



NCR Planning Board  
Asian Development Bank

# Capacity Development of the National Capital Region Planning Board (NCRPB) – Component B (TA No. 7055-IND)

FINAL REPORT

Volume II-C: Detailed Project Report for Rehabilitation &  
Augmentation of Sewerage System in Hapur

Detailed Estimates

July 2010

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**Appendix E-1**  
**Unit Cost of Estimate of Ventilating Shaft**

S. No.	Description of Item		Unit	Quantity	Unit Rate (Rs)	Cost (Rs)	Reference
1	Earth work Excavation and disposal		Cu.m	1.15	83.00	63.27	UPJN 3001
2	RCC M20 Ventilating Shaft with Tin cowl	Concrete	Cu.m	0.61	3,073.00	5,830.54	UPJN 1025
		Longitudinal bars	Kg.	50.00	49.00	2,450.00	LNV 10.05
		Spiral	Kg.	18.00	49.00	882.00	LNV 10.06
		Cowel(Including fixing)	Nos	2.00	150.00	300.00	Market Rate
		Shuttering	Sq.m	15.95	180.40	2,877.88	DSR 5.9.11
3	PCC (M15) for Foundation		Cu.m	1.05	3,745.25	3,928.20	UPJN 1015
4	Shuttering		Sq.m	5.58	76.00	424.08	PWD SOR
5	200mmdia RCC NP2 Pipe		RM	5.00	300.00	1,500.00	Interpolated from UPJN Rates
6	PCC Bedding		RM	5.00	200.00	1,000.00	Rate Analysis
7	Fixing & Erecting 9.0 m high RCC M20 ventilating shaft with Tin						
	Labour charge	Mason	No	1.00	168.00	168.00	UPJN 123 of labour
		Beldar	Nos	10.00	105.00	1,050.00	UPJN 103 of labour
<b>Total cost of Ventshaft</b>						<b>20,473.97</b>	

**Appedix E-2**  
**Unit Cost Estimate for Manholes Type -R**

Size of Manhole: Depth(D) = 0.90 m & Size= 900 mm x 800 mm; Diameter of Pipe Upto 300 mm

S.No.	Description	Nos.	Length/Area a	Breath	Depth	Quantity	Unit	Rate Rs.	Amount Rs.	Remark
1	PCC - M15 Grade, 40 mm grit for foundation	1 lot	1.660	1.560	0.150	0.388	Cu.m.	3,300.00	1,281.85	LVN 5.06
1a	PCC-M15 Grade 20 mm grit									
	For benching portion	1	0.800	0.900	0.300	0.216	Cu.m.			
		2	0.250	0.900	0.001	0.000	Cu.m.			
	Deduction for pipe	1	0.071		0.900	(0.064)	Cu.m.			
						0.153	Cu.m.	3,450.00	527.54	LVN 5.07
2	RCC M 15 For cover slab, 20 mm size	1	1.230	1.360	0.210	0.351	Cu.m.			
	Deductions for opening for cover and frame	1	0.700	0.700	0.210	(0.103)	Cu.m.			
	Total					0.248	Cu.m.	3,850.00	956.29	LVN 5.10
3	M 150 Brick Masonry work with CM (1:4)	1	4.320	0.230	0.600	0.596	Cu.m.			
	Deduction for pipes	2	0.071		0.230	(0.032)	Cu.m.			
	Total					0.564	Cu.m.	2,100.00	1,183.69	LVN 6.04
4	Plastering with CM(1:3)									
	External Plastering (12mm thick)	1	5.240		0.800	4.192				
	Internal plastering(12mm thick)	1	3.400		0.800	2.720				
	Deduction for pipe	4	0.071			(0.283)				
	Deduction for benching	1	3.400		0.300	(1.020)				
	Total					5.609	Sqm	82.00	459.97	LVN 13.06
5	RCC M20	2	0.600	0.876	0.200	0.210	cum	5,000.00	1,051.20	LVN 5.12
6	Steel @ 100 kg / cum					21.024	Kg	49.00	1,030.18	LVN 10.05
7	Form work	2	0.600		0.630	0.756	sqm	119.25	90.15	DSR 5.9.1 P93
	Slab	1	1.660	1.660		2.756	sqm	187.35	516.26	DSR 5.9.3 P93
8	MS Steps with Epoxy Painted					3.000	Nos.	149.85	449.55	DSR19.15P301
9	560 mm dia SFRC Frame & Cover Heavy Duty	1				1.000	Nos.	2,000.00	2,000.00	Market Rate
9	PCC M20	2	0.503	0.230	0.075	0.017	Cum	5,000.00	86.72	LVN 5.12
10	uPVC pipe 160mm dia	2	0.230			0.460	Rm	319.00	146.74	UPJN 30-4-08
	<b>Total cost</b>								9,780.14	
	<b>Cost of Manhole</b>								<b>9,785.00</b>	

## Appendix E-3

## Unit Cost Estimate for Manholes Type - D6

Size of Manhole: Depth(D) = 6.01 to 7.00 m &amp; Dia = 1,800mm; Diameter of Pipe Upto 1,400 mm

S. No.	Description	Nos.	Length/Area	Breath	Depth	Quantity	Unit	Rate Rs.	Amount Rs.	Remark
1	PCC - M15 Grade 40 mm grit for foundation	1 lot	11.648		0.150	1.747	Cu.m.	3,300.00	5,765.64	LNV 5.06
1a	PCC-M15 Grade 20 mm grit	1 lot								
	For benching portion	1 lot	2.543		1.050	2.671	Cu.m.			
		1 lot	0.785		0.001	0.001	Cu.m.			
	Deduction for pipe	1	0.785		1.500	1.178	Cu.m.			
	For cover slab	1	0.814		0.210	0.171	Cu.m.			
	Deductions for opening for cover and frame	1	0.396		0.170	0.067	Cu.m.			
	Total					1.598	Cu.m.	3,450.00	5,511.49	LNV 5.07
2	Brick Masonry work with CM (1:4)	1	8.408	0.876	1.000	7.365	Cu.m.			
		1	7.070	0.450	2.000	6.363	Cu.m.			
		1	2.474		0.700	1.732	Cu.m.			
		1 lot	0.802		2.300	1.844	Cu.m.			
	Deduction for pipes	2	0.785		0.876	(1.375)	Cu.m.			
	Total					15.929	Cu.m.	2,100.00	33,450.77	LNV 6.04
3	Plastering with CM(1:3)									
	External Plastering (12mm thick)	1	11.160		1.000	11.160				
		1	8.546		2.000	17.092				
		1	6.516		0.700	4.561				
		1	4.490		2.300	10.327				
	Internal plastering(12mm thick)	1	5.656		3.000	16.967				
		1	3.297		0.700	2.308				
		1	2.292		2.100	4.814				
	Deduction for pipe	4	0.785			(3.140)				
	Deduction for benching	1	6.280		0.475	(2.983)				
	Total					61.106	Sqm	82.00	5,010.73	LNV 13.06
4	RCC M20	2	0.600	0.876	0.200	0.210	cum	5,000.00	1,051.20	LNV 5.12
5	Steel @ 100 kg / cum					21.024	Kg	49.00	1,030.18	LNV 10.05
6	Form work	2	0.600		1.276	1.531	Sqm	119.25	182.60	DSR 5.9.1 P 93
7	MS Steps with Epoxy Painted					20.000	Nos.	149.85	2,997.00	DSR19.15 P301
8	560 mm dia SFRC Frame & Cover	1				1.000	Nos.	2,000.00	2,000.00	Market Rate
9	PCC M20 20 mm grit	2	0.503	0.876	0.075	0.066	Cum	5,000.00	330.29	LNV 5.12
10	uPVC pipe 160mm dia	2	0.876			1.752	Rm	319.00	558.89	UPJN 30-4-08 Annex A S No 10
	<b>Total cost</b>								<b>57,888.77</b>	
	<b>Cost of Manhole</b>								<b>57,890.00</b>	

## Appendix E-4

## Unit Cost Estimate for Manholes Type - D5

Size of Manhole: Depth(D) = 5.01 to 6.00 m &amp; Dia = 1,800mm; Diameter of Pipe Upto 1,400 mm

S. No.	Description	Nos.	Length/Area	Breath	Depth	Quantity	Unit	Rate Rs.	Amount Rs.	Remark
1	PCC - M15 Grade 40 mm Grit for foundation	1 lot	11.648		0.150	1.747	Cu.m.	3,300.00	5,765.64	LNV 5.06
1a	PCC-M15 Grade 20 mm grit	1 lot								
	For benching portion	1 lot	2.543		1.050	2.671	Cu.m.			
		1 lot	0.785		0.001	0.001	Cu.m.			
	Deduction for pipe	1	0.785		1.500	1.178	Cu.m.			
	For cover slab	1	0.814		0.210	0.171	Cu.m.			
	Deductions for opening	1	0.396		0.170	0.067	Cu.m.			
	for cover and frame									
	Total					1.598	Cu.m.	3,450.00	5,511.49	LNV 5.07
2	M 150 Brick Masonry work with CM (1:4)	1	8.408	0.876	1.000	7.365	Cu.m.			
		1	7.070	0.450	2.000	6.363	Cu.m.			
		1	2.474		0.700	1.732	Cu.m.			
		1 lot	0.802		2.300	1.844	Cu.m.			
	Deduction for pipes	2	0.785		0.876	(1.375)	Cu.m.			
	Total					15.929	Cu.m.	2,100.00	33,450.77	LNV 6.04
3	Plastering with CM(1:3)									
	External Plastering (12mm thick)	1	11.160		1.000	11.160				
		1	8.546		2.000	17.092				
		1	6.516		0.700	4.561				
		1	4.490		2.300	10.327				
	Internal plastering(12mm thick)	1	5.656		3.000	16.967				
		1	3.297		0.700	2.308				
		1	2.292		2.100	4.814				
	Deduction for pipe	4	0.785			(3.140)				
	Deduction for benching	1	6.280		0.475	(2.983)				
	Total					61.106	Sqm	82.00	5,010.73	LNV 13.06
4	RCC M20	2	0.600	0.876	0.200	0.210	cum	5,000.00	1,051.20	LNV 5.12
5	Steel @ 100 kg / cum					21.024	Kg	49.00	1,030.18	LNV 10.05
6	Form work	2	0.600		1.276	1.531	Sqm	119.25	182.60	DSR 5.9.1 P93
7	MS Steps with Epoxy Painted					20.000	Nos.	149.85	2,997.00	DSR19.15P301
8	560 mm dia SFRC Frame & Cover	1				1.000	Nos.	2,000.00	2,000.00	Market Rate
9	PCC M20, 20 mm grit	2	0.503	0.876	0.075	0.066	Cum	5,000.00	330.29	LNV 5.07
10	uPVC pipe 160mm dia	2	0.876			1.752	Rm	319.00	558.89	UPJN 30-4-08 Annex A S No 10
	Total cost								57,888.77	
	<b>Cost of Manhole</b>								<b>57,890.00</b>	



## Appendix E-5

## Unit Cost Estimate for Manholes Type - D4

Size of Manhole: Depth(D) = 4.01 to 5.00 m &amp; Dia = 1,800mm; Diameter of Pipe Upto 1,400 mm

S. No.	Description	Nos.	Length/Area	Breath	Depth	Quantity	Unit	Rate Rs.	Amount Rs.	Remark
1	PCC - M15 Grade 40 mm grit									
	For foundation	1 lot	11.65		0.15	1.75	Cu.m.	3,300.00	5,765.64	LNV 5.06
1a	PCC-M15 Grade 20 mm grit	1 lot								
	For benching portion	1 lot	2.54		1.05	2.67	Cu.m.			
		1 lot	0.79		0.00	0.00	Cu.m.			
	Deduction for pipe	1	0.79		1.50	1.18	Cu.m.			
	For cover slab	1	0.81		0.21	0.17	Cu.m.			
	Deductions for opening for cover and frame	1	0.40		0.17	0.07	Cu.m.			
	Total					1.60	Cu.m.	3,450.00	5,511.49	LNV 5.07
2	M 150 Brick Masonry work with CM (1:4)					-	Cu.m.			
		1	7.07	0.45	2.00	6.36	Cu.m.			
		1	2.07		0.70	1.45	Cu.m.			
		1 lot	0.80		2.30	1.84	Cu.m.			
	Deduction for pipes	2	0.79		0.45	(0.71)	Cu.m.			
	Total					8.95	Cu.m.	2,100.00	18,790.01	LNV 6.04
3	Plastering with CM(1:3)									
	External Plastering (12mm thick)					-				
		1	8.55		2.00	17.09				
		1	6.52		0.70	4.56				
		1	4.21		2.30	9.68				
	Internal plastering(12mm thick)	1	5.66		2.00	11.31				
		1	3.30		0.70	2.31				
		1	2.29		2.30	5.27				
	Deduction for pipe	4	0.79			(3.14)				
	Deduction for benching	1	6.28		0.45	(2.83)				
	Total					44.26	Sqm	82.00	3,628.99	LNV 13.06
4	RCC M20	2	0.60	0.45	0.20	0.11	cum	5,000.00	540.00	LNV 5.12
5	Steel @ 100 kg / cum					10.80	Kg	49.00	529.20	LNV 10.05
6	Form work	2	0.60		0.85	1.02	Sqm	119.25	121.64	DSR 5.9.1,P 93
7	MS Steps with Epoxy Painted					17.00	Nos.	149.85	2,547.45	DSR 19.15,301
8	560 mm dia SFRC Frame &Cover	1				1.00	Nos.	2,000.00	2,000.00	Market rate
9	PCC M20	2	0.50	0.45	0.08	0.03	Cum	5,000.00	169.67	LNV 5.12
10	uPVC pipe 160mm dia	2	0.45			0.90	Rm	319.00	287.10	UPJN 30-4-08 Annex A S No 10
	Total cost								39,891.18	
	<b>Cost of Manhole</b>								<b>39,895.00</b>	

Appendix E-6

Unit Cost Estimate for Manholes Type - D3

Size of Manhole: Depth(D) = 3.01 to 4.00 m & Dia = 1,800mm; Diameter of Pipe Upto 1,400 mm

S.No.	Description	Nos.	Length/ Area	Breath	Depth	Quantity	Unit	Rate Rs.	Amount Rs.	Remark
1	PCC - M15 Grade									
	For foundation	1 lot	11.648		0.15	1.747	Cu.m.	3300	5765.64	LNV 5.06
1a	PCC-M15 Grade	1 lot								
	For benching portion	1 lot	2.543		1.05	2.671	Cu.m.			
		1 lot	0.785		0.0011	0.001	Cu.m.			
	Deduction for pipe	1	0.785		1.5	1.178	Cu.m.			
	For cover slab	1	0.814		0.21	0.171	Cu.m.			
	Deductions for opening for cover and frame	1	0.396		0.17	0.067	Cu.m.			
	Total					1.598	Cu.m.	3300	5271.86	LNV 5.07
2	M 150 Brick Masonry work with CM (1:4)						Cu.m.			
		1	7.070	0.45	1.0	3.181	Cu.m.			
		1	1.679		0.7	1.175	Cu.m.			
		1 lot	0.802		2.3	1.844	Cu.m.			
	Deduction for pipes	2	0.07		0.45	(0.06)	Cu.m.			
	Total					6.14	Cu.m.	2,100.00	12,888.07	LNV 6.04
3	Plastering with CM(1:3)									
	External Plastering (12mm thick)					-				
		1	8.55		1.00	8.55				
		1	6.52		0.70	4.56				
		1	4.49		2.30	10.33				
	Internal plastering(12mm thick)	1	5.66		1.00	5.66				
		1	3.01		0.70	2.11				
		1	2.29		2.30	5.27				
	Deduction for pipe	4	0.79			(3.14)				
	Deduction for benching	1	6.28		0.48	(2.98)				
	Total					30.35	Sqm	82.00	2,488.64	LNV 13.06
4	RCC M20	2	0.60	0.45	0.20	0.11	cum	5,000.00	540.00	LNV 5.12
5	Steel @ 100 kg / cum					10.80	Kg	49.00	529.20	LNV 10.05
6	Form work	2	0.60		0.85	1.02	Sqm	119.25	121.64	DSR 9.5.1 P 93
7	MS Steps with Epoxy Painted	14				14.00	Nos.	149.85	2,097.90	DSR 19.15 P 301
8	560 mm dia SFRC Frame &Cover	1				1.00	Nos.	2,000.00	2,000.00	Market Rate
9	PCC M20	2	0.50	0.45	0.08	0.03	Cum	5,000.00	169.67	LNV 5.12
10	uPVC pipe 160mm dia	2	0.45			0.90	Rm	319.00	287.10	UPJN 30-4-08 Annex A S No 10
	Total cost								32,159.71	
	<b>Cost of Manhole</b>								<b>32,160.00</b>	

**Appendix E-7**  
**Unit Cost Estimate for Manholes Type - D2**

Size of Manhole: Depth(D) = 2.51 to 3.00 m & Dia = 1,800mm; Diameter of Pipe Upto 1,400 mm

S.No.	Description	Nos.	Length/Area	Breath	Depth	Quantity	Unit	Rate Rs.	Amount Rs.	Remark
1	PCC - M15 Grade 40 mm Grit									
	For foundation	1 lot	11.648		0.150	1.747	Cu.m.	3,300	5,765.64	LNV 5.06
1a	PCC-M15 Grade 20 mm grit	1 lot								
	For benching portion	1 lot	2.543		1.050	2.671	Cu.m.			
		1 lot	0.785		0.001	0.001	Cu.m.			
	Deduction for pipe	1	0.785		1.800	1.413	Cu.m.			
	For cover slab	1	0.814		0.210	0.171	Cu.m.			
	Deductions for opening for cover and frame	1	0.396		0.170	0.067	Cu.m.			
	Total					1.362	Cu.m.	3,450	4,699.01	LNV 5.07
2	M 150 Brick Masonry work with CM (1:4)	1	6.740	0.345	0.700	1.628	Cu.m.			
		1	0.802		2.300	1.844	Cu.m.			
	Deduction for pipes	2	0.785		0.345	(0.542)	Cu.m.			
	Total					2.930	Cu.m.	2,100	6,153.68	LNV 6.04
3	Plastering with CM(1:3)									
	External Plastering (12mm thick)									
		1	6.516		0.700	4.561				
		1	6.516		2.300	14.986				
	Internal plastering(12mm thick)									
		1	3.297		0.700	2.308				
		1	2.292		2.300	5.272				
	Deduction for pipe	4	0.785			(3.140)				
	Deduction for benching	1	5.652		0.475	(2.685)				
	Total					21.302	Sqm	82	1,746.74	LNV 13.06
4	RCC M20	2	0.600	0.345	0.200	0.083	cum	5,000	414.00	LNV 5.12
5	Steel @ 100 kg / cum					8.280	Kg	49	405.72	LNV 10.05
6	Form work	2	0.600		0.745	0.894	Sqm	119	106.61	DSR 9.5.1 P 93
7	MS Steps with Epoxy Painted	13				10.000	Nos.	150	1,498.50	DSR 19.15 P 301
8	560 mm dia SFRC Frame & Cover Heavy Duty	1				1.000	Nos.	2,000	2,000.00	market Rate
9	PCC M20	2	0.503	0.345	0.075	0.026	Cum	5,000	130.08	LNV 5.12
10	uPVC pipe 160mm dia	2	0.345			0.690	Rm	319	220.11	UPJN 30-4-08 Annex A S No 10
	Total cost								23,140.09	
	<b>Cost of Manhole</b>								<b>23,145.00</b>	

**Appendix E-8**

**Unit Cost Estimate for Manholes Type - D1**

Size of Manhole: Depth(D) = Upto 2.50 m & Dia = 1,800mm; Diameter of Pipe Upto 1,400 mm

S.No.	Description	Nos.	Length/Area	Breath	Depth	Quantity	Unit	Rate Rs.	Amount	Remark
1	PCC - M15 Grade 40 mm Grit									
	For foundation	1 lot	5.145		0.150	0.772	Cu.m.	3,300	2,546.57	LNV 5.06
1a	PCC-M15 Grade	1 lot								
	For benching portion	1 lot	2.543		1.050	2.671	Cu.m.			
		1 lot	0.785		0.001	0.001	Cu.m.			
	Deduction for pipe	1	0.785		1.800	1.413	Cu.m.			
	For cover slab	1	0.814		0.210	0.171	Cu.m.			
	Deductions for opening for cover and frame	1	0.396		0.170	0.067	Cu.m.			
	Total					1.362	Cu.m.	3,450	4,699.01	LNV 5.07
2	M 15 Brick Masonry work with CM (1:3)	1	6.740	0.230	0.700	1.085	Cu.m.			
		1	0.802		1.800	1.443	Cu.m.			
	Deduction for pipes	2	0.785		0.230	(0.361)	Cu.m.			
	Total					2.167	Cu.m.	2,100	4,551.52	LNV 6.04
3	Plastering with CM(1:3)									
	External Plastering (12mm thick)									
		1	6.516		0.700	4.561				
		1	6.516		1.800	11.728				
	Internal plastering(12mm thick)									
		1	3.297		0.700	2.308				
		1	2.292		1.800	4.126				
	Deduction for pipe	4	0.785			(3.140)				
	Deduction for benching	1	5.652		0.475	(2.685)				
	Total					16.898	Sqm	82	1,385.63	LNV 13.06
4	RCC M20	2	0.600	0.230	0.200	0.055	cum	5,000	276.00	LNV 5.12
5	Steel @ 100 kg / cum					5.520	Kg	49	270.48	LNV 10.05
6	Form work	2	0.600		0.745	0.894	Sqm	119	106.61	DSR 9.5.1 P 93
7	MS Steps with Epoxy Painted	13				10.000	Nos.	150	1,498.50	DSR 19.15 P 301
8	560 mm dia SFRC Frame & Cover Head	1				1.000	Nos.	2,000	2,000.00	Market Rate
9	PCC M20	2	0.503	0.230	0.075	0.017	Cum	5,000	86.72	LNV 5.12
10	uPVC pipe 160mm dia	2	0.230			0.460	Rm	319	146.74	UPJN 30-4-08 Annex A S No 10
	Total cost								17,567.77	
	<b>Cost of Manhole</b>								<b>17570.00</b>	

**Appendix E-9**  
**Unit Cost Estimate for Manholes Type - C8**

Size of Manhole: Depth(D) = 6.01-7.00 m & Dia = 1,500mm; Diameter of Pipe Upto 900 mm

S. No.	Description	Nos.	Length/Area	Breath	Depth	Quantity	Unit	Rate Rs.	Amount Rs.	Remark
1	PCC - M15 Grade 40 mm grit For foundation	1 lot	9.904		0.150	1.486	Cu.m.	3,300	4,902.54	LNV 5.06
1a	PCC-M15 Grade	1 lot								
	For benching portion	1 lot	1.766		0.350	0.618	Cu.m.			
		1 lot	1.130		0.001	0.001	Cu.m.			
	Deduction for pipe	1	0.071		1.500	0.106	Cu.m.			
	For cover slab	1	0.814		0.210	0.171	Cu.m.			
	Deductions for opening for cover and frame	1	0.396		0.170	0.067	Cu.m.			
	Total					0.617	Cu.m.	3,450	2,128.84	LNV 5.07
2	Brick Masonry work with CM (1:4)	1	7.465	0.876	2.000	13.079	Cu.m.			
		1	6.127	0.450	2.000	5.514	Cu.m.			
		1	1.516		0.700	1.061	Cu.m.			
		1 lot	0.802		2.300	1.844	Cu.m.			
	Deduction for pipes	2	0.071		0.345	(0.049)	Cu.m.			
	Total					21.451	Cu.m.	2,100	45,046.12	LNV 6.04
3	Plastering with CM(1:3)									
	External Plastering (12mm thick)	1	10.218		2.000	20.436				
		1	7.604		2.000	15.207				
		1	6.045		0.700	4.231				
		1	6.045		2.300	13.902				
	Internal plastering(12mm thick)	1	4.713		4.000	18.852				
		1	3.297		0.700	2.308				
		1	2.292		2.300	5.272				
	Deduction for pipe	4	0.071			(0.283)				
	Deduction for benching	1	4.710		0.475	(2.237)				
	Total					77.688	Sqm	82	6,370.45	LNV 13.06
4	RCC M20	2	0.600	0.876	0.200	0.210	cum	5,000	1,051.20	LNV 5.12
5	Steel @ 100 kg / cum					21.024	Kg	49	1,030.18	LNV 10.05
6	Form work	2	0.600		1.276	1.531	Sqm	119	182.60	DSR 5.9.1, P 93
7	MS Steps with Epoxy Painted	13				23.000	Nos.	150	3,446.55	DSR 19.15, P 301
8	560 mm dia SFRC Frame & Cover	1				1.000	Nos.	2,000	2,000.00	Market Rate
9	PCC M20	2	0.503	0.345	0.075	0.026	Cum	5,000	130.08	LNV 5.12
10	uPVC pipe 160mm dia	2	0.345			0.690	Rm	319	319.00	UPJN 30-4-08 Annex A S No 10
	Total cost								66,607.55	
	<b>Cost of Manhole</b>								<b>66,610.00</b>	

**Appendix E-10**

**Unit Cost Estimate for Manholes Type - C7**

Size of Manhole: Depth(D) = 5.51-6.00 m & Dia = 1,500mm; Diameter of Pipe Upto 900 mm

