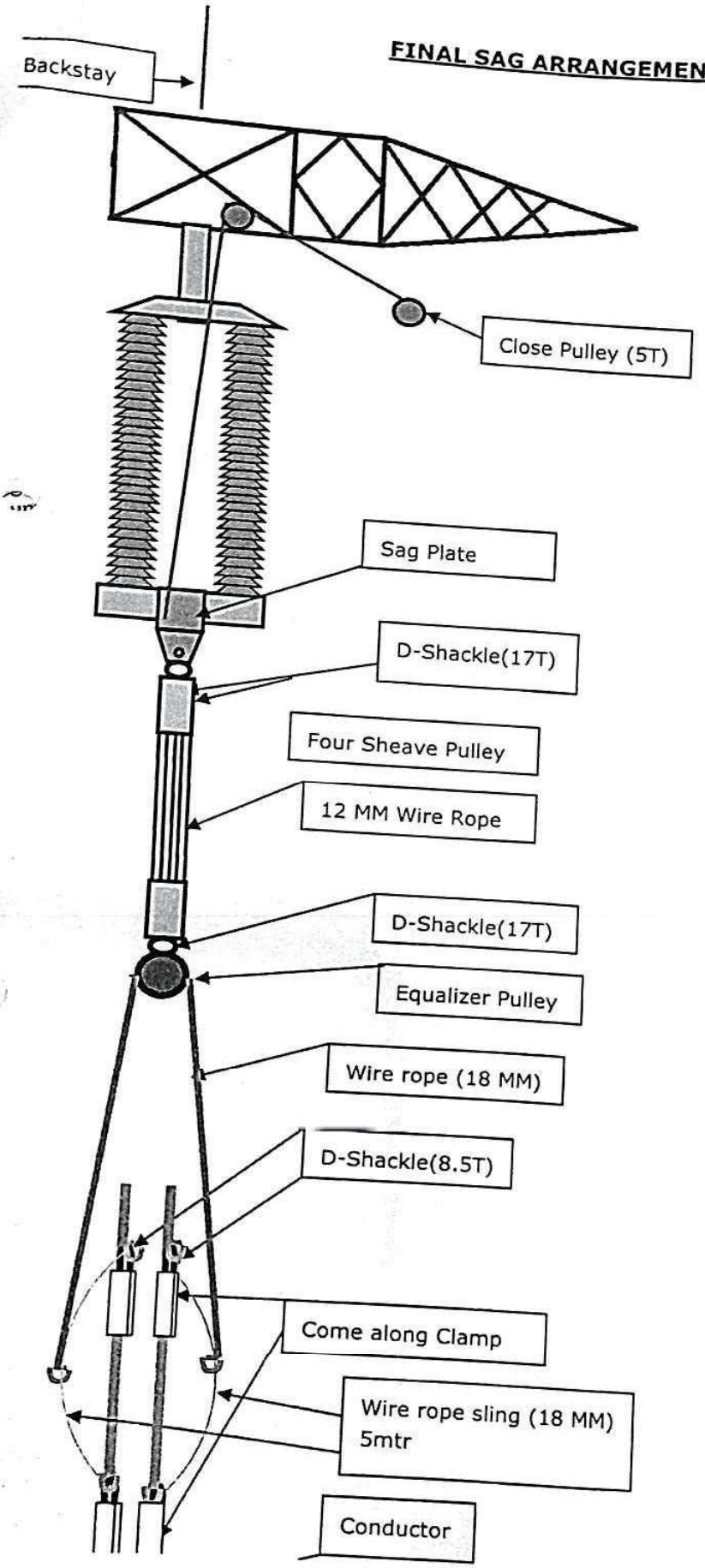
Note: The angle of the guy should not exceed more than 45 Deg. and back stay distance between tower and deadman Pit shall be two times of cross arm height. The direction of back stay is directly opposite to conductor direction.

