Appendices

APPENDICES

Appendix 1.1

(Referred to in paragraph 1.2; page 2)

List of Departments and Autonomous Bodies/ Authorities/ Companies under the audit jurisdiction of the Accountant General Jharkhand

Departments

Sl. No.	Name of Departments
1	Agriculture, Animal Husbandry and Co-operative
2	Building Construction
3	Cabinet Election
4	Cabinet Secretariat and Vigilance
5	Commercial Taxes
6	Drinking Water and Sanitation
7	Energy
8	Excise and Prohibition
9	Finance
10	Food, Public Distribution and Consumer Affairs
11	Forest, Environment and Climate Change
12	Health, Medical Education and Family Welfare
13	Higher and Technical Education
14	Home, Jail and Disaster Management
15	Industries
16	Information and Public Relation
17	Information Technology and e-Governance
18	Labour Employment Training and Skill Development
19	Law
20	Mines and Geology
21	Panchayati Raj
22	Personnel, Administrative Reforms and Rajbhasha
23	Planning and Development
24	Revenue, Registration and Land Reforms
25	Road Construction
26	Rural Development
27	Rural Works
28	Scheduled Tribe, Scheduled Caste, Minority and Backward Class Welfare
29	School Education and Literacy Development
30	Tourism, Art Culture, Sports and Youth Affairs
31	Transport
32	Urban Development and Housing
33	Water Resources
34	Women, Child Development and Social Security

Autonomous Bodies

Sl. No.	Department	Name of the AB	District
1	Health	District Rural Health Society	Bokaro
2	Health	District Rural Health Society	Chatra
3	Health	District Rural Health Society	Deoghar
4	Health	District Rural Health Society	Dhanbad
5	Health	District Rural Health Society	Dumka
6	Health	District Rural Health Society	East Singhbhum
7	Health	District Rural Health Society	Garhwa
8	Health	District Rural Health Society	Giridih
9	Health	District Rural Health Society	Godda
10	Health	District Rural Health Society	Gumla
11	Health	District Rural Health Society	Hazaribagh
12	Health	District Rural Health Society	Jamtara
13	Health	District Rural Health Society	Khunti
14	Health	District Rural Health Society	Koderma
15	Health	District Rural Health Society	Latehar
16	Health	District Rural Health Society	Lohardaga
17	Health	District Rural Health Society	Pakur
18	Health	District Rural Health Society	Palamu
19	Health	District Rural Health Society	Ranchi
20	Health	District Rural Health Society	Ramgarh
21	Health	Jharkhand State Health Mission Society	Namkum, Ranchi
22	Health	District Rural Health Society	Saraikela- Kharsawan
23	Health	District Rural Health Society	Simdega
24	Health	District Rural Health Society	West Singhbhum
25	Health	District Rural Health Society	Sahibganj
26	Education	Jharkhand Shiksha Pariyojana Parishad	Ranchi
27	Health	Jharkhand AIDS Control Society	Ranchi
28	Education	Netarhat Residential School	Netarhat
29	Rural Development	District Rural Development Authority	Deoghar
30	Rural Development	District Rural Development Authority	Latehar
31	Rural Development	District Rural Development Authority	Hazaribagh
32	Rural Development	District Rural Development Authority	Giridih
33	Rural Development	District Rural Development Authority	Garhwa
34	Rural Development	District Rural Development Authority	Ranchi
35	Rural Development	District Rural Development Authority	Jamshedpur
36	Rural Development	District Rural Development Authority	Ramgarh
37	Rural Development	District Rural Development Authority	Chaibasa
38	Rural Development	District Rural Development Authority	Simdega
39	Rural Development	District Rural Development Authority	Koderma
40	Rural Development	District Rural Development Authority	Dumka
41	Rural Development	District Rural Development Authority	Godda
42	Rural Development	District Rural Development Authority	Pakur
43	Rural Development	District Rural Development Authority	Saraikela
44	Rural Development	District Rural Development Authority	Lohardaga
45	Rural Development	District Rural Development Authority	Bokaro
46	Rural Development	District Rural Development Authority	Chatra
47	Rural Development	District Rural Development Authority	Dhanbad
48	Rural Development	District Rural Development Authority	Gumla
49	Rural Development	District Rural Development Authority	Palamu
50	Rural Development	District Rural Development Authority	Sahibganj
51	Rural Development	District Rural Development Authority	Jamtara
52	Rural Development	District Rural Development Authority	Khunti
53	Education(H&T)	Birla Institute of Technology, Mesra, Ranchi	Ranchi
54	Aviation	Civil Aviation Authority, Ranchi	Ranchi

Sl. No.	Department	Name of the AB	District
55	Information Technology	Jharkhand Institute of Application for Promotion (JAP-IT)	Ranchi
56	Information Technology	Jharkhand Space Application Centre, Dhurwa, Ranchi	Ranchi
57	Social Welfare	Jharkhand Pollution Control Board, Ranchi	Ranchi
58	IT & e-Governance	State Information Commission	Ranchi
59	Industry	Industrial Area Development Authority, Ranchi	Ranchi
60	Industry	Industrial Area Development Authority, Bokaro	Bokaro
61	Industry	Industrial Area Development Authority, Adityapur	Jamshedpur
62	Forest	Lac Treatment Plant, Latehar	Latehar
63	Agriculture	National Horticulture Mission, Jharkhand	Ranchi
64	Education (H&T)	Science & Technology Council, Govt. Of Jharkhand	Ranchi
65	Forest	Lac Cultivation Crop in forest, Doranda	Ranchi
66	Animal Husbandry	Bacon Factory, Kanke, Ranchi	Ranchi
67	Law	High Court Legal Services Committee, Ranchi	Ranchi
68	Information and Public Relation	Government Press, Ranchi	Ranchi
69	Education	Birsa Agriculture University	Ranchi
70	Forest	Jharkhand Bio-Diversity Board/ Council, Doranda, Ranchi	Ranchi
71	Industry	Chief Executive Officer, Jharkhand State Khadi and Village Industries Board, Ranchi	Ranchi
72	Health	Director, R.K. Mission, TB sanatorium, Tipudana	Ranchi
73	Education	Director, R.K. Mission Ashram, Morabadi, Ranchi	Ranchi
74	Education	Jharkhand Mahila Samakhya Society, Kadru Ranchi	Ranchi
75	Forest	Executive Director, Wasteland Development Board	Ranchi
76	Forest	Forest Development Authority	Ranchi

