

**Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Narakasur - Access Road
Bill of Quantities**

Sr no.	Item No.	Reference of MoSRT&H Specification	Description	Unit	Quantity	Rate				Amount	
						Local		Foreign		Local	Foreign
						Basic Rate	Applicable taxes and duties etc.	Basic Rate	Applicable taxes and duties etc.	Basic Rate	Applicable taxes and duties etc.
10	2.3	201	Clearing and Grubbing Road Land: Clearing and grubbing road land including uprooting rank vegetation, grass, brush, shrubs sapling and trees of girth upto 300mm removal of stumps, disposal of unserviceable materials and staking of serviceable material to be used or auctioned upto a lead of 1000m including removal and disposal of top organic and not exceeding 150 mm in thickness. I) By Manual Means A) In area of non thorny jungle	Hect	0.76	38,929.00	779.00			29,586	592
11	2.4	202	Dismantling of Structures Dismantling of existing structures like culverts, bridges, retaining wall, and other structure comprising of masonry, cement concrete, wood work, steel work, including T&P and scarping wherever necessary, sorting the dismantled material, disposal of unserviceable material with all lifts and leads of 1000 metres I) Lime / Cement Concrete A) By Manual means a) Lime Concrete, cement concrete M10 grade and below III) Dismantling Stone Masonry b) Rubble Masonry in cement mortar	m ³	0.5	649.00	13.00			325	7
				m ³	15	390.00	8.00			5,850	120
			EARTHWORK, EROSION CONTROL AND DRAINAGE								
12	3.3	301	Excavation in Soil with Dozer with lead upto 100 m Excavation for roadway in Soil by mechanical means including cutting and pushing the earth to site of embankment upto a distance of 100 metres (average lead of 50 m), including trimming bottom of side slopes in accordance with requirements of lines, grades and cross sections	m ³	172500.9	59.00	2.00			10,177,554	345,002
13	3.11	301	Removal of Unserviceable Soil with Disposal upto 1000 metres Removal of Unserviceable Soil with Disposal upto 1000 metres lead but excluding replacement by suitable soil which shall be paid separately as per clause 305.	m ³	169676.8	33.00	1.00			5,599,334	169,677
14	3.17		Embankment Construction with Materials obtained from Roadway Cutting Construction of embankment with approved materials deposited at site from roadway cutting and excavation of drains and foundations of other structures graded and compacted to meet requirement of table 300-2	m ³	2824.14	91.00	2.00			256,997	5,648



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15			SUB-BASES, BASES (NON-BITUMINOUS) AND SHOULDERS Sub-Base Construction of sub-base coarse 150mm compacted thickness by stone dust in single layer of 180 mm loose thickness including collection and supply stone dust coming out as by product during crusher running consisting of hard quarry chipping, machine broken and of size 10mm down as per IRC grading free from dust, dirt and other organic and deleterious constituents including payments of Forest Royalty and Sales Tax, including preparation of sub-base to specified profile and grade after removal of all vegetation and extraneous material if any, dressing, cambering lightly sprinkling with water and rolling with adequate passes of 8-10T roller till the stone dust sub-grade is properly compacted. Spreading the granular materials between prepared shoulders in layers not exceeding 150mm(loose thickness, dressing, watering to bring the moisture content to \pm 2% of OMC for the entire depth of the layer and compacting the same with hpower roller 8-10T capacity, adding or removing materials if necessary to keep the longitudinal and cross profile of the surface within permissible tolerance, checking the same with templates and straight edges, continue rolling and orrecting surface irregularities as the appear within permissible tolerance checking the same with template and straight edges continue rolling and correcting surface irregularities as they appera controlling moisture content of maintaining the same above the OMC and compacting to 95% proctor density (collection of stone dust to be made from barpathar stone quarry) and measurement will be taken on the finished compacted work in position	m ³	1136.84	1,558.00	32.00	1,771,197	36,379



