BHARAT HEAVY ELECTRICALS LIMITED

NEW DELHI

400kV & 11kV TRANSMISSION LINES AT SURATGARH, RAJASTHAN

11kV Transmission Line Route Survey Report, Tower Schedule, Plan and Profile

BHEL DOC. NO: TB-360-316-085

TCE DOC. NO: TCE-7219E-765-RA-6101

TATA

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TATA CONSULTING ENGINEERS LIMITED

REVISION STATUS SHEET

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CONTENT SHEET

Sr. No.	Description
1	Route Survey Report
2	Tower Schedule
3	Plan and Profile
4	Annexure (Key Plan)

ROUTE SURVEY REPORT

1.0 Introduction

2.0 Scope of work

3.0 Reconnaissance survey

4.0 Route Alignment Survey

5.0 Selection of Route

6.0 Major Crossing

7.0 Alternate Route Coordinates

8.0 Route Description

9.0 Comparative Statement

10.0 Tower Types

11.0 Conclusion

1. Introduction

RRVUNL have initiated the activities related to 11kV TRANSMISSION LINES AT SURATGARH, RAJASTHAN. Bharat Heavy Electricals Ltd (BHEL) have been awarded the work as Contractor. M/s Tata Consulting Engineers Limited (TCE) are the Engineering Service Providers for proposed 11kV Transmission Line.

The following Report describes the Route Survey of this 11 kV connection with the optimized routing as practically possible.

2. **Scope of Work**

i. Identification of optimum routes
ii. Selection of shortest and feasible route
iii. Conducting detailed survey for the selected route using total station and hand held GPS devices with positional accuracy
iv. Fix and finalize the angle points by using the survey data
v. Preparation of route alignment survey report in line with the requirement of the Owner and the project specification
vi. Tower spotting and Tower Types

3. **Reconnaissance Survey**

This is the initial phase of the route alignment survey.

For this Project, being a small route length, the site layout provided by RRVUNL/BHEL as base map is used. During the survey, all the crossings has been identified and used while planning the route.

4. Route Alignment Survey

The selected route has been demarcated on the Site plan with the details collected from survey with all the angle point coordinates.

a. Walk-over survey

- Walk-over survey was carried out with the hand-held GPS receivers.
- Data acquired from site layout provided by RRVUNL/BHEL has been used as a reference data.
- Tentative angle point coordinates extracted from reconnaissance survey have been used for GPS navigation.
- During this walk-over survey, location/position of all major crossings like those with pipe line / water body, railway, etc. have been recorded and stored in the GPS device.
- In addition to the above mentioned crossings, structures like building, pump house, fire water tanks, etc. have also been recorded.
- Existing features like road, cart track, canal, nallah, electrical tower/pole locations were also recorded.
- All topographical features along and across the route have been recorded.

b. Route Alignment Finalization

After completion of the walk-over survey, all the relevant data has been downloaded and plotted on the geo-referenced Topo sheets, to finalize the route alignment.

5. Selection of Route

Route selection is the combination of reading details from site layout and superimposing the survey data..

Route selection involves processing and analysis of the data collected through the survey. Selected route should be easily approachable from the point of view of ease of construction and maintenance. All the towers in the selected route should be approachable throughout the year.

Route has been finalized by keeping the following points in mind:

- The distance between the terminal points specified shall be kept shortest possible, consistent with the terrain that is encountered.
- The number of angle points shall be kept to a minimum.
- The route should have minimum number of crossings of Major Rivers/water, Railway lines, overhead power line and communication lines.
- Marshy and low lying areas, water bodies, river beds and earth slip zones shall be avoided to minimize risk to the foundations.
- It would be preferable to utilize levelled ground for the alignment.
- Crossing of power lines shall be minimal. Alignment will be kept at a safe distance from power lines to avoid induction problems on the lower voltage lines. The actual horizontal/vertical clearances as per the codal requirements have to be maintained based on the voltage levels of the crossing lines.
- Crossings with communication lines shall be minimized and it shall be preferably at right angle. Proximity and parallelism with telecom lines shall be eliminated to avoid danger of inducing power frequency high voltages on communication lines.
- Areas subjected to flooding such as canal, nallah shall be avoided.
- Restricted areas such as civil and military airfield shall be avoided. Care shall also be taken to avoid aircraft landing approaches.
- The alignment should be easily accessible both in dry and rainy seasons to enable maintenance throughout the year.

