भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय, भारत सरकार)
National Highways Authority of India
(Ministry of Road Transport & Highways, Govt. of India)
क्षेत्रीय कार्यालय, ओड़िशा / Regional Office, Odisha
301-ए, तीसरी मंजिल, पाल हाईटस, प्लाट नं जे/7, जयदेव विहार, भुवनेश्वर-751013, ओड़िशा
301-A, 3rd Floor, Pal Heights, Plot No : J7, Jayadev Vihar, Bhubaneswar-751013, Odisha
दूरभाष /Ph.: 0674 - 2361470/ 570/ 670 (का/O)
ई-मेल/e-mail: roodisha@nhai.org, ronhaiodisha@gmail.com, वेबसाइट/Web : www.nhai.gov.in

NHAI/13011/54/RO/OD/1608 /2025 25.07.2025

To

The Sr. Technical Director,
NIC Centre at MoRTH,
Transport Bhawan,
New Delhi 110001

Sub: Chandikhole - Bhadrak section of NH-16: proposal of M/s OPTCL for crossing of 400 KV DC transmission line between Km. 66.300 to 66.400 in District - Jajpur in the state of Odisha - Reg.

Ref: PD, PIU- Chandikhole letter no. 1335 dated 10.07.2025

Sir,

Please find enclosed herewith proposal of M/s OPTCL for crossing of 400 KV DC transmission line from Km. 66.300 to 66.400 in District - Jajpur in the state of Odisha. The details are as under:

S. No	Chaninage	Along/ Across	Distance of Tower from center line of Highway (m)		Ground Clearance (m)	Required clearance as per CEA regulation 2023
			RHS	LHS		
1	Between Km. 66.300 to 66.400	Crossing	123	114	22.83	14.15

2. Accordingly, as per guidelines issued by MoRT&H vide F. No. RW/NH-33044/29/2015/S&R(R) dt. 22.11.2016, the application along with the recommendations of concerned PD/Consultants are enclosed herewith with request to hoist the same in the Ministry's Website for public comments within 30 days of uploading on the website.

This is issued with the approval of Regional Officer, Odisha.

Yours Sincerely,

Amkse

(Amit Kumar Gupta)
Dy. General Manager (Tech)

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
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NHAI/13011/54/RO/OD/ 1608 /2025 25.07.2025

INVITATION OF PUBLIC COMMENTS

Sub: Chandikhole - Bhadrak section of NH-16: proposal of M/s OPTCL for crossing of 400 KV DC transmission line between Km. 66.300 to 66.400 in District - Jajpur in the state of Odisha - Reg.

M/s OPTCL has submitted a proposal for crossing of 400 KV DC transmission line from Km. 66.300 to 66.400 in District - Jajpur in the state of Odisha. The details are as under:

S. No	Chaninage	Along/ Across	Distance of Tower from center line of Highway (m)		Ground Clearance (m)	Required clearance as per CEA regulation 2023
			RHS	LHS		
1	Between Km. 66.300 to 66.400	Crossing	123	114	22.83	14.15

2. As per guidelines issued by MoRT&H vide F. No. RW/NH-33044/29/2015/S&R(R) dated 22.11.2016, the Highway Administration will put out the application in the public domain for 30 days for seeking claims and objections on grounds of public inconvenience, safety and general public interest.

3. In view of the above, the comments of public, if any, on the above-mentioned proposal are invited on below mentioned address:

The Regional Officer,
National Highways Authority of India,
Regional Office, Odisha
301-A, 3rd Floor, Pal Heights,
J/7, Jayadev Vihar, Bhubaneswar 751013, Odisha
e-mail: roodisha@nhai.org

This is issued with the approval of RO, Odisha.

Dy. General Manager (Tech)
National Highways Authority of India,
Regional Office, Odisha
301-A, 3rd Floor, Pal Heights,
J/7, Jayadev Vihar, Bhubaneswar 751013

CHECK LIST

DETAILS OF CONSTRUCTION 400KV D/C NEW DUBURI TO LOC 182 TOWARDS ERSAMA TRANSMISSION LINE ACROSS THE NATIONAL HIGHWAY--16 (KOLKATA-CHENNAI) BETWEEN AP 57 & AP 58 , 2.90 KM FROM JARAKA & 5.21 KM FROM CHANDIKHOLE