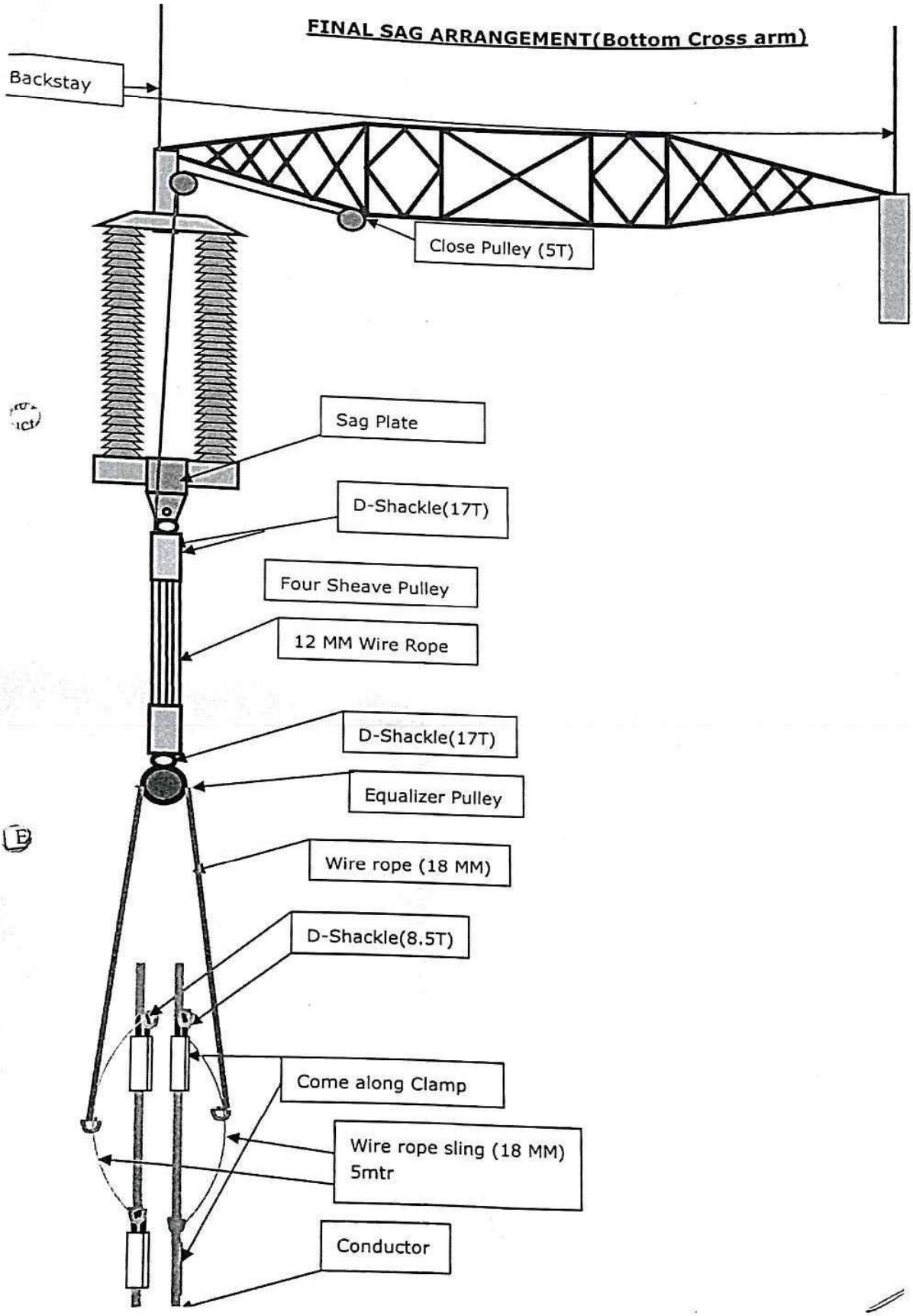


Stay Detail:-



FINAL SAG ARRANGEMENT(Top Conductor)