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16	4.9	404	Water Bound Macadam Providing, Laying, Spreading and compacting stone aggregates of specific size to water bound macadam specification: including spreading in uniform thickness, hand packing, rolling with vibratory roller 80-100 kN in stages to proper grade and camber, applying and brooming, stone screening/binding materials to fill up the interstices of coarses aggregate, watering and compacting to the required density (with an initial lead of 5 km)									
(A) By Manual means.												
I) Grading-II												
(b) Using Screening Type-A (13.2 mm Agg.)						m ³	757.89	2,336.00	47.00		1,770,431	35,621
II) Grading-III												
(a) Using Screening Crushable type such as Moorum or Gravel						m ³	568.42	2,142.00	43.00		1,217,556	24,442
BASES & SURFACE COURSES (BITUMINOUS)												
17	5.1A	502	Prime Coat Providing and applying primer coat with Bituminous emulsion on prepared surface of granular base including cleaning of road surface and spraying primer at the rate of 0.60kg/sqm using mechanical means.(including cost of testing of materials at site and at laboratory as directed by the deptt.)									
I)With bitumen emulsion-CSS-1h						m ²	7578.93	26.00	1.00		197,052	7,579
18	5.2	503	Tack Coat i) Providing and applying Tack Coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20kg per sqm. on the prepared bituminous surface cleaned with mechanical broom as per Technical Specification Clause 503.(including cost of testing of materials at site and at laboratory as directed by the deptt.)									
I)With bitumen emulsion-CSS-1h												
a) Normal bituminous surface						m ²	7578.93	13.00	1.00		98,526	7,579



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						Basic Rate	Applicable taxes and duties etc.	Basic Rate	Applicable taxes and duties etc.	Basic Rate	Applicable taxes and duties etc.	
19	5.10 A	511	Open Graded Premix Surfacing Providing, laying and rolling of open - graded premix surfacing of 20 mm thickness of 13.2 mm to 5.6 mm aggregates either using penetration grade bitumen: (60/70 grade) or bitumen emulsion to required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a smooth wheeled roller 8-10 T static roller capacity to required level and grades (Including carriage upto initial lead of 5 km: from quarry and carriage of mixed materials upto 10.0 km initial lead from mixing plant)(including cost of testing of materials at site and at laboratory as directed by the deptt.)									
			a) Without anti-stripping agent I) Case I: Mechanical Method using Penetration: grade Bitumen and HMP of appropriate capacity not less than 75 tonnes/hour	m ²	7578.93	176.00	4.00	1,333,892	30,316			
20	5.12	513	Seal Coat Providing and laying seal coat sealing the voids in a bituminous surface laid to the specified levels, grade and cross fall using Type A & B seal coats(including cost of testing of materials at site and at laboratory as directed by the deptt.)									
			a) Without anti-stripping agent I) Case I: Type A providing and laying liquid seal coat comprising of a layer of bituminous binder (paving bitumen 60/70 grade) followed by a cover of crushed stone chipping of specified grade (including carriage upto initial lead of 5 km from quarry)	m ²	7578.93	91.00	2.00	689,683	15,158			
			Sub Total					23,189,541	678,959			