State Public Sector Enterprises

Sl. No.	Name of the SPSEs	Name of the Department	Month and year of incorporation
1	2	3	4
Power Sector			
1	Jharbihar Colliery Limited	Energy	June 2009
2	Jharkhand Bijli Vitran Nigam Ltd.	Energy	October 2013
3	Jharkhand Urja Sancharan Nigam Ltd	Energy	October 2013
4	Jharkhand Urja Utpadan Nigam Limited	Energy	October 2013
5	Jharkhand Urja Vikas Nigam Limited	Energy	September 2013
6	Karanpura Energy Ltd.	Energy	September 2008
7	Patratu Energy Limited	Energy	August 2012
8	Tenughat Vidyut Nigam Limited	Energy	November 1987
Non-Power Sector			
9	Jharkhand State Agriculture Development Corporation Limited	Agriculture	January 2016
10	Jharkhand State Beverage Corporation Ltd. (JSBCL)	Excise	November 2010
11	Jharkhand State Food and Civil Supplies Corporation Ltd.	Food, Public Distribution & Consumer Affairs	June 2010
12	Jharkhand State Forest Development Corporation Ltd.(JSFDC)	Forest, Environment & Climate Change	March 2002
13	Jharkhand Medical & Health Infrastructure Development & Procurement Corporation Limited	Health, Medical Education & Family Welfare	May 2013
14	Jharkhand Police Housing Corporation Ltd. (JPHCL)	Home, Jail & Disaster Management	March 2002
15	Adityapur Electronic Manufacturing Cluster Limited	Industries	November 2016
16	Atal Bihari Vajpayee Innovation Lab.	Industries	December 2018
17	Jharkhand Plastic Park Limited	Industries	September 2016
18	Jharkhand Railway Infrastructure Development Corporation Ltd.	Industries	July 2018
19	Jharkhand Silk Textile &Handicraft Development Corporation Ltd.	Industries	August 2006
20	Jharkhand State Industrial Infrastructure Development Corporation Limited	Industries	December 2004
21	Jharkhand Communication Network Ltd.	Information Technology & e-Governance	January 2017
22	Jharkhand Film Development Corp. Ltd.	Information Technology & e-Governance	September 2016
23	Jharkhand State Mineral Development Corporation Ltd. (JSMDC)	Mines & Geology	May 2002
24	Jharkhand State Minority Finance Development Corporation	Scheduled Tribe, Schedule Caste, Minority and Backward Class Welfare	March 2012
25	Jharkhand Tourism Development Corporation Limited	Tourism, Arts, Culture, Sports & Youth Affairs	March 2002
26	Ranchi Smart City Corporation Ltd.	Transport	September 2016
27	Greater Ranchi Development Agency	Urban Development & Housing	January 2003
28	Jharkhand State Building Construction Corporation Limited	Urban Development & Housing	December 2015
29	Jharkhand Urban Infrastructure Development Company Ltd.	Urban Development & Housing	November 2013
30	Jharkhand Urban Transport Corporation Limited	Urban Development & Housing	September 2016
31	Jharkhand Hill Area Lift Irrigation Corporation Limited	Water Resources	March 2002

Appendix 2.1

(Referred to in Paragraph 2.4.7; page 47)

Details of demand and collection of water user charges in the test-checked ULBs, during the FYs 2016-17 and 2020-21