Sr. No		Description	Details
1	1.1	Name of Applicant	**ODISHA POWER TRANSMISSION CORPORATION LIMITED**
	1.2	Details and Purpose of erecting towers	Construction of 400 kV D/C New Duburi To Loc. 182 Towards Ersama Transmission line.
	1.3	Details regarding Over Head Line	
		a) Crossing at Chainage	**KM 66+300 to 66+400**
		b) Distance of Proposed Structure from centre of the road	From AP No. 57/0 (DD+9): 123.0 Mtr. From AP No.58/0 (DD+9): 114.0 Mtr.
		c) Span at the crossing	Crossing span 237.0 M
		d) Angle of Crossing	90°00'00"
		e) Structure used to cross the existing NH and its deviation angle	At AP No.57/0 (DD+9) – 4°15'35"RT At AP No. 58/0 (DD+9) – 21°19'41"RT
2		**Details regarding road alignment**	
	2.1	Name of Road	KOLKATA-CHENNAI
	2.2	Category of Road	NH -16
	2.3	ROW	46 M
	2.4	Black Topped Carriage Way Width	4 lane
	2.5	Road Boundary	Not available
	2.6	All these detail are to be shown on the drawing	Yes shown in drawing
	2.7	Location of 400 KV D/C line along with the crossing to mentioned	Between AP57-AP58 & Between Jaraka and Chandikhole.
3		Details of to be supplied on layout drawing (2 Copies)	Drawing 2 copies attached
4		Ground clearance under maximum sag condition between lowest conductor of proposed line and existing National Highway	22.83 m against the stipulated of 12.0 Mtr (From top of BT surface of NH)
5		Conductor used to cross the National Highway with complete technical details of conductor	i) Conductor Name: ACSR Moose ii) Conductor Diameter-3.177 cm iii) Cross Sectional Area: 5.97 Sq. cm iv) Unit Weight:2.004 Kg/m v) Modulas of Elasticity: 7.036E+05 Kg/Sq cm vi) Ultimate tensile strength: 16428.0 Kg vii) Coefficient of expansion α /°C : 1.93E-05
6		**Document/Drawing enclosed**	
	6.1	Profile Drawing	Enclosed
	6.2	Tower Spotting data of 400 kV DC (Twin Moose) New Duburi To Loc. 182 Towards Ersama Transmission line.	Enclosed
	6.3	Single line diagram of the crossing	Enclosed
	6.4	Methodology for execution of work	Over head stringing through scaffolding: 1. Scaffolding on both side of NH will be provided during stringing activity for maintaining sufficient height for passing of vehicles. 2. Conductor loop will be provided on one side of the tower location. 3. During stringing, conductor will be Pulled through scaffolding to the other side tower location and fixing it with deadend to Tower without disturbing the traffic. 4. Necessary arrangement and safety measures will be taken in during stringing process.

Date & Place:

TRANSRAIL LIGHTING LIMITED

BLOOM CONSTRUCTIONS LLC IN ASSOCIATION WITH SOPL Chandikhole Bhadrak

Dy. Manager(Tech) N.H.A.I, PIU Chandikhole

Project Director, National Highways Authority of India Chandikhole

ODISHA POWER TRANSMISSION CORPORATION LIMITED														
400KV D/C NEW DUBURI TO LOC 182 TOWARDS ERSAMA T/L (WIND ZONE -6)														
TRANSRAIL LIGHTING LIMITED (T & D)														
NH-16 CROSSING PROPOSAL AP 57/0 -AP58/0 =237.00 m Span														
S. N.	Loc. No.	Tower Type	Angle of Deviation	Span Length (m)	Ground Level	Weight Span Hot (m)			Weight Span Cold (m)			Crossing Details	Village Name	GPS Co-ordinate	
						Left	Right	Total	Left	Right	Total			Latitude	Longitude
1	AP-57	DD+9	4°15'35"RT		21.74	250.00	116.00	366.00	258.00	113.00	371.00		RATHIA	20°44'40.82"	86°8'50.85"
				237.00								NATIONAL HIGHWAY- 16			
2	AP-58	DD+9	21°19'41"RT		22.35	123.00	248.00	371.00	125.00	258.00	383.00		RATHIA	20°44'37.68"	86°8'58.34"