6. **Major Crossings**

For major crossing of route, refer tower schedule.

7. Alternate Route Coordinates

There is no alternate route envisaged as the route length of the proposed 11kV line is very short and there are existing ground features along the route.

8. Route Description

Route length of the selected Route has been measured as **5643 m.**

- Entire alignment passes though RRVUNL owned land only.
- For span details and tower coordinates refer tower schedule.

9. Comparative Statement

Sl. No.	Crossing Feature	Details
1	**Route Length (m)**	**5643**
2	**Power Line Crossings**	
	a. 11kV Crossing (required clearance: 2.44m)	**7**
	b. 33kV Crossing(required clearance: 2.44m)	**9**
	c. 66kV Crossing(required clearance: 2.44m)	**-**
	d. 110kV Crossing(required clearance: 2.44m)	**-**
	e. 132kV Crossing(required clearance: 3.05m)	**-**
	f. 220kV Crossing(required clearance: 4.58m)	**2**
	g. 400kV Crossing(required clearance: 5.49m)	**6**
3	**Railway Crossing**	**-**
4	**NH Crossing**	**-**
5	**SH Crossing**	**-**
6	**Water Body Crossing**	**-**
7	**Forest Crossing**	**-**
8	**Mango Plantation**	**-**
9	**Number of Angle Points**	**12**
10	**No. of Dead end towers**	**2**
11	**Total Towers**	**58**

10. Tower Types

Refer tower schedule.

11. **Conclusion**

- By keeping all technical specifications and scope of this project in mind, it is recommended to consider the indicated Route in the drawing as the final route.

Also the entire alignment passes through RRVUNL owned land only.

NAME OF PROJECT :- 11kV D/C TRANSISSION LINE AT SURATGARH

NAME OF CLIENT: RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED

NAME OF CONTRACTOR :- M/S BHARAT HEAVY ELECTRICALS LIMITED

NAME OF CONSULTANT :- M/S TATA CONSULTING ENGINEERS LIMITED

TOWER SCHEDULE (GANTRY - GANTRY)