Sl. No.	ULB	Financial year	Total Demand	Total Collection	O&M Costs	Percentage of collection to the O&M Costs
			(₹ in lakh)			
1.	Basukinath NP	2016-17	28.12	7.72	13.87	55.7
		2017-18	28.19	6.59	13.87	47.5
		2018-19	29.59	7.6	41.17	18.5
		2019-20	30.48	5.1	48.16	10.6
		2020-21	34.24	2.36	17.42	13.5
		Total	**150.62**	**29.37**	**134.49**	**21.8**
2.	Deoghar M. Corpn.	2016-17	74.34	17.59	Not available	
		2017-18	114.96	20.11	Not available	
		2018-19	162.41	41.78	Not available	
		2019-20	199.37	38.21	416.78	9.2
		2020-21	251.98	67.42	416.78	16.2
		Total	**803.06**	**185.11**	**833.56**	**22.2**
3.	Dhanbad M. Corpn.	2016-17	1,930.79	449.96	617.43	72.9
		2017-18	2,182.25	423.27	1,189.91	35.6
		2018-19	2,453.33	500.24	1,509.23	33.1
		2019-20	2,438.28	495	1,300	38.1
		2020-21	5,154.41	369.17	1,700	21.7
		Total	**14,159.1**	**2,237.64**	**6,316.57**	**35.4**
4.	Godda MC	2016-17	136.38	14.24	37.38	38.1
		2017-18	139.28	6.76	37.38	18.1
		2018-19	149.46	3.91	37.38	10.5
		2019-20	163.41	2.92	37.38	7.8
		2020-21	179.07	2.15	37.38	5.8
		Total	**767.6**	**29.98**	**186.9**	**16.0**
5.	Hussainabad NP	2016-17	16.19	1.27	0.73	174.0
		2017-18	22.41	3.26	1.15	283.5
		2018-19	26.7	1.02	1.18	86.4
		2019-20	33.26	3.08	2.11	146.0
		2020-21	37.75	1.49	4.39	33.9
		Total	**136.31**	**10.12**	**9.56**	**105.9**
6.	Khunti NP	2016-17	49.61	4.92	Not available	
		2017-18	58.81	10.79	8.42	128.1
		2018-19	63.25	10.84	2.76	392.8
		2019-20	68.28	11.2	1.91	586.4
		2020-21	73.56	9.69	Not available	
		Total	**313.51**	**47.44**	**13.09**	**362.4**
7.	Medininagar M. Corpn.	2016-17	287.06	25.71	0.35	7345.7
		2017-18	315.68	27.94	3.55	787.0
		2018-19	343.09	30.36	11	276.0
		2019-20	373.17	25.13	Not available	
		2020-21	412.58	25.78	Not available	
		Total	**1,731.58**	**134.92**	**14.9**	**905.5**
8.	Phusro MC	2016-17	61.36	7.75	6.01	129.0
		2017-18	62.07	7.35	19.86	37.0
		2018-19	63.4	4.19	18.34	22.8
		2019-20	68.17	5.86	6.96	84.2
		2020-21	71.5	3.95	3.78	104.5
		Total	**326.5**	**29.1**	**54.95**	**53.0**
9.	Ranchi M. Corpn.	2016-17	6,177.78	389.02	Not available	
		2017-18	6,721.19	414.67	Not available	
		2018-19	7,091.56	436.18	Not available	
		2019-20	7,222.38	436.4	140.9	309.7
		2020-21	7,098.41	190.04	Not available	
		Total	**34,311.3**	**1,866.31**	**140.9**	**1324.6**

Sl. No.	ULB	Financial year	Total Demand	Total Collection	O&M Costs	Percentage of collection to the O&M Costs
			(₹ in lakh)			
10.	Simdega MC	2016-17	67.64	26	31.86	81.6
		2017-18	78.26	5.34	31.86	16.8
		2018-19	86.17	5.23	31.86	16.4
		2019-20	91.63	9.34	31.86	29.3
		2020-21	81.4	4.78	31.86	15.0
Total			**405.1**	**50.69**	**159.3**	**31.8**
Grand total			**53,104.66**	**4,620.68**	**7,864.22**	

Source: *Data provided by test checked ULBs*

Appendix 3.1

(Referred to in Para 3.1; page 55)

Components to be executed under the sewerage and drainage project

Sl. No.	Component	Total cost (₹ in crore)	Remarks
1	Supplying and laying pipes of sewer, road restoration, construction of manholes, construction of house service connections, *etc* (11.74 km of main trunk line and 268 km of network line)	177.86	Item rate contract
2	Designing, supply, construction, erection, commissioning Sewage Treatment Plant (STP) of 37 MLD capacity based on modern technology	42.00	Turnkey basis
3	Five years operation & maintenance of STP	4.21	Turnkey basis
4	Designing, supply, construction, erection, commissioning Sewage Pumping Station (SPS) of 10.2 MLD capacity	5.80	Turnkey basis
5	Five years operation & maintenance of SPS	0.28	Turnkey basis
6	Construction of storm water drains (207 km)	120.38	Item rate contract
7	Construction of storm pipes	1.65	Item rate contract
8.	Construction of culverts	7.07	Item rate contract
	Total	**359.25**	

Appendix 3.2

(Referred to in Paragraphs 3.2.3.2 & 3.2.3.3; page 68 & 70)

Calculations for less recovery from contractor after termination of contract

					(Amount in ₹)
Value of agreement with the contractor					3,59,25,00,465
Total value of work done by the contractor (till termination of contract)					84,00,09,835
Value of unexecuted work					2,75,24,90,630
Total Security deposits of the contractor available with the RMC					21,92,89,729
(i) Initial performance security (BGs)		3,02,00,000 14,94,25,023			
(ii) Security deposits actually deducted from bills		3,96,64,706			
Mobilisation advance paid to contractor		53,88,75,070			53,88,75,070
Mobilisation advance (Principal amount) recovered from bills		17,98,00,000			17,98,00,000
Balance amount (principal) of mobilisation for recovery at the time of termination of contract		35,90,75,070			35,90,75,070
Amount to be deducted for defective work		61,41,398			61,41,398
Calculations for less recovery done by RMC					
On the basis of provisions of JMAM, 2012			On the basis of provisions of agreement		
Additional cost for completion of work to be recovered from the contractor (20 *per cent* of unexecuted work)	55,04,98,126	55,04,98,126 (A)	Initial performance security to be forfeited (2 *per cent* of agreement value)		7,18,50,000 (G)
Security deposits to be forfeited (i) Initial performance security (5 *per cent*) (ii) Deduction of Security Deposits to be made from bills (5 *per cent* of value of work done)	17,96,25,023 4,20,00,491	22,16,25,514 (B)	Security deposits deducted from bills to be forfeited (3 *per cent* of value of work done)		2,52,00,295 (H)
Balance amount (principal) of mobilisation advance, for recovery at the time of termination of contract		35,90,75,070 (C)	Balance amount (principal) of mobilisation for recovery at the time of termination of contract		35,90,75,070 (I)
Amount to be deducted for defective work		61,41,398 (D)	Amount to be deducted for defective work		61,41,398 (J)
Total recoverable amount upon termination (A+B+C+D)		113,73,40,108 (E)	Total recoverable amount upon termination (G+H+I+J)		46,22,66,763 (K)
Actual amounts recovered by RMC (i) By forfeiture of BGs (ii) By security deposits from bills	35,96,25,023 3,96,64,706	39,92,89,729 (F)	Actual amounts recovered by RMC (i) By forfeiture of BGs (35,96,25,023) (ii) By security deposits from bills (3,96,64,706)		39,92,89,729 (L)
Amount of less recovery on the basis of provisions of JMAM, 2012	(E – F)	73,80,50,379	Amount of less recovery on the basis of provisions of agreement (K -L)		6,29,77,034