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CROSS DRAINAGE WORKS (BOX CULVERT)													
Name of Road: Approach Road At Narakasur Hill													
Length of Road = 1894.732 m													
21	12.1	304	Foundation Excavation for Structures Earthwork in excavation of foundation of structures as per drawing and technical specification clause including setting out, construction of shoring and bracing, removal of stumps and other deleterious material, dressing of sides & bottom and backfilling with approved material I. in Ordinary Soil A. Manual Means (i) Upto 3 m depth	m ³	163.03	124.00	3.00	20,216	489				
22	12.8 A	1500, 1700 & 2100	Providing concrete for plain/reinforced concrete in open foundation complete as per drawing and technical specification N, Without Plasticiser A P.C.C. grade M15 C. R.C.C. Grade M20 CASE I Using Concrete Mixer	m ³	5.2	5,840.00	117.00	30,368	608				
23	12.40	1600	Supplying fitting & placing TMT bar reinforcement in super-structure including splicing complete as per drawing and technical specifications c With other make ISI marked TMT rebars Substructure Plain/reinforced Cement concrete in substructure complete as per drawings & technical specification Clause 802, 805, 807, 1202 & 1204 N, Without Plasticiser E. RCC M20 grade a. height upto 5 m CASE I Using Concrete Mixer	Tonne	1.17	54,500.00	1,090.00	63,765	1,275				
24	13.5 A	1500, 1700 & 2200	Supplying fitting & placing TMT bar reinforcement in sub-structure complete as per drawing and technical specifications c With other make ISI marked TMT rebars	Tonne	3.34	54,500.00	1,090.00	182,030	3,641				
25	13.6 (B)	1600 & 2200	Supplying fitting & placing TMT bar reinforcement in sub-structure complete as per drawing and technical specifications c With other make ISI marked TMT rebars	Tonne	3.34	54,500.00	1,090.00	182,030	3,641				



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26	13.10	710.1.4 of IRC:78 & 2200	Providing & laying filter media with granular materials/stone crushed aggregate satisfying the requirements laid down in clause 2504.2.2 of MoRTH specification to a thickness not less than 500 mm with smaller size towards the soil & bigger size towards the wall & providing over entire surface behind abutment, wing wall, return wall to full height compacted to firm condition complete as per drawing and	m ³	60.00	2,985.00	60.00	179,100	3,600		
			Superstructure								
27	14.1	1500,1600 & 1700	Furnishing and Placing Reinforced/Prestressed cement concrete in super-structure as per drawing and Technical Specification including providing plasticier (Masterplast PL - 1/SPL - 2 or equivalent), air entraining and water reducing plasticier (Masterplast PAE or equivalent) and accelerating plasticier (Masterplast ACPL or equivalent) conforming to IS-9103-1999 and steel shuttering framework N, Without Plasticier A RCC m20 grade CASE I Using Concrete Mixer I) FOR SOLID SLAB (p) Height upto 5 m.	m ³	12.60	6,748.00	135.00	85,025	1,701		
28	14.2	1600	Supplying fitting & placing TMT bar reinforcement in super-structure including splicing complete as per drawing and technical specifications c With other make ISI marked TMT rebars	Tonne	1.26	54,500.00	1,090.00	68,670	1,373		
29	14.9	2705	Drainage spout complete as per drawing & Technical specification	m ³	40.00	2,596.00	52.00	103,840	2,080		
			Sub Total					1,002,470	20,173		




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CONSTRUCTION OF ROAD SIDE STONE MASONRY BREAST WALL													
Name of Road: Approach Road At Narakasur Hill													
Length of Road = 1894.732 m													
30	12.1	304	Foundation Excavation for Structures Earthwork in excavation of foundation in structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material										
	I		Ordinary Soil										
	A		Manual Means										
	a		Without Dewatering										
	i		upto a height of 3m	m ³	6124.25	124.00	3.00	759.407	18.373				
31	17.56		Providing brick soling in foundation and under floor with stone/ best quality picked jhama brick, sand packed and laid to level and in panel after preparing the subgrade as directed including all labour and materials and if necessary dewatering, complete. (c).Stone soling 150mm thick	m ²	1155.96	1,428.00	29.00	1,650,711	33,523				
32	12.4	2100	PCC 1:3:6 in Foundation Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregates 40mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days	m ³	173.39	4,283.00	86.00	742,629	14,912				



