HEGGANUR

431607
FTS-404996

KARNATAKA POWER TRANSMISSION CORPORATION LTD

No: CEE (P&C)/SE (P)/EE(P)/KCO-88/33848/15-16
Encl: DPR copy 201-209

O/o the Chief Engineer Electy
Planning and Co-ordination
Kaveri Bhavan, Bangalore-09
Dt. 02-04-2016
2 APR 2016

To

The Chief Engineer Electy

Transmission Zone, KPTCL

Bengaluru

Sir,

Sub: **Establishing 1x8 MVA 66/11kV sub-station at Hegganur in Kanakapura taluk, Ramanagara district.**

Ref: 1)C.O.O.M.No:B19/20560/15-16 dtd. 21.3.2016.

* * * * *

Please find herein enclosed the approved copy of DPR costing **Rs. 991.51 Lakhs** comprising the following:

1. ***Construction of 66kV SC line for a distance of 12.238 kms from existing 66/11kV Doddalahalli substation to proposed 66/11kV Hegganur substation, Kanakapura Taluk, Ramanagara District at a cost of Rs. 578.46 Lakhs.***
2. ***Establishing 1x8 MVA 66/11kV sub-station at Hegganur, Kanakapura taluk, Ramanagara district at a cost of Rs. 366.03 Lakhs.***
3. ***Construction of 66kV Terminal Bay at 66/11kV Doddalahalli sub-station in Kanakapura Taluk, Ramanagara District at a cost of Rs.47.02 Lakhs.***
4. ***Total cost is Rs. 991.51 Lakhs.***

40
05/04/2016

Yours faithfully

Chief Engineer, Electy
Planning and co-ordination

Copy for information to:

1) The Director (Finance) KPTCL, Kaveri Bhavan, Bengaluru.
2) The Director (Technical), BESCOM, K.R.Circle, Bengaluru.
3) The Chief Engineer, Electy, T&P, KPTCL, Kaveri Bhavan, Bengaluru -09.
4) The Chief Engineer Electy, BRAZ, BESCOM, Bengaluru.
5) The Financial Advisor (A&R), KPTCL, Kaveri Bhavan, Bengaluru -09.
6) The Superintending Engineer (El), TR (Works) circle, Ramanagara, KPTCL.
7) The Superintending Engineer (El), P&M, KPTCL, Bengaluru -09.
8) The Executive Engineer (El) Major Works Division, Ramanagara, KPTCL.
9) MF/OC.

AEE 3
5/4/16

DPR file

See (PM)

CE (P&C)

KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

Corporate Office,
Kaveri Bhavan,
Bengaluru - 560 009.

No: B19/20560/15-16

Dated: 21 MAR 2016

CORRIGENDUM

Sub:- DPR for the work of establishing 1x8MVA,66/11kV sub-station at **Hegganur,** Kanakapura Taluk, Ramanagara District.

Read:- This office OM No: B19/20560/15-16 Dt: 21.03.2016

EE P&C(S)

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DPR for establishing 1x8MVA, 66/11kV sub-station at Hegganur, Kanakapura Taluk, Ramanagara District by construction of 66kV SC line on DC towers from 66/11kV Doddalahalli Sub-station to the proposed 66/11kV Hegganur Sub-station for a distance of 12.238kms was approved vide this office OM dated 21.3.2016 under reference. The particulars at item no 3 of the subject DPR shall be read as follows.

Sl No	Existing	Amended
3	Construction of 1 no. of 66kV terminal bay at 66/11kV Hegganur for the work of construction of 66kV SC line on DC towers from 66kV Doddalahalli Sub-station to the proposed 66/11kV Hegganur Sub-staiton.	Construction of 1 no. of 66kV terminal bay at **66/11kV Doddalahalli Sub-station** in Kanakapura Taluk, Ramanagara District.

All other contents of the OM cited under reference shall remain unaltered.

KCO-88

Deputy General Manager (Tech)
KPTCL

Copy to:-

The Principal Accountant General Audit-I, (Karnataka) Bengaluru.
The Chief Engineer Electricity (P&C) Bengaluru with a request to include the subject proposal in APW for the year 2016-17.
The Chief Engineer Electricity (T&P) / (APR&RT) Kaveri Bhavan, KPTCL Bengaluru.
The Chief Engineer (Electricity) Transmission Zone, KPTCL, Bengaluru.
The Financial Adviser (A&R) / (I/A) KPTCL, Kaveri Bhavan, KPTCL, Bengaluru.
The Superintending Engineer Electricity P&M, KPTCL, Bengaluru.
The Superintending Engineer Electricity Works Circle, KPTCL, Bengaluru.
The Superintending Engineer Electricity Ramanagara Maintenance Circle, KPTCL, Bengaluru.
EA to Director(Transmission), KPTCL, Kaveri Bhavan, Bengaluru.
PS to Director(Finance), KPTCL. Bengaluru to place it before the Director(Finance), KPTCL.
PS to Managing Director, BESCOM, Bengaluru to place it before the Managing Director, BESCOM.

31/3/16

FTS: 404496

KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

Corporate Office,
Kaveri Bhavan,
Bengaluru - 560 009.

No: B19/20560/15-16

Dated: 21 MAR 2016

OFFICIAL MEMORANDUM

Sub:- DPR for the work of establishing 1x8MVA,66/11kV sub-station at **Hegganur,** Kanakapura Taluk, Ramanagara District.

Read:- U.O Note No. CEE (P&C)/SEE (P)/EE (P-S)/ KCO-88/33848/2015-16/12833 Dt.01.03.2016 of the Chief Engineer Electy (P&C), KPTCL.

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Administrative approval is hereby accorded to the DPR having an estimated cost of Rs 991.51 Lakhs for the work establishing 1x8MVA, 66/11kV sub-station at Hegganur, Kanakapura Taluk, Ramanagara District by construction of 66kV SC line on DC towers from 66/11kV Doddalahalli Sub-station to the proposed 66/11kV Hegganur Sub-station for a distance of 12.238kms with 1 no. of 66kV terminal bay at 66/11kV Hegganur Sub-station with the following provisions:-

Sl No	Particulars	Amount in Rs Lakhs
1	Establishing 1x8MVA, 66/11kV sub-station at **Hegganur,** Kanakapura Taluk, Ramanagara District.	366.03
2	Construction of 66kV SC line on DC towers from 66kV Doddalahalli sub-station to the proposed 66/11kV Hegganur Sub-station for a distance of 12.238kms	578.46
3	Construction of 1 no. of 66kV terminal bay at 66/11kV Hegganur Sub-station for the work of construction of 66kV SC line on DC towers from 66kV Doddalahalli Sub-station to the proposed 66/11kV Hegganur Sub-staiton.	47.02
	Total DPR cost	**991.51**

(Rs Nine crores ninety-one lakhs and fifty-one thousand only)

The currency of the project report is fixed as **two** years.

21/3

Deputy General Manager (Tech)
KPTCL

KCO-88
25/3

Copy to:-

The Principal Accountant General Audit-I, (Karnataka) Bengaluru.
The Chief Engineer Electricity (P&C) Bengaluru with a request to include the subject proposal in APW for the year 2016-17.
The Chief Engineer Electricity (T&P) / (APR&RT) Kaveri Bhavan, KPTCL Bengaluru.
The Chief Engineer (Electricity) Transmission Zone, KPTCL, Bengaluru.
The Financial Adviser (A&R) / (I/A) KPTCL, Kaveri Bhavan, KPTCL, Bengaluru.
The Superintending Engineer Electricity P&M, KPTCL, Bengaluru.
The Superintending Engineer Electricity Works Circle, KPTCL, Bengaluru.
The Superintending Engineer Electricity Ramanagara Maintenance Circle, KPTCL, Bengaluru.
EA to Director(Transmission), KPTCL, Kaveri Bhavan, Bengaluru.
PS to Director(Finance), KPTCL. Bengaluru to place it before the Director(Finance), KPTCL.
PS to Managing Director, BESCOM, Bengaluru to place it before the Managing Director, BESCOM

KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

DETAILED PROJECT REPORT FOR

Establishing 1x8 MVA 66/11 kV Substation at Hegganur, Kanakapura Taluk, Ramanagara District

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CHIEF ENGINEER ELECTRICITY (P&C)

PLANNING SECTION

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KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

PROJECT AT A GLANCE

1	Project Name	Establishing 1x8 MVA 66/11 kV Substation at Hegganur, Kanakapura Taluk, Ramanagara District		
2	Location	Place	:	Hegganur
		Taluk	:	Kanakapura
		District	:	Ramanagara
3	Sub station details :	Capacity	:	1x8 MVA, 66/11 kV
4	Line details	Voltage and type	:	66kV Radial line from 66/11kV Doddalahalli substation
5	Estimated cost	a) Actual cost	:	991.51 Rs Lakhs
6	Net Energy savings		:	1.82 MU
7	Energy available for sale in 30 years		:	90.90 MU
8	B C ratio		:	1.011
9	MVA added		:	8 MVA, 66/11 kV
10	Line added		:	12.238 kms 66kV line
11	TCCM Approval		:	65th Dt:28-02-2015
12	Budget Provision		:	On approval of DPR will be included in APW for 2015-16

KARNATAKA POWER TRANSMISSION CORPORATION LTD

DETAILED PROJECT REPORT

1.0 SCOPE OF THE PROJECT:

This Project report costing **₹.991.51 Lakhs** envisages for **establishing 1x8 MVA 66/11kV sub-station at Hegganur in Kanakapura taluk, Ramanagara district.**

2.0 INTRODUCTION:

2.1 Hegganur is a village in Kanakapura Taluk, Ramanagara district.

2.2 It consists of domestic, commercial, industrial and IP consumers.

2.3 Kanakapura is a taluk headquarters and consists of educational institutions, hospitals, courts and commercial complexes.

2.4 As it is close to Bangalore a number of resorts, farm houses, horticultural farms are being developed.

3.0 OBJECTIVES:

3.1 To improve the reliability of Power Supply to the surrounding area.

3.2 To meet the future load growth.

3.3 To reduce the loads 66/11 kV Harobele substation.

3.4 To improve the voltage profile in the proposed sub-station area.

3.5 There will be reduction in the length of 11 kV feeders feeding that area which improves the tail end voltage thereby reducing interruptions.

4.0 EXISTING POWER SUPPLY ARRANGEMENTS :

4.1 The areas in and around **Hegganur** village are fed from two numbers of 11 kV feeders from 66/11 kV Harobele Sub-station.

4.2 The lengths of the above 11kV feeders are 28 kms and 50.92 kms.

4.3 The voltage regulation of the 11kV feeders are 26.99% and 22.30%.

4.4 The connected load is 9430 kVA.

4.5 66/11kV substation at Harobele is fed from 66 kV Kanakapura-T.K. Halli line-1with coyote conductor having recorded peak of 212 Amps.

4.6 2x12.5MVA 66/11kV Harobele substation has recorded station peak load of 9.5 MWs.

5.0 PROBLEMS:-

5.1 As per KERC the loadings on the power transformers shall be within 70%.

5.2 The voltage regulation of the 11kV feeders is very high.

6.0 PROPOSALS:

6.1 Construction of 66kV SC line for a distance of 12.238 kms from existing 66/11kV Doddalahalli substation to proposed 66/11kV Hegganur substation, Kanakapura Taluk, Ramanagara District at a cost of ₹. 578.46 Lakhs.

6.2 Establishing 1x8 MVA 66/11kV sub-station at Hegganur, Kanakapura taluk, Ramanagara district at a cost of ₹. 366.03 Lakhs.

6.3 Construction of 66kV Terminal Bay at 66/11kV Doddalahalli sub-station in Kanakapura Taluk, Ramanagara District at a cost of ₹.47.02 Lakhs.

6.4 Total cost is ₹. 991.51 Lakhs.

7.0 BENEFITS:-

7.1 Improves the reliability of Power Supply to the surrounding area.

7.2 Provides capacity to meet the future load growth.

7.3 Reduces the loading factor of the existing Harobele sub station.

7.4 Improves the voltage profile in the proposed sub-station area.

8.0 APPROVALS:-

1) Subject work is approved in 65th TCCM held on 28-02-2015.
2) CGM, BESCOM vide letter Dt: 15-07-2015 has requested to take up the subject work in 2015-16.

9.0 BUDGET PROVISION:-

Consequent to approval of DPR, budget will be provided in the APW for 2015-16.

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KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

Establishing 1x8 MVA 66/11 kV Substation at Hegganur, Kanakapura Taluk, Ramanagara District

GENERAL ABSTRACT

Rs in Lakhs

1	Construction of 66kV SC line on DC towers for a distance of 12.238 kms from existing 66/11kV Doddalahalli substation to proposed 66/11kV Hegganur substation, Kanakapura Taluk, Ramanagara District.	578.46
2	Establishing 1x8 MVA 66/11 kV Substation at Hegganur, Kanakapura Taluk, Ramanagara District	366.03
3	Construction of 66kV Terminal Bay at 66/11kV Doddalahalli sub-station in Kanakapura Taluk, Ramanagara District.	47.02
4	Total	991.51

Certificate :- Certified that the project estimate has been prepared by my Gazetted Assistant based on the Major works estimate sent by CEE, BTZ using Major works current S R for most economical way of execution of work

Executive Engineer Elecl.,
Planning

KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

Construction of 66kV SC line on DC towers for a distance of 12.238 kms from existing 66/11kV Doddalahalli substation to proposed 66/11kV Hegganur substation, Kanakapura Taluk, Ramanagara District.

Abstract - 1

		Rs in Lakhs
1	Material cost	236.00
2	Spares @ 3 % on Material cost (3% of item no 1)	7.08
3	Transportation and Insurance charges at @ 4% on above (4% of item no 1 and 2)	9.72
4	Erection/Labour Charges	13.00
5	Civil Engineering charges.	120.00
6	Service Tax @ 14.5 % on 40% of Civil Engineering Cost (14.5 % on 40% of item no 5)	6.96
7	Work contrct cost @ 14.5 % on 70% of Civil Engineering Cost (14.5 % on70% of item no 5)	12.18
8	Testing & Comissioning Charges	NA
9	Total Works Cost (sum of item nos. 1 to 8)	404.94
10	Establishment charges at 5 % on works cost (5% of item no 9)	20.25
11	Performance Guarantee and loss of interest on margin money for Bank Guarantee @ 0.1% on works cost (0.1% of item no 9)	0.40
12	Contingencies at 2 % on (works cost + Establishment charges.) (2 % of item nos 9 and 10)	8.50
13	Interest during Construction (4% on item nos. 9,10,11 and 12	17.36
14	Total estimated cost for comparision purpose (sum of item nos. 9 to 13)	451.46
15	Statutory charges like PTCC, Electrical Inspectorate charges,Payment towards civic bodies, National Highway etc.,	2.00
16	Compensation cost for crop/Tree cutting forest clearance etc.,	125.00
17	Total cost of the project (sum of item nos 14 to 16)	578.46

KARNATAKA POWER TRANSMISSION CORPORATION LTD

Construction of 66kV SC line on DC towers for a distance of 12.238 kms from existing 66/11kV Doddalahalli substation to proposed 66/11kV Hegganur substation, Kanakapura Taluk, Ramanagara District.