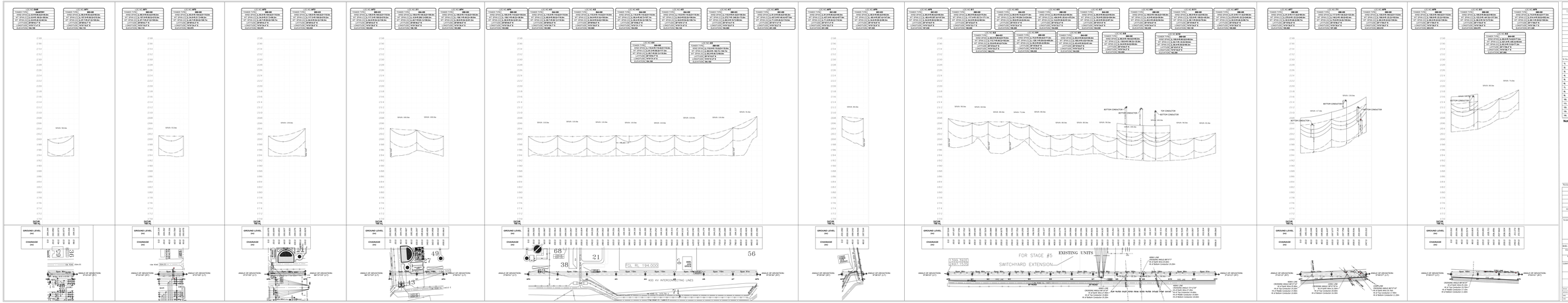
Sl. No	Loc No.	Tower Type	Deviation Angle (DMS)	Span (m)	Section Length (m)	Cum. Chainage (m)	Wind Span (m)	Adjacent Span (m)			Weight Span (Cold)			Weight Span (Hot)			Major Crossings / Remarks (With in ROW)	UTM Coordinates (Zone - 43)			Spherical Coordinates		Local Co-Ordinates	
								Left	Right	Total	Left	Right	Total	Left	Right	Total		Easting	Northing	Elevation	Longitude	Latitude	Southing	Easting
1	GAB	GANTRY				-	49.0	-	98.0	98.0	-	-59.0	-59.0	-	40.3	40.3		404840.19	3226346.91	194.19	74°01'17.4" E	29°09'43.7" N	3628.50	1049.00
				98.0																				
2	AP1	DD+00	0°10'18" (RT)		98.0	98.0	95.5	98.0	93.0	191.0	157.0	58.5	215.5	57.7	47.3	105.0		404937.81	3226339.07	194.11	74°01'18.0" E	29°09'43.7" N	3630.34	1146.73
				93.0													11kV Line							
3	AP2	DB+00	0°37'19" (LT)			191.0	116.0	93.0	139.0	232.0	34.5	21.7	56.2	45.7	55.0	100.7		405030.30	3226331.36	193.97	74°01'24.4" E	29°09'43.3" N	3632.05	1239.72
				139.0																				
4	AP3	DD+03	86°37'24" (LT)		232.0	330.0	119.5	139.0	100.0	239.0	117.3	100.9	218.2	84.0	54.3	138.3		405168.50	3226321.35	193.83	74°01'29.5" E	29°09'43.0" N	3633.10	1378.27
				100.0																				
5	3/1	DA+00				430.0	100.0	100.0	100.0	200.0	-0.9	206.1	205.2	45.7	63.1	108.8		405181.58	3226420.50	196.10	74°01'30.0" E	29°09'46.2" N		
				100.0													Compound Wall							
6	AP4	DB+00	3°50'51" (LT)			530.0	105.0	100.0	110.0	210.0	-106.1	49.2	-56.9	36.9	54.3	91.2		405194.71	3226519.97	193.86	74°01'30.4" E	29°09'49.5" N	3433.20	1391.59
				110.0													Compound Wall							
7	4/1	DA+00			310.0	640.0	110.0	110.0	110.0	220.0	60.8	56.0	116.7	55.7	55.1	110.8		405201.75	3226629.75	193.98	74°01'30.7" E	29°09'53.0" N		
				110.0													Compound Wall							
8	4/2	DA+00				750.0	110.0	110.0	110.0	220.0	54.0	51.6	105.7	54.9	54.6	109.5		405208.79	3226739.52	193.96	74°01'30.9" E	29°09'56.6" N		
				110.0																				
9	4/3	DA+00				860.0	110.0	110.0	110.0	220.0	58.4	48.7	107.1	55.4	54.3	109.7		405215.84	3226849.30	194.03	74°01'31.1" E	29°10'00.2" N		
				110.0																				
10	4/4	DA+00				970.0	110.0	110.0	110.0	220.0	61.3	56.0	117.2	55.7	55.1	110.8		405222.88	3226959.07	194.16	74°01'31.4" E	29°10'03.7" N		
				110.0																				
11	4/5	DA+00				1,080.0	110.0	110.0	110.0	220.0	54.0	52.0	106.0	54.9	54.8	109.7		405229.92	3227068.84	194.14	74°01'31.6" E	29°10'07.3" N		
				110.0																				
12	4/6	DB+00				1,190.0	110.0	110.0	110.0	220.0	58.0	-162.7	-104.7	55.2	40.7	95.9		405236.97	3227178.62	194.18	74°01'31.8" E	29°10'10.9" N		
				110.0																				
13	4/7	DB+03			660.0	1,300.0	100.5	110.0	91.0	201.0	272.7	-346.5	-73.8	69.3	19.7	89.0		405244.01	3227288.39	194.06	74°01'32.0" E	29°10'14.4" N		
				91.0																				
14	AP5	DC+00	9°39'36" (RT)			1,391.0	85.5	91.0	80.0	171.0	437.5	140.4	577.9	71.3	45.2	116.5		405249.81	3227378.88	201.35	74°01'32.2" E	29°10'17.4" N	2572.52	1391.02
				80.0													BT Road							
15	AP6	DC+03	9°38'33" (LT)		171.0	1,471.0	85.0	80.0	90.0	170.0	-60.4	207.4	147.0	34.8	55.5	90.4		405268.26	3227456.73	197.53	74°01'32.9" E	29°10'19.9" N	2493.65	1404.39
				90.0																				
16	6/1	DB+00				1,561.0	75.0	90.0	60.0	150.0	-117.4	-53.7	-171.0	34.5	26.4	60.8		405274.05	3227546.55	198.80	74°01'33.1" E	29°10'22.8" N		
				60.0																				
17	6/2	DA+03				1,621.0	70.0	60.0	80.0	140.0	113.7	49.3	163.0	33.6	40.4	74.1		405277.91	3227606.42	196.27	74°01'33.2" E	29°10'24.8" N		
				80.0																				
18	6/3	DA+03				1,701.0	77.5	80.0	75.0	155.0	30.7	204.1	234.8	39.6	44.8	84.4		405283.05	3227686.26	196.20	74°01'33.4" E	29°10'27.4" N		
				75.0																				
19	6/4	DB+00				1,776.0	77.5	75.0	80.0	155.0	-129.1	534.9	405.8	30.2	65.4	95.6		405287.88	3227761.10	198.03	74°01'33.5" E	29°10'29.8" N		
				80.0																				