S. No.	Description	Nos.	Length/Area	Breath	Depth	Quantity	Unit	Rate Rs.	Amount Rs.	Remark
1	PCC - M15 Grade 40 mm grit for foundation	1 lot	9.904		0.150	1.486	Cu.m.	3,300	4,902.54	LNV 5.06
1a	PCC-M15 Grade 20 mm Grit For benching portion	1 lot	1.766		0.350	0.618	Cu.m.			
		1 lot	1.130		0.001	0.001	Cu.m.			
	Deduction for pipe	1	0.071		1.500	0.106	Cu.m.			
	For cover slab	1	0.814		0.210	0.171	Cu.m.			
	Deductions for opening	1	0.396		0.170	0.067	Cu.m.			
	for cover and frame									
	Total					0.617	Cu.m.	3,450	2,128.84	LNV 5.07
2	Brick Masonry work with CM (1:4)	1	7.465	0.876	1.000	6.540	Cu.m.			
		1	6.127	0.450	2.000	5.514	Cu.m.			
		1	1.516		0.700	1.061	Cu.m.			
		1 lot	0.802		2.300	1.844	Cu.m.			
	Deduction for pipes	2	0.071		0.345	(0.049)	Cu.m.			
	Total					14.911	Cu.m.	2,100	31,312.78	LNV 6.04
3	Plastering with CM(1:3)									
	External Plastering (12mm thick)	1	10.218		1.000	10.218				
		1	7.604		2.000	15.207				
		1	6.045		0.700	4.231				
		1	6.045		2.300	13.902				
	Internal plastering(12mm thick)	1	4.713		3.000	14.139				
		1	3.297		0.700	2.308				
		1	2.292		2.300	5.272				
	Deduction for pipe	4	0.071			(0.283)				
	Deduction for benching	1	4.710		0.475	(2.237)				
	Total					62.758	Sqm	82	5,146.13	LNV 13.06
4	RCC M20	2	0.600	0.876	0.200	0.210	cum	5,000	1,051.20	LNV 5.12
5	Steel @ 100 kg / cum					21.024	Kg	49	1,030.18	LNV 10.05
7	MS Steps with Epoxy Painted	13				18.000	Nos.	150	2,697.30	DSR 19.15P 301
8	560 mm dia SFRC Frame & Cover	1				1.000	Nos.	2,000	2,000.00	Market Rate
9	PCC M20	2	0.503	0.345	0.075	0.026	Cum	5,000	130.08	LNV 5.12
10	uPVC pipe 160mm dia	2	0.345			0.690	Rm	319	220.11	UPJN 30-4-08 Annex A S No 10
	Total cost								50,619.15	
	<b>Cost of Manhole</b>								<b>50,620.00</b>	

## Appendix E-11

## Unit Cost Estimate for Manholes Type - C6

Size of Manhole: Depth(D) = 5.01-5.50 m &amp; Dia = 1,500mm; Diameter of Pipe Upto 900 mm

S. No.	Description	Nos.	Length/Area	Breath	Depth	Quantity	Unit	Rate Rs.	Amount Rs.	Remark
1	PCC - M15 Grade									
	For foundation	1 lot	9.904		0.150	1.486	Cu.m.	3,300	4,902.54	LNV 5.06
1a	PCC-M15 Grade	1 lot								
	For benching portion	1 lot	1.766		0.350	0.618	Cu.m.			
		1 lot	1.130		0.001	0.001	Cu.m.			
	Deduction for pipe	1	0.071		1.500	0.106	Cu.m.			
	For cover slab	1	0.814		0.210	0.171	Cu.m.			
	Deductions for opening for cover and frame	1	0.396		0.170	0.067	Cu.m.			
	Total					0.617	Cu.m.	3,300	2,036.28	LNV 5.07
2	Brick Masonry work with CM (1:4)	1	7.465	0.876	0.500	3.270	Cu.m.			
		1	6.127	0.450	2.000	5.514	Cu.m.			
		1	1.516		0.700	1.061	Cu.m.			
		1 lot	0.802		2.300	1.844	Cu.m.			
	Deduction for pipes	2	0.071		0.345	(0.049)	Cu.m.			
	Total					11.641	Cu.m.	2,100	24,446.11	LNV 6.04
3	Plastering with CM(1:3)									
	External Plastering (12mm thick)	1	10.218		0.500	5.109				
		1	7.604		2.000	15.207				
		1	6.045		0.700	4.231				
		1	6.045		2.300	13.902				
	Internal plastering(12mm thick)	1	4.713		2.500	11.783				
		1	3.297		0.700	2.308				
		1	2.292		2.300	5.272				
	Deduction for pipe	4	0.071			(0.283)				
	Deduction for benching	1	4.710		0.475	(2.237)				
	Total					55.292	Sqm	82	4,533.97	LNV 13.06
4	RCC M20	2	0.600	0.876	0.200	0.210	cum	5,000	1,051.20	LNV 5.12
5	Steel @ 100 kg / cum					21.024	Kg	49	1,030.18	LNV 10.05
6	Form work	2	0.600		1.276	1.531	Sqm	119	182.60	DSR 9.5.1 P 93
7	MS Steps with Epoxy Painted	13				18.000	Nos.	150	2,697.30	DSR 19.15 P 301
8	560 mm dia SFRC Frame & Cover	1				1.000	Nos.	1,359	1,359.00	UWSEIP SOR
9	PCC M20	2	0.503	0.345	0.075	0.026	Cum	5,000	130.08	LNV 5.12
10	uPVC pipe 160mm dia	2	0.345			0.690	Rm	319	220.11	UPJN 30-4-08 Annex A S No 10
	Total cost								42,589.36	
	<b>Cost of Manhole</b>								<b>42590.00</b>	

## Appendix E-12

## Unit Cost Estimate for Manholes Type - C5

Size of Manhole: Depth(D) = 4.51-5.00 m &amp; Dia = 1,500mm; Diameter of Pipe Upto 900 mm

S. No.	Description	Nos.	Length/Area	Breath	Depth	Quantity	Unit	Rate Rs.	Amount Rs.	Remark
1	PCC - M15 Grade 40 mm Grit for foundation	1 lot	5.723		0.150	0.858	Cu.m.	3,300	2,832.71	LNV 5.06
1a	PCC-M15 Grade 20 mm grit	1 lot								
	For benching portion	1 lot	1.766		0.350	0.618	Cu.m.			
		1 lot	1.130		0.001	0.001	Cu.m.			
	Deduction for pipe	1	0.071		1.500	0.106	Cu.m.			
	For cover slab	1	0.814		0.210	0.171	Cu.m.			
	Deductions for opening for cover and frame	1	0.396		0.170	0.067	Cu.m.			
	Total					0.617	Cu.m.	3,450	2,128.84	LNV 5.07
2	Brick Masonry work with CM (1:4)	1	6.127	0.450	2.000	5.514	Cu.m.			
		1	1.516		0.700	1.061	Cu.m.			
		1 lot	0.802		2.300	1.844	Cu.m.			
	Deduction for pipes	2	0.071		0.345	(0.049)	Cu.m.			
	Total					8.371	Cu.m.	2,100	17,579.45	LNV 6.04
3	Plastering with CM(1:3)									
	External Plastering (12mm thick)	1	7.604		2.000	15.207				
		1	6.045		0.700	4.231				
		1	6.045		2.300	13.902				
	Internal plastering(12mm thick)	1	4.713		2.000	9.426				
		1	3.297		0.700	2.308				
		1	2.292		2.300	5.272				
	Deduction for pipe	4	0.071			(0.283)				
	Deduction for benching	1	4.710		0.475	(2.237)				
	Total					47.827	Sqm	82	3,921.80	LNV 13.06
4	RCC M20	2	0.600	0.450	0.200	0.108	cum	5,000	540.00	LNV 5.12
5	Steel @ 100 kg / cum					10.800	Kg	49	529.20	LNV 10.05
6	Form work	2	0.600		0.850	1.020	Sqm	119	121.64	DSR 5.9.1 P 93
7	MS Steps with Epoxy Painted	13				17.000	Nos.	150	2,547.45	DSR 19.15 P 301
8	560 mm dia SFRC Frame & Cover, Heavy Duty	1				1.000	Nos.	2,000	2,000.00	Market rate
9	PCC M20	2	0.503	0.345	0.075	0.026	Cum	5,000	130.08	LNV 5.12
10	uPVC pipe 160mm dia	2	0.345			0.690	Rm	319	220.11	UPJN 30-4-08 Annex A S No 10
	Total cost								32,551.28	
	<b>Cost of Manhole</b>								<b>32,555.00</b>	



Appendix E-13

Unit Cost Estimate for Manholes Type - C4

Size of Manhole: Depth(D) = 4.01-4.50 m & Dia = 1,500mm; Diameter of Pipe Upto 900 mm

S.No.	Description	Nos.	Length/Area	Breath	Depth	Quantity	Unit	Rate Rs.	Amount Rs.	Remark
1	PCC - M15 Grade 40 mm Grit for foundation	1 lot	4.522		0.150	0.678	Cu.m.	3,300	2,238.19	LNV 5.06
1a	PCC-M15 Grade 20 MM Grit	1 lot								
	For benching portion	1 lot	1.766		0.350	0.618	Cu.m.			
		1 lot	1.130		0.001	0.001	Cu.m.			
	Deduction for pipe	1	0.071		1.500	0.106	Cu.m.			
	For cover slab	1	0.814		0.210	0.171	Cu.m.			
	Deductions for opening for cover and frame	1	0.396		0.170	0.067	Cu.m.			
	Total					0.617	Cu.m.	3,450	2,128.84	LNV 5.07
2	Brick Masonry work with CM (1:4)	1 lot	2.378		1.500	3.567	Cu.m.			
		1 lot	1.516		0.700	1.061	Cu.m.			
		1 lot	0.802		2.300	1.844	Cu.m.			
	Deduction for pipes	2	0.071		0.345	0.049	Cu.m.			
	Total					6.424	Cu.m.	2,100	13,489.60	LNV 6.04
3	Plastering with CM(1:3)									
	External Plastering (12mm thick)	1 lot	7.206		1.500	10.809				
		1 lot	6.045		0.700	4.231				
		1 lot	6.045		2.300	13.902				
	Internal plastering(12mm thick)	1 lot	4.239		1.500	6.359				
		1 lot	3.297		0.700	2.308				
		1 lot	2.292		2.300	5.272				
	Deduction for pipe	4	0.071			0.283				
	Deduction for benching	1	4.710		0.475	2.237				
	Total					40.362	Sqm	82	3,309.65	LNV 13.06
4	RCC M20	2	0.600	0.450	0.200	0.108	cum	5,000	540.00	LNV 5.12
5	Steel @ 100 kg / cum					10.800	Kg	49	529.20	LNV 10.05
6	Form work	2	0.600		0.850	1.020	Sqm	119	121.64	DSR 9.5.1 P 93
7	MS Steps with Epoxy Painted	13				15.000	Nos.	150	2,247.75	DSR 19.15 P 301
8	560 mm dia SFRC Frame & Cover Heavy Duty	1				1.000	Nos.	2,000	2,000.00	Market Rate
9	PCC M20	2	0.503	0.345	0.075	0.026	Cum	2,962	77.06	UWSEIP SOR
10	uPVC pipe 160mm dia	2	0.345			0.690	Rm	319	220.11	UPJN 30-4-08 Annex A S No 10
	Total cost								26,902.03	
	<b>Cost of Manhole</b>								<b>26,905.00</b>	

Appendix E-14

Unit Cost Estimate for Manholes Type - C3

Size of Manhole: Depth(D) = 3.51-4.00 m & Dia = 1,500mm; Diameter of Pipe Upto 900 mm

S. No	Description	Nos.	Length/Area	Breath	Depth	Quantity	Unit	Rate Rs.	Amount Rs.	Remark
1	PCC - M15 Grade for foundation	1 lot	4.522		0.150	0.678	Cu.m.	3,300	2,238	LNV 5.06
1a	PCC-M15 Grade	1 lot								
	For benching portion	1 lot	1.766		0.350	0.618	Cu.m.			
		1 lot	1.130		0.001	0.001	Cu.m.			
	Deduction for pipe	1	0.071		1.500	0.106	Cu.m.			
	For cover slab	1	0.814		0.210	0.171	Cu.m.			
	Deductions for opening for cover and frame	1	0.396		0.170	0.067	Cu.m.			
	Total					0.617	Cu.m.	3,300	2,036	LNV 5.07
2	Brick Masonry work with CM (1:4)	1 lot	2.378		1.000	2.378	Cu.m.			
		1 lot	1.516		0.700	1.061	Cu.m.			
		1 lot	0.802		2.300	1.844	Cu.m.			
	Deduction for pipes	2	0.071		0.345	0.049	Cu.m.			
	Total					5.235	Cu.m.	2,100	10,993	LNV 6.04
3	Plastering with CM(1:3)									
	External Plastering (12mm thick)	1 lot	7.206		1.000	7.206				
		1 lot	6.045		0.700	4.231				
		1 lot	6.045		2.300	13.902				
	Internal plastering(12mm thick)	1 lot	4.239		1.000	4.239				
		1 lot	3.297		0.700	2.308				
		1 lot	2.292		2.300	5.272				
	Deduction for pipe	4	0.071			0.283				
	Deduction for benching	1	4.710		0.475	2.237				
	Total					34.639	Sqm	82	2,840	LNV 13.06
4	RCC M20	2	0.600	0.450	0.200	0.108	cum	5,000	540	LNV 5.12
5	Steel @ 100 kg / cum					10.800	Kg	49	529	LNV 10.05
6	Form work	2	0.600		0.850	1.020	Sqm	119	122	DSR 5.9.1 P 93
7	MS Steps with Epoxy Painted	13				13.000	Nos.	150	1,948	DSR 19.15 P 301
8	560 mm dia SFRC Frame & Cover Heavy Duty	1				1.000	Nos.	2,000	2,000	Market Rate
9	PCC M20	2	0.503	0.345	0.075	0.026	Cum	5,000	130	LNV 5.12
10	uPVC pipe 160mm dia	2	0.345			0.690	Rm	319	220	UPJN 30-4-08 Annex A S No 10
	Total cost								23,597	
	<b>Cost of Manhole</b>								<b>23,600</b>	

**Appendix E-15**

**Unit Cost Estimate for Manholes Type - C2**

Size of Manhole: Depth(D) = 3.01-3.50 m & Dia = 1,500mm; Diameter of Pipe Upto 900 mm

S. No.	Description	Nos.	Length/ Area	Breath	Depth	Quantity	Unit	Rate Rs.	Amount Rs.	Remark
1	PCC - M15 Grade 40 mm Grit for foundation	1 lot	4.522		0.150	0.678	Cu.m.	3,300	2,238.19	LNV 5.06
1a	PCC-M15 Grade 20 MM Grit	1 lot								
	For benching portion	1 lot	1.766		0.350	0.618	Cu.m.			
		1 lot	1.130		0.001	0.001	Cu.m.			
	Deduction for pipe	1	0.071		1.500	0.106	Cu.m.			
	For cover slab	1	0.814		0.210	0.171	Cu.m.			
	Deductions for opening for cover and frame	1	0.396		0.170	0.067	Cu.m.			
	Total					0.617	Cu.m.	3,450	2,128.84	LNV 5.07
2	Brick Masonry work with CM (1:4)	1 lot	2.416		0.500	1.208	Cu.m.			
		1 lot	1.516		0.700	1.061	Cu.m.			
		1 lot	0.802		2.300	1.844	Cu.m.			
	Deduction for pipes	2	0.071		0.345	0.049	Cu.m.			
	Total					4.065	Cu.m.	2,100	8,536.01	LNV 6.04
3	Plastering with CM(1:3)									
	External Plastering (12mm thick)	1 lot	7.206		0.500	3.603				
		1 lot	6.045		0.700	4.231				
		1 lot	6.045		2.300	13.902				
	Internal plastering(12mm thick)	1 lot	4.239		0.500	2.120				
		1 lot	3.297		0.700	2.308				
		1 lot	2.292		2.300	5.272				
	Deduction for pipe	4	0.071			0.283				
	Deduction for benching	1	4.710		0.475	2.237				
	Total					28.916	Sqm	82	2,371.13	LNV 13.06
4	RCC M20	2	0.600	0.450	0.200	0.108	cum	5,000	540.00	LNV 5.12
5	Steel @ 100 kg / cum					10.800	Kg	49	529.20	LNV 10.05
6	Form work	2	0.600		0.850	1.020	Sqm	119	121.64	DSR 5.9.1 P 93
7	MS Steps with Epoxy Painted	11				11.000	Nos.	150	1,648.35	DSR 19.15 P 301
8	560 mm dia SFRC Frame & Cover Heavy Duty	1				1.000	Nos.	2,000	2,000.00	Market Rat
9	PCC M20	2	0.503	0.345	0.075	0.026	Cum	5,000	130.08	LNV 5.12
10	uPVC pipe 160mm dia	2	0.345			0.690	Rm	319	220.11	UPJN 30-4-08 Annex A S No 10
	Total cost								20,463.55	
	<b>Cost of Manhole</b>								<b>20,465.00</b>	

Appendix E-16

Unit Cost Estimate for Manholes Type - C1

Size of Manhole: Depth(D) = 2.31-3.00 m & Dia = 1,500mm; Diameter of Pipe Upto 900 mm

S. No.	Description	Nos.	Length/Area	Breath	Depth	Quantity	Unit	Rate Rs.	Amount Rs.	Remark
1	PCC - M15 Grade 40 mm Grit for foundation	1 lot	4.867		0.150	0.730	Cu.m.	3,300	2,409	LNV 5.06
1a	PCC-M15 Grade 20 MM Grit	1 lot								
	For benching portion	1 lot	1.766		0.350	0.618	Cu.m.			
		1 lot	1.130		0.001	0.001	Cu.m.			
	Deduction for pipe	1	0.071		1.500	0.106	Cu.m.			
	For cover slab	1	0.814		0.210	0.171	Cu.m.			
	Deductions for opening for cover and frame	1	0.396		0.170	0.067	Cu.m.			
	Total					0.617	Cu.m.	3,450	2,129	LNV 5.07
2	Brick Masonry work with CM (1:4)	1 lot	1.516		0.700	1.061	Cu.m.			
		1 lot	0.802		2.300	1.844	Cu.m.			
	Deduction for pipes	2	0.071		0.345	0.049	Cu.m.			
	Total					2.857	Cu.m.	2,100	6,000	LNV 6.04
3	Plastering with CM(1:3)									
	External Plastering (12mm thick)	1 lot	6.045		0.700	4.231				
		1 lot	4.208		2.300	9.677				
	Internal plastering(12mm thick)	1 lot	4.239		0.700	2.967				
		1 lot	2.763		2.300	6.355				
	Deduction for pipe	4	0.071			0.283				
	Deduction for benching	1	4.710		0.475	2.237				
	Total					20.711	Sqm	82	1,698	DSR 13.06
4	RCC M20	2	0.600	0.345	0.200	0.083	cum	5,000	414	LNV 5.12
5	Steel @ 100 kg / cum					8.280	Kg	49	406	LNV 10.05
6	Form work	2	0.600		0.745	0.894	Sqm	119	107	DSR 5.9.1 P 93
7	MS Steps with Epoxy Painted	9				9.000	Nos.	150	1,349	DSR 19.15 P 301
8	560 mm dia SFRC Frame & Cover Heavy Duty	1				1.000	Nos.	2,000	2,000	Market Rate
9	PCC M20	2	0.503	0.345	0.075	0.026	Cum	5,000	130	LNV 5.12
10	uPVC pipe 160mm dia	2	0.345			0.690	Rm	319	220	UPJN 30-4-08 Annex A S No 10
	Total cost								16,861	
	<b>Cost of Manhole</b>								<b>16,865</b>	

**Appendix E-17**  
**Unit Cost Estimate for Manholes Type - B2**

Size of Manhole: Depth(D) = 2.01-2.30 m & Dia = 1,200mm; Diameter of Pipe Upto 600 mm

S. No.	Description	Nos.	Length/Area	Breath	Depth	Quantity	Unit	Rate Rs.	Amount Rs.	Remark
1	PCC - M15 Grade 40 mm grit for foundation	1 lot	3.016		0.150	0.452	Cu.m.	3,300	1,492.75	LNV 5.06
1a	PCC-M15 Grade 20 mm Grit									
	For benching portion( up to pipe level)	1 lot	1.130		0.250	0.283	Cu.m.			
		1 lot	0.785		0.001	0.001	Cu.m.			
	Deduction for pipe	1	0.031		1.200	0.038	Cu.m.			
	For cover slab	1	0.814		0.210	0.171	Cu.m.			
	Deductions for opening for cover and frame	1	0.396		0.170	0.067	Cu.m.			
	Total					0.349	Cu.m.	3,450	1,205.37	LNV 5.07
2	Brick Masonry work with CM (1:4)	1 lot	0.802		2.300	1.844	Cu.m.			
	Deduction for pipes	2	0.031		0.230	0.014	Cu.m.			
	Total					1.830	Cu.m.	2,100	3,842.83	LNV 6.04
3	Plastering with CM(1:3)									
	External Plastering (12mm thick)	1 lot	4.208		2.300	9.677				
	Internal plastering(12mm thick)	1 lot	2.763		2.300	6.355				
	Deduction for pipe	4	0.031			0.126				
	Deduction for benching	1	3.768		0.375	1.413				
	Total					14.494	Sqm	82	1,188.53	LNV 13.06
4	RCC M20	2	0.600	0.230	0.200	0.055	cum	5,000	276.00	LNV 5.12
5	Steel @ 100 kg / cum					5.520	Kg	49	270.48	LNV 10.05
6	Form work	2	0.600		0.630	0.756	Sqm	119	90.15	DSR 5.9.1 P 93
7	MS Steps with Epoxy Painted	6				6.000	Nos.	150	899.10	DSR 19.15 P 301
8	560 mm dia SFRC Frame & Cover Heavy Duty	1				1.000	Nos.	2,000	2,000.00	Market Rate
9	PCC M20	2	0.503	0.230	0.075	0.017	Cum	5,000	86.72	LNV 5.12
10	uPVC pipe 160mm dia	2	0.230			0.460	Rm	319	146.74	UPJN 30-4-08 Annex A S No 10
	Total cost								11,498.67	
	<b>Cost of Manhole</b>								<b>11,500.00</b>	

Appendix E-18

Unit Cost Estimate for Manholes Type - B1

Size of Manhole: Depth(D) = 1.66-2.00 m & Dia = 1,200mm; Diameter of Pipe Upto 600 mm

S. No.	Description	Nos.	Length/ Area	Breath	Depth	Quantity	Unit	Rate Rs.	Amount Rs.	Remark
1	PCC - M15 Grade 40 mm Grit for foundation	1 lot	3.016		0.150	0.452	Cu.m.	3,300	1,492.75	LNV 5.06
1a	PCC-M15 Grade 20 mm Grit									
	For benching portion( up to pipe level)	1 lot	1.130		0.250	0.283	Cu.m.			
		1 lot	0.785		0.001	0.001	Cu.m.			
	Deduction for pipe	1	0.031		1.200	0.038	Cu.m.			
	For cover slab	1	0.814		0.210	0.171	Cu.m.			
	Deductions for opening	1	0.396		0.170	0.067	Cu.m.			
	for cover and frame									
	Total					0.349	Cu.m.	3,450	1,205.37	LNV 5.07
2	Brick Masonry work with CM (1:4)	1 lot	0.802		1.800	1.443	Cu.m.			
	Deduction for pipes	2	0.031		0.230	0.014	Cu.m.			
	Total					1.429	Cu.m.	2,100	3,000.84	LNV 6.04
3	Plastering with CM(1:3)									
	External Plastering (12mm thick)	1 lot	4.208		1.800	7.574				
	Internal plastering(12mm thick)	1 lot	2.763		1.800	4.974				
	Deduction for pipe	4	0.031			0.126				
	Deduction for benching	1	3.768		0.375	1.413				
	Total					11.009	Sqm	82	902.72	LNV 13.06
4	RCC M20	2	0.600	0.230	0.200	0.055	cum	5,000	276.00	LNV 5.12
5	Steel @ 100 kg / cum					5.520	Kg	49	270.48	LNV 10.05
6	Form work	2	0.600		0.630	0.756	Sqm	119	90.15	DSR 5.9.1 P 93
7	MS Steps with Epoxy Painted	6				6.000	Nos.	150	899.10	DSR 19.15 P 301
8	560 mm dia SFRC Frame &Cover Heavy Duty	1				1.000	Nos.	2,000	2,000.00	Market rate
9	PCC M20	2	0.503	0.230	0.075	0.017	Cum	5,000	86.72	LNV 5.12
10	uPVC pipe 160mm dia	2	0.230			0.460	Rm	319	146.74	UPJN 30-4-08 Annex A S No 10
	Total cost								10,370.88	
	<b>Cost of Manhole</b>								<b>10,375.00</b>	

**Appendix E-19**

**Unit Cost Estimate for Manholes Type - A3**

Size of Manhole: Depth(D) = 1.51-1.65 m & Dia = 900mm; Diameter of Pipe Upto 500 mm

S. No.	Description	Nos.	Length/ Area	Breath	Depth	Quantity	Unit	Rate Rs.	Amount Rs.	Remark
1	PCC - M15 Grade 40 mm Grit for foundation	1 lot	2.163		0.150	0.324	Cu.m.	3,300	1,070.76	LNV 5.06
1a	PCC-M15 Grade 20 MM Grit									
	For benching portion(up to pipe level)	1 lot	0.636		0.250	0.159	Cu.m.			
		1 lot	0.385		0.011	0.004	Cu.m.			
	Deduction for pipe	1	0.031		0.900	0.028	Cu.m.			
	For cover slab	1	0.814		0.210	0.171	Cu.m.			
	Deductions for opening for cover and frame	1	0.396		0.170	0.067	Cu.m.			
	Total					0.239	Cu.m.	3,450	822.94	LNV 5.07
2	Brick Masonry work with CM (1:4)	1 lot	0.694		1.450	1.006	Cu.m.			
	Deduction for pipes	2	0.031		0.230	0.014	Cu.m.			
	Total					0.991	Cu.m.	2,100	2,081.47	LNV 6.04
3	Plastering with CM(1:3)									
	External Plastering (12mm thick)	1 lot	3.737		1.450	5.418				
	Internal plastering(12mm thick)	1 lot	2.292		1.450	3.324				
	Deduction for pipe	4	0.031			0.126				
	Deduction for benching	1	2.826		0.375	1.060				
	Total					7.556	Sqm	82	619.63	LNV 13.06
4	RCC M20	2	0.600	0.230	0.200	0.055	cum	5,000	276.00	LNV 5.12
5	Steel @ 100 kg / cum					5.520	Kg	49	270.48	LNV 10.05
6	Form work	2	0.600		0.630	0.756	Sqm	119	90.15	DSR 5.9.1 P93
7	MS Steps with Epoxy Painted	5				5.000	Nos.	150	749.25	DSR 19.15 P 301
8	560 mm dia SFRC Frame & Cover Heavy Duty	1				1.000	Nos.	2,000	2,000.00	Market Rate
9	PCC M20	2	0.503	0.230	0.075	0.017	Cum	5,000	86.72	LNV 5.12
10	uPVC pipe 160mm dia	2	0.230			0.460	Rm	319	146.74	UPJN 30-4-08 Annex A S No 10
	Total cost								8,214.14	
	<b>Cost of Manhole</b>								<b>8,215.00</b>	

**Appendix E-20**  
**Unit Cost Estimate for Manholes Type - A2**

Size of Manhole: Depth(D) = 1.21-1.50 m & Dia = 900mm; Diameter of Pipe Upto 500 mm