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			Sub-Structure						
33	13.1	1300 & 2200	Stone Masonry work in cement mortar 1:3 in sub-structure complete as per drawing and technical specification A. Random Rubble Masonry	m ³	2991.96	2,596.00	52.00	7,767,128	155,582
34	13.2	1300 & 2200	Pointing with cement mortar (1:3) on brickwork in sub-structure as per drawing & technical specification	m ²	1956.24	143.00	3.00	279,742	5,869
35	13.8	2200 & 2706	Providing weepholes on brick/plain/reinforced abutment, wing wall/return wall/ 100mm dia AC pipes, extending through full width of the structure and slope of 1V:20H towards drawing face. Complete as per drawing & technical specification.	each	1740.00	325.00	7.00	565,500	12,180
36	13.10	710.1.4 of IRC:78 & 2200	Providing and laying filter media with granular materials/crushed stone aggregates satisfying the requirements laid down in clause 2504.2.2 of MoRTH Specification to a thickness not less than 600 mm with smaller size towards the soil and bigger size	m ³	234.00	2,985.00	60.00	698,490	14,040
			Sub Total					12,463,608	254,478



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CONSTRUCTION OF ROAD SIDE STONE MASONRY TOE WALL (1.2m HEIGHT)									
Name of Road: RAM NAGAR ROAD									
Ward: 12									
Length of Road = 140.00 m									
Foundation									
37	12.1	304	Excavation for Structures Earthwork in excavation of foundation in structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material						
	V		Ordinary Soil						
	A		Manual Means						
	ii		With dewatering	m ³	713.95	124.00	3.00	88,530	2,142
38	17.56		Providing brick soling in foundation and under floor with stone/ best quality picked jhama brick, sand packed and laid to level and in panel after preparing the subgrade as directed including all labour and materials and if necessary dewatering, complete. (c).Stone soling 150mm thick	m ²	252.00	1,428.00	29.00	359,856	7,308
39	12.4	2100	PCC 1:3:6 in Foundation Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregates 40mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days	m ³	25.20	4,283.00	86.00	107,932	2,167
Sub-Structure									
40	13.1	1300 & 2200	Stone Masonry work in cement mortar 1:3 in sub-structure complete as per drawing and technical specification a. Random Rubble Masonry	m ²	323.14	2,596.00	52.00	838,871	16,803
41	13.2	1300 & 2200	Pointing with cement mortar (1:3) on brickwork in sub-structure as per drawing & technical specification	m ²	230.40	143.00	3.00	32,947	691
						Sub Total		1,428,136	29,112
						Total		58,764,001	1,383,012



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Sonaighuli - Access Road
Bill of Quantities**

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						Local	Foreign	Local	Foreign
						Basic Rate	Applicable taxes and duties etc.	Basic Rate	Applicable taxes and duties etc.
CONSTRUCTION OF ROAD SIDE STONE MASONRY OPEN DRAIN									
Name of Road: Approach Road At Sonaighuli									
Length of Road = 626.781 m									
1	12.1	304	Foundation Excavation for Structures Earthwork in excavation of foundation in structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material						
	I		Ordinary Soil						
	A		Manual Means						
	a		Without Dewatering						
	i		upto 3 m height	m ³	3027.35	124.00	3.00	375,391	9,082
2	12.3	304	Sand Filling in foundation trenches as per drawing and technical specification:	m ³	571.62	844.00	17.00	482,447	9,718
3	17.56		Providing brick soling in foundation and under floor with stone/ best quality picked jhama brick, sand packed and laid to level and in panel after preparing the subgrade as directed including all labour and materials and if necessary dewatering, complete. (c).Stone soling 150mm thick	m ²	1886.61	1,428.00	29.00	2,694,079	54,712
4	12.4	2100	PCC 1:3:6 in Foundation Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregates 40mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days	m ³	113.45	4,283.00	86.00	485,906	9,757
			Sub-Structure						