Sl. No	Loc No.	Tower Type	Deviation Angle (DMS)	Span (m)	Section Length (m)	Cum. Chainage (m)	Wind Span (m)	Adjacent Span (m)			Weight Span (Cold)			Weight Span (Hot)			Major Crossings / Remarks (With in ROW)	UTM Coordinates (Zone - 43)			Spherical Coordinates		Local Co-Ordinates	
								Left	Right	Total	Left	Right	Total	Left	Right	Total		Easting	Northing	Elevation	Longitude	Latitude	Southing	Easting
20	6/5	DB+00				1,856.0	80.0	80.0	80.0	160.0	-454.9	-20.4	-475.4	14.6	36.6	51.3		405293.03	3227840.93	194.00	74°01'33.7" E	29°10'32.4" N		
				80.0																				
21	6/6	DA+00				1,936.0	80.0	80.0	80.0	160.0	100.4	4.0	104.4	43.4	38.0	81.4		405298.17	3227920.77	194.52	74°01'33.8" E	29°10'35.0" N		
				80.0																				
22	6/7	DA+00				2,016.0	85.0	80.0	90.0	170.0	76.0	228.9	304.9	42.0	55.2	97.2		405303.32	3228000.60	194.83	74°01'34.0" E	29°10'37.6" N		
				90.0																				
23	6/8	DB+00				2,106.0	95.0	90.0	100.0	190.0	-138.9	106.3	-32.6	34.8	54.8	89.6		405309.11	3228090.42	193.05	74°01'34.2" E	29°10'40.5" N		
				100.0													400kV Line 2nos							
24	6/9	DB+00				2,206.0	100.0	100.0	100.0	200.0	-6.3	45.9	39.6	45.2	49.6	94.8		405315.54	3228190.21	192.23	74°01'34.4" E	29°10'43.8" N		
				100.0													400kV Line							
25	6/10	DB+00				2,306.0	95.0	100.0	90.0	190.0	54.1	-33.5	20.6	50.4	39.9	90.2		405321.97	3228290.00	192.29	74°01'34.6" E	29°10'47.0" N		
				90.0																				
26	6/11	DB+00				2,396.0	85.5	90.0	81.0	171.0	123.5	-189.0	-65.4	50.1	28.5	78.6		405327.76	3228379.82	193.13	74°01'34.8" E	29°10'49.9" N		
				81.0																				
27	AP7	DB+00	3°10'13" (RT)		1,006.0	2,477.0	99.0	81.0	117.0	198.0	270.0	-23.2	246.8	52.5	46.2	98.7		405332.99	3228460.96	195.06	74°01'35.0" E	29°10'52.6" N	1487.33	1404.04
				117.0													400kV Line							
28	7/1	DB+00				2,594.0	123.5	117.0	130.0	247.0	140.2	-56.8	83.4	70.8	34.8	105.6		405346.92	3228576.77	197.28	74°01'35.4" E	29°10'56.3" N		
				130.0													33kV Line 2nos, 220kV Line							
29	AP8	DB+00	5°49'27" (LT)		247.0	2,724.0	115.0	130.0	100.0	230.0	186.8	-23.2	163.6	95.2	43.8	139.0		405362.50	3228706.27	203.01	74°01'36.0" E	29°11'00.5" N	1240.62	1417.61
				100.0													400kV Line							
30	8/1	DB+00				2,824.0	90.0	100.0	80.0	180.0	123.2	-441.0	-317.8	56.2	16.7	72.9		405364.31	3228806.26	204.07	74°01'36.0" E	29°11'03.8" N		
				80.0																				
31	8/2	DA+00				2,904.0	77.0	80.0	74.0	154.0	521.0	-440.4	80.5	63.3	13.9	77.2		405365.75	3228886.25	207.86	74°01'36.1" E	29°11'06.4" N		
				74.0													11kV Line							
32	AP9	DB+00	4°04'41" (RT)			2,978.0	77.0	74.0	80.0	154.0	514.4	38.0	552.4	60.1	39.9	99.9		405367.09	3228960.65	211.34	74°01'36.1" E	29°11'08.8" N	986.48	1405.75
				80.0													11kV Line							
33	9/1	DA+00			334.0	3,058.0	90.0	80.0	100.0	180.0	42.0	81.8	123.8	40.1	52.2	92.3		405374.22	3229040.33	211.36	74°01'36.3" E	29°11'11.4" N		
				100.0																				
34	9/2	DB+00				3,158.0	101.5	100.0	103.0	203.0	18.2	14.4	32.6	47.8	48.0	95.9		405383.13	3229139.93	210.97	74°01'36.6" E	29°11'14.6" N		
				103.0																				
35	AP10	DB+09	8°05'31" (LT)			3,261.0	89.5	103.0	76.0	179.0	88.6	-158.1	-69.4	55.0	28.8	83.8		405392.34	3229242.80	202.57	74°01'36.9" E	29°11'18.0" N	703.29	1412.69
				76.0													33kV Line, 11kV Line							
36	AP11	DB+09	6°44'12" (RT)		279.0	3,337.0	90.5	76.0	105.0	181.0	234.1	425.6	659.6	47.2	90.4	137.5		405388.39	3229318.54	204.01	74°01'36.8" E	29°11'20.4" N	627.96	1403.85
				105.0													11kV Line							
37	11/1	DB+09				3,442.0	107.5	105.0	110.0	215.0	-320.6	218.9	-101.7	14.6	74.5	89.2		405395.30	3229423.77	197.50	74°01'37.0" E	29°11'23.9" N		
				110.0																				
38	11/2	DB+09				3,552.0	110.0	110.0	110.0	220.0	-108.9	-98.8	-207.7	35.5	40.3	75.7		405402.54	3229534.01	194.05	74°01'37.2" E	29°11'27.4" N		
				110.0																				
39	11/3	DA+06				3,662.0	105.0	110.0	100.0	210.0	208.8	-30.5	178.3	69.7	42.3	112.0		405409.78	3229644.26	199.76	74°01'37.4" E	29°11'31.0" N		
				100.0																				
40	11/4	DA+09				3,762.0	100.0	100.0	100.0	200.0	130.5	54.4	184.9	57.7	50.4	108.1		405416.37	3229744.48	198.05	74°01'37.7" E	29°11'34.3" N		
				100.0													33kV Line							
41	11/5	DB+06				3,862.0	103.0	100.0	106.0	206.0	45.6	-360.5	-314.9	49.6	13.4	63.0		405422.95	3229844.70	200.98	74°01'37.9" E	29°11'37.5" N		