S. No.	Description	Nos.	Length/Area	Breath	Depth	Quantity	Unit	Rate Rs.	Amount Rs.	Remark
1	PCC - M15 Grade 40 mm grit for foundation	1 lot	2.163		0.150	0.324	Cu.m.	3,300	1,070.76	LNV 5.06
1a	PCC-M15 Grade									
	For benching portion(up to pipe level)	1 lot	0.636		0.250	0.159	Cu.m.			
		1 lot	0.385		0.001	0.000	Cu.m.			
	Deduction for pipe	1	0.031		0.900	0.028	Cu.m.			
	For cover slab	1	0.814		0.210	0.171	Cu.m.			
	Deductions for opening for cover and frame	1	0.396		0.170	0.067	Cu.m.			
	Total					0.235	Cu.m.	3,450	809.80	LNV 5.07
2	Brick Masonry work with CM (1:4)	1 lot	0.694		1.300	0.902	Cu.m.			
	Deduction for pipes	2	0.031		0.230	0.014	Cu.m.			
	Total					0.887	Cu.m.	2,100	1,863.01	LNV 6.09
3	Plastering with CM(1:3)									
	External Plastering (12mm thick)	1 lot	3.737		1.300	4.858				
	Internal plastering(12mm thick)	1 lot	2.292		1.300	2.980				
	Deduction for pipe	4	0.031			0.126				
	Deduction for benching	1	2.826		0.375	1.060				
	Total					6.652	Sqm	82	545.47	LNV 13.06
4	RCC M20	2	0.600	0.230	0.200	0.055	cum	5,000	276.00	LNV 5.12
5	Steel @ 100 kg / cum					5.520	Kg	49	270.48	LNV 10.05
6	Form work	2	0.600		0.630	0.756	Sqm	119	90.15	DSR5.9.1 P 93
7	MS Steps with Epoxy Painted	4				4.000	Nos.	150	599.40	DSR 19.15 P 301
8	560 mm dia SFRC Frame & Cover Heavy Duty	1				1.000	Nos.	2,000	2,000.00	Market Rate
9	PCC M20	2	0.503	0.230	0.075	0.017	Cum	5,000	86.72	LNV 5.12
10	uPVC pipe 160mm dia	2	0.230			0.460	Rm	319	146.74	UPJN 30-4-08 Annex A S No 10
	Total cost								7,758.53	
	<b>Cost of Manhole</b>								<b>7,760.00</b>	



Appendix E-21

Unit Cost Estimate for Manholes Type - A1

Size of Manhole: Depth(D) = 0.91-1.20 m & Dia = 900mm; Diameter of Pipe Upto 500 mm

S. No.	Description	Nos.	Length/ Area	Breath	Depth	Quantity	Unit	Rate Rs.	Amount Rs.	Remark
1	PCC - M15 Grade 40 mm grit for foundation	1 lot	2.163		0.150	0.324	Cu.m.	3,300	1,070.76	LNV 5.06
1a	PCC-M15 Grade 20 mm grit									
	For benching portion(up to pipe level)	1 lot	0.636		0.250	0.159	Cu.m.			
		1 lot	0.385		0.001	0.000	Cu.m.			
	Deduction for pipe	1	0.031		0.900	0.028	Cu.m.			
	For cover slab	1	0.814		0.210	0.171	Cu.m.			
	Deductions for opening for cover and frame	1	0.396		0.170	0.067	Cu.m.			
	Total					0.235	Cu.m.	3,450	809.80	LNV 5.07
2	Brick Masonry work with CM (1:4)	1 lot	0.694		1.000	0.694	Cu.m.			
	Deduction for pipes	2	0.031		0.230	0.014	Cu.m.			
	Total					0.679	Cu.m.	2,100	1,426.09	LNV 6.04
3	Plastering with CM(1:3)									
	External Plastering (12mm thick)	1 lot	3.737		1.000	3.737				
	Internal plastering(12mm thick)	1 lot	2.292		1.000	2.292				
	Deduction for pipe	4	0.031			0.126				
	Deduction for benching	1	2.826		0.375	1.060				
	Total					4.843	Sqm	82	397.16	LNV 13.06
4	RCC M20	2	0.600	0.230	0.200	0.055	cum	5,000	276.00	LNV 5.12
5	Steel @ 100 kg / cum					5.520	Kg	49	270.48	LNV 10.05
6	Form work	2	0.600		0.630	0.756	Sqm	119	90.15	DSR 5.9.1 P 93
7	MS Steps with Epoxy Painted	3				3.000	Nos.	150	449.55	DSR 19.15
8	560 mm dia SFRC Frame & Cover Heavy duty	1				1.000	Nos.	2,000	2,000.00	Market Rate
9	PCC M20	2	0.503	0.230	0.075	0.017	Cum	5,000	86.72	LNV 5.12
10	uPVC pipe 160mm dia	2	0.230			0.460	Rm	319	146.74	UPJN 30-4-08 Annex A S No 10
	Total cost								7,023.45	
	<b>Cost of Manhole</b>								<b>7,025.00</b>	

**Appendix E-22**  
**Unit Cost Estimate for Inspection Chamber 600 x 600mm**  
**Depth = 0.9 to 1.2 m**

S. No.	Description	Nos.	Length	Breath	Depth	Quantity	Unit	Rate Rs.	Amount Rs.	Remark
1	Earthwork Excavation 0 - 1.5 m	1 lot	1.360	1.360	1.300	2.404	Cu. m.	38	91.37	LNV 4.01
2	PCC - M15 Grade For foundation 40 mm grit		1.360	1.360	0.100	0.185	Cu.m.	3,300	610.37	LNV 5.06
3	PCC-M15 Grade 20 mm grit									
	For Flooring	1	0.600	0.600	0.060	0.022				
	For cover Portion		1.060	1.060	0.150	0.169				
	Deductions		0.900	0.700	0.150	(0.095)				
	Total					0.096	Cu.m.	3,450	329.96	LNV 5.07
4	Brick Masonry work with CM (1:4)	1 lot	3.320	0.230	0.900	0.687	Cu.m.	2,100	1,443.20	LNV 6.04
5	uPVC Pipe Pieces of 110 OD	2	0.500			1.000	RM	140	140.00	UPJN 30.4.08 Annex A S No 8
6	Plastering with CM(1:3)									
	External Plastering (12mm thick)	1 lot	4.240		1.200	5.088				
	Internal plastering(12mm thick)	1 lot	2.400		1.050	2.520				
	Total					7.608	Sqm	82	623.86	LNV 13.06
7	1 nos 600 mmX 600 mm SFRC Cover and Frame (Medium Duty)	1					No.	2,000	2,000.00	Market Rate
8	Grand Total								5,238.76	

Say Cost of one no road side Inspection Chamber including excavation

**5,240.00**

**Appendix E-23**  
**Unit Cost Estimate for Inspection Chamber 600 x 400mm**  
**Depth = Upto 0.9 m**

S. No.	Description	Nos.	Length	Breath	Depth	Quantity	Unit	Rate Rs.	Amount Rs.	Remark
1	Earthwork Excavation 0 - 1.5 m	1 lot	1.360	1.160	1.125	1.775	Cu.m.	38	67.44	LNV 4.01
2	PCC - M15 Grade For foundation 40 mm grit	1 lot	1.360	1.160	0.100	0.158	Cu.m.	3,300	520.61	LNV 5.06
3	PCC-M15 Grade 20 mm grit									
	For Flooring	1	0.600	0.400	0.040	0.010				
	For cover Portion	1	1.060	0.860	0.150	0.137				
	Deductions	1	0.800	0.600	0.150	(0.072)				
	Total					0.074	Cu.m.	3,450	256.47	LNV 5.07
4	Brick Masonry work with CM (1:4)	1 lot	3.000	0.230	0.700	0.483	Cu.m.	2,100	1,014.30	LNV 6.04
5	uPVC Pipe Pieces of 110 OD	2	0.500			1.000	RM	140	140.00	UPJN 30.4.08 Annex A S No 8
6	Plastering with CM(1:3)									
	External Plastering (12mm thick)	1 lot	3.840		0.900	3.456				
	Internal plastering(12mm thick)	1 lot	2.000		0.713	1.425				
	Total					4.881	Cu.m.	82	400.24	LNV 13.06
7	1 nos 600mmX 400 mm SFRC Cover with frame ( Medium Duty)	1					No.	1,700	1,700.00	Market Rate
8	Grand Total								4,099.07	

Cost of one road side Inspection Chamber including excavation, say

**4,100.00**

**Appendix E-24**  
**Unit Cost Estimate for Inspection Chamber 400 x 400mm**  
**Depth = Upto 0.45 m**

S. No.	Description	Nos.	Length	Breath	Depth	Quantity	Unit	Rate Rs.	Amount Rs.	Remark
1	Earthwork Excavation 0 - 1.5 m	1 lot	1.16	1.16	0.60	0.807	Cu. m.	38	30.68	LNV 4.01
2	PCC - M 7.5 Grade for foundation	1 lot	1.16	1.16	0.10	0.135	Cu.m.	3,035	408.45	UPJN 1017
3	PCC-M15 Grade 20 mm grit									
	For Flooring	1	0.40	0.40	0.04	0.006				
	For cover Portion	1	0.86	0.86	0.15	0.111				
	Deductions	1	0.60	0.60	0.15	(0.054)				
	Total					0.063	Cu.m.	3,450	218.52	LNV 5.07
3	Brick Masonry work with CM (1:4)	1 lot	2.52		0.40	1.008	Cu.m.	2,100	2,116.80	LNV 6.04
4	uPVC Pipe Pieces of 110 OD	2	0.50			1.000	RM	140	140.00	UPJN 30.4.08 Annex A s No 8
5	Plastering with CM(1:3)									
	External Plastering (12mm thick)	1 lot	3.44		0.45	1.548				
	Internal plastering(12mm thick)	1 lot	1.60		0.45	0.720				
	Total					2.268	Cu.m.	82	185.98	LNV 13.06
6	CI Cover	1				19.000	Kg	45	855.00	Market Rate
7	Grand Total								3,955.43	
	Say Cost of one no road side Inspection Chamber including excavation								<b>3,960.00</b>	

**Appendix E-25**  
**Unit Cost Estimate for Drop Arrangements**

S. No.	Description	Unit	Length	Breath	Depth	Quantity	Rate Rs.	Amount Rs.	Ref
1	PCC (M15) for vertical walls	Cum	1.1	0.15	1	0.165	3300.00	545	LNV 5.06
2	Centering and shuttering for vertical walls (outside)	Sqm	1.5		1	1.5	104.00	156	
3	Top slab RCC M 20	Sqm	0.5	0.5	0.1	0.025	5000.00	125	LNV 5.12
4	Supplying, conveying to site, lowering UPVC pipes 200 mm dia 6 kg/sqm	Lm	1			1	503.00	503	UPJN 30.4.08 Annex A S No 11
5	Supplying and conveying to site following PVC specials for 200mm dia								
6	Tee	Sets	1			1	1200.00	1200	Market rate
7	45degree bend	Sets	1			1	1500.00	1500	Market rate
	<b>Cost for 1 Rm</b>						<b>Total</b>	<b>4029</b>	

Itemwise Cost							MANHOLE COST DEPTH UP TO (m)																											
							1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10	10.5	11	11.5	12	12.5	13	14			
<b>Earth Work Excavation</b>																																		
Sr.No	Depth of excavation (m)	Average Depth	Bottom area sqm	volume,cum	Unit rate (Rs)	Cost(Rs)																												
<b>PCC M15 GRADE</b>																																		
<b>Base slab</b>	Height of footing, m	Area of footing,sqm	volume,cum	Unit rate Rs/Cum		Cost Rs																												
Cement concrete (M10)	0.30	10.11	3.03	3,236	UPJN 1016	9,816																												
				Total		<b>9,816</b>	9,816	9,816	9,816	9,816	9,816	9,816	9,816	9,816	9,816	9,816	9,816	9,816	9,816	9,816	9,816	9,816	9,816	9,816	9,816	9,816	9,816	9,816	9,816	9,816				
Channel inside manhole (M10)	Base area, sqm	Volume, cum	Diduction, cum	Actual volume ,cum	Unit rate Rs/Cum	Cost Rs																												
	2.25	2.25	0.95	1.30	3236	UPJN 1016	4,194	4,194	4,194	4,194	4,194	4,194	4,194	4,194	4,194	4,194	4,194	4,194	4,194	4,194	4,194	4,194	4,194	4,194	4,194	4,194	4,194	4,194	4,194	4,194				
				Total		<b>4,194</b>																												
PCC at top of manhole (M20)	Height,m	Area	Volume, cum	Unit rate Rs/Cum		Cost Rs																												
	0.45	1.32	0.59	5,000	LVN 5.12	2,960																												
				Total		<b>2,960</b>	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960				
<b>BRICK MASONRY WORK WITH CM ((1:4)</b>																																		
Brick walls depth upto (m)	Wall thick (mm)	Height of wall(m)	Area of wall(sqm)	Volume (cu.m)	Unit rate Rs/Cum	Cost Rs																												
upto 1.5	230 MM	1.50	0.21	0.31	2,100	LVN 6.04	658	658																										
1.5-2.0	345 MM	0.50	2.55	1.27	2,100	LVN 6.04	2,673		3,332																									
2.0-2.5		0.50	2.55	1.27	2,100	LVN 6.04	2,673			6,005																								
2.5-3.0	460 MM	0.50	3.61	1.80	2,100	LVN 6.04	3,787				9,792																							
3.0-3.5		0.50	3.61	1.80	2,100	LVN 6.04	3,787				#####																							
3.5-4.0		0.50	3.61	1.80	2,100	LVN 6.04	3,787				#####																							
4.0-4.5		0.50	3.61	1.80	2,100	LVN 6.04	3,787					21,152																						
4.5-5.0		0.50	3.61	1.80	2,100	LVN 6.04	3,787						24,939																					
5.0-5.5	575 MM	0.50	4.77	2.39	2,100	LVN 6.04	5,011						29,950																					
5.5-6.0		0.50	4.77	2.39	2,100	LVN 6.04	5,011							34,961																				
6.0-6.5		0.50	4.77	2.39	2,100	LVN 6.04	5,011								39,972																			
6.5-7.0		0.50	4.77	2.39	2,100	LVN 6.04	5,011									44,983																		
7.0-7.5		0.50	4.77	2.39	2,100	LVN 6.04	5,011										49,994																	
7.5-8.0		0.50	4.77	2.39	2,100	LVN 6.04	5,011											55,006																
8.0-8.5		0.50	4.77	2.39	2,100	LVN 6.04	5,011												60,017															
8.5-9.0		0.50	4.77	2.39	2,100	LVN 6.04	5,011													65,028														
9.0-9.5	690	0.50	6.04	3.02	2,100	LVN 6.04	6,347														71,374													
9.5-10.0		0.50	6.04	3.02	2,100	LVN 6.04	6,347															77,721												
10.0-10.5		0.50	6.04	3.02	2,100	LVN 6.04	6,347																84,068											
10.5-11.0		0.50	6.04	3.02	2,100	LVN 6.04	6,347																	90,414										
11.0-11.5		0.50	6.04	3.02	2,100	LVN 6.04	6,347																		96,761									
11.5-12.0		0.50	6.04	3.02	2,100	LVN 6.04	6,347																			103,107								
12.0-12.5		0.50	6.04	3.02	2,100	LVN 6.04	6,347																				109,454							
12.5-13.0		0.50	6.04	3.02	2,100	LVN 6.04	6,347																					115,801						
13.0-13.5		0.50	6.04	3.02	2,100	LVN 6.04	6,347																											
13.5-14.3		0.80	6.04	4.84	2,100	LVN 6.04	10,155																							132,302				
					<b>Total</b>		<b>72,766</b>																											

Itemwise Cost								MANHOLE COST DEPTH UP TO (m)																								
								1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10	10.5	11	11.5	12	12.5	13	14
<b>INSIDE PLASTERING WITH CM(1:3)</b>																																
Inside plastering depth upto (m)	Wall thick.(mm)	Height of wall,m	inside perimeter (m)	surface area (sqm)	Unit rate Rs/Sqm		Cost Rs																									
upto 1.5	230 MM	1.50	5.40	8.10	82 LNV 13.06		664	664																								
1.5-2.0	345 MM	0.50	6.00	3.00	82 LNV 13.06		246		910																							
2.0-2.5		0.50	6.00	3.00	82 LNV 13.06		246			1,156																						
2.5-3.0	460 MM	0.50	6.00	3.00	82 LNV 13.06		246				1,402																					
3.0-3.5		0.50	6.00	3.00	82 LNV 13.06		246					1,648																				
3.5-4.0		0.50	6.00	3.00	82 LNV 13.06		246						1,894																			
4.0-4.5		0.50	6.00	3.00	82 LNV 13.06		246							2,140																		
4.5-5.0		0.50	6.00	3.00	82 LNV 13.06		246								2,386																	
5.0-5.5	575 MM	0.50	6.00	3.00	82 LNV 13.06		246									2,632																
5.5-6.0		0.50	6.00	3.00	82 LNV 13.06		246										2,878															
6.0-6.5		0.50	6.00	3.00	82 LNV 13.06		246											3,124														
6.5-7.0		0.50	6.00	3.00	82 LNV 13.06		246												3,370													
7.0-7.5		0.50	6.00	3.00	82 LNV 13.06		246													3,616												
7.5-8.0		0.50	6.00	3.00	82 LNV 13.06		246														3,862											
8.0-8.5		0.50	6.00	3.00	82 LNV 13.06		246															4,108										
8.5-9.0		0.50	6.00	3.00	82 LNV 13.06		246																4,354									
9.0-9.5	690 MM	0.50	6.00	3.00	82 LNV 13.06		246																	4,600								
9.5-10.0		0.50	6.00	3.00	82 LNV 13.06		246																		4,846							
10.0-10.5		0.50	6.00	3.00	82 LNV 13.06		246																			5,092						
10.5-11.0		0.50	6.00	3.00	82 LNV 13.06		246																				5,338					
11.0-11.5		0.50	6.00	3.00	82 LNV 13.06		246																					5,584				
11.5-12.0		0.50	6.00	3.00	82 LNV 13.06		246																						5,830			
12.0-12.5		0.50	6.00	3.00	82 LNV 13.06		246																						6,076			
12.5-13.0		0.50	6.00	3.00	82 LNV 13.06		246																						6,322			
13.0-13.5		0.50	6.00	3.00	82 LNV 13.06		246																									
13.5-14.3		0.80	6.00	4.80	82 LNV 13.06		394																						6,962			
					Total		6,962																									
<b>OUTSIDE PLASTERING WITH CM(1:3)</b>																																
Outside plastering depth upto (m)	Wall thick.(mm)	Height of wall,m	Outside perimeter (m)	surface area (sqm)	Unit rate Rs/Sqm		Cost Rs																									
upto 1.5	230 MM	1.50	7.24	10.86	82 LNV 13.06		891	891																								
1.5-2.0	345 MM	0.50	8.76	4.38	82 LNV 13.06		359		1,250																							
2.0-2.5		0.50	8.76	4.38	82 LNV 13.06		359			1,609																						
2.5-3.0	460 MM	0.50	9.68	4.84	82 LNV 13.06		397				2,006																					
3.0-3.5		0.50	9.68	4.84	82 LNV 13.06		397					2,403																				
3.5-4.0		0.50	9.68	4.84	82 LNV 13.06		397						2,799																			
4.0-4.5		0.50	9.68	4.84	82 LNV 13.06		397							3,196																		
4.5-5.0		0.50	9.68	4.84	82 LNV 13.06		397								3,593																	
5.0-5.5	575 MM	0.50	10.60	5.30	82 LNV 13.06		435									4,028																
5.5-6.0		0.50	10.60	5.30	82 LNV 13.06		435										4,462															
6.0-6.5		0.50	10.60	5.30	82 LNV 13.06		435											4,897														
6.5-7.0		0.50	10.60	5.30	82 LNV 13.06		435												5,332													
7.0-7.5		0.50	10.60	5.30	82 LNV 13.06		435													5,766												
7.5-8.0		0.50	10.60	5.30	82 LNV 13.06		435														6,201											
8.0-8.5		0.50	10.60	5.30	82 LNV 13.06		435															6,635										
8.5-9.0		0.50	10.60	5.30	82 LNV 13.06		435																7,070									
9.0-9.5	690 MM	0.50	11.52	5.76	82 LNV 13.06		472																	7,542								
9.5-10.0		0.50	11.52	5.76	82 LNV 13.06		472																		8,015							
10.0-10.5		0.50	11.52	5.76	82 LNV 13.06		472																				8,487					
10.5-11.0		0.50	11.52	5.76	82 LNV 13.06		472																						8,959			
11.0-11.5		0.50	11.52	5.76	82 LNV 13.06		472																						9,432			
11.5-12.0		0.50	11.52	5.76	82 LNV 13.06		472																						9,904			
12.0-12.5		0.50	11.52	5.76	82 LNV 13.06		472																						10,376			
12.5-13.0		0.50	11.52	5.76	82 LNV 13.06		472																						10,849			
13.0-13.5		0.50	11.52	5.76	82 LNV 13.06		472																									
13.5-14.3		0.80	11.52	9.22	82 LNV 13.06		756																						12,077			
					Total		12,077																									

Itemwise Cost							MANHOLE COST DEPTH UP TO (m)																											
Sr. No	Depth up to (m)	Height,m	Number of steps	cost Rs/Step	Market	Cost Rs	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10	10.5	11	11.5	12	12.5	13	14			
1	upto 1.5	1.05	4.00	150	Market	600	600																											
2	1.5-2.0	0.50	2.00	150	Market	300		900																										
3	2.0-2.5	0.50	2.00	150	Market	300			1,200																									
4	2.5-3.0	0.50	2.00	150	Market	300				1,500																								
5	3.0-3.5	0.50	2.00	150	Market	300					1,800																							
6	3.5-4.0	0.50	2.00	150	Market	300						2,100																						
7	4.0-4.5	0.50	2.00	150	Market	300							2,400																					
8	4.5-5.0	0.50	2.00	150	Market	300								2,700																				
9	5.0-5.5	0.50	2.00	150	Market	300									3,000																			
10	5.5-6.0	0.50	2.00	150	Market	300										3,300																		
11	6.0-6.5	0.50	2.00	150	Market	300											3,600																	
12	6.5-7.0	0.50	2.00	150	Market	300												3,900																
13	7.0-7.5	0.50	2.00	150	Market	300													4,200															
14	7.5-8.0	0.50	2.00	150	Market	300														4,500														
15	8.0-8.5	0.50	2.00	150	Market	300															4,800													
16	8.5-9.0	0.50	2.00	150	Market	300																5,100												
17	9.0-9.5	0.50	2.00	150	Market	300																	5,400											
18	9.5-10.0	0.50	2.00	150	Market	300																		5,700										
19	10.0-10.5	0.50	2.00	150	Market	300																			6,000									
20	10.5-11.0	0.50	2.00	150	Market	300																				6,300								
21	11.0-11.5	0.50	2.00	150	Market	300																					6,600							
22	11.5-12.0	0.50	2.00	150	Market	300																						6,900						
23	12.0-12.5	0.50	2.00	150	Market	300																							7,200					
24	12.5-13.0	0.50	2.00	150	Market	300																								7,500				
25	13.0-13.5	0.50	2.00	150	Market	300																												
26	13.5-14.3	0.50	2.00	150	Market	300																									8,100			
<b>Total</b>						<b>8,100</b>																												
<b>MANHOLE COVER</b>																																		
Manhole cover			No.	Unit rate Rs/Cover	Market	Cost Rs																												
SFRC 1200 X 900 OPENING			1.00	3,000	market	3,000																												
<b>Total</b>						<b>3,000</b>	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000			
<b>Total</b>						<b>122,688</b>	<b>22,784</b>	<b>#####</b>	<b>29,941</b>	<b>#####</b>	<b>39,400</b>	<b>#####</b>	<b>48,860</b>	<b>53,589</b>	<b>59,581</b>	<b>65,573</b>	<b>71,564</b>	<b>77,556</b>	<b>83,547</b>	<b>89,539</b>	<b>95,531</b>	<b>101,523</b>	<b>108,888</b>	<b>116,252</b>	<b>123,617</b>	<b>130,982</b>	<b>138,347</b>	<b>145,712</b>	<b>153,077</b>	<b>160,442</b>	<b>179,411</b>			