APURBA ATHA
Asst Officer (Survey)
Transrail Lighting Ltd

TRANSRAIL LIGHTING LIMITED

Dy. Manager (EL)
EHT (Const) Sub-Division
OPTCL, Kendrapara

S.D.O
EHT (Const) Sub-Division
OPTCL, Kendrapara

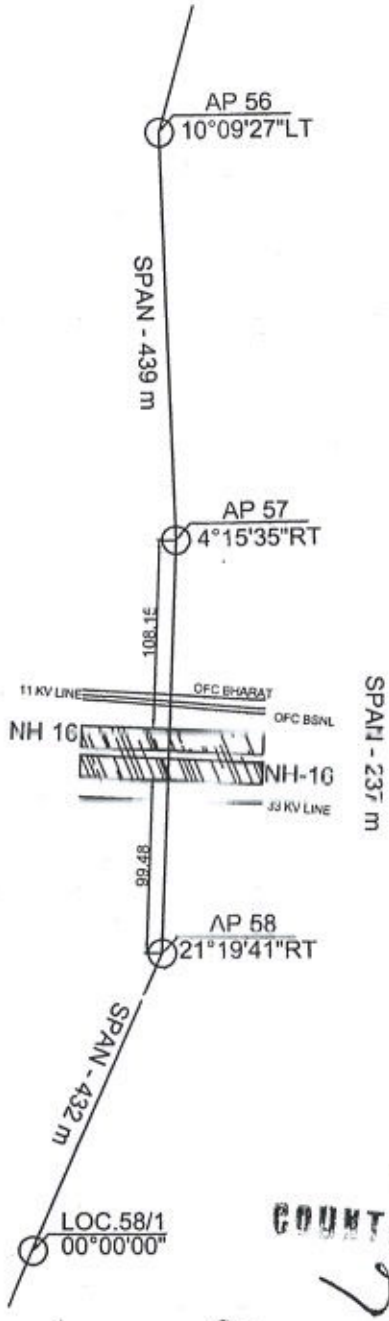
Deputy General Manager (Elect.)
E.H.T. Construction Division
OPTCL, CUTTACK

BLOOM COMPANIES LLC IN ASSOCIATION WITH SCPL
NH-16, Chandikhole, Bhadrak

COUNTERSIGNED
12/8/22
General Manager (ELC.)
EHT, Construction Circle
OPTCL, Bhubaneswar

12/07/2022
Manager(Elect.)
EHT (Const.) Circle,
OPTCL, Bhubaneswar

SINGLE LINE DIAGRAM



COUNTERSIGNED

12/9/22

General Manager (ELC)
EHT, Construction Circle
OPTCL, Bhubaneswar

12/07/2022

Manager(Elect.)
EHT (Const.) Circle,
OPTCL, Bhubaneswar

Dy. Manager (EL)
EHT (Const) Sub-Division
OPTCL, Kendrapara

S.D.O
EHT (Const) Sub-Division
OPTCL, Kendrapara

TRANSRAIL LIGHTING

BLOOM COMPANIES LLC IN ASSOCIATION WITH SCPL
Chandikhole
Bhadrak

7/7/22

Deputy General Manager (Elect.)
E.H.T. Construction Division
OPTCL, CUTTACK

Transrail Lighting Ltd.

TRANSRAIL

MUMBAI (INDIA)

SUBJECT:	TOWER SPOTTING DATA
CLIENT:	ODISHA POWER TRANSMISSION CORPORATION LIMITED
DESIGNER & MANUFACTURER:	TRANSRAIL LIGHTING LIMITED
PROJECT:-	Design, Engineering, Supply, Erection and Commissioning of 400KV D/C line using Wind-Zone-VI (55 mtrs/sec) Lattice Towers from Loc. No. 1 (dead end tower of 400/220 KV AIS S/S at New Duburi) to Loc no. 182 (Before Birupa River Crossing towards 400KV Proposed GIS gird sub-station at Ershama) (Approx. line length- 67.814 Kms);
SPECIFICATION NO:-	Sr. G.M. - CPC-TENDER-PACKAGE-36(III)/2020-21

CONTENTS

PREPARED BY	REVIEWED BY	APPROVED BY
SREERAJ	J.V.RANA	C.S.MAJGAONKAR

CUSTOMER APPROVAL				
				G487/TSD-02
	0	24.05.22	FIRST ISSUE	
	NO.	DATE	DESCRIPTION	
	REVISION			DOCUMENT NO.

TRANSRAIL LIGHTING LIMITED

TRANSRAIL	Design, Engineering, Supply, Erection and Commissioning of 400KV D/C line using Wind-Zone-VI (55 mtrs/sec) Lattice Towers from Loc. No. 1 (dead end tower of 400/220 KV AIS S/S at New Duburi) to Loc no. 182 (Before Birupa River Crossing towards 400KV Proposed GIS gird sub-station at Ershama)	TOWER SPOTTING DATA FOR ALL TOWERS

Line Voltage, V	=	400	Kv
Normal span for Tower in m	=	400	m

Conductor & Insulator Details:

