



भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय, भारत सरकार)
NATIONAL HIGHWAYS AUTHORITY OF INDIA
(Ministry of Road Transport & Highways, Government of India)



क्षेत्रीय कार्यालय - हैदराबाद

प्रथम तल, नया भवन, भारतीय प्रशासनिक स्टाफ कॉलेज, रोड नं-3, बंजारा हिल्स, हैदराबाद-500 034. तेलंगाना.

REGIONAL OFFICE - HYDERABAD

First Floor, New Building, Administrative Staff College of India (ASCI), Road No. 3, Banjara Hills, Hyderabad - 500 034, Telangana.

टेली / Tele : 040 - 29562147 / 48 ई-मेल / Email : rohyderabad@nhai.org, nhairohyd@gmail.com

Notice Inviting Public Comments

NHAI/RO-HYD/25011/7/5/2022/Utility/599

Dt.30.05.2022

Sub: NHAI - RO Hyderabad - PIU Khammam- Proposal for crossing of 400KV D/C Hyderabad Kurnool Transmission line - Crossing of 400 KV D/C line between Km. 156/000 to Km. 157/000 on Warangal to Khammam section of NH-563 in the State of Telangana- Reg..

Ref: 1. PIU Khammam lr no. NHAI/PIU-KMM/NH-563/Warora-Kurnool/2022/5501, dt: 06.05.2022

The Project Director, PIU, NHAI, Khammam vide letter cited above has recommended the Proposal M/s Warora - Kurnool Transmission Limited for Crossing of 400 KV D/C line between Km. 156/000 to Km. 157/000 on Warangal to Khammam section of NH-563 in the State of Telangana.

2. As per para 4 of the Ministry's guidelines no. RW/NH-33044/29/2015/S&R(R) dated 22.11.2016, public comments is hereby invited on the above proposal seeking claims and objections (on grounds of public inconvenience, safety and general public interest) within 30 days on public portal i.e. website of Ministry of Road Transport and Highways (www.morth.nic.in) in Form-A (copy enclosed) for "Accommodation of Public and Industrial Utility Services along and across National Highways".

Comment Inviting Authority

The Regional Officer,
National Highways Authority of India,
Regional Office: Hyderabad,
First Floor, New Building,
Administrative Staff College of India(ASCI),
College Park Campus, Road No.3,
Banjara Hills, Hyderabad - 500 034,
Telangana State,
Phone: 040-29562147, 040-29562148,
Email: rohyderabad@nhai.org, nhairohyd@gmail.com

Yours faithfully,

Encls: Above Proposal


(V. Nagamani)

Dy General Manager(Tech)

For Regional Officer-cum-

Highway Administrator, Hyderabad

To:

1. Senior Technical Director, NIC, Transport Bhawan, New Delhi- 110001 for uploading on Ministry's website.
2. Shri S.Manivasagam, Dy. GM (IT), NHAI HQs, New Delhi for uploading on NHAI website.

Copy to:-1. The Project Director, NHAI, PIU Khammam: for information

2. M/s Warora Kurnool Transmission Limited: for information

FORM-A

Form for seeking claims and objections (on grounds of public inconvenience, safety and general public interest) on the application for Accommodation of Public and Industrial Utility Services along and across National Highways

Sub: NHAI - RO Hyderabad - PIU Khammam- Proposal for crossing of 400KV D/C Hyderabad Kurnool Transmission line - Crossing of 400 KV D/C line between Km. 156/000 to Km. 157/000 on Warangal to Khammam section of NH-563 in the State of Telangana-**Reg.**

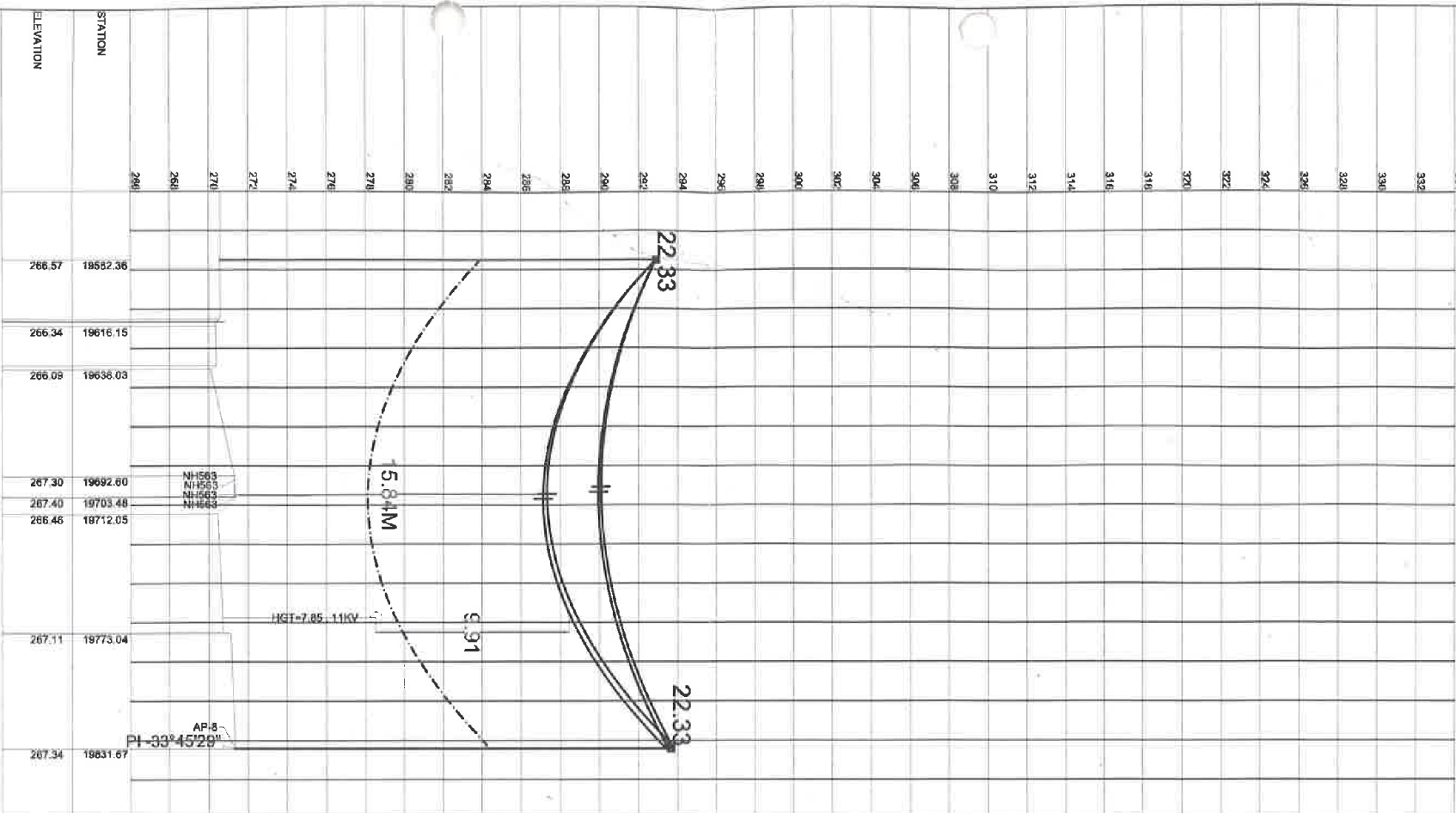
The claims and objections (on grounds of public inconvenience, safety and general public interest) by the general public needs to be given within 30 days of uploading the online application for comments