Appendix 3.3

(Referred to in Para 3.2.3.4(i); page 73)

Component-wise amount for design and drawing on the basis of price breakup as recommended by M/s WAPCOS Ltd. for new contractor

Sl. No.	Compo-nents	Sub-component	Component percentage out of total cost	Activity percentage	Activity Amount (in ₹)	Amount payable to contractor for design and drawing
	STP Total cost on turnkey basis				42,00,00,000	---
A	Civil works (70 *per cent*)				29,40,00,000	---
1	Main pumping station		12%	---	3,52,80,000	---
		Approval of hydraulic design and drawing	---	5%	17,64,000	---
		Approval of structural design and drawing	---	5%	17,64,000	---
2	Primary treatment unit		13%	---	3,82,00,000	---
		Approval of hydraulic design and drawing	---	5%	19,11,000	---
		Approval of structural design and drawing	---	5%	19,11,000	---
3.	SBR basin		35%		10,29,00,000	---
		Approval of hydraulic design and drawing		5%	51,45,000	51,45,000
		Approval of structural design and drawing		5%	51,45,000	51,45,000
4	CCT		4%		1,17,60,000	---
		Approval of hydraulic design and drawing		5%	5,88,000	---
		Approval of structural design and drawing		5%	5,88,000	---
5	Chlorine room with toner room		4%		1,17,60,000	---
		Approval of hydraulic design and drawing		5%	5,88,000	---
		Approval of structural design and drawing		5%	5,88,000	---
6	Sludge pump house		4%		1,17,60,000	---
		Approval of hydraulic design and drawing		5%	5,88,000	---
		Approval of structural design and drawing		5%	5,88,000	---
7	Sludge sump		3%		88,20,000	---
		Approval of hydraulic design and drawing		5%	4,41,000	---
		Approval of structural design and drawing		5%	4,41,000	---
8	Centrifuge house		4%		1,17,60,000	---
		Approval of hydraulic design and drawing		5%	5,88,000	---
		Approval of structural design and drawing		5%	5,88,000	---
9	Blower room/ MCC/PLC/ Admn block		15%		4,41,00,000	---
		Approval of hydraulic design and drawing		5%	22,00,500	---
		Approval of structural design and drawing		5%	22,00,500	---
10	HT substation area		2%		58,80,000	---
11	DG area		1%		29,40,000	---
12	Security cabin		1%		29,40,000	---
13	Internal road, compound wall and site development		2%		58,80,000	---
		Approval of structural design and drawing		5%	2,94,000	---
B	Mechanical works (15 *per cent*)				6,30,00,000	---
C	Electrical and instrumental works (10 *per cent*)				4,20,00,000	---
D	Testing and commissioning (5 *per cent*)				2,10,00,000	---
					Total	**1,02,90,000**

Appendix 4.1

(Referred to in Para 4.5, Pages 95 & 106)

Details of vetting (approval) by three institutions

Name of Institution/ Year of vetting	Details of report
IIT, Mumbai (October 2015)	Component: 1. Hydraulic design & drawing of Underground Sewerage System • Design life: 30 years (2018 base year, 2033 Intermediate year, 2048 Ultimate year) • Peak sewage generation: 15.03 MLD for base year 18.35 for intermediate year 22.15 MLD[1] for ultimate year • Sewer line: 18,985 m (17254 m of 300 mm pipe and 1731 m of 450 mm pipe), number of Manholes: 651 Conclusion: The sewerage system has been planned and designed to cater to the sewage generated along the river, for a width of 250 m on either side of the river.
	2. Component: Hydraulic design & drawing of river cross section • River section- design for return cycle of 25 years Discharge (urban stretch): • Between chainage 0 m and 2180 m: Actual- 30.07 to 32.94 m^3/sec, designed- 34.95 to 45.16 m^3/sec, width of channel-3.0m, Area of cross section-15.45 m^2 • Between chainage 2180 m and 2769 m : Actual- range 32.94 to 34.53 m^3/sec, designed-41.33 to 44.15 m^3/sec, width of channel-3.0m, Area of cross section-15.45 m^2 • Between chainage 2769 m and 4068 m : Actual- range 34.53 to 41.21 m^3/sec, designed-41.86 to 44.15 m^3/sec, width of channel-3.0m to 4m, Area of cross section-15.45 m^2 to 21.38 m^2 • Between chainage 4068 m and 6440 m : Actual- range 41.21 to 54.34 m^3/sec, designed-41.86 to 55.69 m^3/sec, width of channel-4.0m to 6.0m, Area of cross section-21.38 m^2 to 30.50 m^2 • Between chainage 6440 m and 7818 m : Actual- range 54.34 to 59.22 m^3/sec, designed-55.69 to 60.39 m^3/sec, width of channel-6.0m to 7.0m, Area of cross section-28.88 m^2 to 30.50 m^2 • Between chainage 7818 m and 10400 m : Actual- range 59.22 to 64.11 m^3/sec, designed-60.39 to 79.96 m^3/sec, width of channel- 7.0m, Area of cross section-28.88 m^2 to 33.25 m^2 Conclusion: The present section is safe for runoff coefficient[2] 0.29 and for a rainfall of 25 years return period.
	3. Component: Elevated pathways Conclusion: Elevated pathway is designed as per the prevailing design code