Number of conductor	=	2	
Diameter of conductor	=	0.0317	m
Unit weight of conductor	=	19.6592	N/m
Maximum Sag of conductor	=	13.256	m
No. of Suspension Insulator	=	1	
Length of Double Suspension Insulator	=	4.5	m
No. of Double Suspension Insulator String		2	
Diameter of Double Suspension Insulator	=	0.125	m
Length of Single Suspension Insulator	=	4.2	m
No. of Single Suspension Insulator String		1	
Diameter of Single Suspension Insulator	=	0.125	m
No. of Tension Insulator	=	2	
No. of Tension Insulator String	=	2	
Diameter of Tension Insulator	=	0.125	m
Length of Tension Insulator	=	5.247	m
No. of Pilot Insulator	=	1	
Diameter of Pilot Insulator	=	0.125	m
Length of Pilot Insulator	=	4.028	m

Wind pressure on conductor	=	2266	N/m^2
Wind pressure on Suspension Insulator	=	2874	N/m^2
Wind pressure on Tension Insulator	=	2855	N/m^2
Max.Conductor tension 400m Span (32 Deg Full Wind)	=	100866	N
75% Wind Cond. tension (32 Deg & 75% of Full Wind)	=	82825.8	N

OPGW/EW Details:

Diameter of Earthwire	=	0.0125	m
Wind pressure on Earthwire	=	2776	N/m^2
Max.tension 400m Span (32 Deg Full Wind)	=	42065.3	N
75% Wind Cond. tension (32 Deg & 75% of Full Wind)	=	34452.7	N

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Tower Types

Tower Type	Deviation Limit	Typical use
DA	(0° - 2°)	To be used as Tangent Tower
DB	(0° - 15°)	To be used as Angle Tower for line deviation from 0° to 15° .Also to be used as Section Tower and to be used for Anti Cascading Condition.
DC	(15° - 30°)	To be used as Angle Tower for line deviation from 15° to 30°. Also to be used as Section Tower and to be used for Anti Cascading Condition.
DD	(30° - 60°)	To be used as Angle Tower for line deviation from 30° to 60°.
DE	(0° - 15°)	DE with 0° to 15° deviation both on line side & sub-station side(Slack span).

Extensions

Body Extensions : +3 m, +6 m & +9 m for Tower Types DA, DB, DC & DD

TRANSRAIL LIGHTING LIMITED

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DGM (E&Q) Sr. General Manager (E&Q)

OPTCL, BBSR OPTCL, BBSR

TRANSRAIL	Design, Engineering, Supply, Erection and Commissioning of 400KV D/C line using Wind-Zone-VI (55 mtrs/sec) Lattice Towers from Loc. No. 1 (dead end tower of 400/220 KV AIS S/S at New Duburi) to Loc no. 182 (Before Birupa River Crossing towards 400KV Proposed GIS gird sub-station at Ershama) (Approx. line length- 67.814 Kms)	TOWER SPOTTING DATA FOR ALL TOWERS

Sl No	DESCRIPTION	TOWER TYPES					
		DA (0°-2°) - SUSPENSION	DB (0°-15°) - TENSION	DC (15°-30°) - TENSION	DD (30°-60°) - TENSION	DE (0°-15°) - DEAD END	DE (0°-15°) With Slack
1	Deviation not to exceed	0° - 2°	0° - 15°	15° - 30°	30° - 60°	0° - 15°	0° - 15°
2	Span	BASIC SPAN - 400 MTRS					
	Span Details (Except Dead End Tower)	Normal Condlition - 400 M, Broken Wire Condition - 240 M					
	Wind Span for Dead End Tower	Normal Condlition - 200 M, Broken Wire Condition - 40 M					
	Wind Span for DE Type with Slack Span	Normal Condlition - 300 M, Broken Wire Condition - 220 M					
3	Vertical Load Limitation						
	Maximum Weight Span (GW/OPGW)						
	Effect of Both Spans	600	600	600	600	300	450
	Effect of One Span	360	360	360	360	60	330
	Maximum Weight Span Conductor						
	Effect of Both Spans	600	600	600	600	300	450
	Effect of One Span	360	360	360	360	60	330
	Minimum Weight Span (GW/OPGW)						
	Effect of Both Spans	200	0	0	0	0	0
	Effect of One Span	100	-200	-200	-300	-300	-300
	Minimum Weight Span Conductor						
	Effect of Both Spans	200	0	0	0	0	0
	Effect of One Span	100	-200	-200	-300	-300	-300
4	Allowable Sum of adjacent span (m) (Lmax x 2)	1644	1563	1563	1709	855	1709

LMax x 2
{PERMISSIBLE SUM OF ADJACENT SPANS FOR VARIOUS DEVIATION ANGLES (SUBJECT TO AVAILABILTY OF ALL CLEARANCE)