Sl. No	Item	Details
1	Name of the person who is desiring to give claims and objections (on grounds of public inconvenience, safety and general public interest)	
2	Address of the person	
3	Details of the application for Accommodation of Public and Industrial Utility Services along and across National Highways against which claims and objections are being given (name of applicant and other details like site address etc.)	
	a) Application No.	
	b) Name of applicant (who applied to Accommodation of Public and Industrial Utility Services along and across National Highways)	
	c) Details of Application	
4	The claims and objections (on grounds of public inconvenience, safety and general public interest)	

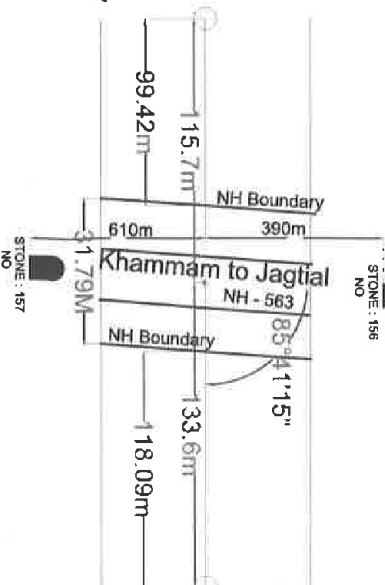
7/7
DQ+0
HT=48.62 ELE=266.57
668.3
344.2
WTS COLD=304(187,117)
WTS HOT=316(196,121)

8/0
DS+0
HT=48.62 ELE=267.34
668.3
334.2
WTS COLD=328(132,196)
WTS HOT=328(128,200)

249.30M



AP 7/7
00°00'00"
E: 351977.97
N: 1972932.07



AP 8/0
33°45'29"L
E: 352227.11
N: 1972940.99

CONDUCTOR		GROUND WIRE
NAME	ACSR MOOSE	EW
COPPER EQUIVALENT (cm) ²	-	-
STRANDS IN ALUMINIUM (No.cm)	-	-
STRANDS IN STEEL (No.cm)	-	-
DIAMETER (cm)	3.177	1.088
SECTIONAL AREA (cm) ²	5.97	0.7365
UNIT WEIGHT (kg/m)	2.004	0.5830
MODULUS OF ELASTICITY (Kg/cm) ²	703389	1889896
COEFF. OF LINEAR EXPANSION (1/Deg)	0.0000194	0.0000115
ULTIMATE STRENGTH (KG)	16439	8938

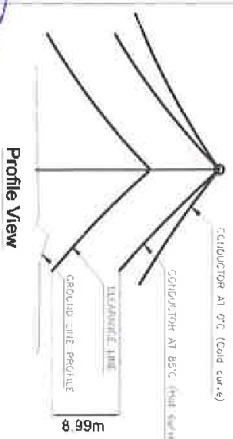
NOTES:-

1. ALL DIMENSIONS ARE IN M.
2. ELECTRICAL CLEARANCE FOR RAILWAY CROSSING DETAILS:-
 - i) PRIOR APPROVAL OF RAILWAY AUTHORITY IS TO BE OBTAINED.
 - ii) MINIMUM CLEARANCE BETWEEN LOWEST POINT OF 400KV LINE CONDUCTOR AND RAIL LEVEL SHALL BE 17.9M. HOWEVER APPROVAL OF RAILWAY CROSSING FROM RAILWAY AUTHORITY HAS TO BE OBTAINED IN EACH CASE.
3. MINIMUM CLEARANCE FOR POWER LINE CROSSING
 - i) FOR 400 KV : 5490MM
 - ii) FOR 220KV : 5490MM
 - iii) FOR 132 KV : 5490MM
4. TELECOMMUNICATION LINE CROSSING:-