[1] *Sewage flowing through six inlets: 7.46 MLD; sewage produced by the riverside houses (250 m on either side of river): 12.97 MLD; and sewage produced by the 33 toilet blocks: 1.72 MLD*

[2] *As per Paragraph 3.9.1 of the CPHEEO Manual, the characteristics of the drainage area, such as imperviousness; topography, including depressions: water pockets, shape of the drainage basin; and duration of the precipitation, determine the fraction of the total precipitation which will reach the sewer. This fraction is known as the coefficient of runoff.*

Name of Institution/ Year of vetting	Details of report
BIT, Mesra (January 2016)	1. Component: Drawing and design of 8 STPs Raised observations on design of STP (PST, phytorid bed, collection tank *etc*.) in its initial vetting report but final vetting report was not submitted.
NIT, Jamshedpur (Between December 2016 and November 2017)	1. Component: Design of revised cross section of river Design of revised section between chainage 1,900 m and 2,040 m: not produced to Audit Design of revised section between chainage 2,040 m and 2,180 m: River section-design for return cycle of 50 years • Discharge (chainage 2,050 m): Actual- 65 m^3/sec, designed- 182.36 m^3/sec, width of channel-13.50 m, Area of cross section-46.81 m^2 • Discharge (chainage 2,100 m): Actual-65 m^3/sec, designed- 77.96 m^3/sec, width of channel-4.5 m, Area of cross section-23.18 m^2 • Discharge (chainage 2,130 m): Actual-65 m^3/sec, designed-83.54 m^3/sec, width of channel-5.0 m, Area of cross section-24.50 m^2 • Discharge (chainage 2,180 m): Actual-65 m^3/sec, designed-194.24 m^3/sec, width of channel-14.5 m, Area of cross section-49.43 m^2 Component: Design of revised section for strengthening bank of Harmu river (between chainage 2,769 m-chainage 10,400 m) River section- design for return cycle of 50 years Discharge (urban stretch) • Between chainage 2,769 m and 4,068 m: Actual 64.99 m^3/sec, designed -65.07 m^3/sec, width of channel- 3 m, Area of cross section-20.01 m^2 • Between chainage 4,068 m and 6,440m: Actual 102 m^3/sec, designed -102.01 m^3/sec, width of channel- 4m, Area of cross section-27.11 m^2 • Between chainage 6,440 m and 7,818 m: Actual-118 m^3/sec, designed -118.02 m^3/sec, width of channel- 6m, Area of cross section-40.00 m^2 • Between chainage 7,818 m and 10,400m: Actual-137 m^3/sec, designed -137.10 m^3/sec, width of channel-7.0 m, Area of cross section-49.19 m^2
	1. Component: Design of inlets • Out of 14 inlets (in the revised estimates), the final reports of only Inlets 1, 2, 3 and 4 and 1A, was available Discharge of inlets: inlet 1- 34.34 m^3/sec, inlet 1A-5.2 m^3/sec, inlet 2- 15.87 m^3/sec, inlet 3-5.66 m^3/sec and inlet 4- 5.5 m^3/sec Velocity of discharge in inlets: inlet 1- 3.6 m/sec, inlet 1A-5.2 m/sec, inlet 2- 2.116 m/sec, inlet 3-0.761 m/sec and inlet 4- 0.739 m/sec Recommendation: Dimension of the sewer line: NP3 pipe between inlet 1 and 1A and STP: 750 mm

Appendix 4.2

(Referred to in case study-4.2 and table 4.4 (para 4.5.2 and para 4.5.3.1), Page numbers 98 & 100)

Capacity calculation of STP, for inlets 1 and 1A and peak sewage generated through 14 major inlets (Note-1)

Sl. No.	Particulars	Sewage generated through 14 major inlets	Sewage generated through inlets 1 and 1 A
1.	Catchment area (in square km)	14.31	4.3
2.	Total urban area of Ranchi (in square km)	175.12	175.12
3.	Catchment area/Total urban area of Ranchi *(Sl. No. 1/Sl.No.2)*	0.081715	0.024555
4.	Projected Population of Ranchi (Intermediate year 2033) (Note-2)	14,95,998	14,95,998
5.	Population coverage[3] (inlets) *(Sl. No.3 x Sl No.4)* (Note-3)	1,22,246	36,734
6.	Per person use of water (in litre) (Note-4)	135	135
7.	Wastewater generated (in litre) *(Sl. No. 6 x 80 per cent)* (Note-5)	108	108
8.	Average Sewage discharge (in litre) *(Sl. No.5 x Sl. No.7)*	1,32,02,575	39,67,230
9.	Average Sewage discharge (in MLD) *(Sl. No.8/10,00,000)*	13.20	3.96
10.	Peak Sewage discharge (in MLD) *(Sl. No.8 x 2)*	26.40	7.92
11.	STP capacity recommended (in MLD)	-	4
Note 1: IIT Mumbai, adopted catchment area and population based (increase of population in proportion to increase of catchment area) methodology, for assessing the population, water consumption and sewage generation. Audit followed the same methodology for calculation of sewage generation.			
Note 2: Population projection is done by using the 'Arithmetic Increase' and 'Incremental Increase' Methods. In this case, averaging of these methods was used to arrive at the projected population. The growth of population from 1951 to 2011 (last census) is available and this growth pattern was used to arrive at the incremental and arithmetic growths of population from 2011 to 2048. These figures were then averaged, to arrive at the final projection data. This methodology was used by IIT, Mumbai. This forecast data has been used to prepare the DPR by the consultant.			
Note 3: The projected population coverage (inlets) was calculated as the proportionate population (total catchment area, covering the inlets/ total area of Ranchi). This is on the same lines as calculated by IIT, Mumbai.			
Note 4: Government of Jharkhand notified (August 2011) 135 litre per person water requirement as the service level benchmark for different services, like water supply and sewerage and sanitation, for all ULBs. This figure was taken by IIT, Mumbai, for assessing the water requirement. Audit followed the same methodology.			
Note 5: Government of Jharkhand notified (August 2011) 80 *per cent* of 135 litres per person water requirement for sewage generation, as the service level benchmark for different services, like water supply and sewerage and sanitation, for all ULBs. This figure was taken by IIT, Mumbai, for assessing the sewage generation. Audit followed the same methodology.			