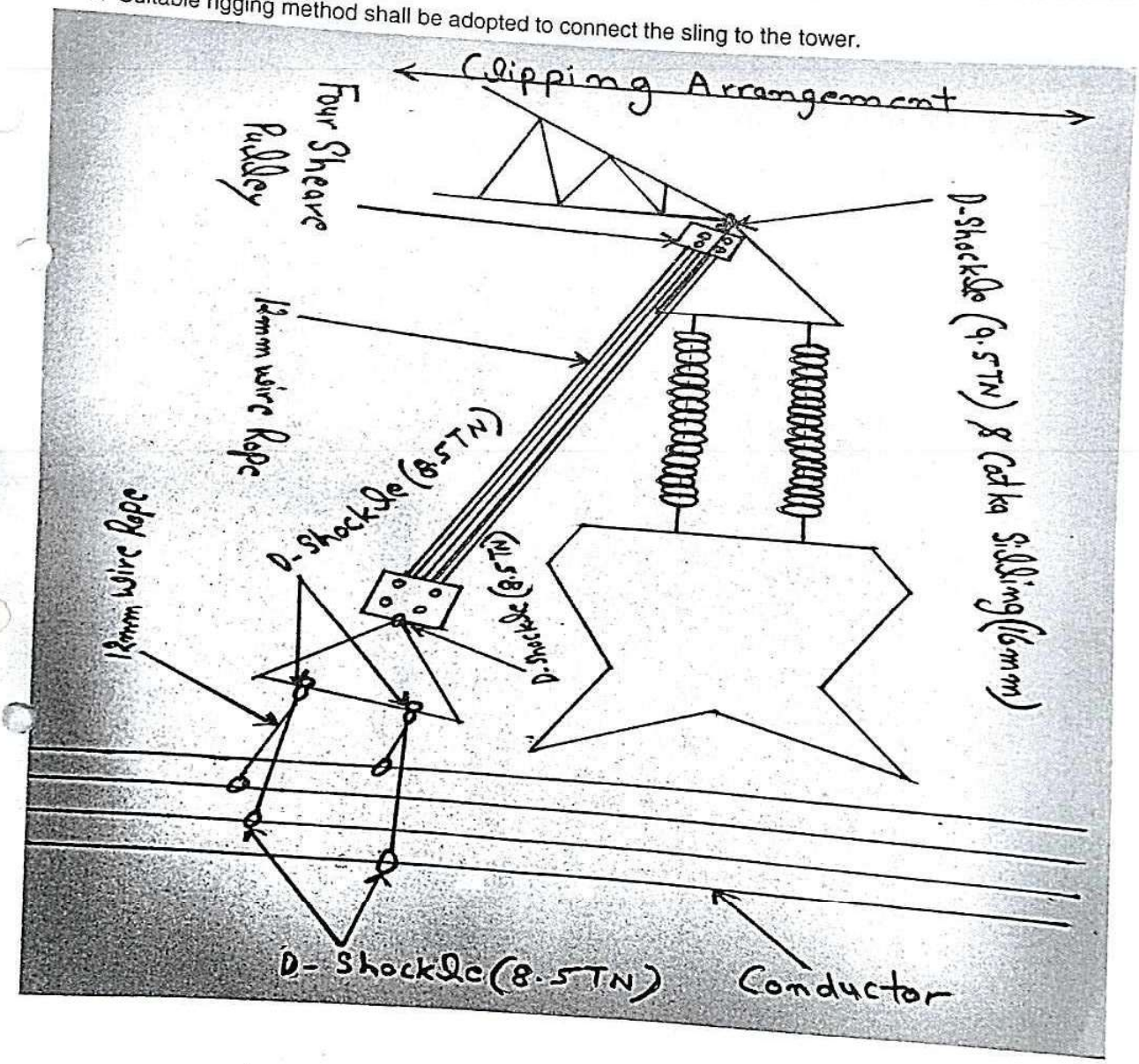


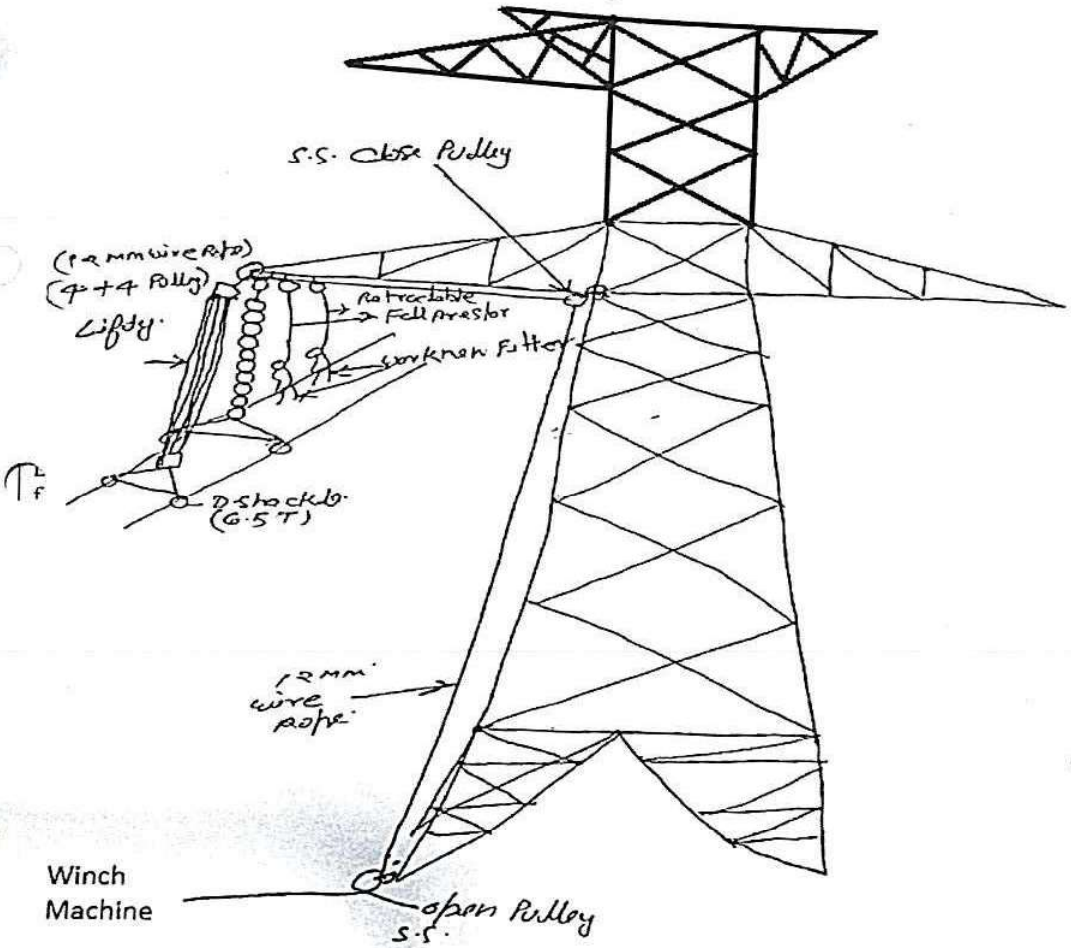


D/C Line, 50Hz, 3 Phase

Clipping Arrangement

1. Ensure local temporary earthing arrangements are made prior to commencement of clipping operations.
2. Ensure cross checking verticality of suspension insulators from ground level to avoid damages to Suspension fittings as well as strands cut on conductor due to error loads.
4. Clipping ladders to be used for descending down on suspension string to avoid damages to insulators Strings.
5. Suitable rigging method shall be adopted to connect the sling to the tower.





MEGHA ENGINEERING AND INFRASTRUCTURE LIMITED							
CLIENT	MEIL				Doc no	132DC-TSD	Prepred JK
PROJECT	132KV DC LINE IN WZ 4 IN MP				DATE	31-03-23	Checked MSM
					REV	0	Appvd KSR
TITLE	Tower Spotting Requirements of 132KV Double Ckt DA,DB,DC,DD Type Towers up TO +12mtr BE in wind zone 4						

	Description	Tower Type					
		DA	DB	DC	DD / DEAD END		
					28	970	
					27	970	
					26	970	
					25	970	
					24	970	
					23	970	
					22	970	
					21	970	
	Broken wire conditions considered	Any one wire	Any two wires,	Any two wires	Any Three wires		
	Longitudinal component of mechanical tension in kgs	DA	DB	DC	DD		DE
	Power Conductor	4945	4903	4777	4282		4903
	OPGW	3026	3000	2923	2621		3000
	Towers are designed as per IS 802-P1-S1(2015) & P1-S2 (2016)						

ii) ELECTRICAL CLEARANCES FOR RAILWAY CROSSING

i) Prior approval of Railway Authority is to be obtained.

ii) The crossing span shall be limited to 260 m and vertical clearance shall be 15560 mm

iii) The crossing angle shall be between 90° to 60°to the railway track.

iv) Crossing shall be done with DD type tower.

iii) MINIMUM CLEARANCE FOR POWER LINE CROSSING EACH OTHER

VOLTAGE LEVEL	Clearance (mm)
UPTO 66KV	3050
132KV	3050
220KV	4580
400KV	5490
765kv	7940

iv) TELECOMMUNICATION LINE CROSSING

The angle of crossing shall be as near to 90 deg as possible. However, deviation to the extent of 30 deg may be permitted under exceptionally difficult situations. For a crossing angle below 60 deg, the matter shall be referred to authorities. In the crossing span power line support shall be as near the telecommunication line as possible to obtain increased vertical clearance between wires.