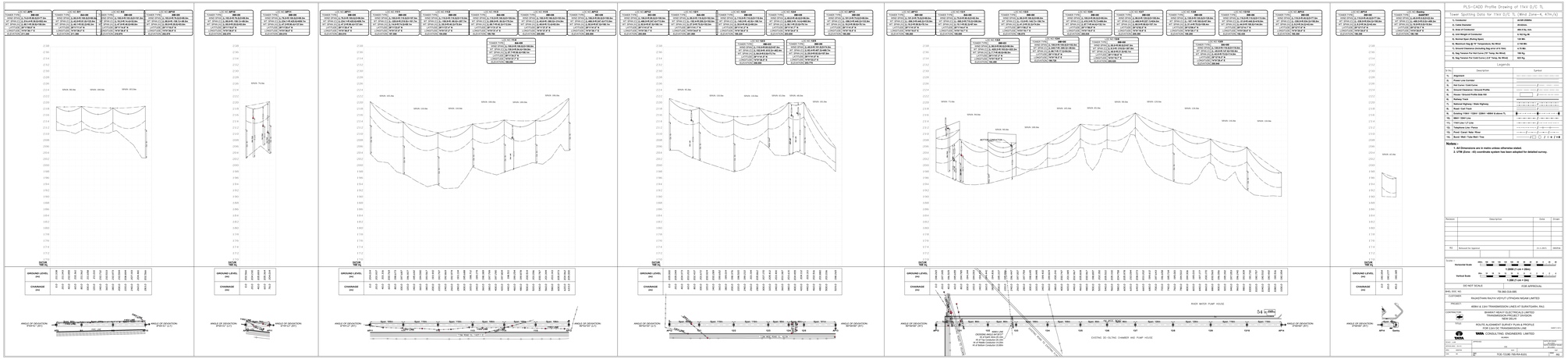
Sl. No	Loc No.	Tower Type	Deviation Angle (DMS)	Span (m)	Section Length (m)	Cum. Chainage (m)	Wind Span (m)	Adjacent Span (m)			Weight Span (Cold)			Weight Span (Hot)			Major Crossings / Remarks (With in ROW)	UTM Coordinates (Zone - 43)			Spherical Coordinates		Local Co-Ordinates	
								Left	Right	Total	Left	Right	Total	Left	Right	Total		Easting	Northing	Elevation	Longitude	Latitude	Southing	Easting
				106.0																				
42	AP12	DC+09	90°02'55" (LT)		631.0	3,968.0	100.5	106.0	95.0	201.0	466.5	247.4	713.9	92.6	67.5	160.1		405429.87	3229950.14	205.00	74°01'38.1" E	29°11'41.0" N	-5.00	1404.39
				95.0													33kV Line							
43	12/1	DA+09			95.0	4,063.0	102.5	95.0	110.0	205.0	-152.4	255.2	102.7	27.5	75.0	102.5		405335.07	3229956.29	201.86	74°01'34.6" E	29°11'41.1" N		
				110.0																				
44	12/2	DB+09				4,173.0	110.0	110.0	110.0	220.0	-145.2	-42.9	-188.0	35.0	45.2	80.2		405225.30	3229963.40	198.22	74°01'30.5" E	29°11'41.3" N		
				110.0																				
45	12/3	DB+03				4,283.0	87.5	110.0	65.0	175.0	152.9	-615.3	-462.5	64.8	8.9	73.7		405115.53	3229970.52	206.00	74°01'26.5" E	29°11'41.5" N		
				65.0																				
46	12/4	DB+09				4,348.0	56.5	65.0	48.0	113.0	680.3	-14.4	665.9	56.1	23.0	79.1		405050.57	3229974.73	203.63	74°01'24.0" E	29°11'41.7" N		
				48.0													33kV Line 2nos							
47	12/5	DB+09				4,396.0	74.5	48.0	101.0	149.0	62.4	407.3	469.7	25.0	82.8	107.7		405002.23	3229977.86	203.77	74°01'22.3" E	29°11'41.8" N		
				101.0																				
48	AP13	DD+00	90°00'00" (RT)		434.0	4,497.0	88.0	101.0	75.0	176.0	-306.3	440.2	134.0	18.2	59.9	78.2		404901.59	3229984.38	198.26	74°01'18.5" E	29°11'41.9" N	-5.00	875.00
				75.0													33kV Line, 11kV Line 2nos							
49	13/1	DA+06				4,572.0	82.5	75.0	90.0	165.0	-365.2	715.2	350.0	15.1	82.3	97.4		404906.44	3230059.19	195.00	74°01'18.7" E	29°11'44.4" N		