Itemwise Cost								MANHOLE COST DEPTH UP TO (m)																												
								1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10	10.5	11	11.5	12	12.5	13	13.5	14			
<b>PCC M15 GRADE</b>																																				
<b>Base slab</b>	Height of footing, m	Area of footing, sqm	volume, cum	Unit rate Rs/Cum	Reference	Cost Rs																														
Cement concrete (M10)	0.3	11.0664	3.31992	3235.72	UPJN 1016	10,742																														
						<b>10,742</b>	10,742	10,742	10,742	10,742	10,742	10,742	10,742	10,742	10,742	10,742	10,742	10,742	10,742	10,742	10,742	10,742	10,742	10,742	10,742	10,742	10,742	10,742	10,742	10,742	10,742	10,742				
																						#####														
<b>Channel inside manhole (M10)</b>	Base area, sqm	Volume, cum	Diduction, cum	Actual volume ,cum	Unit rate Rs/Cum	Reference	Cost Rs																													
	2.7	3.51	1.6956	1.8144	3235.72	UPJN 1016	5,871	5,871	5,871	5,871	5,871	5,871	5,871	5,871	5,871	5,871	5,871	5,871	5,871	5,871	5,871	5,871	5,871	5,871	5,871	5,871	5,871	5,871	5,871	5,871	5,871	5,871				
							<b>5,871</b>																													
<b>PCC at top of manhole (M20)</b>	Height, m	Area	Volume, cum	Unit rate Rs/Cum	Reference	Cost Rs																														
	0.45	1.3156	0.59202	5000	LNV 5.12	2,960																														
						<b>2,960</b>	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960					
<b>BRICK MASONRY WORK WITH CM ((1:4)</b>																																				
Brick walls depth upto (m)	Wall thick.(mm)	Height of wall(m)	Area of wall(sqm)	Volume (cu.m)	Unit rate Rs/Cum	Reference	Cost Rs																													
upto 1.5	230 MM	1.5	0.088	0.131	2100	LNV 6.04	276	276																												
1.5-2.0	345 MM	0.5	2.753	1.377	2100	LNV 6.04	2,891		3,166																											
2.0-2.5		0.5	2.753	1.377	2100	LNV 6.04	2,891			6,057																										
2.5-3.0	460 MM	0.5	3.882	1.941	2100	LNV 6.04	4,077				10,134																									
3.0-3.5		0.5	3.882	1.941	2100	LNV 6.04	4,077					14,210																								
3.5-4.0		0.5	3.882	1.941	2100	LNV 6.04	4,077						18,287																							
4.0-4.5		0.5	3.882	1.941	2100	LNV 6.04	4,077							22,363																						
4.5-5.0		0.5	3.882	1.941	2100	LNV 6.04	4,077								26,440																					
5.0-5.5	575 MM	0.5	5.118	2.559	2100	LNV 6.04	5,373									31,813																				
5.5-6.0		0.5	5.118	2.559	2100	LNV 6.04	5,373										37,186																			
6.0-6.5		0.5	5.118	2.559	2100	LNV 6.04	5,373											42,560																		
6.5-7.0		0.5	5.118	2.559	2100	LNV 6.04	5,373													47,933																
7.0-7.5		0.5	5.118	2.559	2100	LNV 6.04	5,373														53,307															
7.5-8.0		0.5	5.118	2.559	2100	LNV 6.04	5,373															58,680														
8.0-8.5		0.5	5.118	2.559	2100	LNV 6.04	5,373																64,053													
8.5-9.0		0.5	5.118	2.559	2100	LNV 6.04	5,373																	69,427												
9.0-9.5	690 MM	0.5	6.458	3.229	2100	LNV 6.04	6,781																	#####												
9.5-10.0		0.5	6.458	3.229	2100	LNV 6.04	6,781																			82,989										
10.0-10.5		0.5	6.458	3.229	2100	LNV 6.04	6,781																					89,771								
10.5-11.0		0.5	6.458	3.229	2100	LNV 6.04	6,781																							96,552						
11.0-11.5		0.5	6.458	3.229	2100	LNV 6.04	6,781																								103,333					
11.5-12.0		0.5	6.458	3.229	2100	LNV 6.04	6,781																									110,115				
12.0-12.5		0.5	6.458	3.229	2100	LNV 6.04	6,781																										116,896			
12.5-13.0		0.5	6.458	3.229	2100	LNV 6.04	6,781																											123,677		
13.0-13.5		0.5	6.458	3.229	2100	LNV 6.04	6,781																												130,459	
13.5-14.3		0.8	6.458	5.167	2100	LNV 6.04	10,850																												141,309	
							<b>141,309</b>																													

Itemwise Cost								MANHOLE COST DEPTH UP TO (m)																											
								1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10	10.5	11	11.5	12	12.5	13	13.5	14		
<b>INSIDE PLASTERING WITH CM(1:3)</b>																																			
Inside plastering depth upto (m)	Wall thick.(mm)	Height of wall,m	inside perimeter (m)	surface area (sqm)	unit rate Rs/Sqm		cost Rs																												
upto 1.5	230 MM	1.5	5.700	8.550	82	LNV 13.06	701	701																											
1.5-2.0	345 MM	0.5	6.600	3.300	82	LNV 13.06	271		972																										
2.0-2.5		0.5	6.600	3.300	82	LNV 13.06	271			1,242																									
2.5-3.0	460 MM	0.5	6.600	3.300	82	LNV 13.06	271				1,513																								
3.0-3.5		0.5	6.600	3.300	82	LNV 13.06	271					1,784																							
3.5-4.0		0.5	6.600	3.300	82	LNV 13.06	271						2,054																						
4.0-4.5		0.5	6.600	3.300	82	LNV 13.06	271							2,325																					
4.5-5.0		0.5	6.600	3.300	82	LNV 13.06	271								2,595																				
5.0-5.5	575 MM	0.5	6.600	3.300	82	LNV 13.06	271									2,866																			
5.5-6.0		0.5	6.600	3.300	82	LNV 13.06	271										3,137																		
6.0-6.5		0.5	6.600	3.300	82	LNV 13.06	271											3,407																	
6.5-7.0		0.5	6.600	3.300	82	LNV 13.06	271												3,678																
7.0-7.5		0.5	6.600	3.300	82	LNV 13.06	271													3,948															
7.5-8.0		0.5	6.600	3.300	82	LNV 13.06	271														4,219														
8.0-8.5		0.5	6.600	3.300	82	LNV 13.06	271															4,490													
8.5-9.0		0.5	6.600	3.300	82	LNV 13.06	271																4,760												
9.0-9.5	690 MM	0.5	6.600	3.300	82	LNV 13.06	271																	5,031											
9.5-10.0		0.5	6.600	3.300	82	LNV 13.06	271																			5,301									
10.0-10.5		0.5	6.600	3.300	82	LNV 13.06	271																					5,572							
10.5-11.0		0.5	6.600	3.300	82	LNV 13.06	271																						5,843						
11.0-11.5		0.5	6.600	3.300	82	LNV 13.06	271																							6,113					
11.5-12.0		0.5	6.600	3.300	82	LNV 13.06	271																								6,384				
12.0-12.5		0.5	6.600	3.300	82	LNV 13.06	271																								6,654				
12.5-13.0		0.5	6.600	3.300	82	LNV 13.06	271																								6,925				
13.0-13.5		0.5	6.600	3.300	82	LNV 13.06	271																								7,196				
13.5-14.3		0.8	6.600	5.280	82	LNV 13.06	433																								7,628				
<b>OUTSIDE PLASTERING WITH CM(1:3)</b>																																			
Outside plastering depth upto (m)	Wall thick.(mm)	Height of wall,m	Outside perimeter (m)	surface area (sqm)	unit rate Rs/Sqm		cost Rs																												
upto 1.5	230 MM	1.5	7.540	11.310	82	LNV 13.06	927	927																											
1.5-2.0	345 MM	0.5	9.360	4.680	82	LNV 13.06	384		1,311																										
2.0-2.5		0.5	9.360	4.680	82	LNV 13.06	384			1,695																									
2.5-3.0	460 MM	0.5	10.280	5.140	82	LNV 13.06	421				2,116																								
3.0-3.5		0.5	10.280	5.140	82	LNV 13.06	421					2,538																							
3.5-4.0		0.5	10.280	5.140	82	LNV 13.06	421						2,959																						
4.0-4.5		0.5	10.280	5.140	82	LNV 13.06	421							3,381																					
4.5-5.0		0.5	10.280	5.140	82	LNV 13.06	421								3,802																				
5.0-5.5	575 MM	0.5	11.200	5.600	82	LNV 13.06	459									4,262																			
5.5-6.0		0.5	11.200	5.600	82	LNV 13.06	459										4,721																		
6.0-6.5		0.5	11.200	5.600	82	LNV 13.06	459											5,180																	
6.5-7.0		0.5	11.200	5.600	82	LNV 13.06	459													5,639															
7.0-7.5		0.5	11.200	5.600	82	LNV 13.06	459														6,098														
7.5-8.0		0.5	11.200	5.600	82	LNV 13.06	459															6,558													
8.0-8.5		0.5	11.200	5.600	82	LNV 13.06	459																7,017												
8.5-9.0		0.5	11.200	5.600	82	LNV 13.06	459																	7,476											
9.0-9.5	690 MM	0.5	12.120	6.060	82	LNV 13.06	497																		7,973										
9.5-10.0		0.5	12.120	6.060	82	LNV 13.06	497																								8,470				
10.0-10.5		0.5	12.120	6.060	82	LNV 13.06	497																								8,967				
10.5-11.0		0.5	12.120	6.060	82	LNV 13.06	497																								9,464				
11.0-11.5		0.5	12.120	6.060	82	LNV 13.06	497																								9,961				
11.5-12.0		0.5	12.120	6.060	82	LNV 13.06	497																								10,457				
12.0-12.5		0.5	12.120	6.060	82	LNV 13.06	497																								10,954				
12.5-13.0		0.5	12.120	6.060	82	LNV 13.06	497																								11,451				
13.0-13.5		0.5	12.120	6.060	82	LNV 13.06	497																								11,948				
13.5-14.3		0.8	12.120	9.696	82	LNV 13.06	795																								12,743				
					Total		12,743																												

Itemwise Cost							MANHOLE COST DEPTH UP TO (m)																											
							1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10	10.5	11	11.5	12	12.5	13	13.5	14		
MS																																		
Sr. No	depth up to (m)	Height,m	Number of steps	cost Rs/Step	Market	Cost Rs																												
1	upto 1.5	1.05	4	150	Market	600	600																											
2	1.5-2.0	0.5	2	150	Market	300	900																											
3	2.0-2.5	0.5	2	150	Market	300	1,200																											
4	2.5-3.0	0.5	2	150	Market	300	1,500																											
5	3.0-3.5	0.5	2	150	Market	300	1,800																											
6	3.5-4.0	0.5	2	150	Market	300	2,100																											
7	4.0-4.5	0.5	2	150	Market	300	2,400																											
8	4.5-5.0	0.5	2	150	Market	300	2,700																											
9	5.0-5.5	0.5	2	150	Market	300	3,000																											
10	5.5-6.0	0.5	2	150	Market	300	3,300																											
11	6.0-6.5	0.5	2	150	Market	300	3,600																											
12	6.5-7.0	0.5	2	150	Market	300	3,900																											
13	7.0-7.5	0.5	2	150	Market	300	4,200																											
14	7.5-8.0	0.5	2	150	Market	300	4,500																											
15	8.0-8.5	0.5	2	150	Market	300	4,800																											
16	8.5-9.0	0.5	2	150	Market	300	5,100																											
17	9.0-9.5	0.5	2	150	Market	300	5,400																											
18	9.5-10.0	0.5	2	150	Market	300	5,700																											
19	10.0-10.5	0.5	2	150	Market	300	6,000																											
20	10.5-11.0	0.5	2	150	Market	300	6,300																											
21	11.0-11.5	0.5	2	150	Market	300	6,600																											
22	11.5-12.0	0.5	2	150	Market	300	6,900																											
23	12.0-12.5	0.5	2	150	Market	300	7,200																											
24	12.5-13.0	0.5	2	150	Market	300	7,500																											
25	13.0-13.5	0.5	2	150	Market	300	7,800																											
26	13.5-14.3	0.5	2	150	Market	300	8,100																											
						<b>Total</b>	<b>8,100</b>																											
<b>MANHOLE COVER</b>																																		
Manhole cover			No.	Unit rate Rs/Cover		Cost Rs																												
SFRC 1200 X 900 OPENING			1	3000		3,000																												
						<b>Total</b>	<b>3,000</b>	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000		
						<b>Total</b>	<b>#REF!</b>	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####

**Appendix E-28**

**Unit Rates of Man Holes and Scrapper Manholes**

Type of Manholes						Scrapper Manholes				
S No	Type of Manhole	Depth	Manhole Dia	Maximum Pipe Dia	Rate Rs	S No	Type	Depth	Size	Rate Rs
		<i>m</i>	<i>mm</i>	<i>mm</i>				<i>m</i>	<i>mm</i>	
1	R	1	900*800	300	9,785					
2	A1	0.91-1.2	900	500	7,025	21	G1	upto 1.5	1500*1500	22,784
3	A2	1.21-1.5	900	500	7,760	22	G2	1.51-2.0	1500*1500	26,363
4	A3	1.51-1.65	900	500	8,215	23	G3	2.01-2.5	1500*1500	29,941
5	B1	1.66-2	1,200	600	10,375	24	G4	2.51-3.0	1500*1500	34,671
6	B2	2-2.3	1,200	600	11,500	25	G5	3.01-3.5	1500*1500	39,400
7	C1	2.31-3	1,500	900	16,865	26	G6	3.51-4.0	1500*1500	44,130
8	C2	3.01-3.5	1,500	900	20,465	27	G7	4.01-4.5	1500*1500	48,860
9	C3	3.51-4	1,500	900	23,600	28	G8	4.51-5.0	1500*1500	53,589
						29	G9	5.01-5.5	1500*1500	59,581
						30	G10	5.51-6	1500*1500	65,573
						31	G11	6.01-6.5	1500*1500	71,564
10	C4	4.01-4.5	1,500	900	26,905	32	H1	upto 1.5	1800*1500	25,078
11	C5	4.51-5.0	1,500	900	32,555	33	H2	1.51-2.0	1800*1500	28,923
12	C6	5.01-5.5	1,500	900	42,590	34	H3	2.01-2.5	1800*1500	32,768
13	C7	5.51-6	1,500	900	50,620	35	H4	2.51-3.0	1800*1500	37,837
14	C8	6.01-7	1,500	900	66,610	36	H5	3.01-3.5	1800*1500	42,905
15	D1	upto 2.5	1,800	1,400	17,570	37	H6	3.51-4.0	1800*1500	47,974
16	D2	2.51-3	1,800	1,400	23,145	38	H7	4.01-4.5	1800*1500	53,043
17	D3	3.01-4	1,800	1,400	32,160	39	H8	4.51-5.0	1800*1500	58,111
18	D4	4.01-5	1,800	1,400	39,895	40	H9	5.01-5.5	1800*1500	64,514
19	D5	5.01-6	1,800	1,400	57,890	41	H10	5.51-6.0	1800*1500	70,918
20	D6	6.01-7	1,800	1,400	66,000	42	H11	6.01-6.5	1800*1500	77,321
43	Drop arrangement				4029	Per Meter				
44	Ventilating shaft				20474					
45	Inspection Chamber 600*600, D=.9-1.2				5240					
46	Inspection Chamber 600*400, upto .9 m									
47	Inspection Chamber 400*400, upto.45 m									

**Appendix E 29 : Estimate for Excavation for Sewers, Timbering and Road Reinstatement**

Sr. No.	Description	Unit	Quantity	Rate Rs	Amount in Rs.	Source of Rate / Reference / Unit Estimate
	<b>A EARTH WORK EXCAVATION</b>					
1	Excavation for foundation / pipe trenches in earth, soils of all types, clay, sand, gravel, soft murum, hard murum, boulders, W.B.M. road , Slushy, muddy soil including removing the excavated material upto a distance of 50 metres and lifts as below, stacking and spreading as directed, normal dewatering, preparing the bed for foundation and excluding backfilling, etc. complete.					
	a Depth upto 1.5 m	cu.m	166,501.00	63.27	10,534,518.00	UPJN 3001
	b Depth 1.5 to 3.0 m	cu.m	132,944.00	79.76	10,603,613.00	UPJN 3002
	c Depth 3.0 to 4.5 m	cu.m	101,148.00	100.27	10,142,110.00	UPJN 3003
	d Depth 4.5 to 6.0 m	cu.m	64,159.00	117.70	7,551,514.00	UPJN 3004
	e Depth 6 to 7.5 m	cu.m	4,649.16	153.82	715,134.00	UPJN 3005
2	<b>Excavation</b> for foundation / pipe trenches in <b>soft rock</b> and old cement and lime masonry foundation , <b>asphalt road</b> including removing the excavated material upto a distance of 50 m beyond area and lift as below , stacking as directed by Engineer -in-charge, dewatering,preparing the bed for foundation and excluding backfilling, etc. complete.Depth upto 1.5 m	cu.m	25,960.00	152.60	3,961,496.00	DSR 2.7
3	<b>Refilling the trenches with available excavated stuff</b> with soft material first over pipeline and then hard material in 15 cm layers with all leads and lift including consolidation using mechanical means to attain 95% of proctor MDD (PROCTOR DENSITY), surcharging , etc, complete.	cu.m	466,040.00	40.00	18,641,600.00	MP Urban PMC RATE - Item E-9A
4	Disposal of surplus earth beyond 50 meters up to a lead of 5 Km.	m <sup>3</sup>	44,451.00	76.48	3,399,612.00	DSR 1.1.2
5	Providing and fixing <b>Close</b> timbering in trenches including strutting, shoring and packing cavities where required complete (Measurement to be taken of the face timbered)					
	Quantity:39197.45*2.25*2+15056.45*3.75*2+9705.12*5.25*2+1056.73*6.75*2+726.95*8*2					
	a Trench Up to 1.5 m deep	sq.m	-	69.80	-	DSR 2.16.1
	b Trench 1.5 to 3.0 m deep	sq.m	88,194.26	72.20	6,367,626.00	DSR 2.16.2
	c Trench 3 to 6.0 m deep	sq.m	111,427.07	77.60	8,646,741.00	DSR 2.16.3
	Trench above 6.0 m deep	sq.m	24,971.52	87.00	2,172,523.00	Extrapolated
6	Add extra over Item No.5above for planking, strutting and packing material for cavities in close timbering if required to be left permanently in position (face area of timber permanently left to be measured)	sq.m	11,229.64	923.05	10,365,522.00	DSR 2.19

Sr. No.	Description	Unit	Quantity	Rate Rs	Amount in Rs.	Source of Rate / Reference / Unit Estimate
7	Providing and fixing <b>open</b> timbering in trenches including strutting, shoring and packing cavities where required complete (Measurement to be taken of the face timbered)					DSR 2.20
a	Up to 1.5	sq.m	-	33.00	-	DSR 2.20.1
b	Depth 1.5 to 3.0 m	sq.m	88,194.26	34.00	2,998,605.00	DSR 2.20.2
c	Depth exceeding 3m.	sq.m	111,427.07	36.00	4,011,374.00	DSR 2.20.3
8	Add extra over Item No.9 above for planking, strutting and packing material for cavities in open timbering if required to be left permanently in position (face area of timber permanently left to be measured)	sq.m	9,981.07	463.85	4,629,718.00	DSR 2.23
<b>Reinstatement of Bituminous pavement and WBM Pavement</b>						
9	Supplying and laying water bound macadam sub base (GSB) with brick aggregate and binding material, earth etc including screening, sorting and spreading to template and consolidation with light power road roller etc complete including cost of moorum etc.					
	( 200mm thick), Quantity: Road Cutting=25960 cum or Road area=25960/.2=129800 sqm, out of it consider 60%Black top,30% CC,10% others	cu.m	25,960.00	558.05	14,486,978.00	Code 16.5.1 & 16.3.10 of DSR 2007
10	Providing, laying ,spreading and compacting stone aggregate of specified sizes to WBM specifications including spreading in uniform thickness, hand picking, rolling with 3 wheeled road/vibratory roller 8-10 tonne in stages to proper grade and camber, applying and brooming requisite type of screening/binding material to fill up interstices of coarse aggregate watering and compacting to the required density. wooden or steel rammers and rolling over 3rd and top most layer with power roller of minimum 8 tonnes and dressing up, in embankments for roads, flood banks, marginalbanks and guide banks etc lead upto 50 m and lift upto 1.5 m as per table 400-7 of MoRT&H specifications for all kinds of soil.					
	Hand Broken Grade I 90-45 mm,100 mm thick	cu.m	12,980.00	934.85	12,134,353.00	Code 16.3.1 of DSR 2007
	Hand broken Grade II 63-45 mm, 75 mm thick	cu.m	9,735.00	961.00	9,355,335.00	Code 16.3.2
	Crusher broken Grade III 53-22.4 mm, 75 mm thick	cu.m	9,735.00	1,003.10	9,765,179.00	Code 16.3.3
11	Providing and applying tack coat using hot straight run bitumen of grade 80/100 including heating the bitumen, spraying the bitumen with mechanically operated spray unit fitted on bitumen boiler,cleaning and preparing the existing road surface as per MoRT&H specifications on WBM new surface @ 0.75 kg/sqm	sqm	129,800.00	23.90	3,102,220.00	Code 16.30 of DSR 2007

Sr. No.	Description	Unit	Quantity	Rate Rs	Amount in Rs.	Source of Rate / Reference / Unit Estimate
12	2 cm premix carpet surfacing with 1.8 cum and 0.9 cum of stone chippings of 13.2 mm size and 11.2 mm size respectively per 100 sqm and 52 kg and 56 kg of hot bitumen per cum of stone chippings of 13.2 mm and 11.2 mm size respectively including a tack coat with hot straight run bitumen including consolidation with road roller of 6-9 tonne capacity etc. complete (tack coat to be paid separately) with paving asphalt 80/100 heated and then mixed with solvent at the rate of 70 gms per kg of asphalt.	sqm	129,800.00	81.95	10,637,110.00	Code 16.32.1 of DSR 2007
<b>Reinstatement of cement concrete pavement</b>						
13	a Providing and laying in position cement concrete of 1:3:6 (1 Cement : 3 Sand : 6 Graded Stone Aggregate 20 mm nominal size excluding the cost of centering and shuttering - All work up to plinth level. <b>(Reinstatement of cement concrete pavement of 1:3:6 and making good to original condition.- Level course), 150 mm thick</b>	cu.m	5,841.00	3,235.72	18,899,841.00	UP JN 1016
14	a Providing and laying in position cement concrete of 1:2:4 (1 Cement : 2 Sand : 4 Graded Stone Aggregate 20 mm nominal size excluding the cost of centering and shuttering - All work up to plinth level. <b>(Reinstatement of cement concrete pavement of 1:2:4 and making good to original condition.- Top Surface), 150 mm thick</b>	cu.m	5,841.00	3,745.25	21,876,005.00	UP JN 1015
	<b>TOTAL</b>				<b>204,998,727</b>	

**Appendix E-30 Estimate for RCC pipe**

S. No	Description	Unit	Quantity	Rate Rs	Amount in Rs.	Source of Rate / Reference / Unit Estimate
<b>B</b>	<b>PIPE LINE WORKS</b>					
1	Pipe Supplying, conveying to site, lowering in trenches, aligning, laying & jointing of <b>RCC pipes NP2 class (with s/s ends)</b> as per IS: 458 - 2003 (Amended up to date) with Rubber gaskets as per (EPDM/SBR) for sewer lines as per IS: 5382-1985 or (Amended up to date), (including cost of Rubber gaskets lubricants) and barricading trenches etc., including necessary fittings as per drawing, testing the laid pipe line (including cost and conveyance of water to site) etc., complete as directed by Engineer. etc.,the pipe shall be ISI marked.					
	200 mm dia pipes	Rm	111,862	391	43,738,042	Rate Analysis on DSR
	250 mm dia pipes	Rm	3,969	456	1,807,880	Rate Analysis on DSR
	300 mm dia pipes	Rm	3,739	627	2,344,353	Rate Analysis on DSR
	400 mm dia pipes	Rm	3,905	775	3,026,375	Rate Analysis on DSR
	450 mm dia pipes	Rm	1,598	874	1,396,652	Rate Analysis on DSR
	500 mm dia pipes	Rm	1,631	1,155	1,883,805	Rate Analysis on DSR
	600 mm dia pipes	Rm	6,041	1,612	9,735,072	Rate Analysis on DSR
	700 mm dia pipes	Rm	485	1,800	873,000	Rate Analysis on DSR
	800 mm dia pipes	Rm	706	2,061	1,454,713	Rate Analysis on DSR
	900 mm dia pipes	Rm	794	2,748	2,181,926	Rate Analysis on DSR
	1100 mm dia pipes	Rm	1,645	4,120	6,777,855	Rate Analysis on DSR
	1400 mm dia pipes	Rm	1,506	5,066	7,631,042	Rate Analysis on DSR
	<b>Total</b>				<b>82,850,714</b>	



Sr. No	Description	Unit	Quantity	Rate Rs	Amount in Rs.	Source of Rate / Reference / Unit Estimate
<b>C</b>	<b>Bedding and Allied Works</b>					
<b>16 A</b>	Shaped bottom or compacted granular bedding with lightly compacted backfill, type C bedding	cum	22270	1386	30866774	
<b>16 B</b>	Shaped bottom or compacted granular bedding with carefully compacted backfill, type B bedding	cum	3441	1386	4769226	
17 A	Providing plain cement concrete bedding of M-15 Grade with carefully compacted backfill (PCC-CCB) using 20mm hard crusher broken stone, laying in layers of not more than 15cm thick, curing, ramming, compaction etc., including shuttering complete for pipe bedding and surrounding as per drawing and/or as directed by Engineer for NP2 pipes, lightly tampted back fill, type Aa bedding	cum	921	3,745	3447690	UP JN 1015
17 B	Providing plain cement concrete bedding of M-15 Grade with carefully compacted backfill (PCC-CCB) using 20mm hard crusher broken stone, laying in layers of not more than 15cm thick, curing, ramming, compaction etc., including shuttering complete for pipe bedding and surrounding as per drawing and/or as directed by Engineer for NP2 pipes, carefully tampted back fill type Ab bedding		3,753	4,000	15012000	
17 C	Providing reinforced cement concrete (P-0.4%) bedding with M-15 Grade concrete carefully compacted backfill [RCC(0.4)-CCB] using 20mm hard crusher broken stone, laying in layers of not more than 15cm thick, curing, ramming, compaction etc., including shuttering, steel reinforcement etc. complete for pipe bedding and surrounding as per drawing and/or as directed by Engineer for NP2 pipes, carefully tampted back fill, type Ac bedding	cum	860	4,415	3796823	UP JN 1019
18	Reinforcement @33 kg/cum	KG	28,380	49	1390620	LNV 10.05
	<b>Total</b>				59,283,133	

**Appendix E 32 Estimate for Manholes**

Sr. No	Description	Unit	Quantity	Rate Rs	Amount in Rs.	Source of Rate / Reference / Unit Estimate	
	<b>D Manholes and Ancillary Works</b>						
	Construction of Manhole for depth up to 1.65 m and for outgoing pipe dia up to 500 mm (Manhole Type "A" for internal dia 900mm)						
19	Construction of Circular Manholes in Brick Masonry of 230 mm thick wall with well burnt chimney bricks crushing strength not less than 40 kg/cm <sup>2</sup> and water absorption not more than 20% and in cement sand mortar 1:4, including barricading, dressing of sides and ramming of bottoms, dewatering if any, providing and Laying M-15 grade (1:2:4) cement concrete including curing, compaction and shuttering etc. complete using stone aggregate 20mm nominal size in foundation, 12 mm thick inside & outside plaster in C. M. 1:3. Providing and Laying cement concrete M-15 grade including curing, compaction, shuttering etc. complete using stone aggregate 20 mm nominal size around the manhole cover of 210mm thick, 200mm thick RCC-M20 grade on pipe top, supply and fixing of M.S foot steps with 20x20mm square bar with epoxy painted of approved make fixed in manhole with 20x20x10 cm cement concrete blocks in 1:3:6, supplying and fixing heavy duty SFRC manhole frame and cover as per IS 12592 (Part I and II) having clear opening of 560mm, including refilling of Jhiri with watering and ramming and disposal of surplus excavated soil at suitable site as directed. Providing and Laying cement concrete M-15 (1:2:4) grade with 20 mm crusher broken coarse aggregates including curing, compaction, shuttering etc. complete for benching as per drawing and as directed by the Engineer. Note-Excavation work will be measured and paid separately.						
	a	0.9 m to 1.2 m Depth	No.	1,265	7,025	8,886,625	Unit Estimate - Manhole-A-3
	b	1.21-1.5 m Depth	No.	1,389	7,760	10,778,640	Unit Estimate - Manhole-A-4
	c	1.51-1.65 m Depth	No.	402	8,215	3,302,430	Unit Estimate - Manhole-A-5
	Construction of Manholes for depth up to 2.30 m and for outgoing pipe dia up to 600 mm ( Manhole Type "B" for internal dia.1200 mm)						