THE ANGLE OF CROSSING SHALL BE AS NEAR TO 90° AS POSSIBLE
HOWEVER DEVIATION TO THE EXTENT OF 30° MAY BE PERMITTED UNDER EXCEPTIONALLY DIFFICULT SITUATIONS.
5. THE NUMBER OF CONSECUTIVE SPANS BETWEEN THE SECTION POINTS SHALL NOT EXCEED 15 OR 50M IN PLAIN TERRAIN AND 10 SPANS OR 30M IN HILLY TERRAIN. A SECTION POINT SHALL COMPRISE OF TENSION POINT WITH DBB TYPE OR DC/C TYPE OR DBD TYPE TOWER AS APPLICABLE.
6. FOR ALL NATIONAL HIGHWAY CROSSING TENSION TOWER IS TO BE USED AND THE CROSSING SPAN IS NOT TO EXCEED 250METERS.
7. WAY LEAVE CLEARANCE: 23M EITHER SIDE FROM THE C.L. OF THE TOWER
8. MAXIMUM DEVIATION OF LINE FOR DEAD AND TOWER SHALL BE 15° BOTH SIDE I.e. LINE SIDE AND SUBSTATION SIDE (SLACK SPAN SIDE)
9. Horizontal Scale : 1cm = 20m and Vertical Scale : 1cm = 2m

TOWER TYPES		
TOWER NAME	ANGLE OF DEVIATION	WIND SPAN
P (SUSPENSION)	0°-2°	430M WIND SPAN 415M WIND SPAN 400M WIND SPAN
Q (TENSION)	0°-15°	
R (TENSION)	15°-30°	
S (TENSION)	30°-60°	

LEGEND	
1/0	Location No.
P-40	Tower Type
HT=48.62 ELE=266.57	Sum of Adj. spans
598	Wind Span
253 (97.186)	WT Span Cold
284 (86.178)	WT Span Hot



Plan View

OWNER :		WARORA-KURNOOL TRANSMISSION LTD.	
EXECUTIVE AGENCY		KEC INTERNATIONAL LIMITED	
ORDER NO.	W.O.B-827	LOA No.	WTEL/04/KEC/MKT/Transmission Line/2017 Dated 21.06.2017
LINE	Additional Inter-Regional AC link for Import into Southern Region (Warangal-Warangal 400kv DC link)		
DESCRIPTION	PLAN & PROFILE DRAWING : 400KV D/C WARANGAL-WARANGAL T/L FOR SECTION 7/7 TO 8/0 Length = 249.3M (Wind Zone-III)		
SURVEY	SANDEEP SAIN	SCALE	V=1:200 & H=1:2000
DRAWN	SANDEEP SAIN	DRG No.	400KV D/C WARANGAL-WARANGAL/JF/7/0-9/0
CHECKED	G.L. MANCHAR	SHEET	REV SYM. 0 A B
APPROVED			



CHECK LIST

Project Director for processing the Proposal of overhead electrical line crossing national highways vested with NHA

Circular / Codes:-

Ministry Circular No NH-III/P/20/77 dated 08-04-1982

Indian Electricity Act 1910

Indian Electricity Rules 1956

IRC: 32-1969

IS:5613-1976 Part I to IV

For getting approval for layering of overhead electrical line along the National Highways NH - 563, vested with NHA

<u>S.NO</u>	<u>Item</u>	<u>Information/ status</u>	<u>Remarks</u>
1	General Information	400 KV D/C Warangal – Warangal Transmission Line	
1.1	Name and address of the applicant	Warora – Kurnool Transmission Limited	
1.2	National Highway No	NH-563	
1.3	State	Telangana	
1.4	Location	Panthini, Warangal District	
1.5	Type of electric including carrying voltage details and purpose	400 KV D/C	
1.6	Kilometers Stone no	156 & 157	
1.7	Length in Meter	249.3	
1.8	Width of available ROW	46	
	(a). Left side from Center Line towards increasing chainage / KM Direction	23	
	(b) Right side from Center Line towards increasing chainage / KM Direction	23	
1.9	<u>Proposal to lay Overhead</u>		
(a)	Left side from Center Line towards increasing chainage / KM Direction	As above	
(b)	Right side from Center Line towards increasing chainage / KM Direction	As above	
(c)	Errrection of Electrical line along the NH 563	NA	
1.10	<u>Proposal to acquire land</u>	NA	
	(a)Left side from Center Line	115.7m	
	(b)Right side from Center Line	136.6m	
1.11	Whether the proposal is a- in the same side where land is not to the acquired b- Crossing the National Highway If not then where to lay the overhead electrical line	Yes NH 563 Yes From Khammam -Jagtial	
1.12	Details of Already laid services (overhead telecommunication line, overhead electric line etc), if any , along the proposed route / proposed crossing	NA	
1.13	NO of lanes (2/4/6/8 lanes) existing	02 lane	
1.14	Proposed number of lanes (2 lanes with paved shoulder 4/6/8 lanes)	N/A	
1.15	Service Road existing or not	N/A	
	If yes then which side		
	a) Left side from center line		
	b) Right side from center line		
1.16	<u>Proposed Service Road</u>	N/A	
	a) Left side from center line		
	b) Right side from center line		