Clearance over the communication lines is 3050 mm

V. The number of consequitive spans between the section points shall not exceed 15 spans or 5 KM in plain terrain and 10 spans or 3 KM in hilly terrain.

VI. Minimum ground clearance at Maximum temperature =6100 mm.

Vii Maximum span of adjacent spans for various angle of deviation are subject to the condition that minimum specified Live metal clearance & minimum ground clearance are available.

Viii Maximum Deviation of line for Dead end tower shall be 15 deg both side i.e, line side & sub station side (Slack span side).

IX. Vertical load of individual spans are acting downwards for suspension tower.

X. For River Crossing tower, the clearance from the HFL in case of navigable river is 19220 mm

XI. For River Crossing tower, the clearance from the HFL in case of non-navigable river is 4300 mm

MEGHA ENGINEERING & INFRASTRUCTURES LTD. S-2, TIE, Balanagar, Hyd-37, T.S.

MEGHA ENGINEERING AND INFRASTRUCTURE LIMITED

CLIENT	MEIL	Doc no	132DC-TSD	Prepred	JK
PROJECT	132KV DC LINE IN WZ 4 IN MP	DATE	31-03-23	Checked	MSM
		REV	0	Appvd	KSR

TITLE: Tower Spotting Requirements of 132KV Double Ckt DA,DB,DC,DD Type Towers up TO +12mtr BE in wind zone 4

	Description	Tower Type				
		DA	DB	DC	DD /	DEAD END
i)	Deviation not to exceed in degrees	2	15	30	60	15
	Normal WIND SPAN (m)	325	325	325	325	163
	Individual Span not greater than from vertical separation consideration.	461	485	485	485	243
	Max Wt Span (m)					
	Vertical load limitation on Weight Span					
	Conductor & Earth Wire	Down	Down	Down	Down	Down
	Effect of both spans(m) NC	487	487	487	487	244
	Effect of one span(m) BWC	300	310	310	310	150
	Min Wt Span(m)					
	Conductor & Earthwire	Down	Up	Up	Up	
	Effect of both spans(m) NC MIN	200	0	0	0	0
	Effect of one span(m) BWC MIN	100	-200	-200	-200	-100

		Dev. Angle	Span	Dev. Angle	Span	Dev. Angle	Span	Dev. Angle	Span	Dev. Angle	Span
	Permissible sum of adjacent spans in meters for various deviation angles Based on the condition that required minimum ground clearance is available	2	650	15	650	30	650	60	650	15	163
		1	694	14	694	29	693	59	688	14	173
		0	738	13	738	28	736	58	727	13	184
				12	782	27	779	57	766	12	195
	Limiting to max sum of adjacent span			11	826	26	822	56	805	11	206
	Permissible one span for various deviation angles should not exceed 60% of the value shown for sum of adjacent span.			10	870	25	865	55	844	10	217
				9	914	24	908	54	883	9	228
				8	958	23	951	53	923	8	239
				7	970	22	970	52	962	7	244
				6	970	21	970	51	970	6	244
				5	970	20	970	50	970		
				4	970	19	970	49	970		
				3	970	18	970	48	970		
						17	970	47	970		
						16	970	46	970		
						15	970	45	970		
						14	970	44	970		
						13	970	43	970		
						12	970	42	970		
						11	970	41	970		
						10	970	40	970		
						9	970	39	970		
								38	970		
								37	970		
								36	970		
								35	970		
								34	970		
								33	970		
								32	970		
								31	970		
								30	970		
								29	970		

MEGHA ENGINEERING & INFRASTRUCTURES LTD. S-2, TIE, Balanagar, Hyd-37, T.S.