				90.0													33kV Line							
50	13/2	DB+03				4,662.0	90.0	90.0	90.0	180.0	-625.2	103.0	-522.2	7.7	48.8	56.4		404912.26	3230149.00	194.49	74°01'18.9" E	29°11'47.3" N		
				90.0													400kV Line							
51	13/3	DB+00				4,752.0	95.0	90.0	100.0	190.0	-13.0	-145.7	-158.7	41.2	33.3	74.5		404918.08	3230238.81	196.87	74°01'19.1" E	29°11'50.2" N		
				100.0																				
52	13/4	DB+00				4,852.0	102.5	100.0	105.0	205.0	245.7	-305.3	-59.6	66.7	17.3	84.0		404924.55	3230338.60	199.72	74°01'19.3" E	29°11'53.5" N		
				105.0																				
53	13/5	DB+00				4,957.0	95.0	105.0	85.0	190.0	410.3	75.7	486.0	87.7	44.4	132.1		404931.32	3230443.17	205.83	74°01'19.5" E	29°11'56.9" N		
				85.0																				
54	13/6	DB+00				5,042.0	87.5	85.0	90.0	175.0	9.3	-316.9	-307.6	40.6	21.5	62.0		404936.82	3230527.94	205.52	74°01'19.7" E	29°11'59.6" N		
				90.0																				
55	13/7	DB+00				5,132.0	105.0	90.0	120.0	210.0	406.9	227.1	634.0	68.5	88.6	157.1		404942.64	3230617.71	209.39	74°01'19.9" E	29°12'02.5" N		
				120.0																				
56	13/8	DB+09				5,252.0	120.0	120.0	120.0	240.0	-107.1	165.0	57.8	31.4	78.0	109.4		404950.39	3230737.39	195.20	74°01'20.1" E	29°12'06.4" N		
				120.0																				
57	13/9	DA+00				5,372.0	118.0	120.0	116.0	236.0	-45.0	147.6	102.6	42.0	72.0	114.1		404958.15	3230857.07	200.94	74°01'20.4" E	29°12'10.3" N		
				116.0																				
58	13/10	DB+06				5,488.0	113.0	116.0	110.0	226.0	-31.6	448.5	416.8	44.0	100.8	144.7		404965.62	3230972.37	192.43	74°01'20.6" E	29°12'14.1" N		
				110.0																				
59	AP14	DD+00	0°00'00" (RT)			5,598.0	77.5	110.0	45.0	155.0	-338.5	534.3	195.9	9.2	34.2	43.4		404972.73	3231082.08	190.35	74°01'20.8" E	29°12'17.6" N	-1105.00	875.00
				45.0																				
60	Gantry	GANTRY				5,643.0	22.5	45.0	0.0	45.0	-489.3	0.0	-489.3	10.8	0.0	10.8		404975.65	3231126.98	190.19	74°01'20.9" E	29°12'19.1" N	-1150.00	875.00