1.17	Whether proposal to lay overhead electric line is after the service road or between the service road and main carriage way, or crossing for approval / rejection based on the Ministry circulars and relevant codes mentioned as above.	N/A	
1.19	<p>I- If crossings of the roads involved</p> <p>(a) Crossing angle for NH and provide length along the Highway</p> <p>(b) Structure (Tower, pole and for HT Line only tension towers) for crossings shall not be too near the existing structures on the National Highway, The minimum distance being 15 meter.</p> <p>(i)- Type of Existing / proposed structure for National Highways</p> <p>(ii)- What is the distance of tower, pole and tension tower lying from the existing / proposed structure for National Highways.</p>	<p>Yes</p> <p>(a) 85°41'15", 249.3 Meters</p> <p>(b) Tower no AP 7/7 & AP 8/0 placed at a distance of 115.7 m & 133.6 mtr Respectively</p>	
	<p>(c)- The overhead lines and their supporting poles / towers should ordinarily be placed at the extreme edge of the road land boundary. In any case, these shall be at least 10 meter away from the edge of the existing shoulders of extreme traffic lane. Where the existing road way is narrower than the minimum according to standard or where the widening is proposed for any reason the lateral clearance shall be reckoned with respect to ultimate road way.</p> <p>What is the horizontal clearance from the extreme edge of the road land boundary?</p>	<p>N/A.</p> <p>N/A</p>	
	<p>(d)The overhead lines and their supporting poles/ towers should originally be placed at the minimum distance of 5.0 m from the nearest line of avenue trees.</p> <p>What is the horizontal clearance from the nearest line of avenue trees?</p>	N/A	
	(e)- in mountainous / hilly terrain the overhead lines should be erected preferably on the valley side as far away as practicable .In hilly region, label of ground at a suitable distance below the outer conductor on either side from the central line is also to be noted and marked in profile so as to ensure required ground clearance underneath conductor and side clearances in swung conditions. Is the proposal in hilly area?	Plain terrain	
	The horizontal clearances in respect of poles erected for the purpose of street lighting in Urban situations shall be as under:-		
	<p>i-For roads with Minimum 300mm from the Raised kerbs 300mm from the edge of nearest kerb Preferably 600mm</p>	N/A	
	<p>ii- For roads with At least 1.5m from the edge of the carriage way , raised kerbs subject to minimum of 5.0 from the central line of the carriage way.</p>	N/A	
	(g) the Pylons of HT lines along crossing the road shall be located outside the NH land	N/A	
	(h) for crossing the line of same voltage or lower voltage, suspension/ tension tower with suitable extensions shall be used.	N/A	
	(i) The vertical clearance of the overhead lines crossing the road shall be reckoned from the top of the crown of the road taking into account the anticipated final top level due to future raising of road level, strengthening of pavement etc. The actual ground clearance of High Tension line for voltage above 650 volts varies	Ground Clearance shall be taken jointly with WKTL and NHA after completion	



	depending upon the voltage transmitted and these are stipulated in Indian standard. Codes is 56130-1976 part 1 to IV and Indian Electricity Rules 1956 as under.		
<u>2</u>	Affidavit / Under taking to be obtained from (to be furnished by the applicant).	Yes	
<u>2.1</u>	Not to damage to other utility , if damaged then to pay the losses either to NHAI or to the concerned agency	Yes	
<u>2.2</u>	Under Taking for Renewal of Bank Guarantee if required.	N/A	
<u>2.3</u>	Confirming all standard conditions as laid down in ministry circular no- NH-III/P/20/77 dated 08-04-1982 Indian Electricity Act 1910 Indian Electricity Rules 1956 IRC :32-1969, IS : 5613-1976 part I to IV of (NHA I)	. Yes	
<u>2.4</u>	Shifting of overhead Electrical line at their own cost as an when required by (NHA I)	Done by WKTL electrical Department own cost	
<u>2.5</u>	Shifting of overhead Electrical line at their own cost as an when required due to 4/ 6 lanning/ widening of NH	Done by WKTL electrical Department own cost	
<u>2.6</u>	Indemnity against all damage and claims whatsoever kind that may be to NHAI or to any third party in the row during installation, operation and maintenance	Done by WKTL L electrical Department own cost	
<u>2.7</u>	Traffic movement during laying of OFC/Cable to be managed by the applicant	Done by WKTL electrical Department own cost	
<u>2.8</u>	If any claim is raised by the concessionaire then the same has to be paid by the applicant.	Done by WKTL electrical Department own cost	
<u>2.9</u>	Prior approval of the NHAI shall be obtained before undertaking any work of installation, shifting or repairs , or alterations to the overhead electrical line located in the National Highway right of way	Yes	
<u>2.10</u>	Expenditure, if any , incurred by electric department for repairing any damage caused to the National Highway by the laying , maintenance or shifting of the overhead electrical line located in the National Highway right of the way	Yes.	
<u>2.11</u>	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 electric department owing the utility line within a reasonable time (not exceeding 60 days) of the intimation given	Yes	
<u>2.12</u>	Certificate from the applicant in the following format :- (i) Laying of overhead electrical will not have any deleterious effects on any of the bridge components and roadway safety for traffic. (ii) For 4/6 laning "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 6 laning or any other development .	Yes	