Sr. No	Description	Unit	Quantity	Rate Rs	Amount in Rs.	Source of Rate / Reference / Unit Estimate
20	Construction of Circular Manholes in Brick Masonry of 230 mm thick wall with well burnt chimney bricks crushing strength not less than 40 kg/cm <sup>2</sup> and water absorption not more than 20% and in cement sand mortar 1:4, including barricading, dressing of sides and ramming of bottoms, dewatering if any, providing and Laying M-15 grade (1:2:4) cement concrete including curing, compaction and shuttering etc. complete using stone aggregate 20mm nominal size in foundation, 12 mm thick inside & outside plaster in C. M. 1:3. Providing and Laying cement concrete M-15 grade including curing, compaction, shuttering etc. complete using stone aggregate 20 mm nominal size around the manhole cover of 210mm thick, 200mm thick RCC-M20 grade on pipe top, supply and fixing of M.S foot steps with 20x20mm square bar with epoxy painted of approved make fixed in manhole with 20x20x10 cm cement concrete blocks in 1:3:6, supplying and fixing heavy duty SFRC manhole frame and cover as per IS 12592 (Part I and II)					
	having clear opening of 560mm, including refilling of Jhiri with watering and ramming and disposal of surplus excavated soil at suitable site as directed. Providing and Laying cement concrete M-15 (1:2:4) grade with 20 mm crusher broken coarse aggregates including curing, compaction, shuttering etc. complete for benching as per drawing and as directed by the Engineer. Note-Excavation work will be measured and paid separately.					
a	Up to 2.0 m Depth	No.	547	10,375	5,675,125	Unit Estimate - Manhole-B-1
b	2.01-2.3 m Depth	No.	250	11,500	2,875,000	Unit Estimate - Manhole-B-2

Sr. No	Description	Unit	Quantity	Rate Rs	Amount in Rs.	Source of Rate / Reference / Unit Estimate
21	Construction of Manholes for depth up to 9.0 m and for outgoing pipe dia up to 900 mm ( Manhole Type "C" for internal dia. Of 1500 mm)					
	Construction of Circular Manholes in Brick Masonry of 230 mm thick wall up to 2.3 mtr depth, 345 mm thick for depth between 2.3 to 3.0 m, 460mm thick for depth between 3.0 to 5.0m and 876mm thick for depth above 5m with well burnt chimney bricks crushing strength not less than 40 kg/cm <sup>2</sup> and water absorption not more than 20% and in cement sand mortar 1:4, including barricading, dressing of sides and ramming of bottoms, dewatering if any, providing and Laying M-15 grade (1:2:4) cement concrete including curing, compaction and shuttering etc. complete using stone aggregate 20mm nominal size in foundation, 12 mm thick inside & outside plaster in C. M. 1:3. Providing and Laying cement concrete M-15 grade including curing, compaction, shuttering etc. complete using stone aggregate 20 mm nominal size around the manhole cover of 210mm thick, 200mm thick RCC-M20 grade on pipe top, supply and fixing of M.S foot steps with 20x20mm square bar with epoxy painted of approved make					
	fixed in manhole with 20x20x10 cm cement concrete blocks in 1:3:6, supplying and fixing heavy duty SFRC manhole frame and cover as per IS 12592 (Part I and II) having clear opening of 560mm, including refilling of Jhiri with watering and ramming and disposal of surplus excavated soil at suitable site as directed. Providing and Laying cement concrete M-15(1:2:4) grade with 20 mm crusher broken coarse aggregates including curing, compaction, shuttering etc. complete for benching as per drawing and as directed by the Engineer. Note-Excavation work will be measured and paid separately.					
	Upto 3.0 m Depth	No.	347	16,865	5,852,155	Unit Estimate - Manhole-C-1
	3.01 to 3.5 m Depth	No.	203	20,465	4,154,395	Unit Estimate - Manhole-C-2
	3.51 to 4.0 m Depth	No.	144	23,600	3,398,400	Unit Estimate - Manhole-C-3
	4.01 to 4.5 m Depth	No.	135	26,905	3,632,175	Unit Estimate - Manhole-C-4
	4.51 to 5.0 m Depth	No.	159	32,555	5,176,245	Unit Estimate - Manhole-C-5
	5.01 to 5.50 m Depth	No.	114	42,590	4,855,260	Unit Estimate - Manhole-C-6
	5.51 to 6.00 m Depth	No.	78	50,620	3,948,360	Unit Estimate - Manhole-C-7
	6.01 to 7 m Depth	No.	122	66,610	8,126,420	Unit Estimate - Manhole-C-8
	7.01 to 7.50 m Depth	No.	60	82,610	4,956,600	Extrapolated
	7.51 to 8 m Depth	No.	108	98,610	10,649,880	Extrapolated
	8.01 to 8.50 m Depth	No.	75	114,610	8,595,750	Extrapolated
	8.50 to 9.0 m Depth	No.	12	130,610	1,567,320	Extrapolated

Sr. No	Description	Unit	Quantity	Rate Rs	Amount in Rs.	Source of Rate / Reference / Unit Estimate
22	Construction of Scrap Manholes from depth 1.50 m to 6.0 m Depth ( Manhole Type "G" for internal size 1500 x 1500mm) for Pipe Diameter 450 mm to 900 mm					
	Construction of Rectangular Manholes of size 1500x1500 in Brick Masonry of wall thickness 230mm up to 1.5m depth, 345mm thick between 1.5 to 2.5m depth, 460mm thick between 2.5 to 5.0mt depth and 575mm thick between 5.5 to 9.0m depth with well burnt chimney bricks crushing strength not less than 40 kg/cm <sup>2</sup> and water absorption not more than 20% and in cement sand mortar 1:4, including barricading, dressing of sides and ramming of bottoms, dewatering if any, providing and Laying M-15 grade (1:2:4) cement concrete including curing, compaction and shuttering etc. complete using stone aggregate 20mm nominal size in foundation, 12 mm thick inside & outside plaster in C. M. 1:3. Providing and Laying cement concrete M-15 grade including curing, compaction, shuttering etc. complete using stone aggregate 20 mm nominal size around the manhole cover of 210mm thick, 200mm thick RCC-M20 grade on pipe top, supply and fixing of M.S foot steps with 20x20mm square bar with epoxy painted of approved make					
	fixed in manhole with 20x20x10 cm cement concrete blocks in 1:3:6, supplying and fixing heavy duty SFRC manhole frame and cover as per IS 12592 (Part I and II) having clear opening of 1200 x 900mm, including refilling of Jhiri with watering and ramming and disposal of surplus excavated soil at suitable site as directed. Providing and Laying cement concrete M-15(1:2:4) grade with 20 mm crusher broken coarse aggregates including curing, compaction, shuttering etc. complete for benching as per drawing and as directed by the Engineer. Note-Excavation work will be measured and paid separately.					Unit Estimate - S.M Type G-1 to G-9
	Upto 1.5mt depth	No.	1	22,784	22,784	
	1.50 to 2.0 m Depth	No.	5	26,363	131,815	
	2.01 to 2.50 m Depth	No.	4	29,941	119,764	
	2.51 to 3.0 m Depth	No.	5	34,671	173,355	
	3.01 to 3.5 m Depth	No.	6	39,400	236,400	
	3.51 to 4.0 m Depth	No.	1	44,130	44,130	
	4.01 to 4.5 m Depth	No.	2	48,860	97,720	
	4.51 to 5.0 m Depth	No.	2	53,589	107,178	
	5.01 to 5.5 m Depth	No.	1	59,581	59,581	

Sr. No	Description	Unit	Quantity	Rate Rs	Amount in Rs.	Source of Rate / Reference / Unit Estimate
23	Construction of Scrap Manholes from depth 1.50 m to 6.0 m Depth ( Manhole Type "H" for internal size 1800 x 1500mm) for Pipe Diameter 1000 mm to 1400 mm					
	Construction of Rectangular Manholes of size 1800x1500 in Brick Masonry of wall thickness 230mm up to 1.5m depth, 345mm thick between 1.5 to 2.5m depth, 460mm thick between 2.5 to 5.0mt depth and 575mm thick between 5.5 to 9.0m depth with well burnt chimney bricks crushing strength not less than 40 kg/cm <sup>2</sup> and water absorption not more than 20% and in cement sand mortar 1:4, including barricading, dressing of sides and ramming of bottoms, dewatering if any, providing and Laying M-15 grade (1:2:4) cement concrete including curing, compaction and shuttering etc. complete using stone aggregate 20mm nominal size in foundation, 12 mm thick inside & outside plaster in C. M. 1:3. Providing and Laying cement concrete M-15 grade including curing, compaction, shuttering etc. complete using stone aggregate 20 mm nominal size around the manhole cover of 210mm thick, 200mm thick RCC-M20 grade on pipe top, supply and fixing of M.S foot steps with 20x20mm square bar with epoxy painted of approved make					
	fixed in manhole with 20x20x10 cm cement concrete blocks in 1:3:6, supplying and fixing heavy duty SFRC manhole frame and cover as per IS 12592 (Part I and II) having clear opening of 1200 x 900mm, including refilling of Jhiri with watering and ramming and disposal of surplus excavated soil at suitable site as directed. Providing and Laying cement concrete M-15(1:2:4) grade with 20 mm crusher broken coarse aggregates including curing, compaction, shuttering etc. complete for benching as per drawing and as directed by the Engineer. Note-Excavation work will be measured and paid separately.					Unit Estimate - S.M Type H-1 to H-9
	Upto 1.5mt depth	No.	1	25,078	25,078	
	1.50 to 2.0 m Depth	No.	1	28,923	28,923	
	2.01 to 2.50 m Depth	No.	3	32,768	98,304	
	2.51 to 3.0 m Depth	No.	1	37,837	37,837	
	3.01 to 3.5 m Depth	No.	1	42,905	42,905	
	3.51 to 4.0 m Depth	No.	1	47,974	47,974	
	4.01 to 4.5 m Depth	No.	2	53,043	106,086	
	4.51 to 5.0 m Depth	No.	1	58,111	58,111	
24	Construction of Manholes from depth below 0.90 m Depth ( Manhole Type "R" for size. Of 900x800 mm)					

Sr. No	Description	Unit	Quantity	Rate Rs	Amount in Rs.	Source of Rate / Reference / Unit Estimate
	Construction of Rectangular Manholes of size 900x800 in Brick Masonry of 230 mm thick wall with well burnt chimney bricks crushing strength not less than 40 kg/cm <sup>2</sup> and water absorption not more than 20% and in cement sand mortar 1:4, including barricading, dressing of sides and ramming of bottoms, dewatering if any, providing and Laying M-15 grade (1:2:4) cement concrete including curing, compaction and shuttering etc. complete using stone aggregate 20mm nominal size in foundation, 12 mm thick inside & outside plaster in C. M. 1:3. Providing and Laying reinforcement cement concrete RCC-M-20 grade top slab including curing, compaction, shuttering etc. complete using stone aggregate 20 mm nominal size around the manhole cover of 210mm thick, 200mm thick RCC-M20 grade on pipe top, supply and fixing of M.S foot steps with 20x20mm square bar with epoxy painted of approved make fixed in manhole with 20x20x10 cm cement concrete blocks in 1:3:6, supplying and fixing heavy duty SFRC manhole frame and cover as per IS 12592 (Part I and II)					
	having clear opening of 560mm, including refilling of Jhiri with watering and ramming and disposal of surplus excavated soil at suitable site as directed. Providing and Laying cement concrete M-15 (1:2:4) grade with 20 mm crusher broken coarse aggregates including curing, compaction, shuttering etc. complete for benching as per drawing and as directed by the Engineer. Note-Excavation work will be measured and paid separately. 900*800 mm	No.	24	9,785	234,840	Unit Estimate - Manhole- R
25	Construction of drops excluding manholes at various depths per drawing for RCC/ SW pipes & specials incl. connections, earthwork excavation, concreting & refilling sides of foundation with excavated earth etc., complete.					
	a) up to 1.5 m depth	No.	150	1,500	225,000	
	b) up to 3.0 m depth	No.	200	2,000	400,000	
	c) up to 4.5 m depth	No.	75	2,500	187,500	
	d) up to 6.0 m depth	No.	50	3,000	150,000	
	e) up to 7.00 m depth	No.	5	3,500	17,500	
<b>TOTAL</b>					<b>99,083,565</b>	

**Appendix E-33 Estimate for Interconnection from Road-side Chamber to Manhole**

S. No	Description	Unit	Quantity	Rate Rs	Amount in Rs.	Source of Rate / Reference / Unit Estimate
<b>E</b>	<b>Inter Connections of Road side chamber with Manholes</b>					
26	Providing, conveying to site, lowering in trenches, aligning, laying & jointing to street manholes or to lateral sewers directly or through road side chamber , by rigid unplasticised <b>uPVC pipes , of Class III (6 kg/cm<sup>2</sup>)</b> as per IS 4958: 2000, ISI marked and as per specifications with rubber ring with socket and spigot joints, (EPDM/SBR) as per IS -5382 : 1985 including cost of rubber gaskets , lubricants etc.,with type A bedding as per drawing, all transportation, loading and unloading, conveying to site and stacking the same in closed shed duly protected from sun rays and rains, giving satisfactory hydraulic field testing and commissioning, as per technical specifications and drawings etc. complete as directed by the Engineer, No of houses covered in 2011=30700, 3 m length per house, 20% 160 mm dia., 80% 110 mm dia					
a)	160mm dia (OD)	RM	30,700	383	11,751,960	UP JN-30-4-08+20% for laying and escalation
b)	110 mm dia (OD)	RM	122,800	168	20,630,400	UP JN-30-4-08+20% for laying and escalation
27	Construction of road side inspection chamber of Type A including excavation with clear opening of 600x400 and upto the depth of 900mm in all types of soil with 230 mm thick brick masonry with well burnt chimney bricks crushing strength not less than 40 kg/cm <sup>2</sup> and water absorption not more than 20% and in CM (1:4), 100 mm thick PCC of M15 in foundation. 12mm thick inside and outside plastering with CM (1:3), finished with PCC M15 flooring of 75mm thick as per drawings, including covering of chamber by supplying and fixing SFRC frame and cover as per IS 12592 (Part I and II), covering by M15 grade concrete complete as per approved drawing, including fixing 2 Nos. 110 OD uPVC pipe pieces and plugging the same etc., complete as per drawing and/or directed by Engineer.50% houses to be connected through road side inspection chamber, one chamber to serve two houses, 50% chambers of type B and 50% of type A	No	3,838	4,100	15,733,750	Unit Rate - Inspection Chamber of size 400x600
28	Construction of road side inspection chamber of Type B including excavation with clear opening of 600x600 and depth upto 1200mm in all types of soil with 230 mm thick brick masonry with well burnt chimney bricks crushing strength not less than 40 kg/cm <sup>2</sup> and water absorption not more than 20% in CM (1:4), 100 mm thick PCC of M15 in foundation. 12mm thick inside and outside plastering with CM (1:3), finished with PCC M15 flooring of 75mm thick as per drawings, including covering of chamber by supplying and fixing SFRC frame and cover as per IS 12592 (Part I and II) covering by M15 grade concrete complete as per approved drawing,1, including fixing 2 Nos. 110 OD uPVC pipe pieces and plugging the same etc., complete as per drawing and/or directed by Engineer.	No	3,838	5,240	20,108,500	Unit Rate.- Inspection Chamber of size 600X600
	<b>TOTAL</b>				<b>68,224,610</b>	



**Appendix E-34 Estimate for Miscellaneous Items**

Sr. No /	Description	Unit	Quantity	Rate Rs	Amount in Rs.	Source of Rate / Reference / Unit Estimate
<b>F</b>	<b>MISCELLANEOUS WORKS</b>					
29	Providing and fixing in position FRP flexible ISI marked sheet of 2 mm thick available locally in rolls shall be laid between water supply lines and sewer lines, wherever sewer line is unavoidably passing over a water supply line or as directed by the Engineer.	m <sup>2</sup>	400	332.80	133,120.00	320 Rs/per sqm + 4 % TAX=
30	Providing and making baricading wherever required along the pipe line trenches, surrounding manholes etc using 75mm dia wooden post securely fixed in the ground not more than 3 m apart shall not be less than 1.2 m above the surface of the ground. There shall be two rails, one near the top of the posts and the other about 50 mm above the ground and each shall be of 50 mm to 70 mm in diameter and sufficiently long to run from post to post to which it shall be bound with strong rope including removing the baricading after completion of work including cost of all material, excavation etc complete as per direction of Engineer.( <b>measurement shall be taken separately for both sides of trench, manhole etc</b> )	Rm	111,460	15.00	1,671,900.00	Rate analysis
31	Demolising brick work including staking of serviceable material and disposal of unserviceable material with in 50m lea .in lime or cement mortar of any mix	Cum	70	154.00	10,780.00	UPJN 1267
32	Dismantling dressed stone work ashlar fase stone work, marble/any other tile or stone flooring or precast concrete work including staking of serviceable material and disposal of unserviceable material with in 50m lead.					
	a in cement mortar of any mix	Cum	100	229.00	22,900.00	
	b lime mortar	Cum	50	100.00	5,000.00	
33	Providing and laying in position Plain cement concrete in 1:2:4 including mechanical compaction, curing ,centering and shuttering complete with all lead and lift as the direction of Engineer. <b>For Encasing the pipe, Pedestals etc.</b>	Cum	250	3,745	936,313	UP JN 1015
34	Providing and laying in position Reinforced cement concrete in 1:2:4 excluding form work and reinforcement but including mechanical compaction, curing and smooth finishing with rendering in CM 1:3, making good to the joints etc. complete with all lead and lift as the direction of Engineer for <b>Pedestals, Pillars, pipe supports, walls, slabs etc.</b>	Cum	52	4,415	229,575	UP JN 1019

Sr. No /	Description	Unit	Quantity	Rate Rs	Amount in Rs.	Source of Rate / Reference / Unit Estimate
35	Providing and constructing first Class Brick masonry work in CM 1:6 including curing etc, complete with all lead and lift as per specification and direction of Engineer.	Cum	50	2,156	107,807	UP JN 1029
36	Providing 12 mm thick cement plaster in CM 1:4 to internal surface in single coat including finishing even & smooth and curing etc., complete with all lead and lift as per the specification and direction of Engineer.	Sqm	100	74	7,361	UP JN 1188
37	Providing and fixing of formwork with steel sheets including centering, shuttering, strutting, staging, propping, bracings etc. Complete and including its removal for foundations, pillars etc.	Sqm	200	76	15,200	
38	Providing in position Thermo Mechanically Treated reinforcement as per IS :1786 for RCC work including straightening , cutting, bending , placing in position and binding etc as per drawing all complete including cost of binding wire , labour , wastage etc including laps and chairs. Fe 415.	Kg	6,000	49	294,000	LNV 10.05
39	Dewatering charges for laying and jointing of Pipes in watery situations in trenches including cost of machinery, labour charges etc complete with all leads as per specification and as directed by the Engineer for pipes diameters upto 600mm.	Rm	1,000	75	75,000	Lumsum
40	Providing, fixing and erecting RCC (M20) Vent shaft with cowl, 125mm x 225mm internal and external dia respectively at top, 300mm and 450mm internal and external dia at bottom and 9.10m over all length, bottom 1.25m below ground level fixed in the pit 900mmx900mmx1500mm with PCC M15, 250mm in bed and 200mm around with top 150mm in cement concrete 1:2:4 (1 cement 2 coarse sand and 4 graded stone aggregate of 20mm nominal size) junction of vent shaft and concrete grouted with cement mortar 1:2 (1 cement and 2 fine sand) including making connection with sewer manhole with 200mm dia NP2 RCC pipe (IS 458-amended upto date) for 5.0 m length including PCCB bedding complete and as per standard design and finished with water proofing cement of approved brand of required shade as per drawings and/or as directed by Engineer.	No.	50	20,474	1,023,700	Unit Estimate - Ventilating Shaft
	<b>TOTAL</b>				<b>4,532,655</b>	

**Appendix E-35 Estimate for House Service Connections**

Sr. No /	Description	Unit	Quantity	Rate Rs	Amount in Rs.	Source of Rate / Reference / Unit Estimate
	<b>G Property Connections</b>					
41	Excavation for foundation / pipe trenches in earth, soils of all types, clay, sand, gravel, soft murum, hard murum, boulders, W.B.M. road , Slushy, muddy soil including removing the excavated material upto a distance of 50 metres and lifts as below, stacking and spreading as directed, normal dewatering, preparing the bed for foundation and excluding backfilling, etc. complete, depth upto 1.5 m					
	Depth upto 1.5 m	cu.m	51,200	63	3,239,419	UP JN 3001
42	<b>Refilling the trenches with available excavated stuff</b> with soft material first over pipeline and then hard material in 15 cm layers with all leads and lift including consolidation using mechanical means to attain 95% of proctor MDD (PROCTOR DENSITY), surcharging , etc, complete.	cu.m	25,600	40	1,023,999	MP Urban Project
43	Providing, conveying to site, lowering in trenches, aligning, laying & jointing to street manholes or to lateral sewers directly or through road side chamber , by rigid unplasticised <b>uPVC pipes , of Class III (6 kg/cm<sup>2</sup>)</b> as per IS 4958: 2000, ISI marked and as per specifications with rubber ring with socket and spigot joints, (EPDM/SBR) as per IS -5382 : 1985 including cost of rubber gaskets , lubricants etc., including all transportation, loading and unloading, conveying to site and stacking the same in closed shed duly protected from sun rays and rains, giving satisfactory hydraulic field testing and commissioning, as per technical specifications and drawings etc. complete as directed by the Engineer.					
a)	110 mm dia (OD),	RM	84,425	168	14,183,400	UP JN 30-4-08+20% for laying & Escalation
b)	90 mm dia (OD)	RM	61,400	126	7,736,400	UP JN 30-4-08+20% for laying & Escalation
44	Providing, Supplying, Laying, installation, Testing & Commissioning at site of uPVC specials Class IV (10Kg/Sqcm) including rubber rings, suitable for electromeric sealing rings as per specification with rubber rings as IS 5382:1985/relevant ISO with latest ammendmnet including cost of all material, labour required, transportation, loading, unloading & stacking etc complete.					
a	<b>110mm dia Bends</b>					
i	90 <sup>0</sup> bend	No	3,176	445	1,413,409	Market Rate
i	45 <sup>0</sup> bend	No	7,941	416	3,303,248	Market Rate
i	22.5 <sup>0</sup> bend	No	4,764	416	1,981,949	Market Rate
b	<b>90mm dia Bends</b>					Market Rate
i	90 <sup>0</sup> bend	No	1,588	281	446,228	Market Rate

Sr. No /	Description	Unit	Quantity	Rate Rs	Amount in Rs.	Source of Rate / Reference / Unit Estimate
	<b>G Property Connections</b>					
i	45 <sup>o</sup> bend	No	3,970	281	1,115,570	Market Rate
i	22.5 <sup>o</sup> bend	No	2,382	281	669,342	Market Rate
c	<b>110mm dia Tees</b>	No	15,881	147	2,334,507	Market Rate
d	<b>90mm dia Tees</b>	No	7,940	267	2,119,980	Market Rate
45	Providing and fixing square mouth S.W. Gully trap grade A complete with CI grating brick masonry chamber and water tight C I cover with frame of 300x300 mm size (inside) the weight of the cover to be not less than 4.53 kg as per standard design. Cement concrete 1:2:4 around and 1:5:10 in base.125 x 100mm 'P, Q or S' type	No	12,280	574	7,048,720	MP PWD SOR, P 193 Item 4b+ Escalation @ 5% per annum
46	Construction of road side inspection chamber including excavation with clear opening of 400x400 and upto the depth of 450mm in all types of soil with half brick masonry with well burnt chimney bricks crushing strength not less than 40 kg/cm2 and water absorption not more than 20% and in CM (1:4), 100 mm thick PCC of M15 in foundation. 12mm thick inside and outside plastering with CM (1:3), finished with PCC M15 flooring of 75mm thick as per drawings, including covering of chamber by supplying and fixing CI frame and cover as per IS, covering by M15 grade concrete complete as per approved drawing, including fixing 2 Nos. 110 OD uPVC pipe pieces and plugging the same etc., complete as per drawing and/or directed by Engineer.	No	3,070	2,000	6,140,000	Unit Rate - Inspection Chamber of size 400x600
47	Providing 25mm thick Cuddapah stone slab flooring over 20mm ( avg.) thick base of cement mortar 1:4 laid over and jointed with grey cement slurry mixed with pigment to match the shade of slab including grinding, rubbing and polishing etc complete. For kitchen slab	Sqm	1,842	702	1,293,084	MP PWD SOR, P. 123, It 36.a+ Escalation @ 5% per annum
48	Providing Marble stone slab flooring over 20mm ( Average) thick base of cement mortar 1:4 laid and joint with grey cement slurry including grinding rubbing and polishing etc complete.	Sqm	1,842	6,075	11,190,150	MP PWD SOR, P. 120, It 30.i+ Escalation @ 5% per annum
49	Providing 50mm thick Cement concrete flooring with 1:2:4 concrete (1 cement : 2 Sand : 4 graded stone aggregate of 20mm nominal size) finished with a floating coat of neat cement including cost of glass strip of size 40 x 4mm for panels in flooring not exceeding 2.0 Sqm area complete.	Sqm	5,526	138	762,588	MP PWD SOR, P. 115, It 2.b+ Escalation @ 5% per annum
50	Demolishing cement concrete 1:3:6 or richer mix including disposal of material within 50 meters lead	Cum	921	226	208,146	
51	Dismantling dressed stone work ashlar face stone work, marble/any other tile or stone flooring or precast concrete work including staking of serviceable material and disposal of unserviceable material within 50m lead.					
a	in cement mortar of any mix	Cum	50	229	11,450	
b	lime mortar	Cum	50	100	5,000	
	<b>TOTAL</b>				<b>66,226,589</b>	