Sl. No.	Description	Unit	Quantity	Material Cost		Labour Cost	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
1	2	3	4	5	6	7	8
B1	**Survey**						
1	Check survey using ther own equipment for 66 kV Plain terrain	Km	12.238			2137.00	26152.61
B2	**Tower 66 kV Narrow based**						
I	**Tower type 66 kV DC-A**						
1	66 kV A-Normal (02.003MT per tower)	No/MT	3/6.009				
2	66 kV A - 3 Mtrs Extension (02.336MT per tower)	No/MT	23/53.728				
3	66 kV A - 6 Mtrs Extension (02.652 MT per tower)	No/MT	3/7.956				
II	**Tower type 66 kV DC-C**						
1	66 kV C - Normal (03.128MT per tower)	No/MT	6/18.768				
2	66 kV C - 3 Mtrs Extension (03.691MT per tower)	No/MT	5/18.455				
3	66 kV C - 6 Mtrs Extension (04.26 MT per tower)	No/MT	3/12.78				

III	**Tower type 66 kV DC-D**						
1	66 kV D - Normal (03.981MT per tower)	No/MT	8/31.848				
2	66 kV D - 3 Mtrs Extension (04.762MT per tower)	No/MT	2/9.524				
3	66 kV D - 6 Mtrs Extension (05.472MT per tower)	No/MT	1/5.472				
B3	**Tower 66 kV Narrow based (HSR Design)**						
1	66 kV D - 3 Mtrs Extension (8.761MT per tower)	No/MT	7/61.327				
2	66 kV D - 6 Mtrs Extension (9.974MT per tower)	No/MT	2/19.948				
	Sub Total : MS portion	No/MT	63/245.815	68000.00	16715420.00	2060.16	506418.23
B3	**Stub setting templates**						
1	Setting of stub templates and aligning dismantling and transportation of templates from one location to another location for 66 kV	Loc	63			373.00	23499.00
B4	**Supply of Galvanised Bolts & Nuts**	MT	13.37	92000.00	1230159.60	2060.16	27547.02

B5	**Tower accessories :**						
1	Supplying and fixing GI angle 450 x 450 mm 1Mtr length with cleats, bolts nuts as per specification and fixing above 0.5 mts length each at inner and outer surface of tower to facilitate running of barbed wire AC device	Set	63			1772.00	111636.00
2	Supplying and fixing Barbed wire	Rmtr	2584			32.76	84651.32
3	Number Plates	No	63	116.00	7308.00	33.93	2137.59
4	Danger Boards	No	63	129.00	8127.00	33.93	2137.59
5	Circuit plate	No	63	116.00	7308.00	33.93	2137.59
6	Phase plate (Set of 3 No.)	Set	63	153.00	9639.00	103.00	6489.00
7	Earth bond 300 mm long	No	29	277.00	8033.00		
8	Earth bond 450 mm long	No	34	318.00	10812.00		
9	Grounding of tower with GI Pipe including the cost of GI pipe	Set	63	2246.00	141498.00	621.27	39140.01
B6	**Conductor & Earth wire :**						
1	Coyote Plain Terrian	Km	37.26	95000.00	3540147.45	5844.00	217774.97
2	Ground wire Plain Terrian	Km	12.42	46000.00	571392.22	2922.00	36295.83
3	Single Tension string of 5 units each along with hard ware for Coyote ACSR and arcing horn	Stack	204	2839.00	579156.00		

4	Double Tension string of 5 units each along with hard ware for Coyote ACSR and arcing horn	Stack	6	6358.00	38148.00			
5	Single Suspension string of 4 units each.along with hard ware for Coyote ACSR and arcing horn	Stack	93	2598.00	241614.00			
6	Double Suspension string of 4 units each along with hard ware for Coyote ACSR and arcing horn	Stack	6	5129.00	30774.00			
B7	**Accessories for Conductor :**							
1	M S C Joints suitable for Coyote ACSR	No.	19	316.00	5887.82			
2	Pre formed armour rods suitable for Coyote ACSR	No.	93	551.00	51243.00			
3	Repair sleeves suitable for Coyote ACSR	No.	19	153.00	2850.75			
4	P G Clamps suitable for COYOTE ACSR	No.	210	274.00	57540.00			
5	Vibration dampers for Coyote	No.	378	434.00	164052.00			
B8	**Hardware for Earthwire :**							
1	M S C Joints suitable for Ground conductor	No.	10	233.00	2330.00			
2	Repair sleeves suitable for Ground conductor	No.	10	157.00	1570.00			

3	P G Clamps suitable for GROUND ACSR	No.	68	205.00	13940.00		
4	Single Tension clamps (bolted type) suitable for Ground conductor	No.	68	628.00	42704.00		
5	Single Suspension clamps (bolted type) suitable for Ground conductor	No.	29	662.00	19198.00		
6	Tack welding of Bolts and Nuts (No of tower x 250)	No.	15750			9.00	141750.00
B9	**Clearing of Bushes**						
1	Clearing for bushes tree branches etc., upto 3 Mtr. width for detailed survey 66 kV Plain terrain	KM	12.238			637.00	7795.61
B10	**Miscellaneous and other unforeseen materials.**	**L/S**			**99148.16**		**64437.65**
	TOTAL				**23600000.00**		**1300000.00**
	Civil portion						
C1	**Excavation for foundation.(only labour) :**						
1	Normal soil	CMT	150			275.01	41251.50
2	Partially Submerged	CMT	150			412.52	61877.25
3	Dry fissured/Ordinary rock	CMT	2018			1283.90	2591516.38
4	Hard Rock with blasting /Hard laterite	CMT	362			740.06	267892.51

C2	**Foundation Concreting :**						
1	Concreting and curing M20	CMT	802			7143.05	5730511.86
2	Concreting and curing 1:3:6	CMT	55			6546.94	359950.62
C3	**Steel reinforcement (including material and labour)**	MT	35.8			73230.94	2621194.58
C4	**Back filling**						
1	Back filling and levelling with available soil	CMT	150			135.96	20394.00
2	Back filling and levelling with borrowed soil for hard rock and WBC (with 2 km lead)	CMT	1637.45			169.95	278284.03
C5	**Miscellaneous and rounding off**						**27127.27**
C6	**Total**						**12000000.00**

KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

Establishing 1x8 MVA 66/11 kV Substation at Hegganur, Kanakapura Taluk, Ramanagara District

Abstract - 2

Rs in Lakhs

1	Material cost	177.00
2	Spares @ 3 % on Material cost (3% of item no 1)	5.31
3	Transportation and Insurance charges at @ 1.5% on above (1.5% of item no 1 and 2)	2.73
4	Erection/Labour Charges	4.00
5	Civil Engineering charges.	119.00
6	Service Tax @ 14.5 % on 40% of Civil Engineering Cost (14.5 % on 40% of item no 5)	6.90
7	Work contract Tax @ 14.5 % on 70% of Civil Engineering Cost (14.5 % on70% of item no 5)	12.08
8	Testing & Comissioning Charges	2.00
9	Total Works Cost (sum of item nos. 1 to 8)	329.03
10	Establishment charges at 5 % on works cost (5% of item no 9)	16.45
11	Performance Guarantee and loss of interest on margin money for Bank Guarantee @ 0.1% on works cost (0.1% of item no 9)	0.33
12	Contingencies at 1.5 % on (works cost + Establishment charges.) (1.5 % of item nos 9 and 10)	5.18
13	Interest during Construction (4% on item nos. 9,10,11 and 12	14.04
14	Total estimated cost for comparision purpose (sum of item nos. 9 to 13)	365.03
15	Statutory charges like PTCC, Electrical Inspectorate charges,Payment towards civic bodies etc.,	1.00
16	Compensation cost for crop/Tree cutting forest clearance etc.,	NA
17	Total cost of the project (sum of item nos 14 to 16)	366.03

KARNATAKA POWER TRANSMISSION CORPORATION LTD

Establishing 1x8 MVA 66/11 kV Substation at Hegganur, Kanakapura Taluk, Ramanagara District

PART - A : Supply of materials,Erection and Commissioning

Sl No.	Name of the Equipment/Materials	Unit	Quantity	Supply of Material		Erection charges		Testing and Commissioning charges	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
1	2	3	4	5	6	7	8	9	10
A1	**Power Transformer**								
1	**POWER TRANSFORMER :** Power Transformer 8 MVA, 66/11 kV Delta / Star, Dynll, 3 Ph, 50 Hz, Core type winding with OLTC, RTCC panel, etc., complete filled with Transil oil with 10% spare oil. (28 MT)	No.	1	7,331,000.00	7,331,000.00	68,936.00	68,936.00	32,875.00	32,875.00
	Note:-The Terminal connectors shall be suitable for Drake ACSR on the 110kV side and Copper Flat on the LV side.								
A2	**Circuit Breaker:**								
	CIRCUIT BREAKER : SF-6 circuit breakers with semi pneumatic / pneumatic operated / Spring type operating mechanism, including mounting structure with rigid, bi-metallic terminal connector suitable for Drake ACSR and mounting structure.								
I	**66 kV, 1250 A, 40 kA SF6 CB**								
1	Transformer side	No.	1	538,000.00	538,000.00	7,445.00	7,445.00	29,585.00	29,585.00

Sl No.	Name of the Equipment/Materials	Unit	Quantity	Supply of Material		Erection charges		Testing and Commissioning charges	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
A3	**ISOLATORS :**								
	ISOLATORS : Isolators including marshalling box, terminal connectors suitable for Drake ACSR and solid core cylindrical post insulators.								
I	**66 kV, 1250 A, 31.5 KA class double break manually operated isolator with solid core insulators**								
1	Upright mounting type with Earth switch.LPH 4.6 Mtr.	Set	1	151,000.00	151,000.00	2,487.00	2,487.00	249.00	249.00
2	Upright mounting type without Earth switch. LPH 4.6 Mtr.	Set	2	120,000.00	240,000.00	2,487.00	4,974.00	249.00	498.00
II	**11 kV SYSTEM**								
1	11 kV isolator, double break 800 A, 25 KA capacity with rigid bi-metallic terminal connector suitable for Drake ACSR.	Set	1	31,089.00	31,089.00	500.00	500.00		
2	11 kV isolator, double break 400 A, 25 KA capacity with rigid bi-metallic terminal connector suitable for coyote ACSR.	Set	5	24,358.00	121,790.00	500.00	2,500.00		
3	11 kV isolator, single break 400 A, 25 KA capacity with Roaster switch, with rigid bimetallic terminal connector suitable for coyote ACSR.	Set	4	15,444.00	61,776.00				

Sl No.	Name of the Equipment/Materials	Unit	Quantity	Supply of Material		Erection charges		Testing and Commissioning charges	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
A4	**Current Transformer**								
	CURRENT TRANSFORMER : Current transformer Single phase, oil filled outdoor type with rigid bimetallic terminal connectors suitable for Drake ACSR.								
1	66 kV class, 31.5 KA, CT of ratio 200-100 / 1-1-1A for Transformer. For metering : Accuracy 0.2, Burden 10 VA For backup protection : Accuracy 5P20. Burden 30 VA For differential /Distance protection PS class	No.	3	78,000.00	234,000.00	826.33	2,479.00	3,286.67	9,860.00
2	11 kV class, 25 KA, NCT of ratio 600-300/1-1A	No.	1	23,000.00	23,000.00	746.00	746.00	85.00	85.00
	Note:- 1)All the CTs in each kV class shall be of one and the same make for inter-changeability & reliability of performance. 2)The make and characteristics of 11kV NCT should be the same as that of the incomer CT of 11kV switchgear. 3)The terminal connectors for 11kV NCT shall be suitable for 50x6mm Copper flat.								

Sl No.	Name of the Equipment/Materials	Unit	Quantity	Supply of Material		Erection charges		Testing and Commissioning charges	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
A5	**VoltageTransformer**								
	VOLTAGE TRANSFORMER : Single phase, oil filled outdoor type with rigid bimetallic terminal connectors suitable for Drake ACSR.								
1	66 kV class 66kV/√3/110V/√3/ 110V/√3/ 110V/√3 Core - 1 : 300 VA, Accuracy class 3P protection Core - 2 : 200 VA, Accuracy class 0.2. metering Core - 3 : 50 VA, Accuracy class 3P. Open delta Protection	No.	3	78,000.00	234,000.00	826.33	2,479.00	3,286.67	9,860.00
A6	**SURGE ARRESTOR**								
	SURGE ARRESTOR : (Procelain housing) metal oxide, Gapless type with rigid bimetallic connectors suitable for Drake ACSR								
1	60 kV, 10 KA, class - II, Normal duty Metal oxide type	No.	6	15,000.00	90,000.00	124.33	746.00		
A7	**Capacitor Bank**								
1	12.1 kV 2.9 MVAR star connected capacitor bank	Set	1	343,000.00	343,000.00	15,325.00	15,325.00		
A8	**Control and Relay Panel complete**								
1	66/11 kV Transformer panel simplex type	No.	1	523,000.00	523,000.00	2,487.00	2,487.00	29,585.00	29,585.00

Sl No.	Name of the Equipment/Materials	Unit	Quantity	Supply of Material		Erection charges		Testing and Commissioning charges	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
A9	**STATION STRUCTURES :**								
1	66 kV Station Structure fabricated out of galvanised iron. Column type 6T1 with peak. (0.9100 MT per tower)	No/MT	06 / 05.73	66,066.00	396,396.00	2,106.00	12,067.38		
2	66 kV Station Structure fabricated out of galvanised iron. Beam type 6B1(0.4800 MT per tower)	No/MT	03 / 01.51	34,848.00	104,544.00	2,106.00	3,180.06		
3	Station Towers (verticals 3T1) (0.570 MT) with bolted type foundation	No/MT	04 / 02.39	41,382.00	165,528.00	2,106.00	5,033.34		
4	3B1 of 33 kV beam suitable for 7.6 Meters bay width (0.23MT)	No/MT	02 / 0.48	16,698.00	33,396.00	2,106.00	1,010.88		
5	11 kV ODS structure Column out of 9.0 Mtr.. Long RCC pole for 115 Kgs. Working load (using TOR 50 steel 10 mm)for 11 kV ODS & Yard lighting	No.	14	5,941.00	83,174.00	2,106.00	29,484.00		
6	Beams out of Galvanised iron channel of size 100 x 50 mm with arrangement for stringing power conductor on 11 kV side 1B1 7.45 Mtr. long with clamps, bolts and nuts.	No.	18 / 01.22	4,936.80	88,862.40	2,106.00	2,569.32		

Sl No.	Name of the Equipment/Materials	Unit	Quantity	Supply of Material		Erection charges		Testing and Commissioning charges	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
7	Beams out of Galvanised iron channel of size 100 x 50 mm with arrangement for stringing power conductor on 11 kV side 1B2 4.0 Mtr. long with clamps, bolts and nuts.	No.	13 / 00.5	2,613.60	33,976.80	2,106.00	1,053.00		
8	Double pole structure with 8 Mts. RCC poles and with 9kV lightning arrestors with provision for fixing 11 kV 400 A Roaster single break isolators complete set with wiring materials	Set	4	30,000.00	120,000.00	5,000.00	20,000.00		
A10	**MOUNTING STRUCTURES :**								
1	66 kV Isolators. (0.5000 MT per Structure)	No/MT	03 / 01.5	36,300.00	108,900.00	1,593.54	2,390.31		
2	Current transformer. 66 kV & 11 kV NCT's.(0.1900 MT per Structure)	No/MT	07 / 01.3	13,794.00	96,558.00	1,593.54	2,071.60		
3	Voltage transformer. 66 kV . (0.1900 MT per Structure)	No/MT	03 / 00.57	13,794.00	41,382.00	1,593.54	908.32		
4	Lightening arrestors. 66 kV . (0.1400 MT per Structure)	No/MT	06 / 00.684	10,164.00	60,984.00	1,593.54	1,089.98		
5	Pedestal insulators. 66 kV . (0.15 MT per Structure)	No/MT	03/0.45	10,890.00	32,670.00	1,593.54	717.09		
6	For High pedestal insulators for 66 kV side. (0.2200 MT per Structure)	No/MT	03 / 00.66	15,972.00	47,916.00	1,593.54	1,051.74		
A11	**BUS BAR FORMATION :**								
1	Drake ACSR	Mtr	450	294.00	132,300.00				

Sl No.	Name of the Equipment/Materials	Unit	Quantity	Supply of Material		Erection charges		Testing and Commissioning charges	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
2	Coyote ACSR	Mtr	250	95.00	23,750.00				
3	7/3.15 mm Ground wire	Mtr	100	46.00	4,600.00				
4	Formation of Main/Cross bus with Single Drake	Bay	3			5,519.00	16,557.00		
5	Formation of Main/Cross bus with Single Drake for 11 kV	Bay	5			4,591.00	22,955.00		
6	Formation of Main/Cross bus with Single Coyote for 11 kV	Bay	4			4,591.00	18,364.00		
A12	**INSULATORS :**								
1	Post insulator Solid core Insulator 66 kV	No	12	4,135.00	49,620.00	148.00	1,776.00		
2	Single Tension string of 90 KN. 6 units each along with hardware suitable for Coyote ACSR.(66 kV)(line side)	Stack	3	3,254.00	9,762.00				
3	Single Tension string of 90 KN. 6 units each along with hardware suitable for Drake ACSR.(66 kV)	Stack	6	4,403.00	26,418.00				
4	Single Suspension string of 90 KN. 6 units each along with hardware suitable for Drake ACSR.(66 kV)	Stack	3	3,685.00	11,055.00				
5	Single Tension string of 90 KN. 2 units each along with hardware suitable for Drake ACSR.(on LV side of transformer for road crossing)	Stack	6	2,743.00	16,458.00				

Sl No.	Name of the Equipment/Materials	Unit	Quantity	Supply of Material		Erection charges		Testing and Commissioning charges	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
6	Single Suspension string of 90 KN. 2 units each along with hardware suitable for Drake ACSR.(on LV side of transformer for road crossing)	Stack	6	2,025.00	12,150.00				
7	Single Tension string of 90 KN. 2 units each along with hardware suitable for Drake ACSR.(11 kV)	Stack	24	2,743.00	65,832.00				
8	Single Tension string of 90 KN. 2 units each along with hardware suitable for Coyote ACSR.(11 kV)	Stack	30	1,505.00	45,150.00				
9	Single Suspension string of 90 KN. 2 units each along with hardware suitable for Drake ACSR.(11 kV side)	Stack	12	2,025.00	24,300.00				
A13	**HARDWARES :**								
1	GI flat for Transformer Neutral 50 x 6 mm of size 2 x 5 Mtres length	No	1	2,258.10	2,258.10				
2	C type wedged Clamp suitable for Drake - Drake	No.	12	1,939.00	23,268.00				
3	C type wedged Clamp suitable for Coyote - Drake	No.	18	1,444.00	25,992.00				
4	C type wedged Clamp suitable for Coyote - Coyote	No.	12	1,032.00	12,384.00				
5	PI clamps suitable for Drake ACSR	No.	9	514.00	4,626.00				

Sl No.	Name of the Equipment/Materials	Unit	Quantity	Supply of Material		Erection charges		Testing and Commissioning charges	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
A14	**Auxiliary Transformer:**								
1	Supply and erection of Station Auxiliary Transformer with oil, outdoor type, 100 kVA, 11 kV/433 V, 3 Ph, Vector group-II.	No.	1	195,574.00	195,574.00	2,500.00	2,500.00		
2	Double pole structure with 9 Mts. RCC poles and with 11 kV 400 A single break isolators and 9 kV, 5 KA surge arrestor (3 No.) complete set for auxiliary transformer.	Set	1	50,000.00	50,000.00	5,000.00	5,000.00		
3	LTAC panel 415V as per technical specifications Voltmeter, Ammeter, ETV meter 1No.MCCB 200A+2Nos .3 phase 63A OG HRC fuse+ 2nos.3 phase 32A HRC fuse+ 6Nos. 3phase 16A HRC fuse	Set	1	113,000.00	113,000.00				
4	DC Distribution panel (Indoor type) as per technical specification comprising of earth fault indicator, Indication circuit for AC mains failure 1No.100A SFU for IC+12Nos.32A SFU for OG etc complete	Set	1	75,000.00	75,000.00				