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5	13.5	1500, 1700 & 2200	Plain/Reinforced Cement Concrete in sub-structure complete as per drawing and technical specification and steel N) Without Plasticiser A. P.C.C. Grade M15 Height upto 5m.	m ³	75.21	5,840.00	117.00	439,226	8,800	
6	13.4	1400 & 2200	Stone Masonry work in cement mortar 1:3 in sub-structure complete as per drawing and technical specification A. Random Rubble Masonry	m ³	1926.41	2,596.00	52.00	5,000,960	100,173	
7	13.3	1300 & 2200	Plastering with cement mortar (1:3) on brick work in sub-structure as per Technical Specifications	m ²	2945.87	143.00	3.00	421,259	8,838	
8	13.9	710.1.4 of IRC:78 &	Back Filling behind abutment, wing wall and return wall complete as per drawing & technical specification A. Ganular Material	m ³	94.02	649.00	13.00	61,019	1,222	
				Sub Total				9,960,289	202,301	
ROAD WORKS										
Name of Road: Approach Road At Sonaighuli										
Length of Road = 626.781 m										
SITE CLEARANCE										
9	2.1	201	Cutting of Trees, Including Cutting of Trunks, Branches and Removal Cutting of Trees, Including Cutting of Trunks, Branches and Removal of stumps, roots, stacking of serviceable material and upto a lead of 1000 mts and earth filling (1) Girth from 300 mm to 600 mm	each	40	1,039.00	21.00	41,560	840	



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13	3.11	301	Removal of Unserviceable Soil with Disposal upto 1000 metres Removal of Unserviceable Soil with Disposal upto 1000 metres lead but excluding replacement by suitable soil which shall be paid seperately as per clause 305)	m ³	10472.32	33.00	1.00			345,587	10,472	
14	3.17		Embankment Construction with Materials obtained from Roadway Cutting Construction of embankment with approved materials deposited at site from roadway cutting and excavation of drains and foundations of other structures graded and compacted to meet requirement of table 300-2	m ³	1790.16	91.00	2.00			162,905	3,580	
15		Analyzed Item Annexure II	Sub-Base Construction of sub-base coarse 150mm compacted thickness by stone dust in single layer of 180 mm loose thickness including collection and supply stone dust coming out as by product during crusher running consisting of hard quarry chipping, machine broken and of size 10mm down as per IRC grading free from dust, dirt and other organic and deleterous constituents including payments of Forest Royalty and Sales Tax, including preparation of sub-base to specified profile and grade after removal of all vegetation and extraneous material if any, dressing, cambering lightly sprinkling with water and rolling with adequate passes of 8-10T roller till the stone dust sub-grade is properly compacted. Spreading the granular materials between prepared shoulders in layers not exceeding 150mm(loose thickness, dressing, watering to bring the moisture content to \pm 2% of OMC for the entire depth of the layer and compacting the same with hpower roller 8-10T capacity, adding or removing materials if necessary to keep the longitudinal and cross profile of the surface within permissible tolerance, checking the same with templates and straight edges, continue rolling and correcting surface irregularities as the appear within permissible tolerance checking the same with template and straight edges continue rolling and correcting surface irregularities as they appera controlling moisture content of maintaining the same above the OMC and compacting to 95% proctor density (collection of stone dust to be made from barpathar stone quarry) and measurement will be taken on the finished compacted work in position	m ³	376.07	1,558.00	32.00			585,917	12,034	



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16	4.9	404	Water Bound Macadam Providing, Laying, Spreading and compacting stone aggregates of specific size to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 80-100 kN in stages to proper grade and camber, applying and brooming, stone screening/binding materials to fill up the interstices of coarser aggregate, watering and compacting to the required density (with an initial lead of 5 km)						
(A) By Manual means.									
I) Grading-II									
(b) Using Screening Type-A (13.2 mm Agg.)						250.71	47.00	585,659	11,783
II) Grading-III									
(a) Using Screening Crushable type such as Moorum or Gravel						188.03	43.00	402,760	8,085
BASES & SURFACE COURSES (BITUMINOUS)									
17	5.1A	502	Prime Coat Providing and applying primer coat with Bituminous emulsion on prepared surface of granular base including cleaning of road surface and spraying primer at the rate of 0.60kg/sqm using mechanical means.(including cost of testing of materials at site and at laboratory as directed by the deptt.)	m ²	2507.12	26.00	1.00	65,185	2,507
I)With bitumen emulsion-CSS-1h									
18	5.2	503	Tack Coat i) Providing and applying Tack Coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20kg per sqm. on the prepared bituminous surface cleaned with mechanical broom as per Technical Specification Clause 503(including cost of testing of materials at site and at laboratory as directed by the	m ²	2507.12	13.00	1.00	32,593	2,507
I)With bitumen emulsion-CSS-1h									
a) Normal bituminous surface									