2.13	The transmission line installation shall be carried out by trained and experienced personnel and supervised by technically qualified persons competent to undertake such work.	Yes	
2.14	The applicant ensures the safety of the Highway traffic against the Hazards of the high voltage lines during installation , operation and maintenance	Yes	
2.15	Undertaking the compliance with Indian electricity rules and other authorities, regulations- all over headlines shall comply with the requirement of the Indian electricity act and rules made their under and the regulations or specification as laid down by NHAI .	Yes	
	Other documents and drawing to be furnished by the applicant	Yes	
3.1	Methodology for laying of overhead electric line.	Yes	
3.2	Draft license agreement	Yes	
3.3	Performance bank guarantee in favor of NHAI has to be obtain at the Rs 100/- per running meter (Parallel to NH) and Rs 1, 00,000/- per crossing of NH, for a period of one year initially (extendable if required till satisfactory completions of work) as a security for insuring/ making good the area, Clearing debris / loose earth etc produced in the right of way. No payment shall be payable by the NHAI to the license for clearing debris/ loose earth.	YES	
3.4	Strip plan/ route plan showing overhead electrical line, chainage with of ROW, distance of proposed, structure(tower, pole and for HT Line only tension towers) from the edge of ROW, important milestone, intersections, cross drainage works any other structure existing of proposed etc.	Yes	
4	Certificate from the Project Director		
4.1	Certificate for confirming that the proposal has been examined with respect to the structures and developmental work considered at this location and compliance of the standard conditions issued vide ministry circular no- NH-III/P/20/77 dated 08-04-1982 Indian Electricity Act 1910 Indian Electricity Rules 1956 IRC :32-1969, IS : 5613-1976 part I to IV of (NHAI) and NHAI's guideline.	Yes	
4.2	Certificate from PD In the following format:- (i)- "it is certified that any other location of the electric line would be extremely difficult and unreasonable costly and the installation of electric line within ROW will not adversely affect the design , stability & traffic safety of the highway nor the likely future improvement such as widening of the carriage way easing of kerb , etc." (ii) for 6- laning (a) Where feasibility is available " I do certify that there will no hindrance to propose 6 laning based on the feasibility report considering proposed structures at the said location " (b) In case feasibility report is not available "I do certify that sufficient ROW is available at site for accommodating of six - laning"	YES	
5	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 overhead electrical line has also been granted as a right of way to the concessionaire under the concession agreement for up-gradation.	YES	



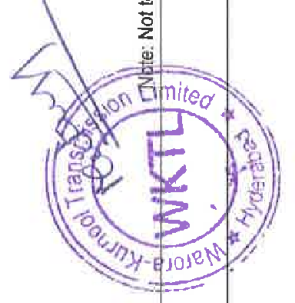
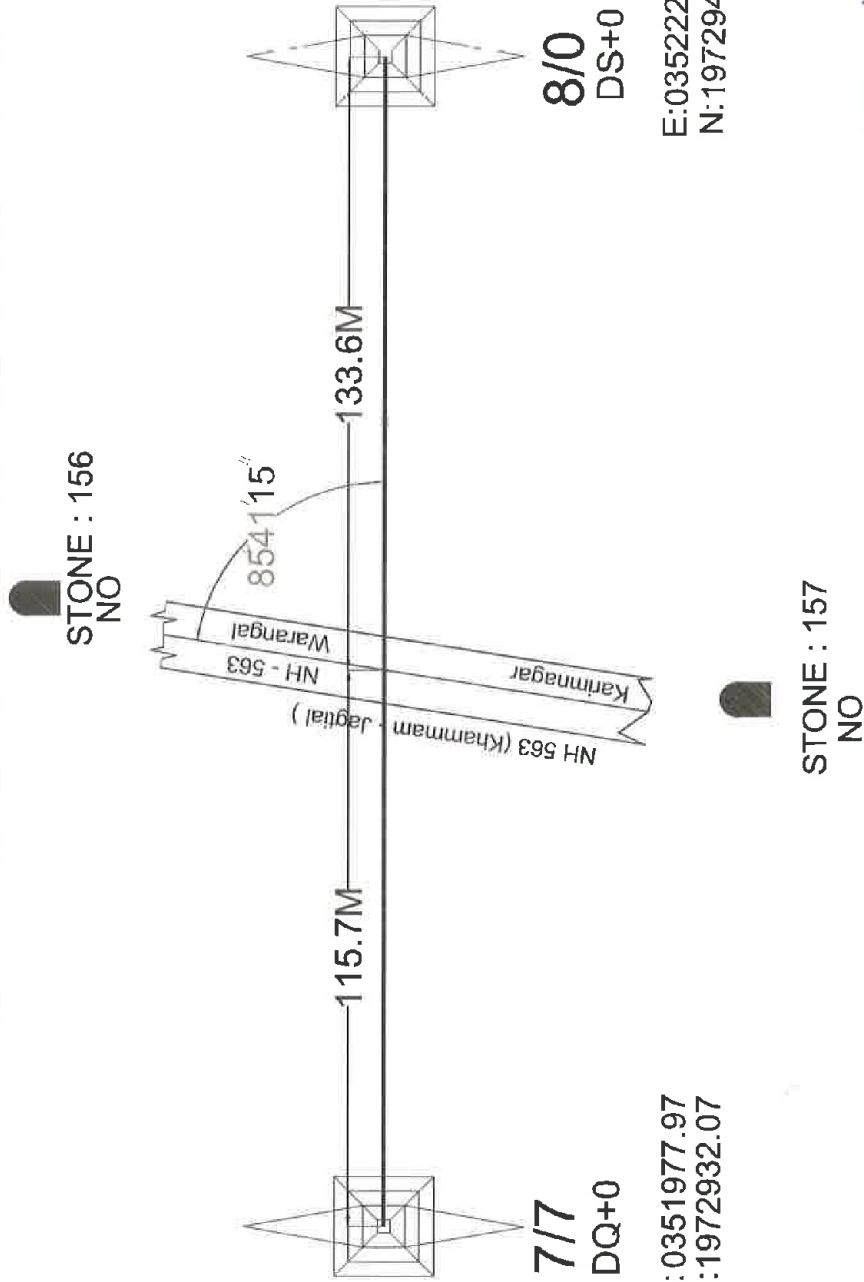
<u>6</u>	Who will supervise the work of laying of overhead electrical line?	WKTL	
<u>7</u>	Who will sign the agreement on behalf of overhead electrical line agency	General Manager, WKTL	
<u>8</u>	Who will ensure that the defect in road portion after laying of overhead electrical are corrected and if not corrected that what action will be taken.	WKTL	
<u>9</u>	Who will pay the claims for damages done / disruption in working of concessionaire, if asked by the concessionaire.	WKTL	
<u>10</u>	A certificate from PD that he will enter the proposed permission in register of record of the permission in the prescribed Performa (copy enclosed)	NHAI	
<u>11</u>	If any previous approval for laying of overhead electrical line, then photocopy of register of records of permission accorded as maintained by PWD may be enclosed.	NO	