[3] *Population residing in the catchment area of the inlets and contributing in sewage generation*

Appendix 4.3

(Referred to in Para 4.6.5, Page number 116)

Differences between the rates of the execution and operation phases and payments made to the contractor

DPR rate (Execution phase)					DPR rate (Operation phase)				Total excess
Brief	Item No	Number of samples tested/ report submitted	Rate (₹)	Value (₹)	Item No.	Number of samples tested/ report submitted	Rate (₹)	Value (₹)	Value (₹)
		1	2	3	4	5	6	7	(3-7)
Air quality	220	80	7,500	6,00,000	225	80	1,500	1,20,000	4,80,000
Stack Emission	221	500	2,500	12,50,000	226	500	500	2,50,000	10,00,000
Noise Level	222	100	1,000	1,00,000	227	100	200	20,000	80,000
Water and waste water quality	223	40	2,500	1,00,000	228	40	500	20,000	80,000
Preparation of Environment Statement	224	3	8,000	24,000	229	3	2,000	6,000	18,000
Total (Execution phase)				20,74,000	Total (Operation phase)			4,16,000	16,58,000
Add 9.97 *per cent* (contractor profit)				2,06,777.80	Add 9.97 *per cent* (contractor profit)			41,475.20	1,65,302.60
Total (payment made to contractor for execution phase)				2280777.80	Total (payment for operation phase not made)			4,57,475.20	18,23,302.60

Appendix 4.4

(Referred to in Para number 4.6.6, Page number 118)

Details of plantation works on the bank of Harmu river MB No, RA No and date of measurement

Types of species	Qty to be planted	Rate (₹)	MB NO 7/ RA 5	MB No 8/RA 6	MB NO 10/ RA 11	MB NO10 /RA 12	MB NO11 /RA 14	MB NO /RA 18	MB NO /RA 19	Total upto 19th RA	Value (₹)	Executed during 29th RA	Total (29 and Final bill)	Value (₹)
			08.03.2016	**26.03.2016**	**21.09.2016**	**25.10.2016**	**03.03.2017**	**06.09.2017**	**07.10.2017**				**30.10.18**	
Coconut trees	360	900	90	270	0	0	0	0	0	360	3,24,000	0	360	3,24,000
Mimusops Elengi(Moulshree)	604	800	0	0	0	81	25	150	98	354	2,83,200	245	599	4,79,200
Cassia Fistula (Amaltas)	550	600	0	0	0	0	0	150	100	250	1,50,000	295	545	3,27,000
Delonix Regia (Red/Yellow Gulmohar)	600	600	0	0	250	76	30	200	0	556	3,33,600	41	597	3,58,200
Bigonia megapotamica (Rio Grand trumpet flower)	300	600	0	0	25	14	20	130	50	239	1,43,400	59	298	1,78,800
Cedrela toona (toon)	450	600	0	0	0	11	20	140	60	231	1,38,600	214	445	2,67,000
Alstonia Scholaris (Chatwan)	700	650	0	0	0	17	25	50	65	157	1,02,050	540	697	4,53,050
Areca Palm	100	800	0	0	15	20	35	0	0	70	56,000	26	96	76,800
Fishtail Palm	100	800	0	0	20	23	35	0	0	78	62,400	20	98	78,400
Largerstromia Speciosa (Jarul)(Shrubs)	400	750	0	0	14	64	41	0	0	119	89,250	279	398	2,98,500
Dombia Wallichhii (Shrubs)	200	500	0	0	0	0	0	0	0	0	0	196	196	98,000
Chinese box (Murraya exotica)(Shrubs)	150	600	0	0	0	0	0	0	0	0	0	147	147	88,200
Euphorbia pulcherrima (shrubs)	150	800	0	0	0	0	0	0	0	0	0	148	148	1,18,400
Sub Total	**4,664**									**2414**	**16,82,500**	**2,210**	**4,624**	**31,45,850**
Upper level plantation (Digging holes)	4,664	90.9								2,414	2,19,433		4,624	4,20,322
Bamboo tree guards	4,664	1,087								2,414	26,24,018		4,624	50,26,288
										Total	45,25,951			85,92,460
									Add 9.97 *per cent*		4,51,237			8,56,668.26
										Total	**49,77,188**			**94,49,128.26**

Appendix 4.5

(Referred to in Para number 4.6.6, Page number 119)

Details of comparative deforestation (between the years 2009 and 2022), on the bank of the Harmu river

Before start of work (Photographs of the years 2009 and 2015)	After start of work (years 2016, 2017 and 2018)	After start of work (year 2021)
		
Between Ganga nagar and Karamtoli		
		
Near Kadru		

Near Overbridge, Main road, Ranchi

Near Amrawati bridge, Chutia

Meeting point, with Subernarekha river, Namkum

Appendix 5.1

(Referred to in paragraph 5.1; page 129)