**Rising Main from Pumping Stations**

Appendix E-36 Estimate for Rising Main

S. No	Description of work	Unit	No.	L (m)	B (m)	D (m)	Quantity	Rate (Rs)	Amount (Rs)	No.	L (m)	B (m)	D (m)	Quantity	Rate (Rs)	Amount (Rs)	
				<b>Pumping Station - 1</b>								<b>Pumping Station - 2</b>					
1	Earth work excavation for pipeline trenches including depositing on bank upto a lead of 90meters including shoring, strutting using sight rails and boning rods at every 90m wherever necessary as directed in the following strata																
	i) 0 to 1.5 m depth	cum	1	100.00	0.90	1.50	135.00	63.27	8,541	1	80.00	0.90	1.50	108.00	63.27	6,833	
	ii) 1.50 to 3.0 m depth	cum	1	50.00	0.90	2.00	90.00	79.68	7,171	1	40.00	0.90	2.00	72.00	79.76	5,743	
2	Supplying, Laying, Joining, Tetsing of DI Pipe K 7 for Sewer Pressure Lines with necessary bends, Specials as per site conditions																
	250 mm dia pipe for SPS1, 1100 mm for SPS 2	m	1	100.00				2318.40	231,840	1	80.00			80.00	32000.00	2,560,000	
4	Providing necessary Air valves, Scour valves, Sluice valve with Chambers of sizes as perposed in the tender drawings or in the specifications as desired and directed by the engineer in charge to suit the design requirements including procurement of necessary civil mechanical and elctro mechanical items, thrust blocks, anchoring blocks, valve chamber covers etc., complete in acordance and approval of the Engineer in charge for the pumping Stations including testing of Pressure line																
	a Sluice Valve	No.	1	250 mm dia				30000	30,000	1	600 mm dia				100000	100,000	
	b Air Valve	No.	2	100 mm				20000	40,000	2	100 mm dia				20000	40,000	
	<b>TOTAL</b>								<b>317,553</b>							<b>2,712,576</b>	
	Total for Both Pumping Stations															<b>3,030,129</b>	

Appendix E-37 Estimate for Sewage Pumping Station  
Detailed Estimate for Sewage Pumping Stations

S. No.	Description of item	Pumping station 1								Pumping Station 2							
		No.	L (m)	B (m)	H (m)	Quantity	Unit	Rate (Rs.)	Amount (Rs)	No.	L (m)	B (m)	H (m)	Quantity	Unit	Rate (Rs.)	Amount (Rs)
<b>A</b>	<b>Wetwell</b>																
1	Earth work excavation for foundation & depositing on bank with lead & lift for depths in hard stiff clay, stiff black cotton, hard red earth mixed with small sized boulders & hard gravelly soil, including dewatering of water etc., complete as per standard specifications and as directed by the Departmental Engineer																
	a) For 0.0 to 1.5 m depth	1	6	28.28	1.5	42.42	cum	190.62	8085	1	22	380.18	1.5	570.27	cum	37.00	21100
	b) For 1.5 to 3.00 m depth	1	6	28.28	1.5	42.42	cum	253.52	10754	1	22	380.18	1.5	570.27	cum	41.10	23438
	c) For 3.00 to 4.50 m depth	1	6	28.28	1.5	42.42	cum	648.10	27491	1	22	380.18	1.5	570.27	cum	55.50	31650
	d) For 4.50 to 6.00 m depth	1	6	28.28	2	56.56	cum	90.80	5135	1	22	380.18	2	760.36	cum	90.80	69041
2	Supplying and filling with sand for foundation and basement including watering consolidating ramming etc complete.	1		28.28	0.3	8.48	cum	450.00	3818	1		380.18	0.3	114.05	cum	172.05	19623
3	Providing and laying base concrete in foundation using Plain Cement Concrete of 1:2:4 using 20 mm metal including consolidation and leveling etc as per standard specifications	1		28.28	0.3	8.48	cum	1,549.40	13144	1		380.18	0.3	114.05	cum	1,549.40	176716
4	Providing Form work with centering for soffits of reinforced cement concrete slab or plain surfaces including strutting up to 3 m.	1		28.28	3	84.83	sqm	3,513.84	298093	1		380.18	3	1,140.55	sqm	302.30	344787
5	Reinforced Cement Concrete <b>M25</b> using 20 mm metal excluding form work and reinforcement for RCC works as detailed in drawings and as per standard specifications and as directed by the Departmental Engineer etc. complete (walls)	1		0.07	4.8	0.34	cum	6,761.95	2294	1		2.01	10	20.11	cum	2,039.99	41016
6	Reinforced Cement Concrete <b>M25</b> using 20 mm metal excluding form work and reinforcement for RCC works as detailed in drawings and as per standard specifications and as directed by the Departmental Engineer etc. complete (Raft)	1		23.76	0.3	7.13	cum	5,809.38	41406	1		369.84	0.8	295.87	cum	2,039.99	603570
7	Reinforced Cement Concrete <b>M20</b> using 20 mm metal excluding form work and reinforcement for RCC works as detailed in drawings and as per standard specifications and as directed by the Departmental Engineer etc. complete for cover slab	1		28.27	0.15	4.24	cum	4,408.62	18698	1		369.84	0.2	73.97	cum	2,039.99	150892
8	Reinforcement for RCC works					936.63	Kg	38.10	35686					31,195.39	Kg	33.34	1040054
9	Inside plastering in CM 1:4, 12 mm thick including necessary scaffolding, water the surface etc all complete as per standard specification.	1		15.71	4.8	75.40	sq.m.	85.31	6432	1		61.26	10	612.61	sq.m.	45.12	27641
10	Outside plastering in CM 1:4, 20 mm thick including necessary scaffolding, watering the surface etc all complete as per standard specification.	1		17.28	4.8	82.94	sq.m.	104.61	8676	1		66.29	10	662.88	sq.m.	82.00	54356
11	Refilling in excavated trenches and basement using excavated earth including complete consolidation and leveling as per standard specifications																
12	Bitumin Paint inside the plastered walls and ceiling with approved colour over the white washed area with neat finishing of 2 coats etc, complying with standard specification and as directed by the Departmental Engineer etc, complete (Inside )	1		15.71	4.8	75.40	sq.m.	150.00	11310	1		61.26	10	612.61	sq.m.	120.00	73513
14	Providing PVC encapsulated rungs at regular intervals staggered arrangement					16	no.	150.00	2400					22	no.	65.00	1430
15	Construction of Chamber in BBM 230 mm thick wall in necessary CM 1:4 with necessary plastering inside and out side as per norms along with M S Heavy Duty Grating for chamber					1	no.		6000					1	no.		6000

**Detailed Estimate for Sewage Pumping Stations**

S. No.	Description of item	Pumping station 1							Pumping Station 2								
		No.	L (m)	B (m)	H (m)	Quantity	Unit	Rate (Rs.)	Amount (Rs)	No.	L (m)	B (m)	H (m)	Quantity	Unit	Rate (Rs.)	Amount (Rs)
16	Providing and fixing Sluice gate of size 300 mm x 300 mm to suit the incoming sewer pipe line along with operating spindle etc. complete.					1	no.		100000					1	no.		100000
<b>B</b>	<b>Superstructure</b>																
17	Providing and constructing brick masonry with approved quality bricks of standard size with necessary centering scaffolding and curing for super structure with table moulded bricks of standard size in c.m.1:6. etc. complete in all respects as directed by the engineer in charge	1	20.54855	9	3.5	8	cum		0	1	24	0.23	4.5	25	cum	1,218.41	30265
	Parappet	1	20.54855	0.115	0.6	1	cum	2,593.14	3677	1	24	0.115	0.75	2	cum	2,593.14	5368
18	Providing plastering to masonry including providing and removing scaffolding roudning off all corners wherever required smooth rendering curing etc., complete.(inside 12 mm thick) including flooring	1		15.71	3.5	71	sq.m.	104.61	7395	1		18.00	4.5	81	sq.m.	104.61	8473
19	Providing Rcc Roof for the Super structure in RCC 1:2:4 for about a thickness of 120mm as per norms and specifications proposed	1				3	Cum	4,041.24	11946	1				3	Cum	4,041.24	12483
	Steel for the Roof in Fe 415 grade					180	Kg	38.10	6858					180	Kg	38.10	6858
20	outside 20 mm thick			15.71	3.5	55	sq.m.	104.61	5751			18.92	4.5	85	sq.m.	104.61	8906
	for parappet	1				11	sq.m.		0	1				11	sq.m.		0
21	Providing Doors	1		2.64		3	sq.m.	2,203.50	5817	1		2.64		3	sq.m.	2,203.50	5817
22	Providing Windows	2		1.44		3	sq.m.	2,203.50	3173	2		1.44		3	sq.m.	2,203.50	3173
23	Rolling Shutter 2.0 m wide	1		6		6	sq.m.	1,570.40	9422	1		6		6	sq.m.	1,570.40	9422
	Ventilators	3	0.6	0.3		1	sq.m.	2,203.50	661	3	0.6	0.3		1	sq.m.	2,203.50	661
	GI Hand Rails:Providing and fixing Gi hand rails in 25 mm dia pipes with three horizontal rows of pipes and posts of angle of iron of 65 mm x 65 mm 8 mm RCC 150 mm x 150 mm and 1.15 m height and [placed at 1.85 c/c including painting twoc oats and anchorahge in CC etc. complete	1				50	rm	208.00	10400	1				18	rm	208.00	3660
24	White washing, Distemping with approved color and brans two coats and of required shade on wall surface to givean even shade over and inclusive of primer coat of whitening after thoroughly brooming the surface free from mortor dropping other material.	1				121		30.00	3620	1				121		30.00	3620
26	Miscellaneous like earthen Ramp etc.						LS		9000						LS		9000
	<b>Sub Total</b>	<b>Total for</b>							<b>677141</b>								<b>2892535</b>
	<b>grand Total</b>														<b>Say</b>		<b>3569677</b>

			<b>Appendix E-38</b>
	<b>Estimate of Hapur South STP with WSP Process: Abstract of Cost</b>		
	<b>Abstract of Cost</b>		
<b>S No</b>	<b>Work</b>	<b>Amount Rs</b>	<b>Detailed Estimate</b>
1	Anaerobic Ponds and Facultative Ponds	62,973,325	Annex E-3
2	Civil works	8,934,142	Annex E-4
3	Administrative Building and Watch Man Hut	1,280,344	Annex E-5
4	Drains	5,920,920	Annex E-6
5	Roads	11,576,136	Annex E-7
6	Clear Water Tank and Pump House	1,100,210	Annex E-8
7	Mislenious	8,058,165	Annex E-9
8	Mechanical	19,978,730	Annex E-10
9	Electrical	1,325,795	Annex E-11
	<b>Grand Total</b>	<b>121,147,767</b>	



<b>Appendix E-39</b>						
<b>Estimate of Hapur south STP on WSP Process: Anaerobic Ponds and Facultative Ponds</b>						
<b>S No</b>	<b>Item</b>	<b>Unit</b>	<b>Quantity</b>	<b>Rate</b>	<b>Reference of Rate</b>	<b>Amount</b>
<b>EARTHWORK</b>						
1	Scraping of grass and Shrubs upto 0.15 m depth, Area of APs and FPs	Sq.m	136,807.91	0.60	UP LNV 4.06	82,085
2	Ploughing the existing ground to a depth of 15 cm to 25 cm and watering the same, all kinds of soil, Bottom area of Aps and FPs	Sq.m	94,609.16	5.12	DSR 2.29.1	484,399
3	Earth work in excavation including loading,unloading,disposal within STP plot bounday and dressing of excavated earth in dry or moist including dressing of excavated area with cost of dewatering wherever required and all applicable taxes and levies etc. complete in all respect, in soft and hard soil (excavation depth for AP 3.75 & for FP 0.34 m)	cu.m	71,897.09	48.53	UPJN 1001	3,489,166
4	Earth work in excavation(within site) for embankments in soft , hard soil, murrum or highly weathered strata dry or moist including laying in layers of 20cm (before compaction) breaking of clods,sorting of grass,pebbles etc. and dressing when compacted by sheep foot roller/pneumatiuc tyred roller to obtain <b>dry density of at least 95%of Standard Proctor's density</b> with required lift (including charges for compaction and watering of embankment) inluding loading and unloading wherever required and all applicable taxes etc.complete in all respect within required lead. (Embankment height for AP 2.25 and for FP 2.66 m)	Cum	64,356.60	80.02	UPJN 1001 &1005	5,149,815
<b>PITCHING WORKS</b>						
5	Pitching using First class brick floor laid in cement mortar 1:6 and pointed with 1;2 cement mortar over 75 mm thick base concrete in 1:4:8 cement, local sand and brick ballast					
5-a	Pitching to the base of Anaerobic ponds	Sqm	7,824.84	428.60	UPJN 1217	3,353,726
5-b	Pitching to the side slopes of Anaerobic and Facultative ponds, at middle height FP is 153.7 by 305.3 and AP is 48.1 by 93.8	Sqm	28,585.53	428.60	UPJN 1217	12,251,759
5-c	Pitching to the base of Facultative Ponds	sqm	86,784.32	428.60	UPJN 1218	37,195,760
6	Turfing by transplantation of grass on outside slopes of embankment etc. in rows 15cm centre to centre in each direction including Ploughing, levelling, breaking of clods, and removal of stones etc. if required including maintenance for 1 year.	Sqm	15,198.69	50.00	Market Rate	759,934
7	Providing precast cement concrete M 25 Kerb stone of 150x150x450 mm and fixing in cc 1;3:6 including necessary excavation,painting etc. complete at spacing of 1m centre to centre	cum	37.97	4,247.70	DSR 16.69 p 238	161,280
8	Providing and fixing 40 mm thick stones steps (riser and tread) in CM 1:6 with width of steps 1500 mm etc complete.	Sqm	154.00	294.81	UPJN 1059	45,401
<b>TOTAL</b>						<b>62,973,325</b>

<b>Appendix E-40</b>						
<b>Estimate of Hapur south STP on WSP Process: Civil Works</b>						
<b>Estimate: Civil Works</b>						
<b>S No</b>	<b>Item</b>	<b>Unit</b>	<b>Quantity</b>	<b>Rate</b>	<b>Reference of Rate</b>	<b>Amount</b>
1	Earthwork in excavation in foundation trenches or drains including dressing of sides and ramming of bottoms, lift upto 1.5Mtr including taking out the excavated soil and depositing and refilling of jhiri with watering and ramming and disposal of surplus excavated soil as directed within a lead of 30Mtr. :Ordinary soil loam,clay or sand					
1-a	0 to 1.5m from the GL	Cu.m	1,257	48.53	UPJN 1001	61,002
1-b	1.5m to 3.0m	Cu.m	379	56.78	UPJN 1001 & 1006	21,520
1-c	3.0m to 4.5m	Cu.m	25	65.03	UPJN 1001 & 1006	1,626
2	Providing and filling in plinth, foundation, under floors etc with locally available sand including watering , ramming, consolidation and dressing etc all complete as per direction of Engineer.	Cu.m	66	31.49	UPJN 1005	2,078
3	Providing and laying cement concrete including curing,compaction etc. complete using stone aggregate 20mm nominal size in foundation and plinth, excluding cost of shuttering, using M-10 grade mix 1:3:6 (1 cement : 3 course sand : 6 graded stone aggregate)	Cu.m	132	3,235.72	UPJN 1016	427,115
4	Providing and laying cement concrete in R.C.C. work in foundations,rafts,footings,strap beam,bases of columns etc. including curing, compaction, finishing with rendering in cement sand mortar 1:3 (1 cement ; 3 course sand) and making good the joints, excluding cost of centering and shuttering and reinforcement :M25 grade mix 1:1:2					
4-a	for any members such as footings, columns, raft, slab, beams, etc. upto Plinth level	Cu.m	201	6,705.12	UPJN 1025 for M20+15%	1,347,729
4-b	for RCC work walls,pillasters,plinth, and string course kerbs,fillet etc complete up to 4.5 mtrs above plinth	Cu.m	400	6,705.12	UPJN 1025 for M20+15%	2,682,048
4-c	for other members such as suspended slab, beams, staircases, coping, bands, etc. from Plinth level upto 5m above plinth level	Cu.m	20	6,705.12	UPJN 1025 for M20+15%	134,102

S No	Item	Unit	Quantity	Rate	Reference of Rate	Amount
5	Centering and Shuttering with plywood or steell sheets including strutting,propping,bracing bothways and removal of formwork for foundations in basements rafts,footings,strap beams,bases of columns,etc upto plinth level	sq m	196	119.25	DSR 5.9.1 page 93	23,373
5-a	for member such as walls of any thickness including attached pillasters,buttresses,plinth and string course	sq m	1,888	64.00	DSR 5.9.2 page 94	120,832
5-b	for suspended floors, roofs, slabs, beams, staircase, landings, coping, sills, chajjas, balconies, cantilevers, bands, etc.	sq m	258	187.35	DSR 5.9.3 page 93	48,336
6	Providing & fabricating steel reinforcement for R.C.C.work including cutting,bending,placing in position and bending completeincluding cost of binding wire in foundations,Raft foundations step beams base of column etc upto plinth level for High yield strength deformed bars of various diameters conforming to IS:1786	kg	47,952	49.00	LNV 10.05	2,349,648
7	Providing , hoisting,fixing precast RCC nominal mix 1:2:4 in lintels, beams exceeding 1.5 m clear span including fiishing and plastering smmoothly and evenly with cement mortar 1:3 of thickness not exceeding of 6 mm.on exposed surfaces cost of centering, shuttering,curing etc complete, excluding cost of steel upto height of 4.5 m above plinth level.	cu.m	13	4,994.89	UPJN 1021	64,934
8	Providing and fixing M S Foot rests in CM 1:3:6 concrete block standered design in 20 mm square M S bar 50 mm embedded in wall and 10 cm projected out complete.	Nos	254	149.85	DSR item 19.15 page 301	38,062
9	Providing and fixing 50mm dia G.I. medium 'B' class railing with two horizontal pipes and 1.5 Mtr.long vertical pipe 1.5 Mtr.centre to centre with all accessories like elbows, tees etc., including welding, threading and embedding in cement concrete 1 : 2 block of size 30 X 30 X 40 cm with 2 Nos. angle iron 25 X 25 X 5 mm size holdfast etc as complete as per design	R M	130	1,000.00	MarketRate	130,000
10	First Class Brick work for masnory for foundation &plinth in cement sand mortar 1:6 for above 30cm thickness of wall					
10-a	below GL	Cu.m	235	2,156.13	UPJN 1029	506,691
10-b	Above GL	Cu.m	432	2,257.05	UPJN 1029 & 1035	975,046
	<b>TOTAL PART 1</b>					8,934,142

Appendix E-41						
Estimate of Hapur south STP on WSP Process: Administrative Building and Guard Cabin						
Estimate: Hapur South STP WSP: Administrative Building and Guard Cabin						
S No	Item	Unit	Quantity	Rate	Reference of Rate	Amount
1	Earth work in excavation in foundation trenches or drains including dressing of side and ramming of bottoms, lift upto 1.5m. including taking out the excavated soil and depositing and refilling and disposal of surplus excavated soil as directed by the Engineer within a lead of 50m.for all types of soil.	cum	147.00	48.53	UPJN 1001	7,134
2	Providing and filling in plinth, foundation, under floors etc with locally available sand including watering , ramming, consolidation and dressing etc all complete as per direction of Engineer.	Cum	67.00	31.49	UPJN 1005	2,110
3	Providing and injecting chemical for preconstructional antitermite treatment and creating and chemical barrier under and around the column pits wall trenches basement excavation top surface in plinth filling junction of wall and floor along the external per meter of binding expansion joints surrounding of pipes and conduit etc complete (plinth area of the building at ground floor only shall be measured as per IS 6313 part II 1981 alderine emulsifiable concentrate or any other approved material such as hephachlor or chlordance will be used. The rate of application of chemical emulsion shall be as follows) 1) Treatment for masonry and foundation 5 litres per sqm, 2) Back fill in immediate contact with foundation: 7.5 litres per sqm 3) Treatment of soil along external perimeter of building 7.5 litres per sqm, 5) Treatment of soil under external perimeter 5 litres per sqm	Sqm	142.00	85.00	UP LNV 19.02	12,070
4	Providing and laying in position cement concrete of M-10 grade mix, 1:3:6 (1Cement : 3 Coarse sand : 6 graded crusher broken stone aggregate 40 mm nominal size) of specified thickness including curing, compaction etc and excluding the cost of centering and shuttering for all work upto plinth level.	Cum	28.00	3,235.72	UPJN 1016	90,600
5	Providing and laying M20 grade mix 1:1.5:3(1 cement:1.5 coarse sand:3 graded stone aggregate 20 mm nominal size)cement concrete in R.C.C work including curing, compaction, finishing with rendering in cement sand mortar 1:3(1 cement:3 course sand) and making good the joints, excluding cost of centering and shuttering and reinforcement:					
5-a	In suspended floors, roofs, girders, canilevers, staircases, landings, balconies, bands, copings, bed plates, anchor blocks, sill and beams etc. upto 4.5m height above plinth level.	Cum	24.00	5,830.54	UPJN 1025	139,933
5-b	In lintels, chajjas,shelves, vertical and horizontal individually or forming box louvers, bands and fascias and fins	Cum	6.00	5,830.54	UPJN 1025 105	34,983

S No	Item	Unit	Quantity	Rate	Reference of Rate	Amount
6	Centering & shuttering with plywood or steel sheets including strutting, propping, bracing bothways and removal of formwork for suspended floors, roofs, landings, staircases, balconies, girders, cantilevers, bands, copings, bed plates, anchor blocks, sills, chajjas, etc. upto 4.5m height.	Sqm	191.00	187.35	DSR 5.9.3 page 93	35,784
7	Providing & fabricating steel reinforcement for R.C.C. work including cutting, bending, placing in position and binding complete including cost of binding wire in foundations, raft footing step beams, base of column etc. upto plinth level. Hot rolled deformed (IS:1139) cold twisted (IS:1786) bars.	Kg	2,110.00	49.00	LNV 10.05	103,390
8	First class Brick Masonry for foundation and plinth in cement sand mortar 1:6 (1cement: 6 sand) for above 30cm thick walls	Cum	98.00	2,257.05	UPJN 1029 & 1035	221,191
9	First class brick Masonry for super structure upto 4.5m height above plinth level in cement sand mortar 1:6 (1cement : 6sand) for above 30cm thick walls	Cum	68.00	2,357.97	UPJN 1029, 1035 & 1036	160,342
10	Providing Half brick masonry using first class burnt bricks of Class 75 in CM 1:4 in superstructure upto 5m height above plinth level including striking of joints, raking out joints, curing, scaffolding, etc. complete.for half brickwall-115mm thk	cum	3.75	2,458.89	UPJN 1029, 1035 & 1036,37	9,221
11	Providing and applying 12mm thick plaster in a single coat of cement mortar in 1:4 and finished smooth including, raking of joints, scaffolding, curing, etc. complete;to new internal surfaces	Sqm	295.00	73.61	UPJN 1188	21,715
12	Providing 12 mm thick plaster on ceiling in cement mortar 1:3 complete finish	Sqm	119.00	97.41	UPJN 1187 & 1191	11,592
13	Precast terrazo tiles 22mm thick with graded marble chips of size upto 12mm laid in floors, and landings, jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing complete with precast tiles on 20mm thick bed of cement mortar 1:4 (1 cement :4 coarse sand) :Light shade using white cement.	Sqm	119.00	565.95	DSR 11.16.page 168	67,348
14	Precast terrazo tiles 22mm thick with graded marble chips of size upto 12mm laid in skirting & risers,treads of steps and dados jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing complete with precast tiles on 20mm thick bed of cement mortar 1:4 (1 cement :4 coarse sand) :Light shade using white cement.	Sqm	7.00	665.75	DSR 11.18.page 169	4,660
15	Providing and fixing 15815 cm china 6mm thick white glazed tiles of approved make and size for dado laid on a bed/paste of neat cement over plastered surface including flush pointing with white cement, cleaning, curing, etc. complete.	Sqm	54.00	776.08	UPJN 1231	41,908

S No	Item	Unit	Quantity	Rate	Reference of Rate	Amount
16	Distemping with dry distemper of approved brand and shade ( two or more coats) and of required shade on new work, over and including priming coat of whitening to give an even shade including all scaffolding.	Sqm	294.00	26.58	UPJN 1261 &1262	7,815
17	Providing and applying two coats of enamel paint of approved brand and shade over a coat of primer to give a uniform shade including preparing the surface and make it smooth by filling up and sanding etc. complete.	Sqm	41.00	89.86	UPJN 1232 &1233	3,684
18	Finishing walls with water proofing cement paint of required shade of approved brand and manufacturer on new work (Two or more coats applied @ 3.84 kg/10 sqm). and of required shade to give an even shade including all scaffolding.	Sqm	160.00	30.80	DSR 13.44.1 page 196	4,928
19	Providing colour washing of pink,green or yellow shade to give even shade including all scaffolding: with two coats with a base coat of whitening	Sqm	110.00	11.02	UPJN 1257	1,212
20	Supply and fixing door, window chowkhats and other frames, including antitermite treatment, M.S.flat,hold fasts of size 250 x 40 x 3mm fixed with M.S. bolt 5mm dia 50mm long duly embedded in cement concrete M-15 grade:Sal wood Grade - I	Cum	0.20	40,078.20	UPJN 1063	8,016
21	Providing and fixing T-iron/ angle iron frames for doors, windows and ventilators or mild steel tee or angle sections joint mitred and welded with 15x3mm lugs, 10cm long embedded in cement concrete blocks 15x15x10cm size of 1:3:6(1 cement:3 coarse and: 6 graded stone aggregate 20mm nominal size) or with wooden plugs and screws or rawl plugs and screws or with fixing clips or screws or with bolts and nuts as required including fixing of necessary butt hinges and screws and applying a primary coat of approved steel primer.	Kg	160.00	65.51	UPJN 1149 +5%	10,481
22	Providing and fixing 40 mm thick C P Teak wood doors and window shutters with 9 mm thick plywood or pressed wood panels and fixing C P teak wood cleats, stops, hinges, lock, bolts, handlers, springs and other fittings	sqm	21.00	2,024.67	UPJN 1135	42,518
<b>Appendix-A ( hardware Schedule)</b>						
	SingleLeafdoorShutters(foreachdoor)					
	SlidingBoltoflength of 300 mm 16 mm dia 2 Nos.					
	TowerBolts300mm1No					
	DoorStooper1No					
	Hingeofsize100mm 4Nos					
	Handles150mm2Nos					
	TowerBolts150mm1No					
	Back Stooper 1 No					