Sl No.	Name of the Equipment/Materials	Unit	Quantity	Supply of Material		Erection charges		Testing and Commissioning charges	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
5	AC distribution Box single joint (out door) 6 terminal 1200 x 1350 x 300 mm , one I/C of 100 Amps MCCB 20 KA + 6 O/G MCB 16 Amps + 1 O/G of 100 A HRC fuse	No.	1	33,000.00	33,000.00	995.00	995.00		
A15	**LT POWER CABLE :**								
1	1.1 kV class 4 X 95 Sq mm L T Cable	Mtr	75	334.00	25,050.00	7.00	525.00		
2	1.1 kV class 4 X 25 Sq mm Copper Cable	Mtr	50	108.00	5,400.00	7.00	350.00		
A16	**STATION BATTERY & BATTERY CHARGER :**								
1	110 V, 100 AH, Battery set consisting of 55 No. cells each	Set	1	250,000.00	250,000.00	6,209.00	6,209.00		
2	Battery charger suitable for '1 X 110 V, 100 AH, Battery set consisting of 55 No. cells with float cum booster type battery charger and with DC Distribution panel indoor type 1IC + 10OG SFU 60A+10OF SFU 30A with all accessories.	Set	1	93,000.00	93,000.00	995.00	995.00	21,303.00	21,303.00
A17	**PVC insulated Copper Control Cable with Lugs / Ferrules. 1.1 KV class. Size of cable:**								
1	19 Core 2.5 Sq.mm. Copper Control Cables	Mtr	1,000	382.00	382,000.00	7.00	7,000.00		
2	4 Core 6.0 Sq.mm. Copper Control Cables	Mtr	1,300	197.00	256,100.00	7.00	9,100.00		

Sl No.	Name of the Equipment/Materials	Unit	Quantity	Supply of Material		Erection charges		Testing and Commissioning charges	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
A20	**MAINTENANCE TOOLS AND PLANTS :**								
1	Portable (mobile) oil pumps (1/2 HP Air pump 500 to 1000 gallons)	No.	1	10,305.00	10,305.00				
2	Telescopic ladder Aluminium 6 Mtr. Height	No.	1	22,327.50	22,327.50				
3	Ring spanner set	Set	1	791.25	791.25				
4	Tube spanner set	Set	1	395.63	395.63				
5	Pipe wrench 24 inch	Nos.	2	791.25	1,582.50				
6	Pipe wrench 18 inch.	Nos.	2	458.93	917.85				
7	Double end spanner	Set	2	422.00	844.00				
8	Hack saw frame B185	Nos.	2	184.63	369.25				
9	Hydraulic crimping tools up to 1000 Sq.mm	No.	1	35,495.00	35,495.00				
10	Rubber hand gloves (15 kV tested)	Nos.	3	148.85	446.55				
11	Hand torch 5 Cells	Nos.	2	446.55	893.10				
12	Hand torch 3 Cells	Nos.	2	377.85	755.70				
13	Insulated cutting plier 12 inch size	Nos.	3	200.45	601.35				
14	Insulated cutting plier 8 inch size	Nos.	3	142.43	427.28				
15	Line live tester AC/DC 500 V	Nos.	2	158.25	316.50				
16	Screw driver 18"	Nos.	3	147.70	443.10				
17	Screw driver 12"	Nos.	3	94.95	284.85				
18	Hammer 8 lbs	Nos.	2	253.20	506.40				
19	Hammer 2 lbs	Nos.	2	126.60	253.20				
20	Chain pulley block 5 ton cap	No.	1	24,617.50	24,617.50				
21	Hydraulic jack 5T capacity	Nos.	4	3,587.00	14,348.00				
22	Pipe derrick suitable for lifting 3 MT and lift of 6 Mtr. height.	No.	1	14,242.50	14,242.50				

Sl No.	Name of the Equipment/Materials	Unit	Quantity	Supply of Material		Erection charges		Testing and Commissioning charges	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
3	4 Core 2.5 Sq.mm. Copper Control Cables	Mtr	600	99.00	59,400.00	7.00	4,200.00		
4	2 Core 2.5 Sq.mm. Copper Control Cables	Mtr	120	66.00	7,920.00	7.00	840.00		
5	2 Core 6.0 Sq.mm. Copper Control Cables	Mtr	400	117.00	46,800.00	7.00	2,800.00		
A18	**Switchgear**								
1	Porcelain clad 11 kV VCB outdoor type, KIOSK, 350 MVA rupturing capacity, 800 A comprising of 1IC+4F+1CB+1AP3 annunciation panel.with CTs & PTs etc.,	Set	1	2,433,000.00	2,433,000.00	10,444.00	10,444.00	38,210.06	38,210.06
A19	**FIRE FIGHTING EQUIPMENTS WITH NECESSARY MOUNTING STANDS :**								
1	Foam type extinguisher (Mechanical) 45 Ltr. capacity	No.	4	11,224.00	44,896.00				
2	Foam type extinguisher (Mechanical) 9 Ltr. capacity	No.	4	2,157.00	8,628.00				
3	Water type (gas pressure type) 9 Ltr. capacity	No.	6	1,849.00	11,094.00				
4	Carbon di-oxide type 6 Ltr. Capacity	No.	6	6,106.00	36,636.00				
5	Sand type G.I Buckets 9 Ltr. Capacity	No.	12	252.00	3,024.00				
6	Steel stands for above to have 4 buckets to each stand.	No.	3	938.00	2,814.00				

Sl No.	Name of the Equipment/Materials	Unit	Quantity	Supply of Material		Erection charges		Testing and Commissioning charges	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
23	Allen keys	Set	1	242.65	242.65				
24	Box spanners	Set	1	3,639.75	3,639.75				
25	Transil oil di-electric break down (with 2.5 mm gap 0-60 kV) Tester.	No.	1	74,425.00	74,425.00				
26	Insulation megger 2.5 - 5 kV	No.	1	38,930.00	38,930.00				
27	Insulation megger 500 V	No.	1	10,877.50	10,877.50				
28	SF-6 Gas leak detector / Gas filling.	No.	1	33,205.00	33,205.00				
29	Multimeter electromechanical	No.	1	2,290.00	2,290.00				
30	Multimeter Electronic	No.	1	4,980.75	4,980.75				
31	Hydrometer	No.	1	458.00	458.00				
32	DC Voltmeter range -3V to + 5V	No.	1	1,374.00	1,374.00				
33	Hydrometer syring suitable for vent holes	No.	1	458.00	458.00				
34	Specific gravity correction chart	No.	1	458.00	458.00				
35	Thermometer with wall mounting holder	No.	1	1,374.00	1,374.00				
36	Rubber appron	Nos.	2	973.25	1,946.50				
37	Pippette	Nos.	2	400.75	801.50				
38	Protective goggles	Nos.	2	458.00	916.00				
39	Acid resisting jars (4 pint capacity)	Nos.	4	458.00	1,832.00				
40	Rubber shoes knee height	Pairs	2	1,087.75	2,175.50				
41	Glass funnel	Nos.	2	343.50	687.00				
42	Hickery rods	Nos.	4	2,748.00	10,992.00				
43	Grounding sticks	Nos.	4	3,320.50	13,282.00				
44	Manila rope 1"	Meters	100	111.07	11,106.50				

Sl No.	Name of the Equipment/Materials	Unit	Quantity	Supply of Material		Erection charges		Testing and Commissioning charges	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
45	Manila rope 3/4"	Meters	100	111.07	11,106.50				
46	Files of sizes	No.	6	4,408.25	26,449.50				
47	Saftey belts	No	2	618.30	1,236.60				
48	Saftey Helmets	No	2	229.00	458.00				
49	Steel measuring tape 30 meters	No	1	629.75	629.75				
50	Steel measuring tape 15 meters	No	1	452.28	452.28				
A21	**MISCELLANEOUS ITEMS :**								
1	Rubber mats 1000 mm x 2000 mm x 12 mm size suitable for 1.1 kV class.	No.	4	2,500.00	10,000.00				
2	First aid box.	No.	1	360.00	360.00				
3	Shock treatment charts, hard board, liminated with coloured pictures & literature both in Kannada & English.	No.	1	1,000.00	1,000.00				
4	Water filter / Water purifier : Wall mounting type (Aqua-guard type).	No.	1	6,000.00	6,000.00				
5	Sub-station name board duly painted.	No.	1	7,500.00	7,500.00				
6	Fixograph of size 1.5m x 2.5m with English / Kannada alphabets.	Set	1	4,000.00	4,000.00				
7	Door locks 7 levers (Navtal make) (Sizes and capacities to be got approved)	No.	5	300.00	1,500.00				

Sl No.	Name of the Equipment/Materials	Unit	Quantity	Supply of Material		Erection charges		Testing and Commissioning charges	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
8	Danger Board with support structure including fixing in front of the gate	No	1	3,500.00	3,500.00				
9	Equipment name plates and earthing name plates	No	45	150.00	6,750.00				
A22	**Furniture for control room, staff and maintenance, staff, godrej / featherlite / chandan make :**								
1	Steel Almirahs 6 1/2 feet	No.	2	8,000.00	16,000.00				
2	Steel Almirahs 6 1/2 feet with glass panel doors.	No.	1	7,500.00	7,500.00				
3	Officer's tables	No.	1	8,000.00	8,000.00				
4	Ordinary tables	No.	2	3,500.00	7,000.00				
5	Steel slotted angle rack (big size)	No.	2	2,000.00	4,000.00				
6	Steel slotted angle rack (small size)	No.	2	1,500.00	3,000.00				
7	Steel dust bins	No.	4	200.00	800.00				
8	Executive Revolving chairs	No.	1	6,000.00	6,000.00				
9	'S' type arm chairs	No.	6	800.00	4,800.00				
10	Steel folding chairs	No.	4	250.00	1,000.00				
A23	**Earth Mat formation :**								
1	Excavation, formation, refilling for earth mat	CMT	1,832	98.00	179,536.00				

Sl No.	Name of the Equipment/Materials	Unit	Quantity	Supply of Material		Erection charges		Testing and Commissioning charges	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
2	Supplying and laying MS.Flat 50 x 6 mm flat welding and applying ACB paint to welded portion and covering with soil as per drawing/standards without Sodium Bentonate clay (all materials to be supplied by the contractor)	Rmtr.	4,112	135.00	555,120.00				
3	Grounding of equipments with 50 x6 mm G I flat and connecting equipments to the earth mat/ground pit including all connected works.	Rmtr.	471	226.00	106,446.00				
4	Providing 25mm dia, 1.05mtr. long Earthmat Spike of MS Rod including bending top 50mm etc and connecting to earthmat as per specificaton	No.	128	194.00	24,832.00				
5	Providing C.I. Pipe of 100mm ID 13mm thick 2.75 mtr. long with 2 part GI Flat 50x6mm clamp welded allround the pipe etc., including cost of excavation (all materials supplied by contractor)	set	29	5,500.00	159,500.00	1,500.00	43,500.00		
6	Supplying and fixing 450mm dia x 450mm height 1.5" to 2" Hume pipe collars for earth pits.	No.	29	645.00	18,705.00				

Sl No.	Name of the Equipment/Materials	Unit	Quantity	Supply of Material		Erection charges		Testing and Commissioning charges	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
7	Providing Deep Bore Earthing of 150mm dia., jointing 40mm dia M S rods as per KPTCL standard with sodium bentonite treatment including transportation of rig etc., complete								
i	Drilling 150 mm dia bore	RMtr.	20	513.00	10,260.00				
ii	40mm dia M S rod	RMtr.	20	404.00	8,080.00				
iii	Bentonite clay	Kgs	180	11.00	1,980.00				
iv	Cost of GI flat for joining two rods by welding	per Joint	2	427.00	854.00				
A24	**STATION & YARD LIGHTING (OUTDOOR)**								
1	Supplying and erection of Fabricated supporting structures including foundation(9mtrs height swaged or welded MS tubular poles).	No.	8	6,400.00	51,200.00				
2	Supplying and fixing and wiring of 250 W high pressure sodium vapour street light fittings deep drawn aluminium for control gear finished stove enamel grey glossy with canopy interval with pair reflection duly wired with Porcelain holder choke igniter and HPE condenser including sodium vapour lamp.	Set	8	7,007.00	56,056.00				

Sl No.	Name of the Equipment/Materials	Unit	Quantity	Supply of Material		Erection charges		Testing and Commissioning charges	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
3	Supplying and laying 1.1 kV LT UG cable (2 core 10 Sq.mm) PVC insulated galvanised steel wire / tape armour cable in the existing trench / stone ware / running above the ground level using necessary fixtures with suitable termination with guard.	Mtr..	308	100.00	30,800.00				
4	Supplying 32 mm dia A class G.I.pipe bracket 2 Mtr. long bent at suitable angle and fixing the brackets to street light fittings to RCC poles using suitable clamps bolts and nuts and wiring using 3/20 copper wire and 15 A fuse.	Set	8	120.00	960.00				
5	Supplying and fixing inspection box switch board control box made out of 16 SWG MS sheet including fabricated with one coat of primes and two coats of approved paint of size 200x90x65 mm.	No.	8	1,000.00	8,000.00				

Sl No.	Name of the Equipment/Materials	Unit	Quantity	Supply of Material		Erection charges		Testing and Commissioning charges	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
6	Fixing of control box on the angle iron mounting at the yard inclusive of connecting of mounting and fixing of weather prof control box to the mounting.	No.	8	150.00	1,200.00				
7	Supplying and fixing Porcelain fuse channel with cutout 60 A.	No.	8	665.00	5,320.00				
8	Supplying and fixing of 30 A DPST.	No.	1	88.00	88.00				
9	Supplying and fixing PVC conduit pipe and accessories of approved guage of 2 mm thick 25 mm dia with 2 of 3/20 copper wire.	Mtr	16	11.00	176.00				
A25	**Miscellaneous and other unforeseen materials.**				**36,027.43**		**52,158.98**		**27,889.94**
A26	**TOTAL**				**17,700,000.00**		**400,000.00**		**200,000.00**

Note: For the DPR purpose the total weight of the Power transformer is taken for erection of the power transformer and a maximum of 50 meters is taken for the movement of the power transformer. However while executing the work, the actual distance and weight of the transformer for movement and actual transportion weight for the erection of the transformer shall be taken. The Testing and comissioning charges are based on Turnkey work. If the work has to be executed on labour contract basis, the same may be altered suitably.

KARNATAKA POWER TRANSMISSION CORPORATION LTD

Establishing 1x8 MVA 66/11 kV Substation at Hegganur, Kanakapura Taluk, Ramanagara District

CIVIL ENGINEERING WORKS - PART ' B '

Sl No	PARTICULARS	UNIT	QTY	Unit Rate (in Rs.)	Amount (in Rs.)
1	2	3	4	5	6
	SCHEDULE OF ITEMS FOR ASSOCIATED CIVIL WORKS AND STRUCTURES :				
C1	**Yard leveling:**				
1	Yard leveling: Earth excavation for Levelling the ODS yard to required RL including cutting, Transporting the excavated stuff to the place shown, in all types of soil and strata including Hardrock and filling the same where ever required with available earth including levelling the approach road length from main road to station to required line and gradient with all lead and lift etc., complete.including compaction (Hard soil)	CMT	51	110.21	5599.77
2	Yard leveling of the ODS yard to required RL including, Transporting the barrowed earth filling the same where ever required including levelling the approach road length from main road to station to required line and gradient with all lead and lift etc., complete.including compaction.	CMT	6073.88	265.00	1609578.20
	Note:-It is proposed to fix the RL of the site at 100 Mtrs and the same is to be refixed at the time of execution.				
C2	**Foundation:**				
	Foundation: Engineering, supply of all labours, materials and construction of RCC Footings of any depth, pedestals including the cost of Excavation, Concreting, Cement, Reinforcement steel for all the works, Grouting, under pinning etc., for the following station towers and mounitng structures"				

1	2	3	4	5	6
1	66 kV Station Structure fabricated out of galvanised iron. Column type 6T1 with peak. (0.9100 MT per tower)	Nos.	6	56722.10	340332.60
2	Station Towers (verticals 3T1) (0.570 MT) with bolted type foundation	Nos.	4	40540.80	161920.00
3	66 kV Isolators. (0.5000 MT per Structure)	Nos.	3	12432.10	37296.30
4	Current transformer. 66 kV & 11 kV NCT's.(0.1900 MT per Structure)	Nos.	7	6447.80	45134.60
5	Voltage transformer. 66 kV . (0.1900 MT per Structure)	Nos.	3	5129.40	15388.20
6	Lightening arrestors. 66 kV . (0.1400 MT per Structure)	Nos.	6	5170.60	31023.60
7	Pedestal insulators. 66 kV . (0.1500 MT per Structure)	Nos.	3	5170.60	15511.80
8	For High pedestal insulators for 66 kV side. (0.2200 MT per Structure)	Nos.	3	6118.20	18354.60
9	11 kV ODS structure Column out of 9.0 Mtr.. Long RCC pole for 115 Kgs. Working load (using TOR 50 steel 10 mm)for 11 kV ODS & Yard lighting	Nos.	14	3000.00	42000.00
10	Double pole structure with 9 Mts. RCC poles	Set	5	6000.00	30000.00
C3	**Equipment Foundation:**				
	Transformer foundation & associated rail track: Design, Engineering, supply of materials/equipments, labour & construction of Transformer foundation by providing all associated works, rail tracks jacking pads,anchor block RCC,PCC miscellaneous structural steel including MS , grouting gravel filling pylon support system and other items Not mentioned herein but required for the completion of the work.				
1	POWER TRANSFORMER : Power Transformer 8 MVA, 66/11 kV Delta / Star, Dyn11, 3 Ph, 50 Hz, Core type winding with OLTC, RTCC panel, etc., complete filled with Transil oil with 10% spare oil. (28 MT)	No.	1	139657.70	139657.70
2	66 kV, 1250 A, 40 kA SF6 CB	No.	1	28283.80	28283.80
3	Platform with size stone cement concrete for errection of 100 kVA , 11kV/433V Auxillary Transformer	No.	1	20363.10	20363.10
4	Porcelain clad 11 kV VCB outdoor type, KIOSK, 350 MVA rupturing capacity, 800 A comprising of 1IC+4F+1CB+1AP3 annunciation panel.with CTs & PTs etc.,	Set	1	188675.40	188675.40