Chandhat



PROPOSAL FOR OVERHEAD CROSSING NH 563 (Khammam - Jagtial) BY 400 KV D/C
WARANGAL - WARANGAL TRANSMISSION LINE



Note: Not to Scale

KEC INTERNATIONAL LIMITED
Additional inter-Regional AC link for import into Southern Region
(Warangal-Warangal 400kV link)

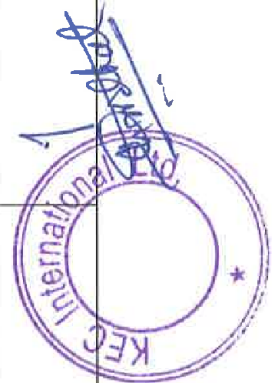
TOWER SCHEDULE - 400kV DC Warangal-Warangal GTY-GTY (WZ-3)


Client :WARORA - KURNOOL TRANSMISSION LIMITED

W.O. B-827

REV B

SL No	Loc. No. (Provisional)	Type of Tower	Wind Zone	HT of Tower (Mtr)	Easting	Northing	Deviation Angle (Deg)	Span (Mtr)	Section Length	Sum of Adjacent Spans	Wind Span (Mtr)	Weight Span in Mtr (Cold)			Weight Span in Mtr (Hot)			Remarks & Crossings.
												Left	Right	Total	Left	Right	Total	
1	7/6	DP+6	WZ-3	59.1	351539.25	1972916.36		439.00		859.0	429.5	238	252	490	230	244	474	
2	7/7	DQ+0	WZ-3	48.6	351977.97	1972932.07	00° 00' 00"		2844.00	688.3	344.2	187	117	304	195	121	316	LT
3	8/0	DS+0	WZ-3	48.6	352227.11	1972940.99	34° 14' 27" LT	249.30		659.3	329.7	132	161	293	128	173	301	NH 563 (Warangal - Karimnagar Road)
4	8/1	DP+9	WZ-3	62.1	352557.58	1973183.67		410.00		791.0	395.5	249	217	466	237	210	447	WELL, CART TRACK, 11 KV LINE, LT
KEC INTERNATIONAL LIMITED																		
WKTL																		
SURVEYED BY			CHECKED BY			SUBMITTED BY			CHECKED BY			RECOMMENDED BY			APPROVED BY			



1	REVISED AS PER COMMENTS	R.M.D	S.M.P	C.M.J.	26-Dec-18
0	FIRST ISSUE	R.M.D	S.M.P	C.M.J.	20-Nov-18
REV	DESCRIPTION	DESIGN	CHECKED	APPROVED	DATE
OWNER : <p style="text-align: center;">WARORA-KURNOOL TRANSMISSION LTD.</p>					
EPC CONTRACTOR : <p style="text-align: center;">PAN INDIA INFRAPROJECTS PVT. LTD.</p>					
EPC SUB-CONTRACTOR : <p style="text-align: center;">MUMBAI WTR PVT. LTD.</p>					
OWNER'S ENGINEER : <p style="text-align: center;">TRACTEBEL ENGINEERING (PVT.) LTD., Gurgaon</p>					
CONTRACTOR : <div style="display: flex; align-items: center; justify-content: center;">  <div> <p>KEC INTERNATIONAL LTD .</p> <p>Mumbai - 400036, India</p> </div> </div>					
PROJECT : <p style="text-align: center;">Additional Inter-Regional AC link for import into Southern Region (Warora-Warangal and Chilakaluripeta-Hyderabad-Kurnool 400kV link)</p>					
	NAME		DATE		
Prepared	R. M. Dharmadhikari		20-Nov-18	TITLE : -	
				400 kV D/C TL (QUAD ACSR MOOSE), WZ-3	
Checked	S. M. Pokale		20-Nov-18	WIND ZONE - 3	
Approved	C. M. Joshi		20-Nov-18	TOWER SPOTTING DATA	
Sheet Size	A4				
				<u>KEC Document Number</u>	<u>REV.</u>
				B827/400kV/TSD-1	1

FORMULA FOR MAXIMUM INDIVIDUAL SPAN (L_{max})

$$L_{max} = L \sqrt{K / S}$$

Where

- L = Normal Span in Meter(m) = 400 m
K = Max. Sag Factor Corresponding to Max. Individual Span
S = Max. Conductor Sag Including Sag Error.

K Value is calculated as per formula mentioned below:-

FOR VERTICAL SEPERATION BETWEEN CONDUCTOR PHASES

$$Vs = 0.75 \sqrt{K + S_i} + (V / 150)$$

V = System Voltage in kV.

Si = Length of Suspension Insulator Assembly.

Vs = Vertical Separation between Phase Conductors

For Suspension Tower Type "DP"

$$Vs = 8.3 \text{ m}$$

$$Si = 4.489 \text{ m}$$

$$V = 400 \text{ kV}$$

$$K = 51.93 \text{ m}$$

$$S = 13.41 \text{ m}$$

$$L_{max} = 787.2 \text{ m} \quad \text{Say} \quad 780 \text{ m}$$

For Tension Tower Type "DR & DS"

$$Vs = 8 \text{ m}$$

$$Si = 0 \text{ m}$$

$$V = 400 \text{ kV}$$

$$K = 50.57 \text{ m}$$

$$S = 13.41 \text{ m}$$

$$L_{max} = 776.9 \text{ m} \quad \text{Say} \quad 770 \text{ m}$$

III MINIMUM CLEARANCE FOR POWER LINE CROSSING EACH OTHER

Voltage Level	400 kV (mm)
66 kV	5490
132 kV	5490
220 kV	5490
400 kV	5490
400 kV HVDC	6040
500 kV HVDC	6790
600 kV HVDC	7540
765 kV	7940
800 kV HVDC	9040
1200 kV	10440

- a) Power line crossing for 400kv and above should be done only with DS type tower.
- b) Power line crossing for 220KV and 132KV line could be done with angle tower as per requirement.
- c) Power line crossing for 66KV and below line could be done with any type of tower.