Details of procurement of major material during FYs 2017-18 to 2020-21

(₹ in crore)

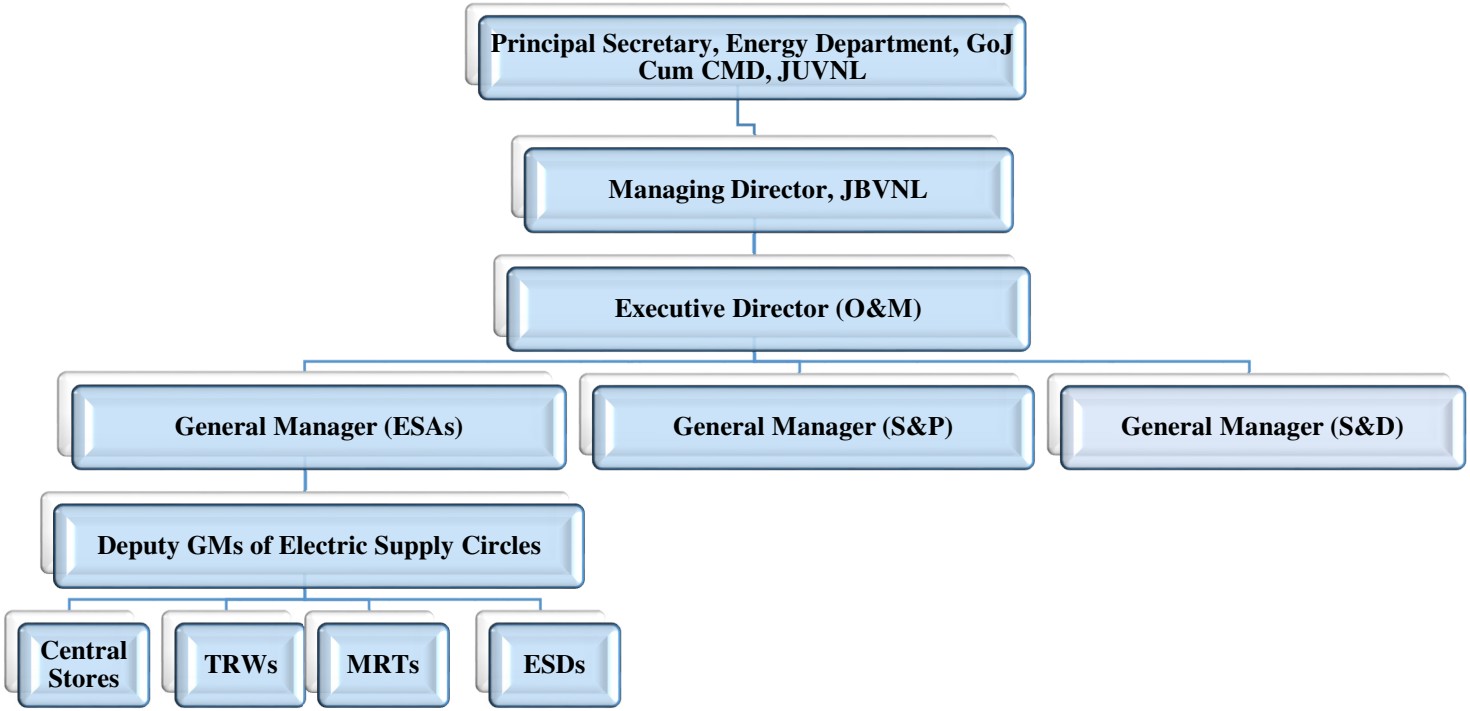
Name of Material	2017-18		2018-19		2019-20		2020-21	
	Quantity Procured	Total amount	Quantity Procured	Total amount	Quantity Procured	Total amount	Quantity Procured	Total amount
Transformers (in Nos.)	8,958	103.46	7,579	75.87	1,233	27.87	1,933	25.72
Cables and Conductors (in KMs)	12,465	99.61	4,542	31.31	2,768	22.41	15	2.66
Meters (in Nos.)	67,280	79.00	8,26,351	74.78	6,881	8.60	0	0
Poles (in Nos.)	99,663	47.30	93,224	30.18	13,338	16.45	39,970	8.83
Sub total		**329.37**		**212.14**		**75.33**		**37.21**
Grand total		**654.05**						

Source: *Information furnished by the Company*

Appendix 5.2

(Referred to in paragraph 5.2; page 129)

Organisational Chart (JBVNL)



Appendix 5.3

(Referred to in paragraph 5.9.6 (i); page 153)