1	2	3	4	5	6
C4	**Site Surfacing**				
	Jelly spreading : Providing and spreading 20/25 mm jelly in station yard including conveying, stacking for measurement, spreading in layer of 100 mm over all.	CMT	239	1112.00	265356.56
C5	**Cable ducts :**				
1	Cable ducts : Construction of RCC Main Cable duct " SSY-I " type of internal dimension 1000 x 800 mm as per Technical specification design and drawings. including material, cement, steel, flats.	Mtr.	20	10629.60	212592.00
2	Cable ducts : Construction of RCC Main Cable duct type " SSY-II " type of internal dimension 800 x 800 mm as per Technical specification design and drawings. including material, cement, steel, flats.	Mtr.	110	8785.90	966449.00
3	Cable ducts : Construction of RCC Main Cable duct with 2 nos of NP2 Pipe with internal dimension 450 x 450 mm as per Technical specification design and drawings. including material, cement, steel, flats.	Mtr.	60	2389.60	143376.00
4	Cable ducts : Construction of RCC Main Cable duct with 1 nos of NP2 Pipe with internal dimension 450 x 450 mm as per Technical specification design and drawings. including material, cement, steel, flats.	Mtr.	100	1215.40	121540.00
5	Inspection Chambers Construction of Brick masonary inspection chamber with cast iron cover of size 650 x 450 mm as per technical specification design and drawing	No.	8	6638.35	53106.80
6	Inspection Chambers Construction of Brick masonary inspection chamber with cast iron cover of size 450 x 450 mm as per technical specification design and drawing	No.	8	4589.68	36717.44
7	Construction of RCC duct across road crossing for " SSY-I " type Cable ducts as per technical specificiton design and drawings.	No.	1	105884.00	105884.00

1	2	3	4	5	6
C4	**Road Works:**				
1	Road Works : Design and construction of 5 meter RCC roads and walkways / shoulders within sub station as per specification, layout and sectional detail drawing etc., complete in all respect.	Mtr.	70	9395.66	657696.20
2	Culverts : Providing and Constructing culverts across approch road using NP-2 class 450 mm dia Hume pipes as per technical specification design and drawing including cost of material labour complete	No.	1	58800.64	58800.64
C5	**Storm water drains :**				
1	Storm water drains : Providing and Constructing storm water drains as per technical specification design and drawing including cost of material labour complete (both side wall)	Rmtr.	50	2688.30	134415.00
2	Storm water drains : Providing and Constructing storm water drains as per technical specification design and drawing including cost of material labour complete (One side wall and one side the existing structure used as wall)	Rmtr.	250	1596.50	399125.00
C6	**Switch Yard fencing :**				
1	Providing and fixing chain link fencing for the switch yard using structural steel poles & chain link mesh as per technical specification, design & drawing including cost of all materials labour etc., complete (for 110/66 kV Stations)	Mtr.	300	2939.62	881886.00
2	Providing and fixing MS gate for the switch yard with a 2.35 x 1.25 Mtr wicket gate and a 2.35 x 2.0 meter main gate fitted over column structure made out of 2 Nos of 125 x 65 mm ISMC as per technical specification (110/66 kV stations).	No.	1	91958.40	91958.40
C7	**Oil sump pit:** Providing & Construction of Oil sump pit as per technical specification, design and drawing including cost of materials and labour (Size 3.0x4.0x2.0meter)	Lot.	1	173658.00	173658.00

1	2	3	4	5	6
C8	**Control Room Building :**				
1	Control Room Building : (4 spans) Design, Engineering, and construction of control room building by giving lime treatement to the soil in the manner specified, depending upon the soil condition. The illumination design is also in the scope of the bidder (the control room building shall be designed for 1st floor loads also) as per technical specification and drawings. The various cable ducts within control room are in the scope of the bidder including internal water supply and sanitary works. Type CBR1	No.	1	3099580.00	3099580.00
C9	**Water supply :**				
1	Water supply : Drilling bore well providing water supply, for the sub station including drinking water and water for fire fighting system and earthing pits.	Set	1	697974.00	697974.00
2	**Sewerage System:** Providing internal and external sewerage system for the switch yard and building in the substation	Lot.	1	105957.11	105957.11
C10	**Toe wall, Retaining Wall and pitching**				
1	Toe wall with stone masonrall round the ODY yard for a height of 0.3 meter above the FGL level and total length of 275.00 meters Construction of size stone masonry toe Wall as per the technical specification design and drawings.	CMT	319.55	2193.90	701060.75
2	Stone masonry: for Retaining wall of average height of 1.00 meters and total length of 50.00 meters Construction of size stone masonry Retaining Wall as per the technical specification design and drawings.	CMT	49.31	4542.97	224025.00
C11	**Miscellaneous and other unforeseen works**	**L/S**			**39722.43**
C12	**TOTAL**				**11900000.00**

Note:- For the DPR purpose the foundation and other civil works are designed for the hard soil condition. However while executing the work, the foundation and other civil works shall be suitablly designed based on the actual soil condition.

KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

Construction of 66kV Terminal Bay at 66/11kV Doddalahalli sub-station in Kanakapura Taluk, Ramanagara District.

Abstract-3

Rs in Lakhs

1	Material cost	30.00
2	Spares @ 3 % on Material cost (3% of item no 1)	0.90
3	Transportation and Insurance charges at @ 1.5% on above (1.5% of item no 1 and 2)	0.46
4	Erection/Labour Charges	1.00
5	Civil Engineering charges.	7.00
6	Service Tax @ 14.5 % on 40% of Civil Engineering Cost (14.5 % on 40% of item no 5)	0.41
7	Work contract Tax @ 14.5 % on 70% of Civil Engineering Cost (14.5 % on70% of item no 5)	0.71
8	Testing & Comissioning Charges	1.00
9	Total Works Cost (sum of item nos. 1 to 8)	41.48
10	Establishment charges at 5 % on works cost (5% of item no 9)	2.07
11	Performance Guarantee and loss of interest on margin money for Bank Guarantee @ 0.1% on works cost (0.1% of item no 9)	0.04
12	Contingencies at 1.5 % on (works cost + Establishment charges.) (1.5 % of item nos 9 and 10)	0.65
13	Interest during Construction (4% on item nos. 9,10,11 and 12	1.77
14	Total estimated cost for comparision purpose (sum of item nos. 9 to 13)	46.02
15	Statutory charges like PTCC, Electrical Inspectorate charges,Payment towards civic bodies etc.,	1.00
16	Compensation cost for crop/Tree cutting forest clearance etc.,	NA
17	Total cost of the project (sum of item nos 14 to 16)	47.02

KARNATAKA POWER TRANSMISSION CORPORATION LTD

Construction of 66kV Terminal Bay at 66/11kV Doddalahalli sub-station in Kanakapura Taluk, Ramanagara District.

PART - A : Supply of materials,Erection and Commissioning

Sl No.	Name of the Equipment/Materials	Unit	Quantity	Suply of Material		Erection charges		Testing and Comissioning charges	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
1	2	3	4	5	6	7	8	9	10
B1	**Circuit Breaker:**								
	CIRCUIT BREAKER : SF-6 Gas circuit breaker with semi-pneumatic / pneumatic operated / spring type operating mechanism including mounting arrangements R bi-metallic terminal connector complete suitable for Drake ACSR and mounting structures.								
I	**66 kV, 1250 A, 40 kA SF6 CB**								
1	LINE	No.	1	538,000.00	538,000.00	7,445.00	7,445.00	29,585.00	29,585.00
B2	**ISOLATORS :**								
	66 kV, 1250 A, 31.5 KA class double break manually operated isolator with solid core insulators								
1	Upright mounting type with Earth switch.LPH 4.6 Mtr.	Set	1	151,000.00	151,000.00	2,487.00	2,487.00	249.00	249.00
2	Upright mounting type without Earth switch. LPH 4.6 Mtr.	Set	1	120,000.00	120,000.00	2,487.00	2,487.00	249.00	249.00

Sl No.	Name of the Equipment/Materials	Unit	Quantity	Suply of Material		Erection charges		Testing and Comissioning charges	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
B3	**Current Transformer**								
	CURRENT TRANSFORMER : Current transformer Single phase, oil filled outdoor type with R bimetallic terminal connectors suitable for drake ACSR.								
1	66 kV class, 31.5 KA, CT of ratio 400-200 / 1-1-1A for 31.5MVA trafo and Lines For metering : Accuracy 0.2, Burden 10 VA For backup protection : Accuracy 5P20. Burden 30 VA For differential /Distance protection PS class	No.	3	78,000.00	234,000.00	826.33	2,479.00	3,286.67	9,860.00
B4	**Lightning Arrestors**								
	SURGE ARRESTOR : (Procelain housing) metal oxide, Gapless type with R bimetallic connectors suitable for drake ACSR.								
1	60 kV, 10 KA, class - II, Normal duty Metal oxide type	No.	3	15,000.00	45,000.00	124.33	373.00		
B5	**Control and Relay Panel complete**								
1	66 kV line panel Simplex type	No.	1	506,000.00	506,000.00	2,487.00	2,487.00	29,585.00	29,585.00
B6	**STATION STRUCTURES :**								

Sl No.	Name of the Equipment/Materials	Unit	Quantity	Suply of Material		Erection charges		Testing and Comissioning charges	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
1	66 kV Station Structure fabricated out of galvanised iron. Column type 6T1 with peak. (0.9100 MT per tower)	No/MT	03 / 002.9	66,066.00	198,198.00	2,106.00	6,107.40		
2	66 kV Station Structure fabricated out of galvanised iron. Beam type 6B1(0.4800 MT per tower)	No/MT	02 / 001.01	34,848.00	69,696.00	2,106.00	2,127.06		
B7	**MOUNTING STRUCTURES :**								
1	66 kV Isolators. (0.5000 MT per Structure)	No/MT	02 / 001.4	36,300.00	72,600.00	1,593.54	2,230.96		
2	Current transformer. 66 kV & 11 kV NCT's.(0.1900 MT per Structure)	No/MT	03 / 000.4	13,794.00	41,382.00	1,593.54	637.42		
3	Lightening arrestors. 66 kV . (0.1400 MT per Structure)	No/MT	03 / 000.2	13,794.00	41,382.00	1,593.54	318.71		
4	Pedestal insulators. 66 kV . (0.1500 MT per Structure)	No/MT	03 / 000.4	10,890.00	32,670.00	1,593.54	637.42		
B8	**BUS BAR FORMATION :**								
1	Drake ACSR	Km	0.2	294,000.00	58,800.00				
2	7/3.15 mm Ground wire	Km	0.05	46000.00	2300.00				
3	Formation of Main/Cross bus with Single Drake	Bay	3			5,519.00	16,557.00		
B9	**INSULATORS**								
1	Post insulator Solid core Insulator 66 kV	No	3	4,135.00	12,405.00	148.00	444.00		

Sl No.	Name of the Equipment/Materials	Unit	Quantity	Suply of Material		Erection charges		Testing and Comissioning charges	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
2	Single Suspension string of 90 KN. 6 units each along with hardware suitable for Drake ACSR.(66 kV)	Stack	3	3,347.00	10,041.00				
3	Single Tension string of 90 KN. 5 units each along with hardware suitable for Coyote ACSR.(66 kV)	Stack	6	3,165.00	18,990.00				
B10	**HARDWARES :**								
1	C type wedged Clamp suitable for Drake - Drake	No.	6	1,939.00	11,634.00				
2	Post insulator clamp suitable for Single Drake ACSR. 127/76 mm 66 kV	No.	3	514.00	1,542.00				
3	C type wedged Clamp suitable for Coyote - Drake	No.	3	1,444.00	4,332.00				
B11	**PVC insulated Copper Control Cable with Lugs / Ferrules. 1.1 KV class. Size of cable.**								
1	19 Core 2.5 Sq.mm. Copper Control Cables	Mtr	300	382.00	114,600.00	7.00	2,100.00		
2	2 Core 2.5 Sq.mm. Copper Control Cables	Mtr	200	66.00	13,200.00	7.00	1,400.00		
3	4 Core 6.0 Sq.mm. Copper Control Cables	Mtr	300	197.00	59,100.00	7.00	2,100.00		
4	4 Core 10.0 Sq.mm. Copper Control Cables	Mtr	200	306.00	61,200.00	7.00	1,400.00		

Sl No.	Name of the Equipment/Materials	Unit	Quantity	Suply of Material		Erection charges		Testing and Comissioning charges	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
5	4 Core 2.5 Sq.mm. Copper Control Cables	Mtr	250	99.00	24,750.00	7.00	1,750.00		
B12	**Earth Mat formation :**								
1	Grounding of equipments with 50 x 6 mm G I flat and connecting equipments to the earth mat/ground pit including all connected works with all materials supplied by the contractor.	Rmts	300	226.00	67,800.00				
2	Providing C.I. Pipe of 100mm ID 13mm thick 2.75 mtr. long with 2 part GI Flat 50x6mm clamp welded allround the pipe etc., including cost of excavation (all materials supplied by contractor)	set	3	5,500.00	16,500.00				
3	Supplying and fixing 450mm dia x 450mm height 1.5" to 2" Hume pipe collars for earth pits.	No.	3	645.00	1,935.00				
B13	**Miscellaneous and other unforeseen materials.**				470,943.00		44,432.04		30,472.00
B14	**TOTAL**				**3,000,000.00**		**100,000.00**		**100,000.00**

KARNATAKA POWER TRANSMISSION CORPORATION LTD

Construction of 66kV Terminal Bay at 66/11kV Doddalahalli sub-station in Kanakapura Taluk, Ramanagara District.

PART - B : Civil

Sl No.	Name of the Equipment/Materials	Unit	Quantity	Labour charges	
				Unit Rate (in Rs.)	Amount (in Rs.)
1	2	3	4	5	6
SCHEDULE OF ITEMS FOR ASSOCIATED CIVIL WORKS AND STRUCTURES :					
C1	**Yard Leveling**				
1	Earth excavation for Levelling the ODS yard to required RL including cutting, Transporting the excavated stuff to the place shown, in all types of soil and strata including Hardrock and filling the same where ever required with avilable earth including levelling the approach road length from main road to station to required line and gradient with all lead and lift etc., complete.including compaction (Hard soil)	CMT	50	110.21	5,510.50
C2	**Foundation:**				
	Foundation: Engineering supplyof all labours, materials and construction of RCC Footings of any depth, pedestals including the cost of Excavation, Concreting, Cement, Reinforcement steel for all the works, Grouting, under pinning etc., for the following station towers/Mounting structures,				
1	66 kV Station Structure fabricated out of galvanised iron. Column type 6T1 with peak. (0.9100 MT per tower)	Nos.	3	56,722.10	162,593.90

2	66 kV, 1250 A, 40 kA SF6 CB	No.	1	28,283.80	28,283.80
3	66 kV Isolators. (0.5000 MT per Structure)	Nos.	2	12,432.10	24,864.20
4	Current transformer. 66 kV (0.1900 MT per Structure)	Nos.	3	6,447.80	19,343.40
5	Lightening arrestors. 66 kV . (0.1400 MT per Structure)	Nos.	3	5,170.60	15,511.80
6	Pedestal insulators. 66 kV . (0.1500 MT per Structure)	Nos.	3	5,170.60	15,511.80
C3	**Site Surfacing**				
1	Jelly spreading : Providing and spreading 20/25 mm jelly in station yard including conveying, stacking for measurement, spreading in layer of 100 mm over all.	CMT	15	1,112.00	16,680.00
C4	**Cable ducts**				
1	Cable ducts : Construction of RCC Main Cable duct type "SSY-II " type of internal dimension 800 x 800 mm as per Technical specification design and drawings. including material, cement, steel, flats.	Mtr.	30	8,785.90	263,577.00
2	Cable ducts : Construction of RCC Main Cable duct with 1 nos of NP2 Pipe with internal dimension 450 x 450 mm as per Technical specification design and drawings. including material, cement, steel, flats.	Mtr.	50	1,215.40	60,770.00
3	Inspection Chambers Construction of Brick masonary inspection chamber with cast iron cover of size 650 x 450 mm as per technical specification design and drawing.	No.	4	6,638.35	26,553.40

4	Inspection Chambers Construction of Brick masonary inspection chamber with cast iron cover of size 450 x 450 mm as per technical specification design and drawing	No.	5	4,589.68	22,948.40
C5	Miscellaneous and unforeseen materials.				37,851.80
C6	**TOTAL**				**700,000.00**

Note:- 1) For the DPR purpose the foundation and other civil works are designed for the hard soil condition. However while executing the work, the foundation and other civil works shall be suitablly designed based on the actual soil condition.
2) The provisions given in the estimate are approximate only, the actual provisions are to be got approved at the time of execution.

KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

Establishing 1x8 MVA 66/11 kV Substation at Hegganur, Kanakapura Taluk, Ramanagara District

Computation of Benefit to cost Ratio

1	Estimated Cost	Lakh	991.51
2	Annual energy Savings	MU	1.82
3	Cost of Energy per unit	Rs	5.34
4	Proposed addition of the capacity	MVA	8
5	Energy sale per MVA per year for 30 Years	MU	11.3623
6	% load growth of the area	%	5.00
7	Additional energy availablefor sale (Item no 4. x 5)	MU	90.90
8	Present Transmission charge	Rs	0.3300
9	Transmission charges for sale of additional energy(Item no 8 x Item no 7x10)	Lakhs	299.96
10	Cost of Annual energy Savings due to loss reduction (2 x 3x10)	Lakhs	97.19
11	Total cost of savings due to reduction in losess + Cost of transmission charges for sale of additonal energy	Lakh	782.85
12	Net present value (Item no 9 + Item no 11)	Lakh	1082.81
13	Annual O & M charges expeses @ 1 % of item no 1 (Estimated cost)	Lakh	9.92
14	Present value of Annual O & M expenses over a project period of 30 years (13x8.055)	Lakh	79.87
15	Total investment + Present value of O & M	Lakh	1071.37
16	Benefit to cost ratio		1.011

KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

Establishing 1x8 MVA 66/11 kV Substation at Hegganur, Kanakapura Taluk, Ramanagara District

PERT CHART

Month	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th

DPR and funding

Erection of equipment

Stage 1

Stage-4

PC Test and commissioning

Stage 2

Stage-6

Stage-3

Stage-5

Tendering and work award

Earth mat laying

ABSTRACT OF TOWERS

Project:	Project: Proposed 66KV S/C ~~on~~ Line on D/C tower from existing 66KV ~~Sathnur~~ Doddalahalli ~~S/C Line~~ on D/C towers to proposed 66/11KV Hegganur sub-station in Kanankapura Taluk, Ramanagara District using Narrowbased KPTCL design towers.

Sl.No	Type of tower	Normal	Extention Towers		
			3M Extn	6M Extn	9M Extn
PROPOSED 66KV D/C TOWERS NBT KPTCL DESIGN					
1	DA'	29	23	3	-
2	DC'	14	5	3	-
3	DD'	11	2	1	-
	Total	**54**	**30**	**7**	**0**
PROPOSED 66KV D/C TOWERS NBT HSR DESIGN					
4	DD'	9	7	2	-
	Total	**9**	**7**	**2**	**0**

For Yeshashwi Engineering Consultants,
Bangalore

Assistant Engineer Ele, 3/11/15
Survey Sub-Division,
Transmission(Works),
KPTCL, Bangalore

Assistant Executive Engineer Ele,
Survey Sub-Division,
Transmission(Works),
KPTCL, Bangalore

Executive Engineer Ele, 19/4
Transmission(Works),
KPTCL, Bangalore

Superintending Engineer Ele, 19/4
Transmission(Works),
KPTCL, Bangalore

TOWER SCHEDULE

: Proposed 66KV S/C Line on D/C towers from existing 66/11KV Doddalahalli station to proposed 66/11KV Hegganur sub-station in Kanankapura Taluk, Ramanagara District using Narrowbased KPTCL design towers.

Clients: Karnataka Power Transmission Corporation Limited

Consultants: M/s Yeshashwi Engineering Consultants., Bangalore

Sl. No	AP No	GPS Coordinates		Type of tower	Angle of Deviation	Span in Mts	Cumu. Chainage in Mts	Weight Span In Mts			Crossing Details	Provisional foundation	Village Limits
		Northing	Easting					L	R	T			
		12 24 51.2	77 22 35.7	BAY	-		0	-	-	-	Survey commenced from existing 66/11KV Doddalahalli station		Yadamaranahlli
						28					KPTCL Fencing	DFR	Yadamaranahlli
1	1	12 24 50.3	77 22 35.7	DD+0	29°13'24"R		28	-	133	133			
						143					11KV Line	DFR	Yadamaranahlli
2				DC+3	0°0'0"		171	10	6	16			
						172					Dumped Soil	DFR	Yadamaranahlli
3	2	12 24 41.6	77 22 30.4	DD+6	54°7'12"L		343	166	-193	-27			
						190					Tar Road [Sathnur-Doddalahalli], 11KV Line, Fencing	DFR	Yadamaranahlli
4				DD+0	0°0'0"		533	383	18	401			
						230						DFR	Yadamaranahlli
5				DC+3	0°0'0"		763	212	203	415			
						210					11KV Line	DFR	Yadamaranahlli
6				DC+6	0°0'0"		973	7	247	254			
						210						DFR	Yadamaranahlli
7				DC+0	0°0'0"		1183	-37	164	127			
						218					Nala, Halla	DFR	Doddalahalli
8	3	12 24 10.1	77 22 44.1	DC+0	27°5'26"R		1401	54	71	125			
						240					Nala2Nos	DFR	Doddalahalli
9				DA+3			1641	169	130	299			
						240					Tar Road [Doddalahalli-Chikkamudude], 11KV Line	DFR	Doddalahalli
10				DA+3			1881	110	158	268			
						225						DFR	Doddalahalli
11				DA+3			2106	67	136	203			
						227					Boulders, LT Line, Halla	DFR	Doddalahalli
12	4	12 23 40.0	77 22 42.0	DD+0	31°47'43"L		2333	91	75	166			
						210						DFR	Doddalahalli
13				DA+3			2543	135	71	206			
						220					LT Line	DFR	Doddalahalli
14				DA+0			2763	149	85	234			
						215					Boulders, Nala		

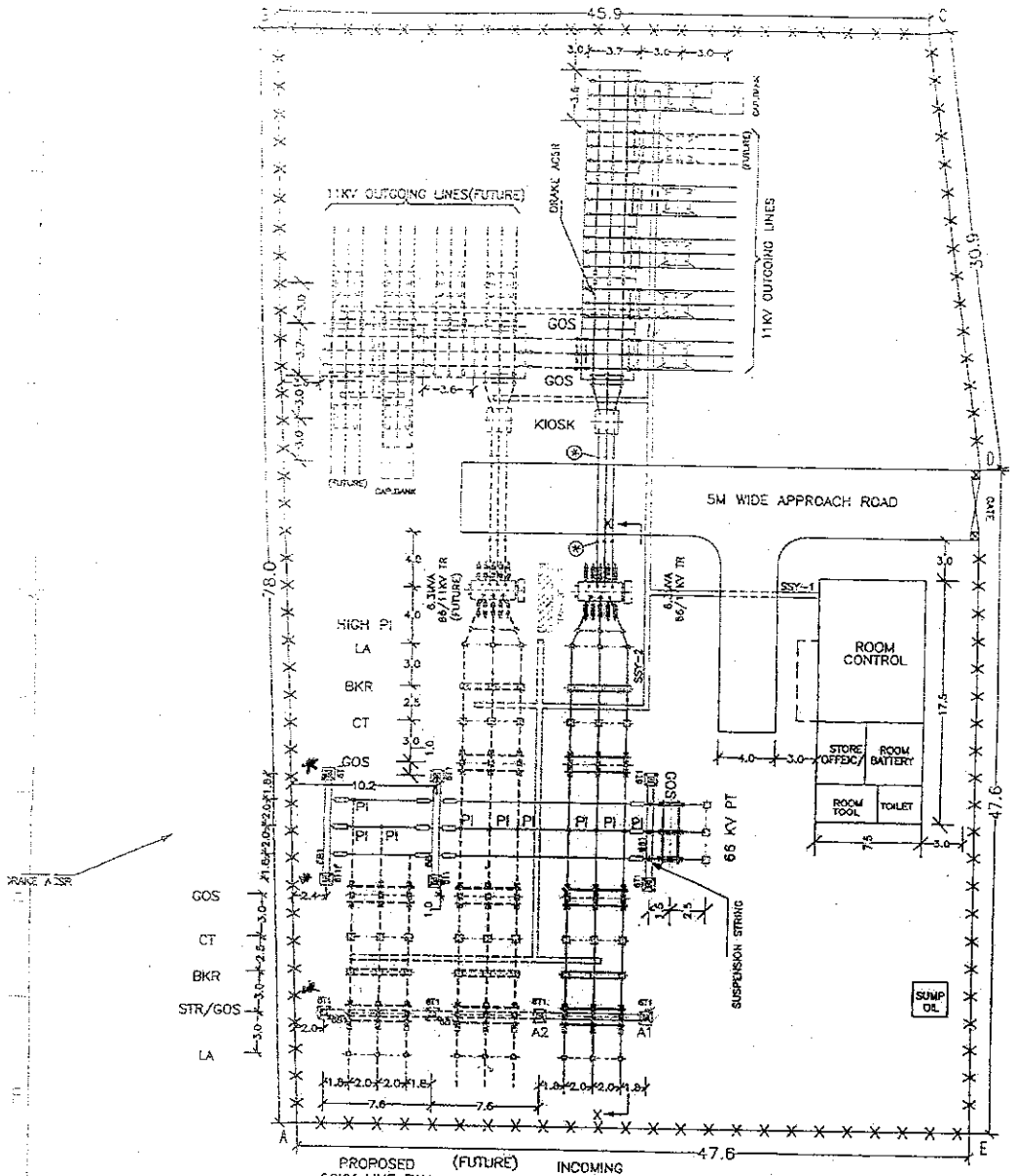
Sl. No	AP No	GPS Coordinates		Type of tower	Angle of Deviation	Span in Mts	Cumu. Chainage in Mts	Weight Span In Mts			Crossing Details	Provisional foundation	Village Limits
		Northing	Easting					L	R	T			
15				DA+3			2978	130	151	281		HR	Doddalahalli
						190					Nala		
16				DC+0	$0^0 0'0''$		3168	39	74	113		DFR	Doddalahalli
						205					Nala		
17				DA+3			3373	131	83	214		HR	Doddalahalli
						224					Mud Road[Doddalahalli-Chilandavadi], 11KV Line, Boulders	DFR	Uyyamballi
18	5	12 23 03.8	77 23 01.5	DD+0	$32^0 13'56''L$		3597	141	78	219		DFR	Uyyamballi
						230					Tar Road[Uyyamballi-Chilandavadi]	DFR	Uyyamballi
19				DA+6			3827	152	132	284		DFR	Uyyamballi
						230					Boulders	DFR	Uyyamballi
20				DA+3			4057	98	170	268		DFR	Uyyamballi
						230					Boulders, Nala	DFR	Uyyamballi
21				DA+6			4287	60	153	213		DFR	Uyyamballi
						223					Nala, Boulders	DFR	Uyyamballi
22	6	12 22 49.0	77 23 27.7	DD+0	$35^0 44'29''R$		4510	70	136	206		DFR	Uyyamballi
						210						DFR	Uyyamballi
23				DA+3			4720	74	103	177		DFR	Uyyamballi
						220						DFR	Uyyamballi
24				DA+3			4940	117	100	217	Mud Road	DFR	Uyyamballi
						200						DFR	Uyyamballi
25				DC+0	$0^0 0'0''$		5140	100	127	227	Nala, LT Line, Boulders	HR	Uyyamballi
						210						DFR	Alahalli
26				DA+0			5350	83	106	189		DFR	Alahalli
						210						DFR	Alahalli
27				DA+3			5560	104	97	201	Boulders, Nala	DFR	Alahalli
						207						DFR	Alahalli
28	7	12 22 11.9	77 23 44.8	DC+0	$13^0 34'0''L$		5767	110	59	169	Cart Road	DFR	Alahalli
						225						DFR	Alahalli
29				DA+3			5992	166	96	262	11KV Line, Nala	DFR	Alahalli
						225						DFR	Alahalli
30				DA+3			6217	129	106	235	LT Line, Nala	DFR	Alahalli
						225						DFR	Alahalli
31				DC+0	$0^0 0'0''$		6442	119	71	190	Cart Road, Fencing 2Nos, 11KV Line		
						225							
32				DA+3			6667	154	135	289			
						225							

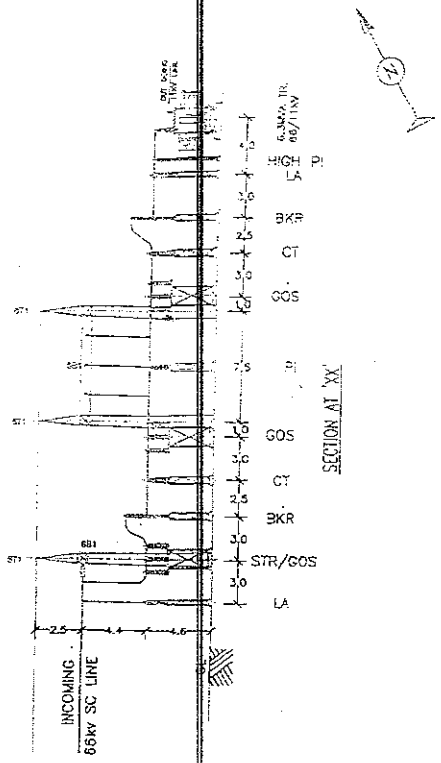
Sl. No	AP No	GPS Coordinates		Type of tower	Angle of Deviation	Span in Mts	Cumu. Chainage in Mts	Weight Span In Mts			Crossing Details	Provisional foundation	Village Limits
		Northing	Easting					L	R	T			
33				DA+3			6892	90	155	245	Cart Road	DFR	Alahalli
						240							
34				DA+3			7132	85	132	217	11KV Line	DFR	Elagalli
						203							
35	8	12 21 31.8	77 24 16.6	DC+3	$13^0$58'1"R		7335	71	117	188	Nala2Nos	DFR	Elagalli
						225							
36				DA+3			7560	108	90	198	11KV Line, LT Line, Mud Road [SH-92-Uyyamballi]	DFR	Elagalli
						225							
37				DA+0			7785	135	109	244		DFR	Elagalli
						225							
38				DA+3			8010	116	156	272	LT Line	DFR	Elagalli
						225							
39				DC+6	$0^0$0'0"		8235	69	131	200		DFR	Elagalli
						225							
40				DA+3			8460	94	141	235	11KV Line, Cart Road	DFR	Elagalli
						225							
41				DA+6			8685	84	114	198		HR	Heligehalli
						209							
42	9	12 20 41.7	77 24 40.2	DC+6	$10^0$11'1"L		8894	95	60	155	Tar Road [Bangalore-Sangama]	DFR	Heligehalli
						146							
43	10	12 20 41.8	77 24 40.2	DD+6 [HSR,NBT]	$20^0$48'50"R		9040	86	64	150	11KV Line, Fencing, Forest Road starts @ Ch 10M, Check post, Arch, Bus stop	DFR	Heligehalli
						70							
44				DD+6 [HSR,NBT]	$0^0$0'0"		9110	6	143	149		HR	Heligehalli
						87							
45	11	12 20 36.8	77 24 41.4	DD+3 [HSR,NBT]	$7^0$39'10"R		9197	-56	58	2		HR	Heligehalli
						93							
46	12	12 20 33.8	77 24 41.7	DD+3 [HSR,NBT]	$5^0$33'34"R		9290	35	72	107		HR	Heligehalli
						97							
47				DD+3 [HSR,NBT]	$0^0$0'0"		9387	25	81	106		HR	Heligehalli
						83							
48	13	12 20 28.0	77 24 41.7	DD+3 [HSR,NBT]	$4^0$38'46"L		9470	2	69	71			
						110							

Sl. No	AP No	GPS Coordinates		Type of tower	Angle of Deviation	Span in Mts	Cumu. Chainage in Mts	Weight Span In Mts			Crossing Details		Provisional foundation	Village Limits
		Northing	Easting					L	R	T				
49	14	12 20 24.5	77 24 42.0	DD+3 [HSR,NBT]	$2^0$59'8"L		9580	41	73	114	-		DFR	Heligehalli
						110								
50	15	12 20 20.9	77 24 42.5	DD+3 [HSR,NBT]	$4^0$8'53"R		9690	37	62	99			DFR	Heligehalli
						102								
51				DD+3 [HSR,NBT]	$0^0$0'0"		9792	40	70	110			DFR	Heligehalli
						96					Forest Road end @88M			
52	16	12 20 44.5	77 24 42.8	DD+3	$29^0$48'50"R		9888	26	146	172			DFR	Hegganuru
						230					Halla			
53				DA+3			10118	84	105	189			DFR	Hegganuru
						230								
54				DA+3			10348	125	113	238			DFR	Hegganuru
						230					Halla, Mud road, Fencing			
55				DC+3	$0^0$0'0"		10578	117	90	207			DFR	Hegganuru
						230					11KVLine 2Nos, Fencing, Nala			
56				DA+3			10808	140	112	252			DFR	Hegganuru
						222					11KV Line, Nala			
57	17	12 19 41.4	77 24 26.3	DD+0	$37^0$36'25"L		11030	110	73	183			DFR	Hegganuru
						190								
58				DA+3			11220	117	114	231	-		DFR	Hegganuru
						180					LT Line, Fencing4Nos			
59				DA+3			11400	66	109	175			DFR	Hegganuru
						183					Boulders, Nala2Nos			
60	18	12 19 23.8	77 24 29.9	DD+3	$57^0$55'17"L		11583	74	133	207			DFR	Hegganuru
						252					Tar Road[Hegganuru-Kuppedoddi]			
61	19	12 19 20.9	77 24 37.7	DC+3	$24^0$45'50"L		11835	119	148	267			DFR	Hegganuru
						212					Fencing 2Nos			
62	20	12 19 21.4	77 24 44.7	DD+0	$33^0$10'34"L		12047	64	132	196			DFR	Hegganuru
						163					Fencing2Nos, LT Line			
63	21	12 19 24.6	77 24 49.8	DD+0	$11^0$36'57"L		12210	31	0	31			DFR	Hegganuru
						28								
				BAY			12238	-	-	-	Proposed 66/11KV Hegganur sub-station.			Hegganuru

Note:-

1. Minor deviation if any due to right of way problems will be incorporates accordingly during the executionof work
2. The provisional foundation given above are for estimate purpose only, actul foundation will get after excavation only.