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19	5.10 A	511	Open Graded Premix Surfacing Providing, laying and rolling of open - graded premix surfacing of 20 mm thickness of 13.2 mm to 5.6 mm aggregates either using penetration grade bitumen (60/70 grade) or bitumen emulsion to required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a smooth wheeled roller 8-10 T static roller capacity to required level and grades (Including carriage upto initial lead of 5 km from quarry and carriage of mixed materials upto 10.0 km initial lead from mixing plant)(including cost of testing of materials at site and at laboratory as directed by the dept.)									
			a) Without anti-stripping agent 1) Case i: Mechanical Method using Penetration grade Bitumen and HMP of appropriate capacity not less than 75 tonnes/hour	m ²	2507.12	176.00	4.00	441,253	10,028			
20	5.12	513	Seal Coat Providing and laying seal coat sealing the voids in a bituminous surface laid to the specified levels, grade and cross fall using Type A & B seal coats(including cost of testing of materials at site and at laboratory as directed by the dept.)									
			a) Without anti-stripping agent 1) Case i: Type A providing and laying liquid seal coat comprising of a layer of bituminous binder (paving bitumen 60/70 grade) followed by a cover of crushed stone chipping of specified grade (including carriage upto initial lead of 5 km from quarry)	m ²	2507.12	91.00	2.00	228,148	5,014			
			Sub Total					3,630,987	91,699			




Chief Executive Officer
 Gurwahati Metropolitan Dev. Authority

**Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Sonaighuli - Access Road
Bill of Quantities**

Sr no.	Item No.	Reference of MoSRT&H Specification	Description	Unit	Quantity	Rate				Amount	
						Local		Foreign		Local	Foreign
						Basic Rate	Applicable taxes and duties etc.	Basic Rate	Applicable taxes and duties etc.	Basic Rate	Applicable taxes and duties etc.
CROSS DRAINAGE WORKS (BOX CULVERT)											
Name of Road: Approach Road At Sonaighuli											
Length of Road = 626.781 m											
21	12.1	304	Foundation Excavation for Structures Earthwork in excavation of foundation of structures as per drawing and technical specification clause including setting out, construction of shoring and bracing, removal of stumps and other deleterious material, dressing of sides & bottom and backfilling with approved material I. in Ordinary Soil A. Manual Means (i) Upto 3 m depth	m ³	106.62	124.00	3.00	13,221	320		
22	12.8 (A)	1500, 1700 & 2100	Providing concrete for plain/reinforced concrete in open foundation complete as per drawing and technical specification N, Without Plasticiser A P.C.C. grade M15 C. R.C.C. Grade M20 CASE I Using Concrete Mixer	m ³	3.36	5,840.00	117.00	19,622	393		
23	12.40	1600	Supplying fitting & placing TMT bar reinforcement in super-structure including splicing complete as per drawing and technical specifications c With other make ISI marked TMT rebars	Tonne	0.86	54,500.00	1,090.00	47,088	942		