NOTE:
A) CONSIDER GW OR CONDUCTOR WHICHEVER GIVES LESSER SUM OF ADJACENT SPANS.
B) PERMISSIBLE ONE SPAN FOR VARIOUS DEVIATION ANGLES SHALL NOT EXCEED 60% OF VALUE SHOWN FOR SUM OF ADJACENT SPANS

2	800	15	800	30	800	60	800	15	400	15	600
1	823	14	842	29	840	59	836	14	440	14	638
0	843	13	884	28	882	58	874	13	482	13	676
		12	926	27	924	57	910	12	524	12	715
		11	968	26	964	56	948	11	564	11	753
		10	1010	25	1006	55	986	10	606	10	791
		9	1052	24	1046	54	1024	9	648	9	829
		8	1094	23	1088	53	1060	8	690	8	867
		7	1136	22	1130	52	1098	& Below		& Below	
		6	1180	21	1172	51	1136				
		5	1222	20	1214	50	1176				
		4	1264	19	1254	49	1214				
		3	1306	18	1296	48	1252				
		2	1348	17	1338	47	1290				
		1	1390	16	1380	46	1330				
		0	1432	15	1422	45	1368	**Note**			
						44	1408	For DE Condition			
						43	1448	the indicated			
						42	1486	values are spans			
						41	1526	on one side only			
						40	1566				
						39	1606				
						38	1646				
						& Below					

5	Broken Wire Condition	ANY 1 GW OR ANY 1 PHASE on same side & same span	ANY 1 GW + ANY 1 PHASE OR ANY 2 PHASES on same side & same span	ANY 1 GW + ANY 1 PHASE OR ANY 2 PHASES on same side & same span	ANY 1 GW + ANY 2 PHASES OR ALL 3 PHASES on same side & same span

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Sr. General Manager (E&Q)
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MAXIMUM INDIVIDUAL SPAN CALCULATION

Max. Individual Span Calulation

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

L = Normal Span

S = Max. Sag (including Sag error)

K = Max. Sag factor corresponding to Max. individual span & is given by the equation written below

$$VS = 0.75\sqrt{K + SI} + \frac{V}{150}$$

VS = Vertical Seperation

SI = Suspension Insulator Assembly Length

V = System Voltage in kVs

TOWER TYPE	VS	SI	K	Lmax (M)	sum of adjacent span (m) (Lmax x 2)
DA	8.5	4.5	55.994	822.1	1644.2
DB	8	0	50.568	781.25	1562.5
DC	8	0	50.568	781.25	1562.5
DD	8.5	0	60.494	854.5	1709
DE	8.5	0	60.494	854.5	854.5

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Sr. General Manager (E&Q)
OPTCL, BBSR

GENERAL NOTES FOR TOWER SPOTTING DATA

A) ROAD CROSSING

1. At all road crossings, the tower shall be fitted with normal suspension and tension insulator strings depending on the type of tower.
2. Ground clearance at the roads under maximum temperature and in still air shall be such that even with conductor broken in adjacent span, ground clearance of the conductor from the road surfaces will not be less than specified minimum ground clearances.
3. At all national highways,DD60 type towers tension insulator strings shall be used and crossing span will not be more than 250 meters, unless higher span is permitted by national highways authority in case of highways having more lanes.

B) ELECTRICAL CLEARANCE FOR RAILWAY CROSSING.

1. Prior approval of Railway Authority is to be obtained.
2. Minimum clearance between lowest point of 400 kV Conductor and Rail level shall be as per following :
   a) Vertical Clearance for OHE other than high rise OHE — 18.26 m
   b) Vertical Clearance for high rise OHE — 20.26 m

   Note: Applicable only for electrification of routes where double stack container having maximum height of 6809mm is plying.

   c) Min. Clearances between Highest Traction and lowest Crossing Conductor — 5.49 m
3. The crossings shall be done with DD60 type tower.
4. The crossing shall normally be at right angle to the railway track.
   The minimum horizontal distance measured at right angles from the centre of nearest track to any part of a structure (all structures shall be rigid and well founded). Carrying electrical conductors crossing a railway shall be equal to the height of the structure in meters above normal ground level plus 6 meters.
5. No crossing shall be located over a booster transformer, traction switching station, traction sub-station, Overlap Section or a track cabin location in an electrified area.
6. The crossing span will be limited to 300 meters or 80 % of the normal span for which the structure are designed whichever is less.
7. However, approval of railway crossing from railway authority has to be obtained in each case. Notwithstanding the above, Minimum clearance for railway crossings shall be as per Indian Railway Schedule of Dimensions (BG) Revised 2004 as amended from time to time.