SAG TENSION & WIND CALCULATIONS IN MP TBCB TL

132 KV DC LINE IN ZONE-4 AS PER IS 802:2015

Sl no	Description	Symbol	Units	Parameters	NO OF SUB CONDUCTORS
1	Voltage	V	kV	132	1
2	Span	L	mtrs	325	
3	Power conductor	FOS		4	25.0%
4	Conductor Name			PANTHER ACSR	
5	Overall dia	D	mm	21	
6	Sectional area	A	mm²	261.5	
7	Mass	W	kg/Km	974	
8	UTS(Breaking load)	U	kgf	9144.0	
9	Modulus of elasticity	E	kgf/Cm²	8.16E+05	
10	Coefficient of linear expansion	α	per C°	1.78E-05	
11	Earth wire Name			OPGW 48 ZTT	
12	Overall dia	D	mm	12.45	
13	Sectional area	A	mm²	58.90	
14	Mass	W	kg/Km	447	
15	UTS(Breaking load)	U	kgf	9126.46	
16	Modulus of elasticity	E	kgf/Cm²	1.31E+06	
17	Coefficient of linear expansion	α	per C°	1.38E-05	
18	Everyday temperature	t	C°	32	
	Sag & Tension factors				
19	Wt factor =(W/1000)*(100/A)	δ		0.3724665	
20	Wind Load	P_1	-	0	
21	Loading factor at still wind =sqrt(1+((1000*p_1)/w^2)	q_1	-	1	
22	Wind zone			4	
23	Basic Wind speed (V_b)		m/sec	47	
24	Reliability level			1	
25	Terrain category/Ground roughness			2	
	Altitude above MSL		mtrs	1000	
26	Ground clearance		mtrs	6.100	
27	Vertical spacing between phases(Top & Bottom)		mtrs	4.000	

Sag Tension Table

Power Conductor -PANTHER ACSR

Temp	Wind Case	Wind Pressure (Kg/m2)	Tension(Kg)	FOS	Vertical sag
32.0	No wind	0	2286	4.00	5.63
32.0	DA Tower - 30 Deg Wind	117.58	4248	2.15	3.03
32.0	DA Tower - 45 Deg Wind	79.53	3480	2.63	3.70
32.0	DB Tower - 30 Deg Wind	131.2	4515	2.03	2.85
32.0	DB Tower - 45 Deg Wind	96.74	3830	2.39	3.36
32.0	DC Tower - 30 Deg Wind	143.41	4750	1.93	2.71
32.0	DC Tower - 45 Deg Wind	115.28	4202	2.18	3.06
32.0	DD Tower - 30 Deg Wind	153.7	4945	1.85	2.60
32.0	DD Tower - 45 Deg Wind	143.41	4750	1.93	2.71
32.0	100% of FW	153.7	4945	1.85	2.60
85.0	No wind	0	1690	5.41	7.61
-5.0	No wind	0	2986	3.06	4.31
-5.0	36% of FW	55.33	3627	2.52	3.55
32.0	75% of FW	115.28	4202	2.18	3.06

Maximum Vertical sag 7.611

Maximum tension 4945

MP POWER TRANSMISSION PACKAGE-1 LIMITED

Sag Tension Table

Earth wire -OPGW 48 ZTT

Temp	Wind	Wind Pressure (Kg/m2)	Tension(Kg)	FOS	Vertical sag
32	No wind	0	1262	7.23	4.68
32.0	DA Tower - 30 Deg Wind	146.74	2606	3.50	2.26
32.0	DA Tower - 45 Deg Wind	99.25	2129	4.29	2.77
32.0	DB Tower - 30 Deg Wind	163.74	2768	3.30	2.13
32.0	DB Tower - 45 Deg Wind	120.73	2350	3.88	2.51
32.0	DC Tower - 30 Deg Wind	178.97	2909	3.14	2.03
32.0	DC Tower - 45 Deg Wind	143.87	2578	3.54	2.29
32.0	DD Tower - 30 Deg Wind	191.82	3026	3.02	1.95
32.0	DD Tower - 45 Deg Wind	178.97	2909	3.14	2.03
32	100% of FW	191.82	3026	3.02	1.95
53	No wind	0	1137	8.03	5.19
-5	No wind	0	1523	5.99	3.88
-5	36% of FW	69.06	2015	4.53	2.93
32	75% of FW	143.87	2578	3.54	2.29

Maximum Vertical sag **5.19**
Maximum tension **3026**

Spans considered for loads calculations

Wind span	NC		BWC	
Suspension	325	mtr	200.2	mtr
Tension	325	mtr	200.2	mtr
Weight span				
Suspension Max DA tower	488	mtr	300	mtr
Suspension Min DA tower	200	mtr	200	mtr
Tension Max DB tower	488	mtr	310	mtr
Tension Min DB tower	0	mtr	-200	mtr
Tension Max DC tower	488	mtr	310	mtr
Tension Min DC tower	0	mtr	-200	mtr
Tension Max DD tower	488	mtr	310	mtr
Tension Min DD tower	0	mtr	-200	mtr

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