IV TELECOMMUNICATION LINE CROSSING:

The angle of crossing shall be as near 90 deg. As possible. However, deviation to the extent of 60deg. May be permitted under exceptionally difficult situations. For a crossing angle below 60 deg. Matter shall be referred to the authorities. Minimum clearance between 400kV conductors and telecommunication lines shall be 4.48m with maximum conductor sag.

V RIVER CROSSING:

Minimum Clearance of Power Conductor over the Highest Flood Level in case of Navigable Rivers is 21.9m
Minimum Clearance of Power Conductor over the Highest Flood Level in case of Non - Navigable Rivers is 6.4m

- VI The number of consecutive spans between the section points shall not exceed 15 spans or 5km in plain terrain, and 10 spans or 3km in hilly terrain. A section point shall comprise of tension point with DR, DS, type towers as applicable.

- VIII Minimum ground clearance required: **8840 mm.**

- IX Way leave clearance: 23m either side from the C.L. of the tower.

- IX Maximum unequal level difference between the legs shall not be greater than 3.0m.

- X Maximum span of adjacent span for various Angles of deviation are subject to the condition that Minimum specified live metal clearance & ground clearance are available.

- XI Tower type "DR" shall be used for transposition with 0 deg. Deviation with modification of cross arms.

- XII Maximum deviation of line for dead end tower shall be 15 deg. Both line side and substation side (slack span side).

- XIII Vertical load of individual spans are acting downwards for suspension towers.

- XIV Broken wire conditions:

Suspension Tower(DP)	Any ground wire broken or all sub-conductor of bundle in one phase broken.
Small/Medium Angle Towers (DR)	Breakage of two Phases on the same side and on same span or breakage of any one phase and any one earth wire on same span.
Large Angle Towers(DS/DE)	Breakage of all three Phases on the same side and on same span or breakage of any two phases and any one earth wire on same span.

Rv/IRC/23

IRC : 32-1969

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LINES AS RELATED TO
ROADS**



THE INDIAN ROADS CONGRESS

1984

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STANDARD FOR VERTICAL AND HORIZONTAL CLEARANCES OF OVERHEAD ELECTRIC POWER AND TELECOMMUNICATION LINES AS RELATED TO ROADS

1. INTRODUCTION

1.1. The 'Standard for Vertical and Horizontal Clearances of Overhead Electric Power and Telecommunication Lines as Related to Roads' was prepared by the Specifications and Standards Committee and later discussed by the Council in their meeting held at Trivandrum in September 1966. The suggestions made by the members of the Council were considered by the Specifications and Standards Committee at their various meetings and the revised standard was approved by the Executive Committee in their meeting held on the 13th March, 1969 and then by the Council in their 71st meeting held at Bhubaneswar on the 26th and 27th May, 1969 for being published as an approved standard of the Indian Roads Congress.

1.2. Overhead electric power and telecommunication lines crossing a road or running within the road land should be provided with adequate clearances so that safe use of the road is not affected. It is necessary to fix standards for these clearances in accordance with the maximum permissible dimensions of vehicles.

1.3. Some of the Central and State Government Departments have issued executive directives in this matter, but there is a lack of uniformity in these directives. Standards regarding horizontal and vertical clearances are suggested here for uniform adoption on all roads throughout the country.

2. SCOPE

2.1. These standards shall apply to overhead electric power and telecommunication lines erected within the road land. The standards shall not apply to overhead power lines meant for tram cars and trolley buses.

2.2. The standards shall not be taken to confer authority for over-riding any statutory provisions on the subject.

3. DEFINITIONS

3.1. **Vertical clearance** is the clear vertical distance between carriageway crown and the lowest point of any overhead conductor installation which includes the conductor wire, bearer wire, guard wire, stay wire, guard cradle, or screen. The lowest point should be determined after accounting for the maximum possible sag in the lowest member of the conductor installation.

3.2. **Horizontal clearance** is the horizontal distance, measured at right angles to road alignment, between roadway or carriageway edge and a pole carrying an overhead utility line, or any pole-supporting structure.

4. VERTICAL CLEARANCES

4.1. Minimum vertical clearances for different categories of overhead conductor installations shall be as under :

- | | |
|--|-----------|
| (i) For ordinary wires and lines carrying very low voltage upto and including 110 volts, e.g., telecommunication lines | 5.5 metre |
| (ii) For electric power lines carrying voltage upto and including 650 volts | 6.0 metre |
| (iii) For electric power lines carrying voltage exceeding 650 volts | 6.5 metre |

These clearances have been fixed taking into consideration the overall height of vehicles and the statutory provisions of the Indian Electricity Rules.

4.2. Guard cradle or screen should be provided for electric power lines carrying voltage exceeding 110 volts while crossing the highway. The cradle should extend desirably over the full right-of-way. However, guards may be omitted in the case of extra high voltage lines strung on self-supporting towers designed with adequate factor of safety.

4.3. In urban areas, in consideration of local factors such as temple cars, tazia processions, fire-fighting equipment, etc., the competent authority may prescribe higher clearances than those specified above.