S No	Item	Unit	Quantity	Rate	Reference of Rate	Amount
23	Providing and fixing factory made ISI marked steel glazed doors, windows and ventilators side /top /centre hung with beading and all members such as K11 B and K12 B etc. complete of standard rolled steel sections, joints mitred and flash butt welded and sash bars tenoned and riveted with 15x3mm lugs, 10cm long, embedded in cement concrete blocks 15x10x10cm of 1:3:6 (1 cement : 3 coarsesand : 6 graded stone aggregate 20mm nominal size) or with wooden plugs and screws or rawl plugs and screws or with fixing clips or with bolts and nuts as required, including providing and fixing of hinges, pivots, float glass panes with glazing clips and special metal sash putty of approved make and a priming coat of approved steel primer excluding the cost of other fittings except necessary hinges or pivots complete as per approved design (Sectional weight of only steel members shall be measured for payment without weight of glass & other fittings.	kg	300.00	178.90	DSR 10.11 page 159	53,670
24	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete for providing and fixing Square bars or other flat welded to window, ventilators etc.	Kg	88.00	46.35	DSR 10.2 page 158	4,079
25	Supplying and fixing <i>fixed wire gauge</i> of 14 mesh x 24 gauge to the metal frame of rolled section by metal beading 20 x 3 mm with suitable screw at not exceeding 150 mm distance	Sqm	23.00	250.00	Market Rate	5,750
26	Providing and placing on terrace (at all floor levels) polyethylene water storage tank ISI : 12701 marked with cover and suitable locking arrangement and making necessary holes for inlet, outlet and overflow pipes, 25mm dia 1m long G.I. overflow pipe & 25cm long wash out pipe with plug & socket, including making connection etc. complete of approved design:	Litre	2,000.00	5.25	DSR 18.48	10,500
27	Providing and fixing gun metal gate valve with C.I. wheel of approved quality (screwed end) : Fullway valve conforming to IS:778 of approved make, complete.					-
27-a	25mm dia	No	1.00	285.50	DSR 18.17.1	286
27-b	20mm dia	No	1.00	260.00	Market Rate	260
28	Providing and fixing G.I. pipes 'B' Class complete with G.I. fittings (IS:1239 Mark) and MS clamps, including cutting and making good the walls etc. for <i>Internal Work</i> for 15mm dia nominal bore	RM	20.00	144.75	DSR 18.11	2,895

S No	Item	Unit	Quantity	Rate	Reference of Rate	Amount
29	Providing and fixing 'B' Class <i>G.I. Pipes (External Work)</i> with GI fittings(IS:1239 Mark) including trenching & refilling earth work.Concealed pipe including painting with anti corrosive bitumastic paint, cutting chases and making good the wall					
29-a	20 mm dia nominal bore	RM	20.00	116.60	DSR 18.12.2	2,332
29-b	25mm dia nominal bore	RM	20.00	156.85	DSR 18.12.3	3,137
30	Providing and fixing wash basin (1st quality, I.S.:2556 Mark) of approved make with C.I. brackets , 15 mm C.P. brass pillar taps (IS:8934 Mark), 32 mm C.P. brass waste coupling of approved make and standard pattern, including painting of fittings and brackets, cutting and making good the walls wherever require :White Vitreous China Wash basin size 630x450 mm 25mm GI waste pipe complete including cutting&making good the wall:	No	1.00	1,332.90	DSR 17.7.1	1,333
31	Providing and fixing C.P. brass bib cock of approved quality conforming to IS:8931 15 mm diameter heavy duty and of approved make including necessary socket union nut complete.	No	4.00	313.10	DSR 18.49.1	1,252
32	Providing and fixing 600x450 mm beveled edge mirror of superior glass of approved make(Atul/equivalent) and of approved quality complete with 6 mm thick hard board ground fixed to wooden cleats with C.P. brass screws and washers of size 600x450mmx4mm thick complete.	No	1.00	493.65	DSR 17.31	494
33	Providing and fixing PTMT towel rail complete with brackets fixed to wooden cleats with CP brass screws with concealed fitting arrangement of approved quality and colour.600mm long towel rail with total length of 645mm, width 78mm and effective height of 88mm, weighing not less than 190gms	RM	1.00	329.50	DSR 17.73.2	330



S No	Item	Unit	Quantity	Rate	Reference of Rate	Amount
34	Providing and fixing water closet squatting pan (Indian type W.C. pan ) with 100mm sand cast Iron P or S trap, 10 litre low level white P.V.C. flushing cistern with manually controlled device (handle lever) conforming to IS : 7231, with all fittings and fixtures complete including cutting and making good the walls and floors wherever required :580x440mm with integral type foot rests.:---- white glazed vitreous china 1st quality “Orissa type” White Vitrified China foot rest 250x125x25mm all conforming to IS:2556 and 100mm dia cast iron soil pipe connected to the trap and extending upto external soil downtake pipe, including cutting and making good the wall and floor in 1:5:10 cement concrete, etc	No	1.00	2,304.65	DSR 17.1.1	2,305
35	Providing and fixing 1st quality white vitreous china flat back or wall corner type lipped front urinal basin of 430x260x350mm and 340x410x265mm sizes respectively conforming to IS:2556 glazed earthenware, with automatic flushing cistern with standard flush pipe and C.P. brass spreaders with brass unions and G.I clamps complete, including painting of fittings and brackets, cutting and making good the walls and floors wherever required with 25mm dia GI waste pipe, couplings, screws, etc ,Range of two urinal basins with 5 litre white P.V.C.automatic flushing cistern, with urinal partition slab both sides polished of approved design .	No	2.00	3,393.60	DSR 17.4.2	6,787
36	Providing and fixing White Vitrified China half round channel of approved make in CM(1:3) and joints finished with white cement of size 150mm.	RM	2.00	500.00	Market Rate	1,000
37	Providing and fixing Class III UPVC pipe conforming to IS:4985 of approved quality and make including necessary fittings, jointing , testing as specified etc. complete					
37-a	90 mm diameter	RM	35.00	115.50	UPJN 30.4.08+10%	4,043
37-b	110 mm diameter	RM	20.00	154.00	UPJN 30.4.08+10%	3,080
37-c	160 mm diameter	RM	20.00	350.90	UPJN 30.4.08+10% for fixing	7,018

S No	Item	Unit	Quantity	Rate	Reference of Rate	Amount
38	Constructing brick masonry chamber for underground C.I. inspection chamber and bends with 75 class designation bricks in cement mortar 1:4 (1 cement : 4 coarse sand) C.I. cover with frame (light duty) 455x610 mm internal dimensions, total weight of cover with frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg) conforming to IS:1726, R.C.C. top slab with 1:2:4 mix (1 cement :2 coarse sand : 4 graded stone aggregate 20 mm nominal size) 100 mm thick foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished smooth with a floating coat of neat cement on walls and bed concrete etc. complete as per standard design : 45 cm deep for single pipe line with F.P.S. bricks, with 300mm thick masonry in CM 1:6 , 50mm thick 1:2:4 cement concrete flooring, channel/half round glazed stone-ware pipe channels including earthwork and disposal of excess earth within a lead of 50m.	No	1.00	3,146.40	DSR 19.30.2.1	3,146
39	As above with depth upto 1 meterFor depth from 500mm up to 1000mm and 38 Kg CI Cover with frame conforming to IS:1726	No	1.00	4,161.51	DSR 19.30.2.1 and 19.31.1.1	4,162
40	Providing and fixing square-mouth S.W. gully trap grade 'A' complete with C.I. grating brick masonry chamber with water tight C.I. cover with frame of 300 x300 mm size (inside) the weight of cover to be not less than 4.50 kg and frame to be not less than 2.70 kg as per standard design 180x150 mm size P type with Sewer bricks conforming to IS : 4885	No	2.00	1,134.95	DSR 19.4.3.2	2,270
41	Construction of Septic tank of size 400x140x150 cm in all types of soil with 40cm thick masonry in CM 1:6, 15cm thk CC bed of 1:5:10, M15 grade CC flooring & over stone slab covering, 80mm thk slab, jointing of slab in CM 1:3, Ralthal, Kharanja, 50mm thk stone partion walls, 20mm thk plaster in CM 1:6 with floating coat of neat cement, 4nos CI foot-rest of approved design, 2nos 450mm dia 25Kg each CI cover with frame, earthwork, etc. as per approved drawing including disposal of surplus earth within a lead of 50m, etc	No	1.00	15,200.00	Market Rate	15,200
42	Making soak pit 2.5 m diameter 3.0 metre deep in all types of soil with 45 x 45 cm dry brick honey comb shaft with bricks of class designation 75 and S.W. drain pipe 100 mm diameter, 1.8 m long complete as per standard design with F.P.S. bricks	No	1.00	9,938.65	DSR 19.32.1	9,939

S No	Item	Unit	Quantity	Rate	Reference of Rate	Amount
43	Providing and fixing rigid PVC pipe(IS:4985 mark) class II (4Kg/Cm2) approved quality/make including jointing the pipe with rubber ring and lubricant of 110mm dia.(Rain water pipe)	RM	10.00	114.40	UPJN 30-4-08+10% for fixing	1,144
44	Providing and fixing white vitreous china laboratory sink (IS:2556 mark) of approved make with C.I. brackets, C.P. brass chain with rubber plug 40mm C.P brass waste and 40mm C.P. brass trap with necessary C.P. brass unions complete including painting of fittings and brackets, cutting and making good the wall wherever required :Size 600x450x200mm	No	2.00	2,149.95	DSR 17.11.2	4,300
	<b>Part B:FURNITURE</b>					
45	steel frame office table of size(1220 X 762 X 762)mm having prelaminate on bothsides ,wood finish of 18/19 mm thick board IS marked with drawers having plastic moulded handles with locks, 18 gauge 25 mm square tube, outer body of cabinet in 22 gauge	No	7.00	3,000.00	Market Rate	21,000
46	providing office chairs made of steel frame of 1" X 14 " gauge pipe duly spray painted finish, with cane seat & back and arm rest made of durable quality teak wood & black polished, cane shall be of high tensile strenght(with full arm rest)	No	12.00	1,000.00	Market Rate	12,000
47	mild steel adjustable racks with slotted shelves(1.2 m wide X 2m high X 0.3 m deep) with minimum 6 shelves	No	3.00	3,000.00	Market Rate	9,000
48	providing steel almirah of size 78 X 36 X 19 " with 4 fixed shelves making 5 compartments with out lockres with spary paint finish fitted with 3 way locking device with duplicte keys , doors and shelves in 20 gauges and rest of the things in 2 gauge	No	2.00	5,000.00	Market Rate	10,000
49	Providing and fixing flat pressed 3 layer particle board in shelves in cupboards with screws and wooden brackets with 19mm thk.	Sqm	5.00	1,000.00	Market Rate	5,000
50	Providing four drawver steel filing cabinet with locking arrangement of approved makes	No	4.00	5,000.00	Market Rate	20,000
51	Providing and fixing wooden cabinet with sunmica top of 1.2 m height and 1 m wide and 2.5 m length with two shelves for laboratory as per drawing and specifications.	No	2.00	5,000.00	Market Rate	10,000
	<b>TOTAL</b>					1,280,344

Appendix E-42									
Estimate of Hapur south STP on WSP Process: Drainage									
Estimate: Hapur South STP WSP: Storm Water Drainage									
S No	Item	Length	width	height	quantity	Unit	Rate	Reference of Rate	Amount
1	Earthwork in excavation in foundation trenches or drains including dressing of sides and ramming of bottoms, lift upto 1.5Mtr including taking out the excavated soil and depositing and refilling of jhiri with watering and ramming and disposal of surplus excavated soil as directed within a lead of 30Mtr. :Ordinary soil loam,clay or sand								
	Drain 1200*1200	400	2.4	1.2	1,152.00				
	Drain 800*700	600	2	0.7	840.00				
	Drain 600*600	800	1.5	0.6	720.00				
	Drain 400*300	350	1.3	0.3	136.50				
	Total				2,848.50	cum	48.53	UPJN 1001	138,238
2	Providing M15 grade cement concrete encasement including shuttering etc. complete for pipe, as directed by engineer								
	Drain 1200*1200	400	2.4	0.075	72.00				
	Drain 800*700	600	2	0.075	90.00				
	Drain 600*600	800	1.5	0.075	90.00				
	Drain 400*300	350	1.3	0.075	34.13				
	Coping 75 mm thick	2150	1.4	0.075	225.75				
	Total				511.88	cum	3,745.25	UPJN 1015	1,917,100
3	Providing M10 grade cement concrete encasement excluding shuttering etc. complete for pipe, as directed by engineer								
	Drain 1200*1200	400	2.4	0.075	72.00				
	Drain 800*700	600	2	0.075	90.00				
	Drain 600*600	800	1.5	0.075	90.00				
	Drain 400*300	350	1.3	0.075	34.13				
	total				286.13	cum	3,235.72	UPJN 1016	925,820
4	First Class brick masonry above 30cm thick walls in cement mortar of 1:6								
	Drain 1200*1200	400	1	0.6	240.00				

S No	Item	Length	width	height	quantity	Unit	Rate	Reference of Rate	Amount
	Drain 1200*1200	400	0.7	0.6	168.00				
	Drain 800*700	600	1	0.4	240.00				
	Drain 800*700	600	0.7	0.3	126.00				
	Drain 600*600	800	1	0.3	240.00				
	Drain 600*601	800	0.7	0.3	168.00				
	Total				1,182.00	cum	2,156.13	UPJN 1029	2,548,546
5	First Class brick masonry less than 30cm thick walls in cement mortar of 1:6 :Drain 400*300	350	0.23	0.3	24.15				
6	Plaster on new surface on walls in cement sand mortar 1:4 including racking of joints etc. complete fine finished 12mm thick.								
	Drain 1200*1200	400	2.4		960.00				
	Drain 800*700	600	1.4		840.00				
	Drain 600*600	800	1.2		960.00				
	Drain 400*300	350	0.6		210.00				
	Total				2,970.00	sqm	73.61	UPJN 1188	218,622
7	Providing and fixing precast RCC cover of 75 mm thick of required sizes								
	Drain 1200*1200	400	1.55	0.075	46.50				
	Drain 800*700	600	1.15	0.075	51.75				
	Drain 600*600	800	0.95	0.075	57.00				
	Drain 400*300	350	0.75	0.075	19.69				
	Total				174.94	sqm	600.00	Market Rate	104,963
8	Pipe supplying,conyeing to site,lowering in treches aligning,laying & jointing of RCC NP2 class with S/S joints as per IS458-1988 at all levels with rubber gaskets(EPRDM/SBR) for sewer lines as per IS:5382(including coost of rubber gasket lubricants).including necessary fittings,testing pipe line etc.complete as directed by Engineer: 300 mm dia RCC NP2				50.00		441.40	UP JN 3071	22,070
9	As above for 800 mm dia RCC NP2				100.00		1,838.00	UPJN 3076	183,800
	<b>TOTAL</b>								5,920,920

Appendix E-43									
Estimate of Hapur south STP on WSP Process: Road Works									
Estimate: Road Works									
	Length of road on embankment	2250							
	Length of road at ground level	1244							
	Road rising from ground to embankment	133							
	Total Length of Road	3627							
S.No	Item	Length	Breadth	Height	Quantity	Unit	Rate	Reference	Amount
1	Cleaning Jungle including up rooting of rank, vegetations grass, push, wood trees and samplings of grith upto 30 cms measured at a height of 1 m above ground level and removal of rubbish up to a distance of 50 m outside the periphery of area cleared.	1,377.00	6.00		8,262.00	100 sqm	180.00	UPLNV 259 (i) page 16	14,872
2	Earth work in excavation by mechanical means (hydraulic excavator )/ by mechanical means over areas (exceeding 30 cm in depth 1.5 m width and 10 sqm in plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled neatly and neatly dressed for all kinds of soil as per MoRT&H specifications.	1,377.00	6.00	0.47	3,883.14	cum	101.85	Code 2.6.1 DSR 2007	395,498
3	Banking excavated earth in layers not exceeding 20 cm in depth, breaking clods, watering, rolling each layer with 1/2 tonne roller or wooden or steel rammers and rolling every 3rd and top most layer with power roller of minimum 8 tonnes and dressing up, in embankments for road, flood banks, marginal banks and guide banks etc lead up to 50 m and lift up to 1.5 m as per MoRT&H specifications for all kinds of soil. For road rising from ground level to embankment	133.00	6.00	0.75	598.50	cum	99.45		59,521
3	Banking excavated earth in layers not exceeding 20 cm in depth, breaking clods, watering, rolling each layer with 1/2 tonne roller or wooden or steel rammers and rolling every 3rd and top most layer with power roller of minimum 8 tonnes and dressing up, in embankments for road, flood banks, marginal banks and guide banks etc lead up to 50 m and lift up to 1.5 m as per MoRT&H specifications for all kinds of soil.	1,377.00	6.00	0.50	4,131.00	cum	99.45	Code 2.3.1 DSR 2007	410,828

S.No	Item	Length	Breadth	Height	Quantity	Unit	Rate	Reference	Amount
4	Supplying and laying water bound macadam sub base (GSB) with brick aggregate and binding material, earth etc including screening, sorting and spreading to template and consolidation with light power road roller etc complete including cost of moorum etc.							Code 16.5.1 & 16.3.10 of DSR 2007	
	Carriage way	3,627.00	4.00	0.20	2,901.60	cum			
	Shoulders	3,627.00	2.00	0.20	1,450.80	cum			
	Total				4,352.40	cum	558.05		2,428,857
5	Providing, laying, spreading and compacting stone aggregate of specified sizes to WBM specifications including spreading in uniform thickness, hand picking, rolling with 3 wheeled road/vibratory roller 8-10 tonne in stages to proper grade and camber, applying and brooming requisite type of screening/binding material to fill up interstices of coarse aggregate watering and compacting to the required density. wooden or steel rammers and rolling over 3rd and top most layer with power roller of minimum 8 tonnes and dressing up, in embankments for roads, flood banks, marginalbanks and guide banks etc lead upto 50 m and lift upto 1.5 m as per table 400-7 of MoRT&H specifications for all kinds of soil.							Code 16.4 of DSR 2007	
	Hand broken - Grade-I (90-45mm)	3,627.00	5.00	0.10	1,813.50	cum	934.85	Code 16.3.1 of DSR 2007	1,695,350
	Hand broken - Grade-II (63-45mm)	3,627.00	5.00	0.08	1,360.13	cum	961.00	Code 16.3.2	1,307,080
	Crusher broken - Grade-III (53-22.4mm)	3,627.00	5.00	0.08	1,360.13	cum	1,003.10	Code 16.3.3	1,364,341
6	Providing and applying tack coat using hot straight run bitumen of grade 80/100 including heating the bitumen, spraying the bitumen with mechanically operated spray unit fitted on bitumen boiler, cleaning and preparing the existing road surface as per MoRT&H specifications on WBM new surface @ 0.75 kg/sqm	3,627.00	5.00		18,135.00	sqm	23.90	Code 16.30 of DSR 2007	433,427

S.No	Item	Length	Breadth	Height	Quantity	Unit	Rate	Reference	Amount
7	2 cm premix xarpet surfacing with 1.8 cum and 0.9 cum of stone chippings of 13.2 mm size and 11.2 mm size respectively per 100 sqm and 52 kg and 56 kg of hot bitumen per cum of stone chippings of 13.2 mm and 11.2 mm size respectively including a tack coat with hot straight run bitumen including consolidation with road roller of 6-9 tonne capacity etc. complete (tack coat to be paid separately) with paving asphalt 80/100 heated and then mixed with solvent at the rate of 70 gms per kg of asphalt.	3,627.00	5.00		18,135.00	sqm	81.95	Code 16.32.1 of DSR 2007	1,486,163
8	Providing and laying seal coat over prepared surface of road with bitumen heated in bitumen boiler fitted with the spray set spraying using 98 kg of bitumen of grade 80/100 and binding surface with 0.90 cum of stone aggregate of 6.7 mm size (passing 11.2 mm sieve and retained on 2.36 mm sieve) per 100 sqm of road surface including rolling and finishing with power road roller all complete.	3,627.00	5.00		18,135.00	sqm	50.00	Code 16.41 of DSR 2007	906,750
9	Painting road surface marking with adequate number of coats to give uniform finish with ready mixed road marking paint confirming to IS: 164, on bituminous surface in white/yellow shade including cleaning the surface of all dirt, scales, oil, grease and foreign material etc. complete. New work (two or more coats)	3,627.00	0.10		362.70	sqm	58.10	Code 16.48 (1) of DSR 2007	21,073
	Total								10,523,760
	Add 10 % above for increase of cost index over DSR 2007								11,576,136



Appendix E-44						
Estimate of Hapur south STP on WSP Process: Clear Water Pump House, Tank and Tube Well						
Estimate: Hapur South STP WSP: Clear Water Pump House, Tank and Tube Well						
S No	Item	Unit	Quantity	Rate	Reference of Rate	Amount
1	Earth work in excavation in foundation trenches or drains including dressing of side and ramming of bottoms. Including taking out the excavated soil and depositing and refilling and disposal of surplus excavated soil as directed by the Engineer with all lead for all types of soil.					
1-a	0.0m to 1.5m from the GL	cum	52.00	48.53	UPJN 1001	2,524
1-b	1.5m to 3.0m from the GL	cum	32.00	56.78	UPJN 1001 & 1006	1,817
2	Providing and laying cement concreting including curing, compaction etc. complete using stone aggregate 20mm nominal size in foundation and plinth, excluding cost of shuttering, using M-10 grade mix 1:3:6 (1 cement : 3 course sand : 6 graded stone aggregate)	cum	4.00	3,235.72	UPJN 1016	12,943
3	Providing and laying cement concrete in R.C.C. work in foundations, rafts, footings, strap beam, bases of columns etc. including curing, compaction, finishing with rendering in cement sand mortar 1:3 (1 cement ; 3 course sand) and making good the joints, excluding cost of centering and shuttering and reinforcement, M-25 grade Design Mix					
3-a	for any members such as footings, columns, raft, wall, slab, beams, etc. upto Plinth level	cum	15.00	6,705.12	UPJN 1025 for M 20+15%	100,577
3-b	for members such as columns, wall, struts, etc. from Plinth level upto 5m above plinth level	cum	18.00	6,705.12	UPJN 1025 for M 20+15%	120,692
4	Providing and erecting shuttering using steel or plywood plates along with centering including strutting, propping, bracing in both directions, as necessary and sealing of the joints between shutters and shuttering around the openings for embedded pipes or for openings in structural members, sealing of the joints between shuttering members/ embedded pipes, for RCC members and de-shuttering the same after the specified period, etc. complete for any members such as footings, columns, raft, wall, slab, beams, etc. upto plinth Level.	sq m	51.00	187.35	DSR 5.9.3p 93	9,555
5	Providing and erecting shuttering using steel or plywood plates along with centering including strutting, propping, bracing in both directions with wooden members, as necessary and sealing of the joints between shutters and de-shuttering the same after the specified period, etc. for following RCC members in superstructure upto 5m above plinth level: for R C wall including attached pillasters, buttresses, plinth and string course, etc	sq m	136.00	180.40	DSR 5.9.2 p 93	24,534
6	Providing, cleaning, cutting, bending and placing in position with necessary chairs, cover blocks, laps, using 16 SWG soft annealed iron wire (binding wire) for all RCC members such as footings, foundations, slabs, rafts, walls, beams, columns, canopies, for High yield strength deformed bars of various diameters conforming to IS:1786	kg	3,600.00	49.00	LNV 10.05	176,400

S No	Item	Unit	Quantity	Rate	Reference of Rate	Amount
7	Providing masonry using first class burnt bricks in CM 1:6 in superstructure upto 5m height above plinth level including striking of joints, raking out joints, curing, scaffolding, etc. complete.	cu.m	8.00	2,257.05	JPJN 1029 & 103	18,056
8	Providing and laying 12mm thick cement plaster (1:6) mixed with water-proofing compound at 2% of the weight of cement used and finish with floating coat of neat cement, etc.complete	sqm	40.00	66.84	UPJN 1190	2,674
9	One priming coat and one coat of dry distemper on new work including supply of all material labour tools and plant etc required for proper completion of work	sq m	40.00	15.00	LNV 16.12	600
10	Providing and fixing T - iron@3.8Kg/m (40x40x6mm) frames for doors, windows and ventilators or mild steel tee or angle sections joints mitred and welded with 15 x 3mm lugs, 10 cm. Long embdedded in cement concrete blocks 15 x 15 x 10cm. Size of 1 : 3 : 6 (1 cement : 3 courses and : 6 graded stone aggregate 20mm nominal size) or with wooden plugs and screws or rawl plugs and screws or with fixing of necessary butt hinges and screws and applying a priming coat of approved steel primer.	Kg	84.00	65.51	UPJN 1149 +5%	5,503
11	Providing and fixing 40 mm thick C P Teak wood doors and window shutters with 9 mm thick plywood or pressed wood panels and fixing C P teak wood cleats, stops, hinges, lock, bolts, handlers, springs and other fittings	Sq.m	6.00	2,024.67	UPJN 1135	12,148
12	Providing and fixing 1 mm thick M.S. sheet garage door with frame of 40 x40 x6 mm angle iron 3.15 mm thick M.S. gusset plate at the junction and corners including supply and fixing of necessary fittings. Lock rail of 15" length of oxidised iron and including pintels hooks at the top and applying priming coat of red lead paint on all sides complete using M.S. angles 40x40x6 mm for diagonal bracings	sqm	2.00	2,200.00	DSR 10.11 a	4,400
13	Supplying and Fixing Ferro Cement cover with 500 dia 25Kg CI Frame to withstand 22 MT centre point load and minimum unfractured load of 1MT.	No	2.00	3,000.00	Market Rate	6,000
14	Providing and Fixing Unplasticized Poly Vinyl Chloride (UPVC) SWR Pipes Type B for sciland waste discharge System (IS:13592:1992 marked) of approved quality/ make including jointing of pipes complete, 75 mm dia	Mtr	7.00	150.00	Market Rate	1,050
15	Providing and Fixing Unplasticized Poly Vinyl Chloride (UPVC) SWR Pipes Type B for sciland waste discharge System (IS:13592:1992 marked) of approved quality/ make.Bend 45 Dg	Nos	4.00	100.00	Market Rate	400
16	Providing and fixing overflow pipe CI LA Class fixed for underground watertank, as per drawing/directed by Engineer for 80mm dia pipe,	Nos	1.00	334.00	DSR item 7809	334
17	Provision of tube well with pumping set, electric panel and pump house	LS				600,000
	<b>TOTAL</b>					<b>1,100,210</b>