Abstract of Towers for 11 kV D/C							
Tower Type \ Extn	**+0**	**+3**	**+6**	**+9**	**+18**	**+25**	**Total**
DA	11	2	2	2	0	0	17
DB	21	3	2	8	0	0	34
DC	1	1	0	1	0	0	3
DD	3	1	0	0	0	0	4
Gantry	2	0	0	0	0	0	2
Total	38	7	4	11	0	0	**60**
Net Total (Excluding Gantry)							**58**

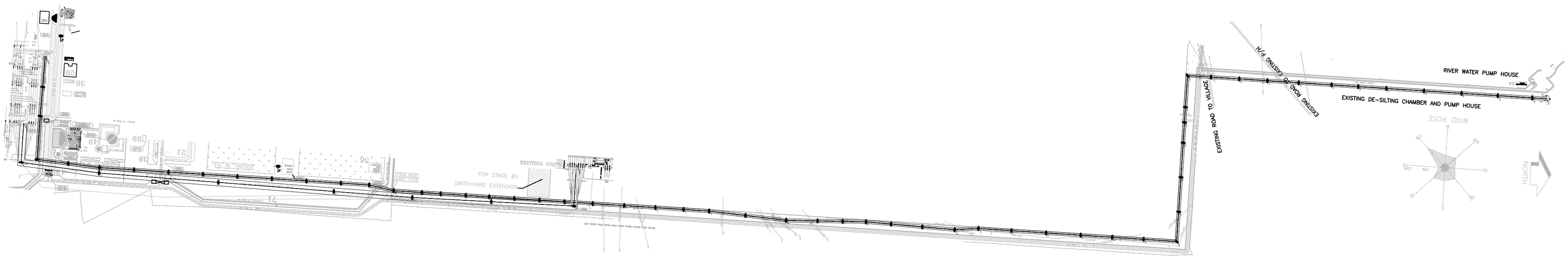
Note :
1. DD type tower to be used in place of DC
2. For some locations as weight spans are exceeding the required criteria, it is proposed that normal span may be increased
3.For existing line crossings between 7/0-8/0 (length 247m), 8/0-8/1 (length 100m), 13/0 to 13/1 (length 75m) & 13/2 to 13/3 (length 90m), required vertical clearance is not met so it is proposed to go for underground cabling of 3 C X 240 sq mm AL/XLPE, for a total of 512 m underground. 11kV cables shall be buried.
4.The above observations are concluded after several number of iterations in profiles.
5.Considering very small route length, type testing will not be conducted and additional design margin of 10 % in tower design will be considered .