5. HORIZONTAL CLEARANCES

5.1. Poles carrying overhead power and telecommunication lines shall, excepting the urban areas, be erected at least 10.0 metres away from the nearest edge of the roadway, provided also that these are at a minimum distance of 5.0 metres from the nearest line of avenue trees. In case of roads having, at present, a narrower roadway than that prescribed in the standards in force, this horizontal clearance shall be reckoned from what will be the ultimate edge of the roadway after widening to the said standards.

5.2. The standards for horizontal clearance laid down above shall not apply to roads situated in mountainous country. In such areas, poles should be erected preferably on the valley side, and as far away from the edge of the road as practicable.

5.3. The horizontal clearances in respect of poles erected for the purpose of street lighting shall be as under :

- | | |
|-------------------------------------|---|
| (i) For roads with raised kerbs | Minimum 300 mm from the edge of the raised kerb; 600 mm being preferable. |
| (ii) For roads without raised kerbs | At least 1.5 metre from the edge of the carriageway, subject to minimum of 5.0 metre from the centre line of the carriageway. |

5.4. The clearances given in para 5.3 shall apply to poles carrying electric power and telecommunication lines in urban situations.

5.5. The clearances mentioned in paras 5.1 and 5.3 shall be deemed to apply not only to poles but pole-supporting structures as well.

6. Plate 1 illustrates the standards specified above.

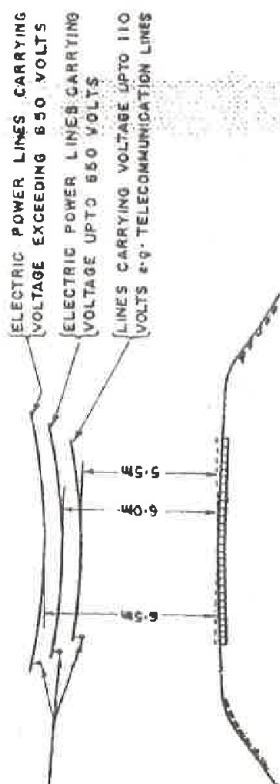


FIG-1 MINIMUM VERTICAL CLEARANCES

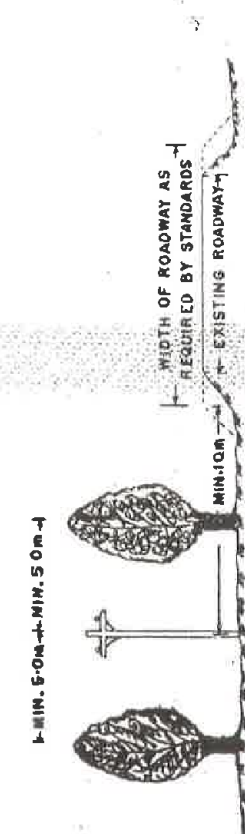


FIG-2 MINIMUM HORIZONTAL CLEARANCE FOR POWER AND TELECOMMUNICATION LINES ON RURAL ROADS, EXCEPT
(i) FOR POLES ERECTED FOR STREET LIGHTING AND
(ii) FOR POLES ERECTED IN MOUNTAINOUS COUNTRY

FIG-3 MINIMUM HORIZONTAL CLEARANCES FOR STREET LIGHTING POLES ON RURAL ROADS AND FOR TELECOMMUNICATION, ELECTRIC POWER OR STREET LIGHTING POLES ON URBAN ROADS

VERTICAL AND HORIZONTAL CLEARANCES OF OVERHEAD ELECTRIC POWER AND TELECOMMUNICATION LINES

Methodology for Execution of National Highway Crossings

- Crossing is supported on angle tower on either side.
- The minimum distance of the crossing tower is kept at least equal to the height of the tower plus 6M way from the centre point of the National Highway.
- Minimum ground clearance above road level of the lowest portion of any conductor under condition of maximum sag shall be maintained.
- The crossing span will be limited to 250 M.
- At the time of detailed survey, it was ensured that the National Highway crossing is to be finalized as per the regulations laid down by the Indian Electricity Rules/CBIP Manual/MROTH guidelines.
- Adequate traffic control shall be maintained wherever erection work is being carried out at highway crossings.
- The permissions required from the concerned authorities, such as the department of highway, police etc., shall be obtained prior to commencement of work
- For controlling the vehicles and pedestrian traffic while performing work at national highway crossing warning signs or flags will be displayed by keeping a man at crossings

Specific Safety precautions during National Highway Crossings

- The earthing shall be done in accordance with the stipulation made in IS 3043 -1972 and IS 5613 –II /Section I -1976
- Before commencement of stringing, all towers are to be checked for completion in all respect. All bolt/nuts are to be fully tightened. The angle tower is to be provided guy supports for all the phases till completion of the other adjacent section.
- For national highway crossing stringing scaffolding is provided on either side of road to maintain the safety
- There is no M.S. Joint over national highway crossings

Stringing:

The Stringing procedure is broadly divided into the following steps.

- i) Paying out & stringing of earth wire.
- ii) Paying out & stringing of conductor.
- iii) Final sagging of Earthwire & conductor.
- iv) Regulation
- v) Clipping and fixing of accessories.

- The guys used generally are 20mm steel wire rope.
- The guys are anchored in the ground at an angle of 45 degrees
- Per phase 4 strings of 210 kN insulators are used.
- For national highway crossings stringing scaffolding is provided on either side of NH to maintain the safety of vehicles. We have to be making up the conductor and earthwire of one side prior to availing blockage.
- Initially conductor and OPGW/Earthwire is to be paying out with help of tractor and scaffolding and all six phases shall be anchored in rough sag operation. The final sagging of the conductor shall be done using sagging winches.
- After completion of stringing spacer and Vibration damper is to be installed.