## Estimate of Hapur south STP on WSP Process: Miscellaneous Items

## Estimate: Hapur South STP WSP: Miscellaneous Items

S No	Item	Unit	Quantity	Rate	Reference of Rate	Amount
1	Supplying at site R.C.C. Standards post/ struts/rails/ pales of mix 1:1.5:3 (1 cement : 1.5 coarse sand : 3 graded stone aggregate 12.5 mm nominal size) with wooden plugs or 6mm bar nibs wherever required as per direction of Engineer-in-charge (cost of earth works in excavation, concrete works infoundation to be paid separately). :---200 cm high fencing of precast R.C.posts of 15cm x 15cm tapered to 100cm x 100cm at top placed at every 3m apart 30 cm in ground embedded in cement concrete 1:3:6 30x30x45cm corner and every tenth posts to be same strutted with same R.C. posts provided with 6 horizontal holes for barbed wire including earthwork in excavation etc. complete.(length of barbed wire fencing 2050 m)	cum	25	11,547.90	DSR 16.15.1	294,021
2	Foundation concrete for fencing posts in 1:3:6, 30*30*45 cm	cum	12	3,235.72	UPJN 1016	39,314
3	Fencing with R.C.C. post placed at required distance, embedded in cement concrete blocks, every 15th post, last but one end post and corner post shall be strutted on both sides and end post one side only, provided with horizontal lines and two diagonals of barbed wire 9.38 kg per 100 metres (min) between the two posts fitted and fixed with G.I. staples on wooden plugs or G.I. binding wire tied to 6 mm bar nibs fixed while casting the post (cost of R.C.C. posts, struts, earth work and concrete to be paid for separately), Payment to be made per metre cost of total length of barbed wire used with G.I. barbed wire.	M	18,450	5.85	DSR 16.17	107,933
4	Providing and fixing steel gate, grating and grills made out of MS angles, Tees, Square bars or other flats, black pipes with hold fast and fittings complete as per design and drawings including cutting ,welding and fabrication, and painting with oriming coat of red oxide, making good the support etc. complete	kg	1,000	46.35	DSR 10.2	46,350
5	Supply of laboratory equipments, and neccessary chemicals and commisioning as per specifications and of approved make	LS	1	700,000.00	Market Rate	700,000
6	Digging holes in ordinary soil and refilling the same with the excavated earth mixed with manure or sludge in the ratio of 2:1 by volume (2 parts of stacked volume of earth after reduction by 20% : 1 part of stacked volume of manure after reduction by 8%) flooding with water, dressing including removal of rubbish and surplus earth, if any with all leads and lifts (cost of manure, sludge or extra good earth if needed to be paid for separately) : Holes 60 cm dia, and 60 cm deep.	No	3,000	19.25	DSR 23.14.2	57,750

S No	Item	Unit	Quantity	Rate	Reference of Rate	Amount
7	Supply of different varieties of Plants according to height and age of the plant near pond including loading,unloading and transportation, planting, watering, protection etc. complete as per specifications and as directed by Engineer for one year, different varieties of Plants 900mm to 1500mm high	Nos	3,000	40.00	Market Rate	120,000
8	Compaction of earth or highly weathered starata by manually or plain roller	Sq.M	150,000	6.00	Market Rate	900,000
9	Earthwork in excavation in foundation, trenches or drains including dressing of sides and ramming of bottoms, including taking out the excavated soil and depositing and refilling of jhiri with watering and ramming and disposal of surplus excavated soil as directed with all lead and lift, 0.0m to 1.5m from the GL	cu.m	62	48.53	UPJN 1001	3,009
10	Providing and laying cement concrete including curing,compaction etc. complete using stone aggregate 20mm nominal size in foundation and plinth, excluding cost of shuttering, using M-10 grade mix 1:3:6 (1 cement : 3 course sand : 6 graded stone aggregate)	cu.m	11	3,235.72	UPJN 1016	35,593
11	Brick masonry above 30cm thick walls in cement mortar of 1:6	cu.m	108	2,357.97	UPJN 1029, 1035 & 1036	254,661
12	Pipe Supplying, conveying to site, lowering in trenches, aligning, laying & jointing of <b>RCC pipes NP3 class (with s/s ends)</b> as per IS: 458 - 1988 (Amended up to date) with Rubber gaskets (EPDM/SBR) for sewer lines as per IS: 5382 (including cost of Rubber gaskets, lubricants) etc., including necessary fittings as per drawing, testing the pipe line etc., complete as directed by Engineer. etc., complete for the following depths.900 mm internal diameter	RM	310	4,120.68	UP JN 3201	1,277,411
13	Providing granular bedding with carefully compacted backfill (GB-CCB) using graded hard crusher broken stone of 100% passing through 20mm sieve, 20-50% passing through 10mm sieve and 100% retained on 6mm sieve, laying in layers not more than 15 cm. thick including ramming, compaction etc. complete for pipe bedding and surrounding as per drawing and/or as directed by Engineer, 900 mm internal diameter	RM	160	1,057.00	Rate Analysis	169,120

S No	Item	Unit	Quantity	Rate	Reference of Rate	Amount
14	Construction of Circular Manholes in Brick Masonry of 300mm thick wall upto 1.5m depth, 350mm thick for 1.5m-2.5m depth and 450mm thick for depth upto 3.0 m including barricading, dressing of sides and ramming of bottoms, dewatering if any, Providing and Laying M-10grade(1:4:8) cement concrete including curing, compaction and shuttering etc. complete using stone aggregate 20mm nominal size in foundation, 20mm thick inside & outside plaster in C. M. 1:3, Providing and Laying cement concrete M-15 grade including curing, compaction, shuttering etc. complete using stone aggregate 20mm nominal size around manhole cover. Supply and fixing of C. I. foot steps Pattern 1 as per IS:5455 of approved make fixed in CM 1:3. Supplying and fixing heavy duty SFRC manhole frame and cover as per IS 12592 (Part I and II) having clear opening of 560mm, including refilling of Jhiri with watering and ramming and disposal of surplus excavated soil at suitable site as directed. Providing and Laying cement concrete M-15(1:2:4) grade with 20 mm crusher broken coarse aggregates including curing, compaction, shuttering etc. for benching as per drawings and as di	No	3	13,010.00	Rate Analysis	39,030
15	Providing, fixing and erecting RCC (M20) Vent shaft with cowl, 125mm x 225mm internal and external dia respectively at top, 300mm and 450mm internal and external dia at bottom and 9.10m over all length, bottom 1.25m below ground level fixed in the pit 900mmx900mmx1500mm with PCC M15, 250mm in bed and 200mm around with top 150mm in cement concrete 1:2:4 (1 cement 2 coarse sand and 4 graded stone aggregate of 20mm nominal size) junction of vent shaft and concrete grouted with cement mortar 1:2 (1 cement and 2 fine sand) including making connection with sewer manhole with 150mm dia NP4 RCC pipe (IS 458-amended upto date) as required including type "A" bedding complete and as per standard design and finished with water proofing cement of approved brand of required shade as per drawings and/or as directed by Engineer. Note-Excavation work will be measured and paid separately.	No	1	20,474.00	Rate Analysis	20,474
16	Providing rectangular weir in the form of concrete section fixed with MS plate of 6mm thickness and painted by epoxy paint, including painting of scale on the vertical face of open channel as directed by the Engineer.	No	1	1,000.00		1,000
17	Effluent sewage sump 11.5*11.5*4 or 13 m dia, capacity 530 cum	cum	530	3,000.00	Market Rate	1,590,000
18	Effluent Pump House 11.5 m* 5 m	sqm	58	7,000.00	Market Rate	402,500
19	Rising Main Net work for irrigation	LS				2,000,000
	<b>TOTAL</b>					<b>8,058,165</b>

						Appendix E-46
						Estimate of Hapur south STP on WSP Process: Mechanical Works
Estimate: Hapur South STP WSP: Mechanical Works						
S No	Item	Unit	Quantity	Rate	Reference of Rate	Amount
1	Providing and fixing of <b>Coarse Bar screen</b> (manually raked), with 50mm clear opening including cleaning rakes for peak flow of 56.25 MLD, complete as per drawing and specification	NO.	1.00	150,000.00	Market Rate	150,000
2	Providing, installation, testing and commissioning of mechanically raked automatic <b>fine bar screen</b> with clear opening of 15 mm including automatic operating system, conveyor belt, portable containers, power supply arrangement etc. complete as per specification each for capable of handling 56.25 mld peak flow	NO.	2.00	1,500,000.00	Market rate	3,000,000
3	Providing, installation, testing and commissioning of <b>grit removing equipment</b> including all associated mechanical and electrical equipment, moving rake type grit removing mechanism, organic return pump, conveyor belt, Classifier Mechanism, power supply arrangement etc. complete as per specification each for capable of handling 56.25 mld peak flow	NO.	2.00	1,000,000.00	Market rate	2,000,000
4	Providing and fixing <b>Sluice Gates</b> as per AWWA C 501 or IS: 13349 Gates of following sizes including all taxes, freight, loading & unloading, fitting in position including cost of all labour, jointing material with nut bolts and giving satisfactory testing etc. complete and as directed by Engineer.					-
4-a	1200*800: one at inlet, one at bye pass in inlet, one at bye pass from distribution chamber	No	3.00	300,000.00	Market Rate	900,000
4-b	800*800: (2 at inlet of fine screen, 2 at outlet of fine screen, 2 at inlet of grit chamber)	No	6.00	200,000.00	Market Rate	1,200,000
5	Providing, Supplying, Installation at site the given valves with EPDM Rubber Gaskets, Rubber Sheet and MS Nuts & Bolts as per requirements, Field Testing and Commissioning complete as per specifications, including all cost of material, labour required, transportation upto site, loading, unloading & stacking etc. complete: <b>Cast Iron rising Spindle Gate Valve PN 1.0 Dimensons as per IS: 14846</b>					-
5-a	750 mm dia.(3 at outlet of distribution chamber, 3 at inlet of AP, 2 at inlet of FP)	No	8.00	411,782.40	MP ADB +20% Price Escalation	3,294,259
5-b	600mm dia.(2 at outlet of facultative pond)	No	2.00	178,929.00	MP ADB +50% Price Escalation+good make	357,858
5-c	500 mm dia. (2 at inlet of FP)	No	2.00	116,605.50	MP ADB +50% Price Escalation+good make	233,211

**Estimate: Hapur South STP WSP: Mechanical Works**

<b>S No</b>	<b>Item</b>	<b>Unit</b>	<b>Quantity</b>	<b>Rate</b>	<b>Reference of Rate</b>	<b>Amount</b>
6	Supply, Laying, Jointing Field Testing & Commissioning complete at site of centrifugally cast (spun) <b>Cast Iron Class 'LA' Pressure Pipes (S &amp;S)</b> ISI marked for water, gas and sewage conforming to IS 1536/2001 with push on type EPDM 'ISI marked' rubber gasket jointing as per IS 5382, Laying & Jointing as per IS:3114 and Field Testing as per specifications. The rates includes all cost of material, labour required, transportation, loading, unloading & stacking etc. complete and also includes the cost of EPDM 'ISI marked' rubber gasket					-
6-a	500 mm internal diameter at Inlet of facultative pond	RM	50.00	7,389.60	MP ADB +20% Price Escalation	369,480
6-a	600 mm internal diameter at outlet of facultative pond	RM	70.00	9,560.40	MP ADB +20% Price Escalation	669,228
6-b	750 mm internal diameter at outlet to distribution chamber, inlet to AP, Inlet to FP	RM	350.00	14,306.40	MP ADB +20% Price Escalation	5,007,240
7	Providing and fixing <b>G.I. pipes</b> complete with G.I. fittings including trenching and refilling etc. for External work (IS 1239 part-I-2004) complete					-
7a	Class-B 25 mm diameter	RM	58.00	156.85	DSR 18.12.3	9,097
7-b	Class-B 32 mm diameter	RM	346.00	223.19	UPJN 30-4-08+10% for fixing	77,224
7 c	Class-B 50 mm diameter on embankment for scum cleaning	RM	2,200.00	280.10	DSR 18.12.6	616,220
8	Supply, Laying, Jointing, Field Testing, Commissioning complete at site of <b>HDPE (PE 80</b> Grade Coumpound) Pipes as per IS:4984 and specifications for water application, including all cost of material, labour required, transportation, loading, unloading & stacking etc. complete. PN 6 kg/cm <sup>2</sup> pressure as per Drawing and specification complete <b>63 mm diameter</b> along road at ground level for gardening	RM	1,844.00	91.20	MP ADB 06+20% for price escalation	168,173
9	Providing and fixing gun metal <b>gate valve</b> with C.I. wheel of approved quality (screwed end) ISI mark including all taxes , freight, loading & unloading, laying and jointing in position including cost of all labour and giving satisfactory hydraulic testing etc. complete and as directed by Engineer.					-
	<b>50 mm diameter PN-1.0</b>	NO.	9.00	578.20	DSR 18.17.4	5,204
	<b>32 mm diameter PN-1.0</b>	NO.	2.00	358.00	DSR 18.17.2	716
	<b>25 mm diameter PN-1.0</b>	NO.	54.00	285.50	DSR 18.17.1	15,417

Estimate: Hapur South STP WSP: Mechanical Works						
S No	Item	Unit	Quantity	Rate	Reference of Rate	Amount
10	Providing, Supplying, Installation at site the given valves with EPDM Rubber Gaskets, Rubber Sheet and MS Nuts & Bolts as per requirements, Field Testing and Commissioning complete as per specifications, including all cost of material, labour required, transportation upto site, loading, unloading & stacking etc. complete. Cast Iron Non Return Valve, as per IS - 5312/ PART- I/84 ' ISI' mark: 50 mm diameter PN-1.0	NO.	4.00	2,353.20	MP ADB 06+20% for price escalation	9,413
10	Providing, installation, testing and commissioning of Non clog <b>Horizontal Centrifugal pumpsets/ Submersible</b> (pump and motor) , including all taxes , freight, loading & unloading, laying and jointing in position including cost of all labour and giving satisfactory testing etc. complete and as directed by Engineer					-
	5 cum/hr capacity @ 125 mwc 5.5 kw for effluent pumping for scum cleaning	NO.	2.00	25,000.00	Market Rate	50,000
	540 cum/hr capacity @ 15 mwc 40 kw for effluent pumping for irrigation and gardening (in campus) with all electrical and mechanical installations such including valves, electri panel etc	NO.	4.00	400,000.00	Market Rate	1,600,000
	5 cum/hr capacity @ 10 mwc 0.55 kw for Clear water pumping for drinking	NO.	2.00	5,000.00	Market Rate	10,000
11	Constructing masonry <b>valve Chamber</b> 30x30x50 cm, inside with 75 class designation brick work in cement mortar 1:4 (1 cement :4 coarse sand) for stop cock, with C. I. surface box 100x100 x75 mm (inside) with hinged cover fixed in cement concrete slab 1:2:4 mix (1 cement :2 coarse sand : 4 graded stone aggregate 20 mm nominal size ) necessary excavation foundation concrete 1:5:10 ( 1 cement :5 fine sand:10 graded stone aggregate 40mm nominal size ) and inside plastering with cement mortar 1:3 (1 cement :3 coarse sand) 12mm thick finished with a floating coat of neat cement complete as per standard design, with F.P.S. brick	NO.	48.00	599.80	DSR 18.32.1	28,790
12	Providing and installation of 20 mm diameter rubber hose of 50 meter length with bronze nozzle as per IS:903, complete as per Specification for <b>hose connection</b>	NO.	6.00	5,600.00	Market Rate	33,600
13	Providing and installation of 20 mm diameter PVC flexible pipe for connection for <b>gardening</b> , complete as per Specification	RM	120.00	30.00	Market Rate	3,600
14	Supply of <b>Safety Equipments</b> as specified	Lot.	1.00	20,000.00	Market Rate	20,000
15	Supply of <b>Fibre Glass Boat</b> as per Specification	NO.	1.00	150,000.00	Market Rate	150,000
	<b>Total for Mechanical Works</b>					19,978,730



Appendix E-47					
Estimate of Hapur south STP on WSP Process: Electrical Works					
Estimate: Electrical Works					
S No	Item	Unit	Quantity	Rate	Amount
1	Supply and installation of 2m high, 75x75 mm chain link fencing along with a 1 m wide padlockable gate, around the transformers/structure including 65x65x6 mm vertical angle supports, at about 1 m spacing, founded 600 mm in ground with concrete grouting, and fixing of a Danger Board on the fence etc.; <b>all complete works.</b>	LS	1.00	11,295.00	11,295.00
2	Supply, installation, testing and commissioning of new main LV switchboard comprising incoming and outgoing feeders with metering, indications and protection as per technical specifications and One Line Diagram; <b>all complete works.</b>	No.	1.00	67,563.00	67,563.00
3	Supply, installation, testing and commissioning of new LV Distribution board for treated sewage pump comprising incoming and outgoing feeders indications as per technical specifications and One Line Diagram; <b>all complete works.</b>	No.	1.00	38,516.25	38,516.25
4	Supply, installation, testing and commissioning of Lighting Distribution Board comprising incoming and outgoing feeders with indications including glanding, termination and connection of cables and conduits as per technical specifications; <b>all complete works.</b>	No.	1.00	15,455.00	15,455.00
5	Supply, installation, testing and commissioning of metal enclosed weather proof start /stop P.B. station. <b>all complete works.</b>	No.	2.00	1,550.00	3,100.00
6	Providing and laying in trench, on wall or surface, PVC insulated, PVC sheathed power cables of 1.1 kV grade including fixing with wooden plugs as per approved spacing by means of screws & rag bolts, G.S. 'U' clamps etc. or steel spacers/clamps/cleats and, also including supply, making connections and testing etc. as per technical specifications; <b>all complete works.</b>				
a)	3.5Cx50 sq.mm. AYFY	Mtrs.	30.00	198.00	5,940.00
b)	3.5Cx35 sq.mm. AYFY	Mtrs.	750.00	156.00	117,000.00
c)	4Cx10 sq.mm. AYFY	Mtrs.	980.00	102.00	99,960.00
d)	4Cx16 sq.mm. AYFY	Mtrs.	3,010.00	120.00	361,200.00
e)	4CX6 sqmm AYWY	Mtrs.	10.00	90.00	900.00
f)	3CX6 sqmm AYWY	Mtrs.	200.00	78.00	15,600.00
g)	4Cx2.5 sq.mm. AYWY	Mtrs.	200.00	97.00	19,400.00

S No	Item	Unit	Quantity	Rate	Amount
7	Supply and fixing in position of cable gland in brass nickel plated heavy duty with three metal washers and one rubber ring, double compression, including preparation of cable and etc. as required and as per technical specifications; <b>all complete works.</b>				
a)	3.5Cx50 sq.mm. AYFY	No.	2.00	171.00	342.00
b)	3.5Cx35 sq.mm. AYFY	Nos.	2.00	103.00	206.00
c)	4Cx10 sq.mm. AYFY	No.	8.00	103.00	824.00
d)	4Cx16 sq.mm. AYFY	Nos.	215.00	103.00	22,145.00
e)	4CX6 sqmm AYWY	Nos.	2.00	72.00	144.00
f)	3CX6 sqmm AYWY	Nos.	8.00	72.00	576.00
g)	4Cx2.5 sq.mm. AYWY	Nos.	8.00	72.00	576.00
8	Providing and fixing tubular/bullet type cable terminal ends duly crimped with crimping tool including making cable ends ready for crimping and providing insulation tape with colour code etc. as required and as per technical specifications; <b>all complete works.</b>				
a)	3.5Cx50 sq.mm. AYFY	Nos.	6.00	21.00	126.00
b)	3.5Cx35 sq.mm. AYFY	Nos.	6.00	21.00	126.00
c)	3.5Cx25 sq.mm. AYFY	Nos.	4.00	10.00	40.00
d)	4Cx10 sq.mm. AYFY	No.	32.00	10.00	320.00
e)	4Cx16 sq.mm. AYFY	Nos.	805.00	10.00	8,050.00
f)	4CX6 sqmm AYWY	Nos.	8.00	10.00	80.00
g)	3CX6 sqmm AYWY	Nos.	24.00	10.00	240.00
h)	4Cx2.5 sq.mm. AYWY	Nos.	32.00	10.00	320.00
9	Supply and fixing Industrial Fluorescent fixture (including tube) with reflector fabricated from CRCA sheet steel and finished with stove enamel paint white on reflecting surface and gray on other surface complete with accessories like copper wound polyster choke, starter, holder and terminal block duly pre-wired with copper conductor including connection as per technical specification, <b>all complete work.</b>				
a)	2 x 40 Watts fixture	Nos.	27.00	1,118.00	30,186.00
10	Supply and fixing Industrial Fluorescent fixture (including tube) with reflector fabricated from CRCA sheet steel and finished with stove enamel paint white on reflecting surface and gray on other surface complete with accessories like copper wound polyster choke, starter, holder and terminal block duly pre-wired with copper conductor including connection as per technical specification, <b>all complete work.</b>				

S No	Item	Unit	Quantity	Rate	Amount
a)	1 x 40 Watts fixture	Nos.	1.00	954.00	954.00
11	Supply and fixing of bulkhead fitting including lamp, brass/porcelain bracket holder of approved quality suitable for 40W lamp complete with making connection as required; <b>all complete works</b>	Nos.	2.00	250.00	500.00
12	Supply and fixing Post Top Lantern type lighting fixture suitable for mounting on gate posts comprises a control gear capsule diecast from LM6 aluminium alloy, copper wound polyster ballast, lamp holder and mains connector, rotational moulded diffuser of polyethylene screwed on top of the capsule, gasketed for weather proofness with 1x70 watts HPSV lamp; <b>all complete work</b>	Nos.	2.00	2,910.00	5,820.00
13	Supply and erection of MS steel welded/sawaged tubular pole of 7.5mtr. height in position on M.S. base plate of size 400mmx400mmx6mm including excavation of pit and filling the same with cement concrete of 1:3:6 from the bottom of the pole and upto 50cms above the ground level with the help of steel frame in 40cm dia. around the pole including painting with red oxide primer and aluminium paint/enamel paint in two coats complete in all respect; <b>all complete work.</b>	Nos.	60.00	2,680.00	160,800.00
14	Supply and fixing of 18 SWG sheet metal junction box of 200x250x75 mm size comprises of TPN terminal block, door with gasket, IP55 protection with all necessary mounting arrangement on the pole including bracket, bolt and painting with red oxide primer and aluminium paint/enamel paint in two coats complete in all respect; <b>all complete work.</b>	Nos.	60.00	450.00	27,000.00
15	Providing fixing weather proof street light luminair in position suitable for 1x70 W HPSV lamp with integrate control gear comprising heavy duty copper wound ballast, condensor, electric ignitor and porcelain terminal block prewired with PVC wire with copper conductor on a detachable tray. The canopy is to be covered with clear acrylic cover adequately gasketed and clamped rigidly with toggles including deep drawn aluminium lamp compartment and reflector with control gear including testing and making connections and testing etc. as required including 1X70W HPSV lamp; <b>all complete works</b>	Nos.	60.00	2,775.00	166,500.00
16	Provide and fixing ceiling fan of approved make complete with regulator and all its accessories like suspension system, canopy cotter pint as required for 1200mm sweep; <b>all complete works</b>	Nos.	7.00	910.00	6,370.00
17	Providing and fixing of exhaust fan single phase 300mm (12") IS:2312 marked in the existing opening with angle iron frame (where as required) making good the damages, testing including making connections etc. as required; <b>all complete work</b>	Nos.	6.00	2,335.00	14,010.00
18	Wiring for light point with 1.5 sq.mm PVC insulated copper conductor cable and of approved make in recessed conduit not less than 2mm thick including conduit fittings, switch, Metal box, round tiles, 18 SWG metal box with 3mm sunmica sheet with bakelite base, all connections and as per technical specification, <b>all complete works.</b>				
a)	Short Point (up to 3 M)	Nos.	10.00	95.00	950.00
b)	Medium Point (up to 6 M)	Nos.	19.00	116.00	2,204.00
c)	Long Point (up to 10 M)	Nos.	28.00	149.00	4,172.00

S No	Item	Unit	Quantity	Rate	Amount
19	Wiring for 3 Pin 5/15A Power plug point with 2.5 Sqmm PVC insulated copper conductor(IS-694) of approved make alongwith Al. Bare conductor for earthing including supply of 5/15A switch, socket with accessories and making connection <b>all complete works.</b>				
a)	Short Point (up to 3 M)	Nos.	3.00	196.00	588.00
b)	Medium Point (up to 6 M)	Nos.	5.00	230.00	1,150.00
c)	Long Point (up to 10 M)	Nos.	2.00	303.00	606.00
20	Supply, laying and fixing earth conductor buried in ground outside the operator room and bonding it to buried earth grid of substation including making connections by welding/bolting etc., as per technical specifications; <b>all complete works.</b>				
a)	50x6 mm MS Flat	Mtrs.	110.00	82.00	9,020.00
21	Supply, laying and fixing earth conductor above ground inside the operator room and bonding it to buried earth grid outside the operator room including making connections by welding/bolting etc., as per technical specifications; <b>all complete works.</b>				
a)	50x6 mm GS Flat	Mtrs.	60.00	82.00	4,920.00
22	Supply, laying and fixing earth strip tapes from Main LV Switchboard & Treated Sewage pump room Distribution Board in horizontal or vertical position, laid on wall, floor or trench including interconnection with main earth grid inside operator room and including welding/bolting and clamps/connectors etc. as per technical specifications; <b>all complete works.</b>				
a)	40x5 mm GS Flat	Mtrs.	15.00	55.00	825.00
23	Supply, laying and fixing earth conductor from LDB, street lighting pole, automatic screen panels, detriator panels and bonding the same to the main earth grid, laid on floor / wall / buried inground including lugging, crimping etc. as per technical specifications; <b>all complete works.</b>				
a)	25x3 mm GS Flat	Mtrs.	3,000.00	31.00	93,000.00
24	Supply, laying and fixing of 8 swg earth conductor for small misc. electrical equipment pnl. Connection <b>all complete works.</b>	Mtr.	50.00	8.00	400.00
25	Treated earthing pit with earth pipe made from heavy gauge GI Pipe 40 mm. Dia., 3 mtrs. long including all accessories and providing masonry enclosure with cover plate and watering pipe with funnel complete with alternate layers of salt and charcoal and connecting it to earth grid conductor in the ground as per technical specifications; <b>all complete works.</b>	Nos.	7.00	825.00	5,775.00
	<b>Total</b>				1,325,795.00