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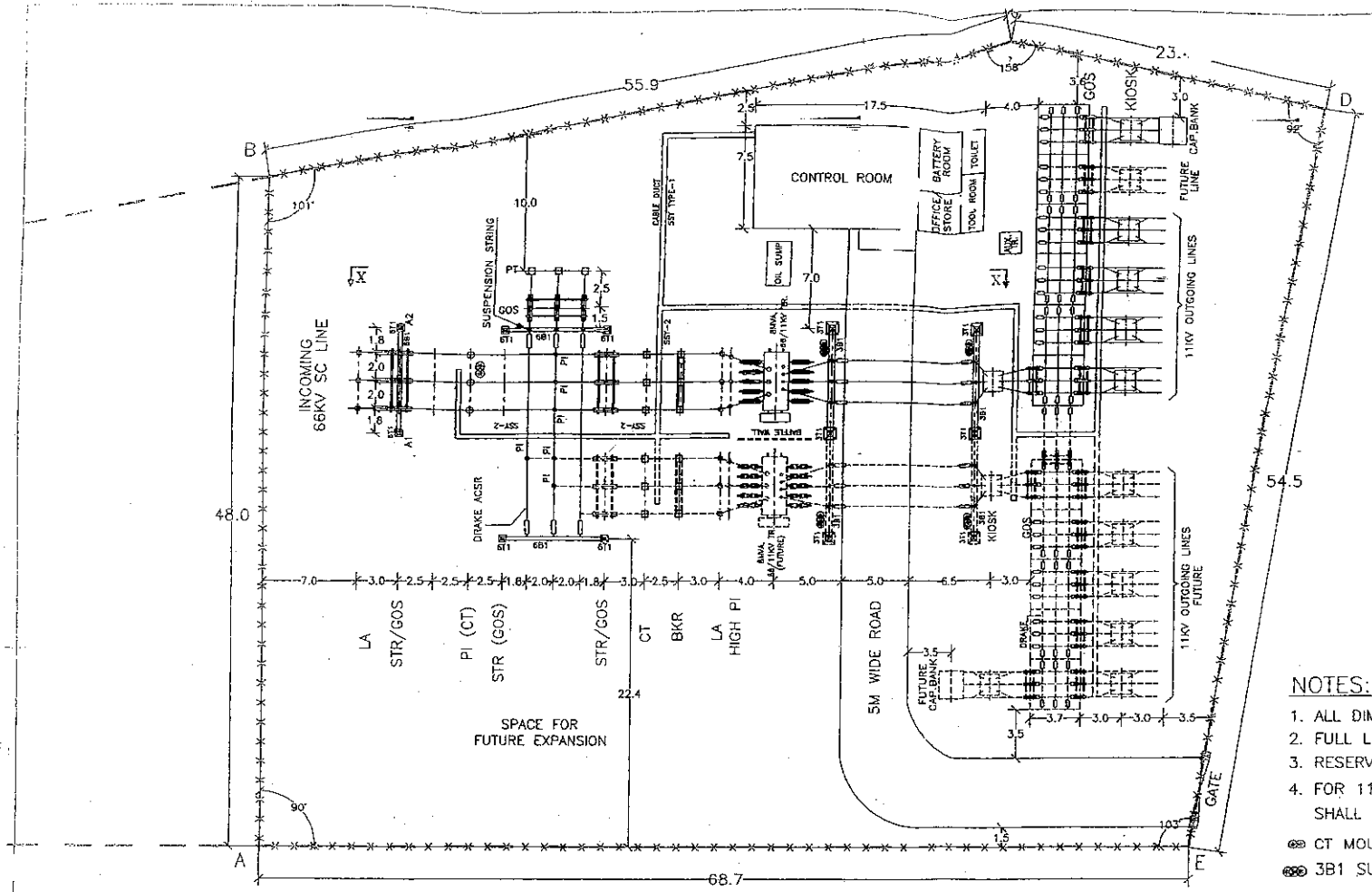
KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

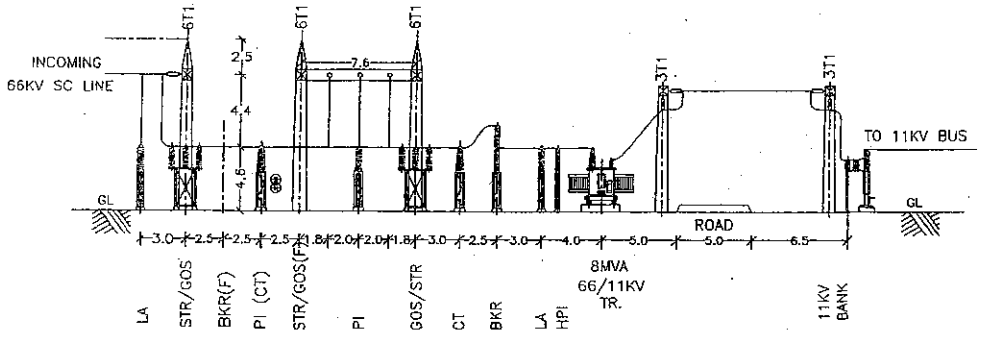
LAY OUT DIAGRAM FOR THE PROPOSED 66/11KV SUB STATION AT DODDALAHALLI, KANAKAPURA TALUK, BANGALORA RURAL DISTRICT.

DRG.NO.KPTCL/TECH/SS-66/615A-R2 DATE: 16.01.2016 SCALE- NTS SHEET 1 OF 3

LAKSHMI DEVI.G				
J.E	A.E.E	E.E	S.E(TECH)	CCE (P&C)
DRN	CHD	SUB	REC	APPROVED

Proposed for 66/11kV Hoggunds.





ENLARGED SECTION THROUGH 'XX'

NOTES:-

1. ALL DIMENSIONS ARE IN METRES.
2. FULL LINES INDICATE PROPOSED & DOTTED LINES FUTURE.
3. RESERVE SPACE FOR FUTURE EXPANSION AS SHOWN.
4. FOR 11KV CROSSING 3T1 WITH BOLTED TYPE FOUNDATION SHALL BE PROVIDED.

CT MOUNTING STRUCTURE WITH PI'S

3B1 SUITABLE FOR 7.6M BAY WIDTH.

5. THE 66KV SWITCH YARD WITH BOUNDRY 'ABCDE' SHALL BE FIXED WITH RESPECT TO THE EXISTING ROAD LEVEL(RL). THE CUTTING & FILLING QUANTITIES SHALL BE FINALISED BASED ON RL FIXED.

KARNATAKA POWER TRANSMISSION CORPORATION LIMITED				
LAY OUT DIAGRAM FOR THE PROPOSED 66/11KV SUB STATION AT HEGGANUR IN KANAKAPURA TALUK, RAMANAGARA DISTRICT.				
DRG.NO.KPTCL/TECH/SS-66/925-A		DATE: 07.09.2015	SCALE:- NTS	SHEET 1 OF 3
LAKSHMI DEVI.G				
J.E	A.E.E	E.E	S.E(TECH)	CEE (P&C)
DRN	CHD	SUB	REC	APPROVED

NOTES:-

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. STRUNG BUS IS PROPOSED FOR 66KV MAIN BUS.
3. a) 66KV SWITCHYARD WITH BOUNDARY 'ABCDE' SHALL BE FIXED WITH RESPECT TO THE EXISTING ROAD LEVEL(RL).THE CUTTING & FILLING QUANTITIES SHALL BE SHALL BE FINALISED BASED ON RL FIXED.
   b) SWITCH YARD FENCING SHALL BE PROVIDED ALONG THE BOUNDARY LINE 'ABCDE'/ RETAINING WALL SHALL BE PROVIDED WHERE EVER NECESSARY ALONG THE BOUNDARY LINE.
   c) 5M WIDE APPROACH ROAD SHALL BE PROVIDED IN THE STATION SITE INCLUDING THAT IN THE SWITCH YARD AS INDICATED IN THE SITE PLAN & DETAILED LAYOUT PLAN.
4. FOR DETAILS OF BOUNDARY DIMENSIONS & CO ORDINATES, REFER DRG. TOPOGRAPHICAL SURVEY WITH BLOCK LEVELS.
5. CONTROL ROOM OF SIZE 17.5X7.5M OF STANDARD CONTROL ROOM BUILDING IS PROPOSED FOR THIS STATION.
6. TO FIX EXACT LOCATION OF STATION YARD, FIRST FIX THE 66KV STRUCTURE LINE A1-A2 WITH CO ORDINATES OF POINTS GIVEN BELOW.

POINTS	N-S	E-W
A1	29.5	-30.0
A2	29.5	-37.6

7. FOR BILL OF MATERIALS/EQUIPMENTS/STATION STRUCTURES & MOUNTING STRUCTURES REFER ANNEXURE- SCHEDULE OF REQUIREMENTS.
8. ROUTE OF PROPOSED CABLE DUCT FOR SSY -1 & SSY-2 TYPES ARE INDICATED IN THE LAYOUT PLAN. FROM MAIN CABLE DUCTS ie. SSY-1 & SSY-2 TYPE TO THE RESPECTIVE EQUIPMENTS 'E' TYPE HUME PIPE SHALL BE PROVIDED FOR THE COMBINATION OF CONTROL & POWER CABLE & 'F' TYPE SHALL BE PROVIDED FOR ONLY CONTROL CABLE/ POWER CABLE. REFER TYPES OF CABLE DUCT DRAWING FOR OTHER DETAILS.
9. SPACE IS EARMARKED ON EITHER SIDE OF 66KV BAYS FOR FUTURE PROVISION, DEPENDING UPON THE ORIENTATION OF 66KV LINES. THE BAYS CAN BE EXTENDED ON ANY SIDE.
10. CABLE DUCT WHICH CROSSES 5M WIDE ROAD SHALL BE SUITABLY DESIGNED TO TAKE CARE OF THE LOAD OF THE VEHICLE WITH TRANSFORMER.
11. APPROVED IN 65TH TCC MEETING DATED:28.02.2015
12. OTHER REFERENCE DRAWINGS-
    a) SITE PLAN WITH BLOCK LEVEL.
    b) CROSS SECTION THROUGH VARIOUS BAYS.
    C) SINGLE LINE DIAGRAM

TECHNICAL PARTICULARS

SL.NO.	PARTICULARS	66KV STRUNG BUS
1.	BASIC INSULATION LEVEL (KV)	325
2.	MINIMUM CLEARANCES	
	a) BETWEEN PHASES	2.0 M
	b) BETWEEN PHASE TO EARTH (CENTRE LINE OF TOWER)	1.8 M
	c) SECTIONAL CLEARANCE	3.0 M
3.	a) HEIGHT OF CROSS BUS CONDUCTOR	4.6 M
	b) BAY WIDTH	7.6 M
	c) HEIGHT OF MAIN BUS	9.0 M
4.	HEIGHT OF CENTRE OF TERMINAL PAD PERTAINING TO VARIOUS EQUIPMENTS	
	a) ISOLATORS ADJACENT TO MAIN BUS	4.6 M
	b) OTHER ISOLATORS AND EQUIPMENTS	4.6 M
5.	MATERIALS OF THE BUS	
	a) MAIN ALUMINIUM TUBE BS 1600 SCH.40	-
	b) MAIN STRUNG BUS	DRAKE
	b) CROSS BUS	DRAKE
	i) ALUMINIUM TUBE BS.1600 SCH.40	-
	ii) ACSR CONDUCTOR	DRAKE
6.	POST INSULATORS USED FOR BUS SUPPORTS AS PER IS 5350 PART II & III	
	a) NO.OF UNITS/STACK	1
	b) VOLTAGE CLASS	66KV
	c) HEIGHT OF INSULATOR STACK (MM)	770
	d) PITCH DIA HOLES AT TOP (MM)	127
	e) NO. OF FIXING BOLTS	4
7.	a) 11KV, 120KN DISC INSULATORS	
	i) TENSION STRING	3
	B) 11KV, 90KN DISC INSULATORS	
	i) SUSPENSION STRING	3

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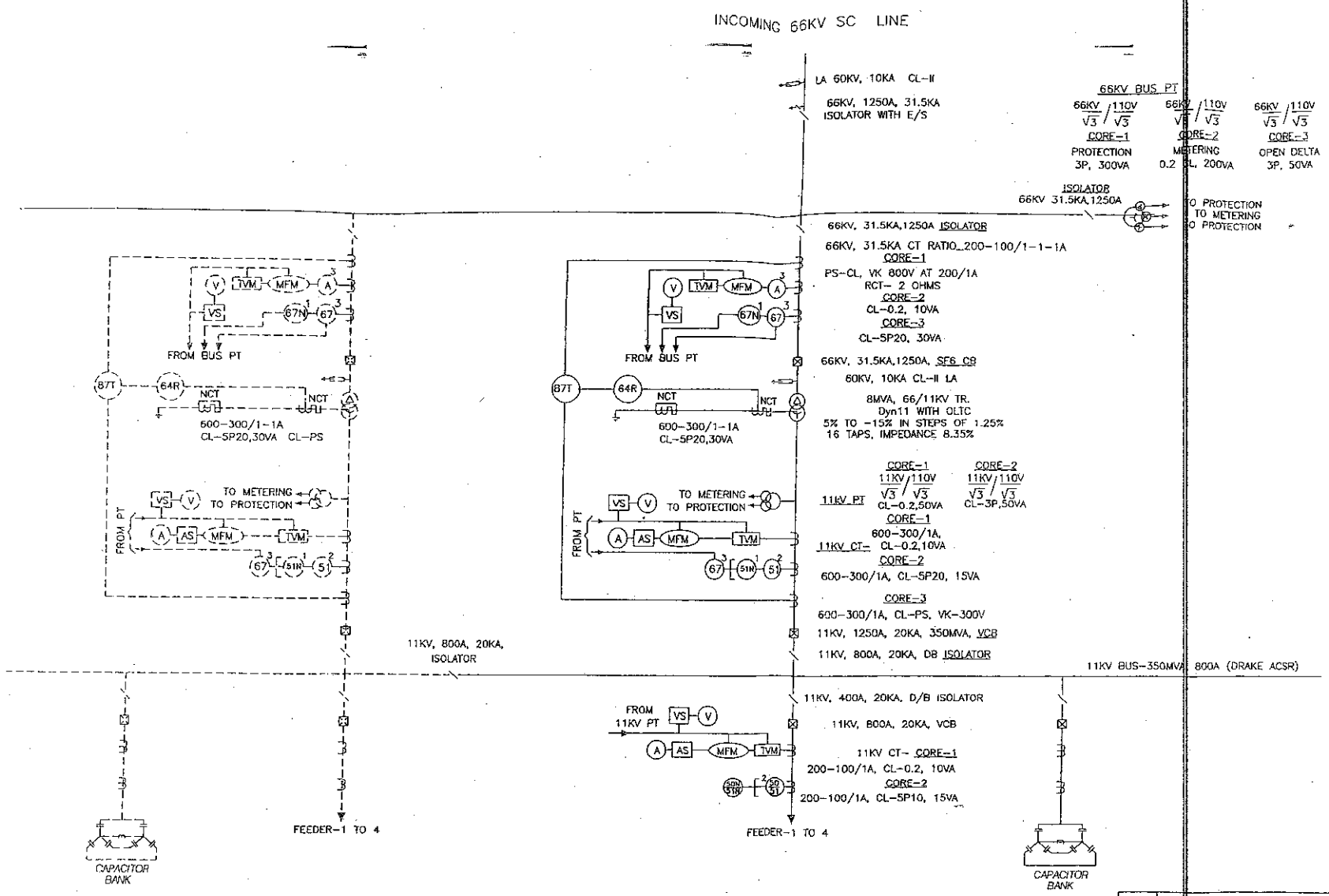
KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

TECHNICAL PARTICULARS OF 66/11KV SUB-STATION AT AT HEGGANUR, KANAKAPURA TALUK, RAMANAGARA DISTRICT.