PLS-CADD Profile Drawing of 1kV D/C TL
Tower Spotting Data for 1kV D/C TL (Wind Zone-4, 47m/s)
Legends
Notes :-
1. All Dimensions are in metre unless otherwise stated.
2. UTM (Zone -43) coordinate system has been adopted for detailed survey.
Revision
Description
Date
Sign
Horizontal Scale
1:2000 (1 cm = 20m)
Vertical Scale
1:200 (1 cm = 2m)
DO NOT SCALE
FOR APPROVAL
NHPC
TEC
CONSULTING ENGINEERS LIMITED
ROUTE ALIGNMENT SURVEY PLAN & PROFILE
FOR 1kV DC TRANSMISSION LINE
FOR STAGE #5
EXISTING UNITS
SWITCHYARD EXTENSION
400 KV INTERCONNECTING LINES
GROUND LEVEL
CHAINAGE

Page 17 of 20


PLS-CADD Profile Drawing of 11kV D/C TL
Tower Spotting Data for 11kV D/C TL (Wind Zone-4, 47m/s)
1. Conductor 42/66 KV(Rabbit)
2. Cable Diameter 28.62mm
3. Conductor Material Al-St-1 No.
4. Weight of Conductor 1.0 Kg/m
5. Normal Span (Rolling Span) 120 Mtr.
6. Maximum Sag at 75° Temperature, No Wind 2.10 Mtr.
7. Ground Clearance (including Sag and of 0 Tide) 6.70 Mtr.
8. Sag Tension For Ant Cross (75° Temp, No Wind) 100 Kg.
9. Sag Tension For Cold Cross (-5.0° Temp, No Wind) 600 Kg.
LEGEND (S):
Sr.No. Description Symbol
1. Alignment
2. Power Line Corridor
3. Ant Cross / Cold Cross
4. Ground Clearance / Ground Profile
5. Conductor / Ground Profile Side Hill
6. Railway Track
7. National Highway / State Highway
8. Road / Cart Track
9. Existing 11kV / 132kV / 220kV / 400kV & above TL
10. MMU / DMU Line
11. 11kV Line / LT Line
12. Canal / Nala / River
13. Pond / Canal / Nala / River
14. Bund / Wall / Tube Well / Tree
Notes:
1. All Dimensions are in metre unless otherwise stated.
2. UTM (Zone - 43) coordinate system has been adopted for detailed survey.
Revision Description Date Drawn
RD Relaxed for legend 01.01.0001 SWPN
Scale :-
Horizontal Scale 1:2000 (1 cm = 20m)
Vertical Scale 1:200 (1 cm = 2m)
DO NOT SCALE
FOR APPROVAL
WBG SYC NO. TB-380-224-000
CUSTOMER RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED
PROJECT 400kV & 220/ 11kV TRANSMISSION LINES AT SUKATGARH, RAJ.
CONSULTANT BHARAT HEAVY ELECTRICALS LIMITED TRANSMISSION PROJECT DIVISION
TITLE ROUTE ALIGNMENT SURVEY PLAN & PROFILE FOR 11kV DC TRANSMISSION LINE
SHEET 1 of 1
WAPCOS CONSULTING ENGINEERS LIMITED
DRAWN SWPN
DATE 01.01.0001
DESIGN SWPN
DATE 01.01.0001
APPROVED
DATE
DATE 01.01.0001
REVISION
SCALE 1:2000 1:200
SIZE A1
DWG NO. TCE-TCDE-TB-RA-6203
REV. RD

Annexure
(Key Plan)


RIVER WATER PUMP HOUSE
EXISTING DE-SILTING CHAMBER AND PUMP HOUSE
EXISTING ROAD TO VILLAGE
EXISTING ROAD TO EXISTING P/H
EXISTING UNIT
FOR STAGE #5
SWITCHYARD EXTENSION
WIND ROSE
NORTH