Statement showing the details of short recovery of transformer oil

Financial Year	Numbers of transformers repaired	Capacity (in litre)	90 *per cent* of capacity (in litre)	Oil Received (in litre)	Short Retrieval (in litre)	Average rate of discarded oil (in ₹)	Value of transformer oil short received (in ₹)
ESC, KODERMA							
2017-18	125	28,786	25,907.40	8,869	17,038.40	25	4,25,960
2018-19	167	39,162	35,245.80	9,749	25,496.80	25	6,37,420
2019-20	222	52,352	47,116.80	13,031	34,085.80	25	8,52,145
2020-21	167	37,654	33,888.60	11,749	22,139.60	25	5,53,490
Sub-Total	681				98,760.60		24,69,015
ESC, SAHIBGANJ							
2017-18	188	43,390	39,051.00	11,371	27,680.00	25	6,92,000
2018-19	116	27,264	24,537.60	7,535	17,002.60	25	4,25,065
2019-20	120	28,858	25,972.20	7,230	18,742.20	25	4,68,555
2020-21	130	30,816	27,734.40	10,377	17,357.40	25	4,33,935
Sub-Total	554				80,782.20		20,19,555
ESC, RANCHI							
2017-18	607	1,43,476	1,29,128.40	35,105	94,023.40	25	23,50,585
2018-19	740	1,72,846	1,55,561.40	28,955	1,26,606.40	25	31,65,160
2019-20	686	1,62,622	1,46,359.80	35,295	1,11,064.80	25	27,76,620
2020-21	777	1,82,376	1,64,138.40	43,215	1,20,923.40	25	30,23,085
Sub-Total	2,810				4,52,618.00		1,13,15,450
ESC, HAZARIBAG							
2017-18	520	1,24,324	1,11,891.60	21,640	90,251.60	25	22,56,290
2018-19	557	1,33,850	12,04,650.00	5,050	1,15,415.00	25	28,85,375
2019-20	514	1,23,994	1,11,594.60	35,953	75,641.60	25	18,91,040
2020-21	423	98,942	8,90,47.80	35,574	53,473.80	25	13,36,845
Sub-Total	2,014				3,34,782.00		83,69,550
ESC, JAMSHEDPUR							
2017-18	807	1,91,872	1,72,684.80	67,971	1,04,713.80	25	26,17,845
2018-19	724	1,70,617	1,53,555.30	41,885	1,11,670.30	25	27,91,758
2019-20	594	1,36,377	1,22,739.30	35,810	86,929.30	25	21,73,233
2020-21	634	1,41,754	1,27,578.60	35,420	92,158.60	25	23,03,965
	2,759				3,95,472.00		98,86,800
Sub-Total	8,818				13,62,414.80		
GRAND TOTAL							**3,40,60,370**

Source: *Compiled from Records of TRWs*

Appendix 5.4

(Referred to in paragraph 5.10.3; page 160)

Statement showing excess quantities issued from six ESCs under the RAPDRP-B scheme

(Amount in ₹)

Name of material	Quantity issued from central stores	Quantity executed as per closure report	Excess issued from central stores	Rate of material per km/No.	Total value of excess material issued
ACSR Rabbit Conductor (Km)	592.259	476.154	116.105	28,083.94	32,60,685.85
ACSR Dog Conductor (Km)	593.363	389.83	203.533	74,340	1,51,30,643.22
Wolf Conductor (km)	55.36	17.44	37.92	1,07,950.87	40,93,496.99
ACSR Panther Conductor (Km)	9.088	5.1	3.988	4,26,235.91	16,99,828.81
AB XLPE Cable 3c*185 sq. mm (Km)	27.259	13.45	13.809	7,18,675.48	99,24,189.70
AB Cable 3C*50 sq. mm (Km)	59.162	46.67	12.492	1,41,214.46	17,64,051.03
AB Cable 3C*35 sq. mm (Km)	26.707	22.14	4.567	69,779.48	3,18,682.89
LT AB Cable 3C*95 (Km)	283.376	232.83	50.546	2,50,209.19	1,26,47,073.72
LT AB Cable 1C*35 (Km)	36.121	0	36.121	80,688.35	29,14,543.89
PSC Pole 8/9 metre (Nos.)	11,058	2,831	8,227	2,427.84	1,99,73,839.68
Steel Tubular Pole	637	14	623	18,424.67	1,14,78,569.41
Single Phase Meter	26,554	12,937	13,617	2,099.005	2,85,82,151.09
Three Phase Meter	1,477	1025	452	7,987.7	36,10,440.40
25 KVA DTR	11	10	1	49,057.18	49,057.18
63 KVA DTR	16	15	1	80,603.23	80,603.23
100 KVA DTR	195	150	45	1,03,522.52	46,58,513.40
200 KVA DTR	33	30	3	1,74,751	5,24,253.00
Total					**12,07,10,623.49**

Appendix 6.1.1

(Referred to in paragraph 6.1; page 163)

A: Details of administrative approval, technical sanction and tender decision

(₹ in lakh)

Name of the road	Administrative approval		Technical sanction		Tender decision	
	Date	Amount	Date	Amount	Date	Amount
Birsa Chowk to Tupudana Chowk	19.10.2013	5,416.58	23.03.2013	4,302.67	26.09.2013	3,786.10
Birsa Rajpath (New Market Chowk to HEC Gate Chowk)	14.08.2014	2,026.11	06.05.2014	2,026.11	26.08.2014	2,038.10
Justice LPN Shahdeo Chowk to Booty More	26.12.2014	2,243.83	15.07.2014	2,243.83	09.04.2015	2,253.97
Namkum to Doranda	05.09.2013	3,037.89	28.06.2013	3,037.89	29.11.2013	2,473.42
Total		**12,724.41**		**11,610.50**		**10,551.59**

B: Details of agreements and final bills

(₹ in lakh)

Name of the road (Agreement number)	Details of agreements				Final bill	
	Date	Amount	Intended date of completion	Actual date of completion	Number	Amount
Birsa Chowk to Tupudana Chowk (82/13-14)	26/11/2013	3,786.10	25/02/2015	26/02/2016	18th and final	3,662.19
Birsa Rajpath (New Market Chowk to HEC Gate Chowk) (25/14-15)	30/08/2014	2,038.10	29/06/2015	18/06/2016	9th and final	1,661.61
Justice LPN Shahdeo Chowk to Booty More (5/15-16)	20/04/2015	2,253.97	26/05/2016	07/04/2016	6th and final	1,226.14
Namkum to Doranda (97/13-14)	15/01/2014	2,473.42	14/01/2015	22/02/2016	15th and final	2,286.83
Total		**10,551.59**				**8,836.77**