DRG.NO.KPTCL/TECH/SS-66/925	DATE: 07.09.2015	SCALE:- NTS	SHEET 2 OF 3

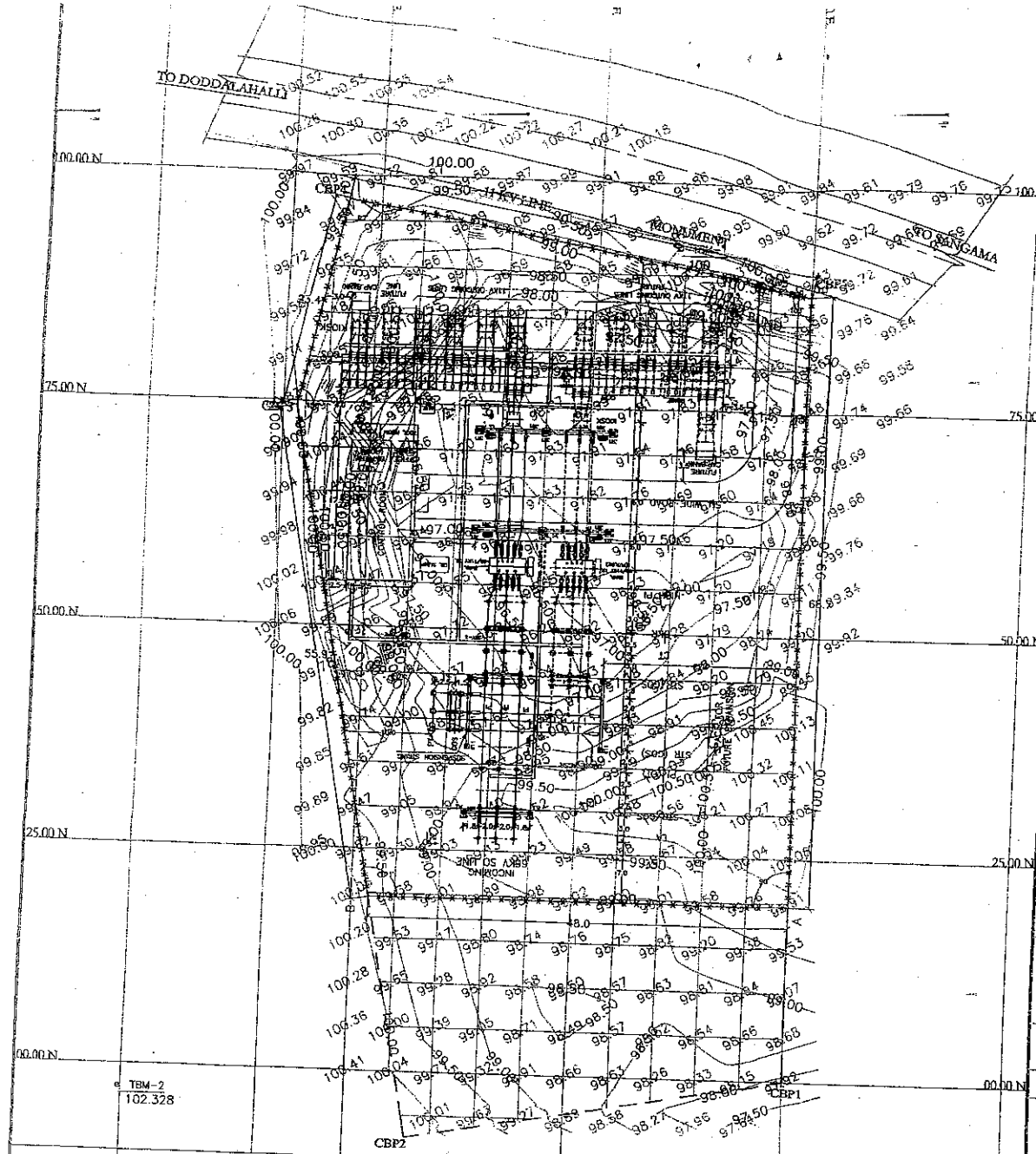
LAKSHMI DEVI.G				
J.E	A.E.E	E.E	S.E(TECH)	CEE (P&C)
DRN	CHD	SUB	REC	APPROVED



KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

SINGLE LINE DIAGRAM OF PROPOSED 66/11kV SUB STATION
HEGGANUR, KANAKAPURA TALUK, RAMANAGARA DISTRICT.

DRG.NO.KPTCL/TECH/SS-66/925-A		DATE:07.09.2015	SCALE- NTS	SHEET 3 OF 3
LAKSHMI DEVI.G	A.E.E	E.E	S.E(TECH)	CEE (P&C)
DRAWN	CHD	SUB	REC	APPROVED



NOTE:-

1. THE 66KV SWITCH YARD WITH BOUNDRY 'ABCDE' SHALL BE FIXED WITH RESPECT TO THE EXISTING ROAD LEVEL(RL). THE CUTTING & FILLING QUANTITIES SHALL BE FINALISED BASED ON RL FIXED.

N

Area Statement

AREA WITHIN BOUNDARY POINTS

CBP1 to CBP5 = 5030.44 Sqm

NOTE:-

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.

2) BLOCK LEVELS ARE RELATIVE TO MAIN OFFICE BUILDING.

3) A BENCHMARK TBM-1 HAS BEEN ESTABLISHED ON THE PLINTH OF SANGAMA MONUMENT AND ASSIGNING IT TO A VALUE OF 100.00 ARBITRARILY

CO-ORDINATES

STATION	EASTING	NORTHING
CBP1	00.00	00.00
CBP2	-42.90	-09.49
CBP3	-58.42	[illegible]
CBP4	-53.65	[illegible]
CBP5	00.00	[illegible]

BOUNDARY

LENGTH M FT	LENGTH M FT	LENGTHS	ANGLE DEGREES STATION	ANGLE
CBP1	CBP2	43.55	CBP1	26.602°
CBP2	CBP3	83.45	CBP2	88.617°
CBP3	CBP4	23.36	CBP3	167.614°
CBP4	CBP5	54.42	CBP4	89.157°
CBP5	CBP1	88.26	CBP5	89.082°

LEGEND

Perimeter Boundary with Pillars, Wire Fence

Main Power line with Pylons, Power line, Telegraph/Telephone line

Road : Metalled, Unmetalled, Cart track, Footpath

Building : Permanent, Under construction, Temporary

Nala : Defined, Undefined, Stream : Defined, Undefined

Hut, Borewell, Pumphouse, Temple, Hand Pump — PH

Embankment, Cutting, Quarry, Hedge

Boulders, Rockyground, Relative height — .2r

Contour and form line with value, Sheet rock, Cliff, Field Bund — 600

Trees : Ordinary, Coconut

Temporary Bench Mark, Spot level — BM TBM-1 / 100

CLIENT	KARNATAKA POWER TRANSMISSION CO.LTD
TITLE	CONTOURING & BLOCK LEVEL SURVEY PLAN OF THE SITE PROPOSED FOR 66/11 KV SUBSTATION @ SY. NO.79 OF HEGGANUR VILLAGE, KANAKAPURA TQ, RAMANAGARA DIST.
SURVEY CONSULTANTS	B R ASSOCIATES Engineers & Contractors Regd Off : # 980, B.M. Shivkhab Talabad Complex, 1st Floor, 3rd Main, Nagendra Block, 30th Main Road, BSK III Stage, BANGALORE - 560050 Ph No: 080-26728563 Mob: 9448048372,984 [illegible] E-mail: brassociates@gmail.com
SEASON AUGUST 2015	5M 0 5 10 15 20 25M
SCALE 1:1000	5M 0 5 10 15 20 25M

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KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

BLOCK LEVEL DIAGRAM FOR THE PROPOSED 66/11KV SUB STATION AT HEGGANUR, KANAKPURA TALUK, RAMANAGARA DISTRICT.

DRG.NO.KPTCL/TECH/SS-66/825-B DATE:07.09.2015 SCALE:-NTS SHEET 1 OF 1

LAKSHMI DEVI.G				
J.E	A.E.E	E.E	S.E(TECH)	CEE (P&C)
DRN	CHD	SUB	REC	

Karnataka Power Transmission Corporation Limited

Ph No: 080-22105764
Fax No: 080-22105766
Email: seernd@gmail.com

Office of the
Chief Engineer Electy.,
RT and R&D,
K.P.T.C.L., Kaveri Bhavan
Bengaluru-560 009

No: CEE/SEE/R&D&Hotlines/EEE/KCO-126/F-5(23)/2015-16/ 1679-81 Date: 22-9-15

To:
The Chief Engineer Electy.,
Transmission zone, KPTCL,
A.R.Circle, Bengaluru.

Sir,

Sub: Designing of Earthmat for establishing 66/11kV, 1x8MVA sub-station at Hegganuru in Kanakpura Taluk, Ramanagara district.

Ref: 1. Ltr. no. EEE/MWD(R)/AEE(O)/15-16/790-92 dtd 01.09.2015 of Executive Engineer(Ele.), Major works division, Ramanagara.

2. Ltr. no.: SEE/R&D&Hotlines/EEE/KCO-126/C2/2015-16/1537-42 dtd 04.09.2015 of the Superintending Engineer (Ele.), R&D and Hotlines.

3. Layout drawing no.: KPTCL/TECH/SS-66/925-A, dtd 07.09.2015 of Chief Engineer Electy., P&C, Kaveri Bhavan.

4. Ltr no.: CEE/P&C/SET/EET-2/AEE-5/KCO-107/F-444/34785/15-16/6223-31, dtd 14.09.2015 of Chief Engineer Electy., P&C, Kaveri Bhavan.

****

With reference to the above, I am herewith enclosing the earthmat drawing for proposed 66/11 kV sub-station at Hegganuru in Kanakpura Taluk, Ramanagara district by considering Power Transformer capacity of 2 x 8 MVA, 66/11kV class for the present fault level (2016-17), along with general guidelines for laying earthmat for further needful.

Yours Faithfully

22/9/15

Chief Engineer, Electy., R&D
RT and R&D

Copy to:

1. The Superintending Engineer (Ele.), Transmisssion Works circle, KPTCL, Bengaluru.
2. The Superintending Engineer (Ele.), R&D and Hotlines, KPTCL, Kaveri Bhavan, Bengaluru.
3. The Executive Engineer (Ele.), Major Works Division, KPTCL, Ramanagara along with copy of earthmat drawing.
4. [illegible]

ARTHMAT FOR THE PROPOSED 66 KV STATION @ HEGGANURU IN KANAKPURA TALUK,BENGALURU DISTRICT

IMPORTANT

NOT TO SCALE

* THE NO OF CAST IRON PIPE ELECTRODES SHALL BE PROVIDED AS PER GUIDELINES (ITEM 2, 4, 5 & 12 OF GUIDELINES)

* BEFORE EXECUTION PLEASE CAREFULLY GO THROUGH THE ENCLOSED GUIDELINES *

* ALL DIMENSIONS ARE IN METER

SALIENT DESIGN FEATURES

AREA COVERED BY EARTHMAT IN SQ MTR	3578
DEPTH OF BURIAL OF EARTHMAT IN MTR	0.9
SPACING BETWEEN MAT CONDUCTOR (M.S. FLAT) IN MTR	2
SIZE OF EARTHMAT CONDUCTOR (M.S.FLAT) IN MM	50 X 6 MM

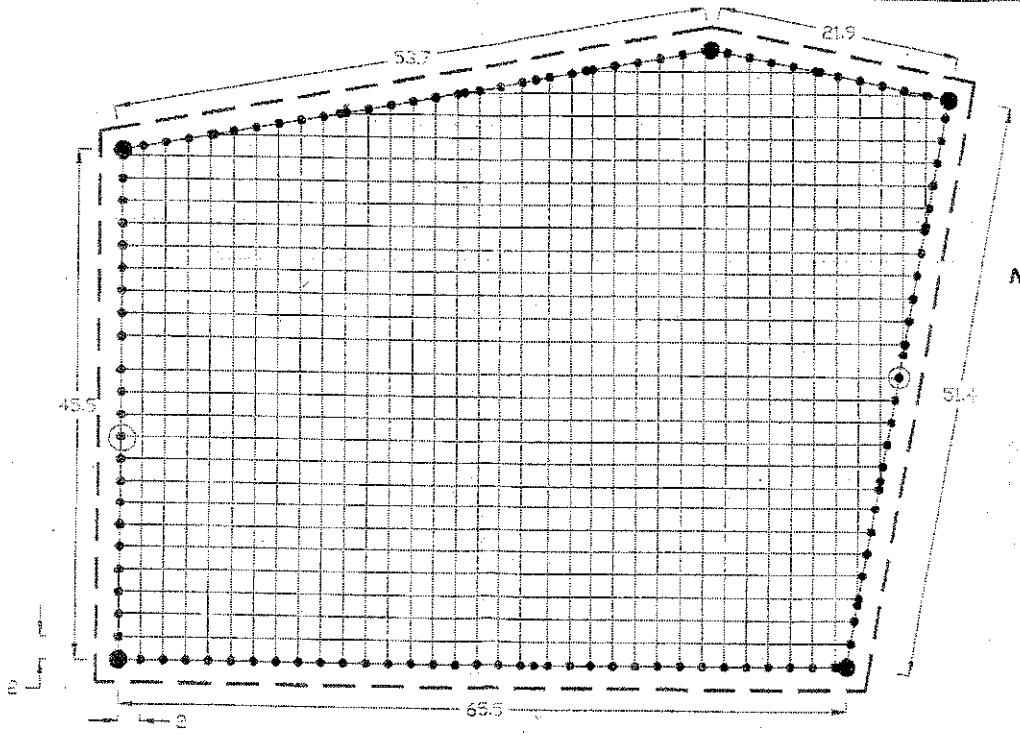
SPREADING OF GRANITE METAL JELLY OF SIZE 20/25 MM TO A HEIGHT OF 100 MM OVER THE ENTIRE EARTH MAT AREA.

BILL OF MATERIALS (APPROXIMATE QUANTITY) FOR EARTHMAT FORMATION & FENCING.

REF: 1) Letter no.: CEE(P&C)/SET/EET2/AEE-5/KCO-107/F-443/34785/S-16/5223-31 dtd 14.09.2015 of CPE, PMC.

2) Letter no.: EEE/MWD(R)/AEE(O)/15-16/790-92 dtd 01.09.2015 of EEE, MWD, Ramanagara.

1.Excavation,formation,refilling	1532	Cmd.
2.Material for formation of earthmat as per specification		
a)M.S.Flat 50 X 6 MM	2112	Mtr.
b)MS Round rods 25 mm dia,1.05 Mt. long	126	No.
c)G.I.Flats 50 X 6 MM for earth connection	471	Mtr.
d)Cast iron pipe electrodes of 100 mm Id,13 mm thick,2.75 mtr.long	39	No.
e)Spreading of Granite metal jelly of size 20/25 mm size to a height of 100 mm	356	Cmd.
f) Deep Bore electrodes of 40mm dia, 10m long	2	No.



NOTE: Designed by considering 2 x 8 MVA, 66/11kV class Power transformers for present fault level.

— — FENCE SHALL BE AT A MINIMUM DISTANCE OF 1.5 METERS AWAY FROM THE PERIPHERY OF THE STATION EARTHMAT

25 MM DIA M.S. ROUND RODS OF LENGTH ONE METER TO BE DRIVEN AS SHOWN

ADDITIONAL C.I.PIPE ELECTRODES PROPOSED (REF.ENCLOSED SKETCH)

DEEP BORE ELECTRODES OF 40mm DIA, 10m LONG, 2 nos.

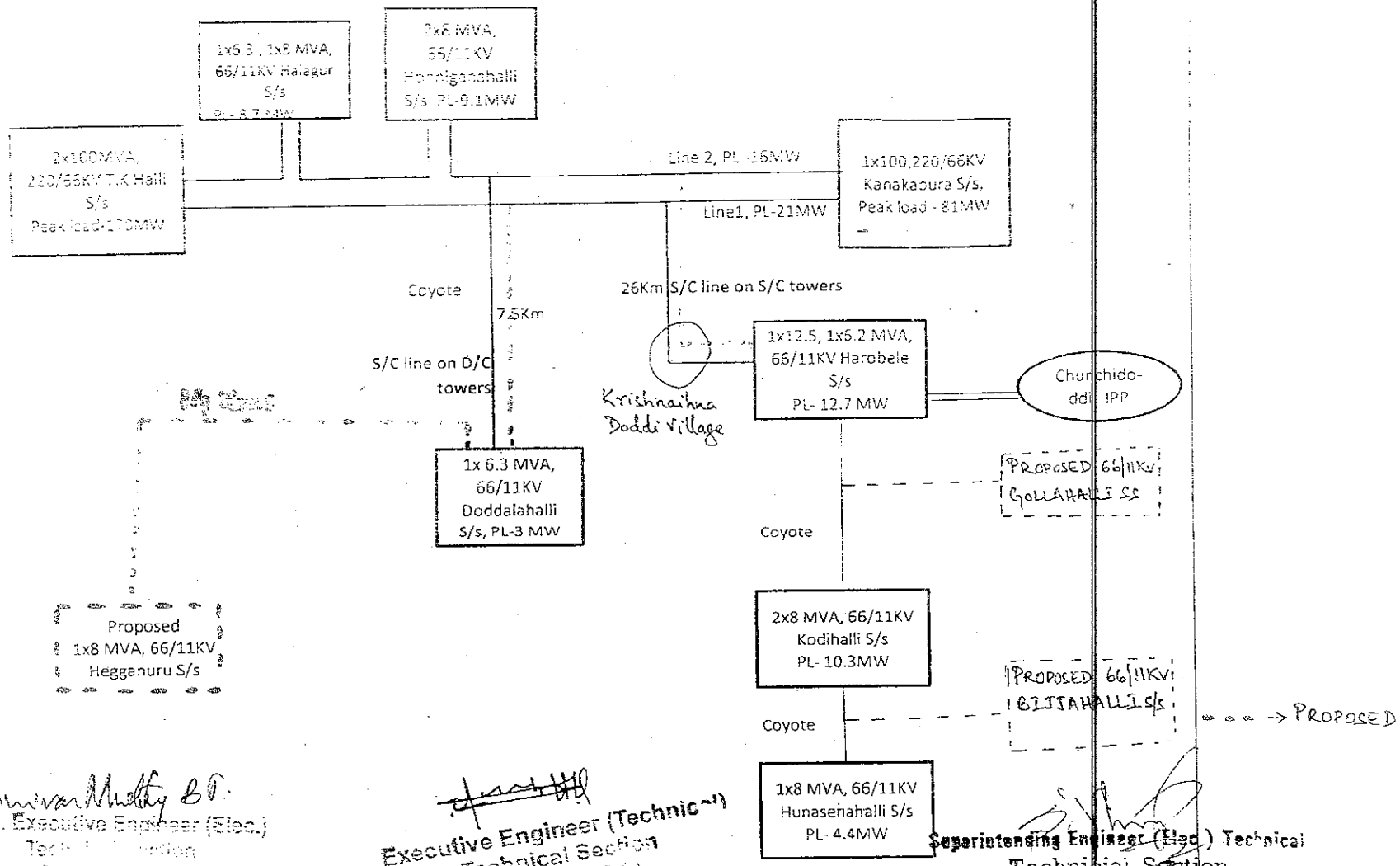
R & D CENTRE, K P T C L

DRG NO. CEE/SEE/R&D/EEE/KCO-126/F-5 (23) Dtd. 21-9-2015

AEEE	EEE	SEE	CEE

ANNEXURE-I

SKETCH OF LINE SCHEME FOR PROPSED 66/11KV HEGGANURU S/S IN KANAKAPURA TALUK



Srinivas Murthy B.T.
Asst. Executive Engineer (Elec.)
Technical Section
Bangalore-9.

Executive Engineer (Technical)
Technical Section
O/o. CEE (P & C)
KPTCL, Kaveri Bhavan, Bangalore-9

Superintending Engineer (Elec.) Technical
Technical Section
O/o. Chief Engineer, Electricity
(Planning & Co-ordination)
K P T C L Kaveri Bhavan Bangalore

Also, the committee observed that, connected load to an extent of 11,032 kVA out of 58,589 kVA of 66 kV Kanakapura sub-station is proposed for transfer on to proposed 66/11 kV sub-station at Allimaranahalli.

In view of the above, and on recommendation of Director (Technical), BESCOM Committee approved the proposal of establishing 1x12.5 MVA, 66/11 kV sub-station at Allimaranahalli village in Kanakapura Taluk, Ramanagra District by constructing 66 kV tap line from 66 kV Kanakapura-Chikkenanahalli line for a distance of 1 kms.

Decision: Approved.

Action: CEE, TZ Bengaluru.

Subject 13: Establishing 1x8 MVA, 66/11 kV sub-station at **Hegganur** in Kanakapura Taluk, Ramanagara District.

Proposed by: CEE, Bengaluru Transmission Zone. **Sketch BNG-1 Page No: 80**

Report:

1. At present, Hegganur in Kanakapura Taluk, Ramanagara District is fed from the following sub-station.

Sl. No.	Name of the sub-station	Installed capacity in MVA	Total DTC capacities connected in kVA	Sub-station peak load in MW
1	66/11 kV Harobele	2x12.5	38459	9.5

2. The areas around Hegganur are fed from 2 numbers of 11 kV feeders from 66/11 kV Harobele sub-station. The details of the feeders feeding in and around the location of the proposed sub-station is given in the table below.

Sl. No.	Name of the Station	Name of the Feeder	Type of conductor	Length of the Feeder in KM	Connected load in KVA	Peak load in Amps	%Voltage regn	AEL in MU
1	66/11kV Harobele	HF-5 Sangam	Rabbit	28	7749	190	26.99	2.71
		HF-12 Marale	Rabbit	50.92	1681	60	22.30	0.89
		Total			**9430**			**3.6**

3. The following alternatives are studied.

   a) Alternative-I:

   i) **Proposal :** In this proposal, strengthening of existing 11 kV trunk lines feeding the proposed 66 kV Hegganur sub-station area with existing Rabbit by Coyote ACSR has been studied.

SL. No	Name of the Sub-station	Name of the Feeder	Length of Feeder in Km	Connected Load in kVA	Peak Load in Amps	% VR	Annual Energy Loss in MU
1	66/11 kV sub-station Harobele	HF-5 Sangam	28	7749	190	17.40	1.1
		HF-12 Marale	50.92	1681	60	7.89	0.18
		Total		**9430**			**1.28**

ii) **Features:**

- After strengthening the voltage regulation ranges from 17.40% to 7.89%.
- The estimated cost of this proposal is ₹. 255.20 Lakhs.
- Annual energy savings for this proposal is = 3.6-1.28 =2.32 MU/Annum
- BCR works out to be 2.94.
- Even though the BCR works out be 2.94, the future load growth cannot be met by this and the feeders will remain lengthy with interruption & regulation being on higher side.

b) Alternative-II:

i) **Proposal:** Establishing 1x8 MVA, 66/11 kV sub-station at Hegganur in Kanakapura Taluk, Ramanagara District by taping the existing 66kV Harobele – Chunchi line and constructing 66 kV SC line on DC towers for a distance of 5.0 Kms.

SL. No.	Name of the Sub-station	Name of the Feeder	Length of Feeder in Km	Connected Load in kVA	Peak Load in Amps	% VR	Annual Energy Loss in MU
1	66/11 kV Harobele	HF-5 Sangam	14.63	4052	100	6.88	1.31
		HF-12 Marale	38	980	60	6.43	0.13
		Total		**5032**			**1.44**
2	Proposed 66/11kV Hegganur	New F-1 Marale	22.72	701	30	6.22	0.13
		New F-2 Sangam	13.37	3697	90	4.05	0.21
		Total		**4398**			**0.34**
		Grand total		**9430**			**1.78**

ii) **Features:**

- Peak load of 66 kV Harobele - Chunchi SC line is 8 MW.
- The voltage regulation ranges from 4.5% to 6.88% (within the permissible limits)

- The estimate cost of ₹. 502.50 Lakhs was studied with formation of 2 numbers of 11 kV feeders.
- The annual energy savings in the system for this proposal is =3.6-1.78=1.82 MU/annum
- The BCR works out to be 1.18.

iii) **Recommendation of CEE, TZ Bengaluru:** Re-conductoring of existing 11kV line by Coyote ACSR conductor will not improve voltage regulations to the tail end of the system. Hence, establishment of new sub-station at Hegganur by taping the existing 66kV Harobele – Chunchi line and constructing 66 kV SC line on DC towers for a distance of 5.0 Kms. and drawing 2 No's of 11KV feeders are proposed. The Voltage regulation can be brought within permissible limits. The energy savings is found to be 1.82 MU/annum and BCR works out to 1.18. The interruptions can be minimized. Reliable power supply can be provided. Future load growth can be met. The load transfer from the surrounding sub-station on to the proposed 66 kV Hegganur sub-station is as follows.

Sl. No.	Name of the sub-station	Capacity and voltage class	Connected Load in kVA			Peak Load in MW	
			Existing	Transferred to 66 kV Hegganur sub-station	Residual	Before	After (Calculated)
1	66/11 kV Harobele	2 x 12.5 MVA	38459	4398	34061	9.5	8.41

4. Planning section Comments: It is proposed to tap 66 kV Harobele-Chunchi DC line which is connected to Chunchi Generating station (IPP).

Discussion: *The Committee discussed the subject in detail. The Committee noted that, at present Hegganur village surrounding areas are fed from two numbers of feeders from 66/11 kV Harobele sub-station. The length of the 11 kV lines is above 50.92 and 28 kMs. The Voltage Regulation for all the two feeders feeding the area is about 26.99 & 22.3 %.*

Director (Technical) BESCOM has submitted to the Committee that the existing 66/11 kV Harobele sub-station with 2x 12.5 MVA 66/11 kV installed capacity has recorded the peak load of 9.5 MW and are loaded 40%. Even though 66/11 kV Harobele sub-station is not loaded these two 11 kV lines are very lengthy (28 & 50.92 kMs) and voltage regulation is more(26.99 &22.30). Since the 11 kV line is lengthy, maintenance of the line is difficult and lot of interruptions are being occurred. Also, clearance of interruption is taking too much time causing public grievance.

Further, the Committee observed that by establishing 66/11 kV sub-station at Hegganur village, the following objectives can be achieved.

a) There will be reduction in the length of 11 kV feeders feeding that area which reduces the interruptions.

b) Tail end voltage of these 11 kV feeders will also improve.

c) The savings of energy in more.

d) Future load growth can be catered.

e) There will be improvement in voltage profile of the areas fed from the proposed 66/11 kV Hegganur sub-station.

Also, the committee observed that, connected load to an extent of 4398 kVA out of 38459 kVA of 66 kV Harobele sub-station is proposed for transfer on to proposed 66/11 kV sub-station at Heggnur.

However, CEE, TZ Bengaluru has proposed for taping the existing 66kV Harobele – Chunchi line constructed by an IPP at Chunchidoddi which is not permissible. The Committee observed in the network map that 66 kV Harobele and Doddaalahaali are the two nearby sub-station from which proposed 66 kV Hegganur sub-station can be radially fed. Both of these sub-stations are at a distance of about 13 to 14 kMs from Hegganur. It was submitted to the Committee that proposal of construction 66 kV line between Doddalhalli and Harobele sub-station have been approved in the earlier TCC meeting and this line can also be tapped to feed proposed 66/11 kV Hegganur sub-station. But, the Committee is of the opinion that it would be appropriate to construct a radial line to have control over the line in case of emergencies. Hence the Committee instructed to draw a radial line from 6 kV Doddalahalli sub-station to feed proposed 66 kV Hegganur sub-station

In view of the above, and on recommendation of Director (Technical), BESCOM Committee approved the proposal of establishing 1x8 MVA, 66/11 kV sub-station at Hegganur in Kanakapura Taluk, Ramanagara District ***by constructing 66 kV SC line on DC towers Doddalahalli sub-station for a distance of about 14 kM duly constructing a 66 kV GIS bay.***

Decision: Approved with above transmission scheme.

Action: CEE, TZ Bengaluru.

Subject 14: Establishing 1x8 MVA, 66/11 kV sub-station at **Maniyambal village** in Kanakapura Taluk, Ramanagara District.

Proposed by: CEE, Bengaluru Transmission Zone. **Sketch BNG-1 Page No: 80**

KCO-98- 330868

BANGALORE ELECTRICITY SUPPLY COMPANY LIMITED

(Wholly owned by Government of Karnataka Undertaking)

No: BESCOM/CGM(O)/DGM(op-3)/AGM(op-2)/BC-5/F-505/15-16/4678
Encl: Statement 1 to 4 [48 Sheets]

Corporate Office,
K.R. Circle, Bangalore-560 001
Date:- 15 JUL 2015

Chief Engineer(Electricity.),
Planning and Co-ordination,
KPTCL, Kaveri Bhavan,
Bangalore.

Sir,

Sub: Proposal for Annual Program of works of KPTCL for FY 2015-16

Please find here in enclosed the list of proposals for establishing New Stations, Augmentation, Station / Transmission Network Constrains and Requirement of Additional Switchgears in the Stations along with the details of recommendations from Hon'ble Ministers/MLAs/MPs/others and duly considering the overloading of existing stations and expected load growth.

It is hereby requested to include these proposals in the Annual Program works of KPTCL for FY 2015-16 and take necessary action at the earliest

Yours faithfully,

15/07/15

Chief General Manager(Elec.)
Operations, BESCOM'

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ಅ. ಇಂ. (ಯೋಜನೆ)
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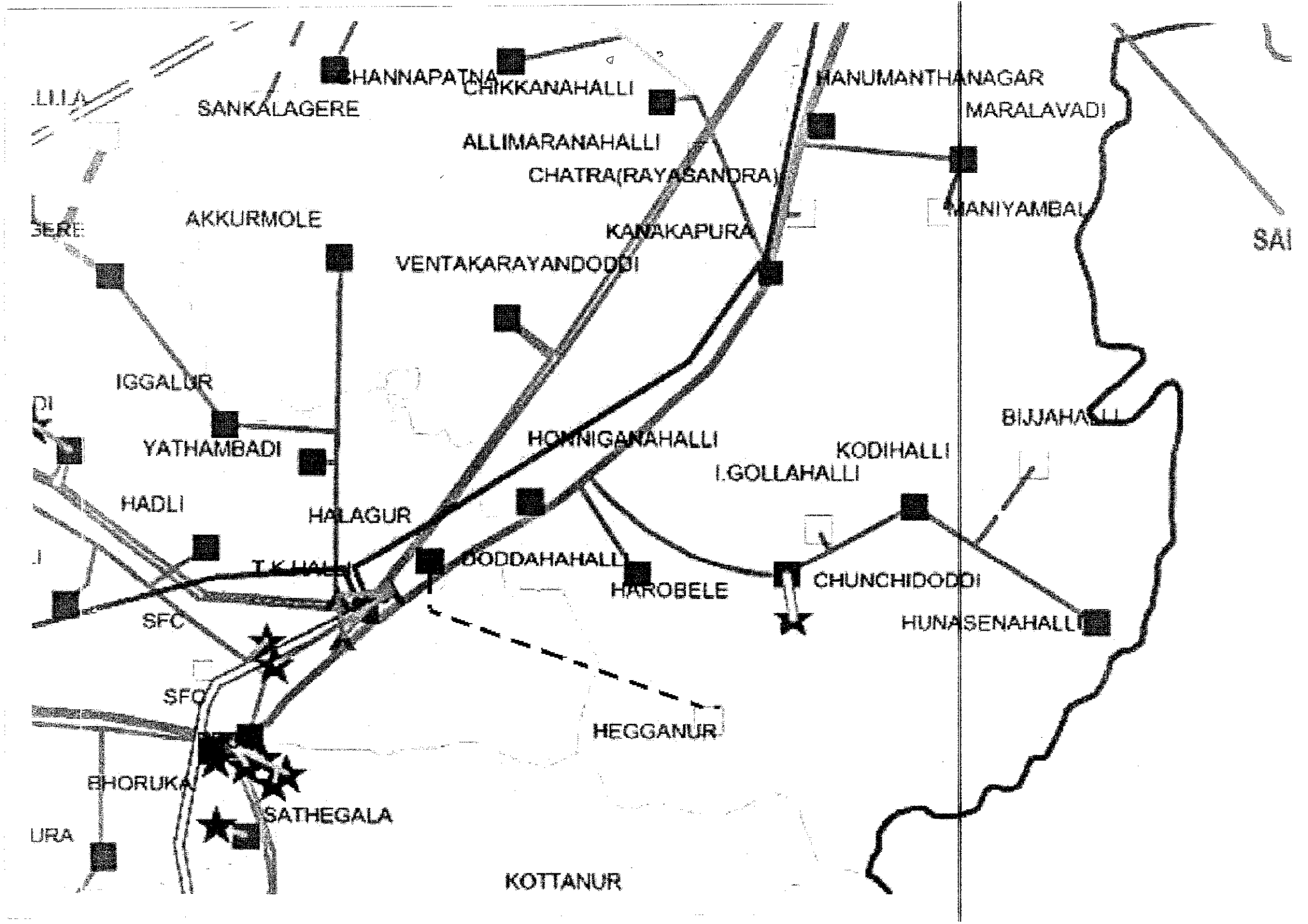
EE plg (S)
HMS
16/7

KCO-95/88/92
16/7

Sl. No	Circle	Place of proposed S/S	Capacity in MVA	Voltage class IN kv	Taluk	Dist	Details of Hon'ble Minister/ MLA/MP/ Others letters	Status of Land Availablity	TCCM/ TAC Status	Names of nearby Stations including works included in APW 2014-15feeding the area	Capacity of near by Stations	Peak load of nearby Stations in MW	Distance of nearby Stations to proposed Station	Reasons for the proposal of new Station
17	RMG	Rayasandra (Chatra)	2x8	66/11 kV	Kanakapura	Ramanagara	Shri D.K.Shivakumar / D.K.Suresh	Land available with KPTCL	Approved in 63rd TCCM	Kanakapura	2*20 MVA	27.45	6 Kms	To release the load on Kanakapura MUSS
18	RMG	Aralimaranahalli	1X12.5	66/11 kV	Kanakapura	Ramanagara	Shri D.K.Shivakumar / D.K.Suresh	to be identified	Approved in 65rd TCCM	Chikkenahalli	2*12.5 MVA	12	5.3 Kms	To release the load on Chikkenahalli MUSS
19	RMG	Bijjalli	1X8	66/11.kV	Kanakapura	Ramanagara	Shri D.K.Shivakumar / D.K.Suresh	to be identified	Approved in 65rd TCCM	Kodihalli	2*8 MVA	9.5	12 Kms	To release the load on Kodihalli MUSS
20	RMG	Hegganur	1X8	66/11 kV	Kanakapura	Ramanagara	Shri D.K.Shivakumar / D.K.Suresh	to be identified	Approved in 65rd TCCM	Doddalahalli	1*6.3 MVA	3.4	15 Kms	To release the load on Doddalahallii MUSS
21	RMG	Kenchanahalli	1X8	66/11 kV	Kanakapura	Ramanagara	Shri D.K.Shivakumar / D.K.Suresh	land identified	Under rpocess	Honniganahalli	2*8 MVA	11.6	22 Kms	To release the load on Honniganahalli MUSS
22	RMG	B.V.Halli	1X8	66/11 kV	Channapattana	Ramanagara	Shri Yogeshwar / D.K.Suresh	Land available with KPTCL	Approved in 43rd TCCM	Channapatna	1*20 MVA 1*12.5 MVA	24	6 Kms	To release the load on Channapattanna MUSS
23	RMG	Vandaraguppe	1X8	66/11 kV	Channapattana	Ramanagara	Shri Yogeshwar / D.K.Suresh	Land available with KPTCL	Approved in 43rd TCCM	Channapatna	1*20 MVA 1*12.5 MVA	24	8 Kms	To release the load on Channapattanna MUSS
24	RMG	Dashavara	1X8	66/11 kV	Channapattana	Ramanagara	Shri Yogeshwar / D.K.Suresh	Alternate land to be identified	Approved in 43rd TCCM	Bevoor	1*6.3 MVA 1*12.5 MVA	10	7 Kms	To release the load onBevoor MUSS


HANNAPATNA
CHIKKANAHALLI
HANUMANTHANAGAR
SANKALAGERE
MARALAVADI
ALLIMARANAHALLI
CHATRA(RAYASANDRA)
MANIYAMBAL
AKKURMOLE
KANAKAPURA
VENTAKARAYANDODDI
IGGALUR
BIJJAHALLI
YATHAMBADI
HONNIGANAHALLI
KODIHALLI
I.GOLLAHALLI
HADLI
HALAGUR
T.K.HALLI
DODDAHAHALLI
HAROBELE
CHUNCHIDODDI
SFC
HUNASENAHALLI
SFC
HEGGANUR
BHORUKA
SATHEGALA
KOTTANUR