Chief Executive Officer
 Guwahati Metropolitan Dev. Authority

**Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Sonaighuli - Access Road
Bill of Quantities**

Chief Executive Officer
Guwahati Metropolitan Dev. Authority

Sr no.	Item No.	Reference of MoSRT&H Specification	Description	Unit	Quantity	Rate				Amount	
						Local		Foreign		Local	Foreign
						Basic Rate	Applicable taxes and duties etc.	Basic Rate	Applicable taxes and duties etc.	Basic Rate	Applicable taxes and duties etc.
			Substructure								
24	13.5 (A)	1500, 1700 & 2200	Plain/reinforced Cement concrete in substructure complete as per drawings & technical specification Clause 802, 805, 807, 1202 & 1204 N, Without Plasticiser E. RCC M20 grade a. height upto 5 m CASE I Using Concrete Mixer	m ³	21.2	5,840.00	117.00	123,808	2,480		
25	13.6 (B)	1600 & 2200	Supplying fitting & placing TMT bar reinforcement in sub-structure complete as per drawing and technical specifications c With other make ISI marked TMT rebars	Tonne	2.12	54,500.00	1,090.00	115,540	2,311		
26	13.10	710.1.4 of IRC:78 & 2200	Providing & laying filter media with granular materials/stone crushed aggregate satisfying the requirements laid down in clause 2504.2.2 of MoRTH specification to a thickness not less than 600 mm with smaller size towards the soil & bigger size towards the wall & providing over entire surface behind abutment, wing wall, return wall to full height compacted to firm condition complete as per drawing and technical specification	m ³	38.4	2,985.00	60.00	114,624	2,304		
			Superstructure								
27	14.1	1500,1600 & 1700	Furnishing and Placing Reinforced/Prestressed cement concrete in super-structure as per drawing and Technical Specification including providing plasticier (Masterplast PL - 1/SPL - 2 or equivalent), air entraining and water reducing plasticier (Masterplast PAE or equivalent) and accelerating plasticier (Masterplast ACPL or equivalent) conforming to IS-9103-1999 and steel shuttering framework N, Without Plasticiser A RCC m20 grade CASE I Using Concrete Mixer I) FOR SOLID SLAB (p) Height upto 5 m	m ³	9.6	6,748.00	135.00	64,781	1,296		



**Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Sonaighuli - Access Road
Bill of Quantities**

Sr no.	Item No.	Reference of MoSRT&H Specification	Description	Unit	Quantity	Rate		Amount	
						Local	Foreign	Local	Foreign
						Basic Rate	Applicable taxes and duties etc.	Basic Rate	Applicable taxes and duties etc.
28	14.2	1600	Supplying fitting & placing TMT bar reinforcement in super-structure including splicing complete as per drawing and technical specifications c With other make ISI marked TMT rebars	Tonne	0.96	54,500.00	1,090.00	52,320	1,046
29	14.9	2705	Drainage spout complete as per drawing & Technical specification	m ³	32	2,596.00	52.00	83,072	1,664
Sub Total								689,018	13,862
CONSTRUCTION OF ROAD SIDE STONE MASONRY BREAST WALL									
Name of Road: Approach Road At Sonaighuli									
Length of Road = 626.781 m									
30	12.1	304	Foundation Excavation for Structures Earthwork in excavation of foundation in structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material						
			Ordinary Soil						
			Manual Means						
			Without Dewatering						
			upto a height of 3m		588.87	124.00	3.00	73,020	1,767
31	17.56		Providing brick soling in foundation and under floor with stone/ best quality picked jhama brick, sand packed and laid to level and in panel after preparing the subgrade as directed including all labour and materials and if necessary dewatering, complete. (c).Stone soling 150mm thick	m ²	111.15	1,428.00	29.00	158,722	3,223
32	12.4	2100	PCC 1:3:6 in Foundation Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregates 40mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days	m ³	16.67	4,283.00	86.00	71,398	1,434



Chief Executive Officer
Guwahati Metropolitan Dev. Authority

**Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Sonaighuli - Access Road
Bill of Quantities**

Sr no.	Item No.	Reference of MoSRT&H Specification	Description	Unit	Quantity	Rate				Amount		
						Local		Foreign		Local	Foreign	
						Basic Rate	Applicable taxes and duties etc.	Basic Rate	Applicable taxes and duties etc.	Basic Rate	Applicable taxes and duties etc.	
			Sub-Structure									
33	13.1	1300 & 2200	Stone Masonry work in cement mortar 1:3 in sub-structure complete as per drawing and technical specification. A. Random Rubble Masonry	m ³	287.69	2,596.00	52.00	746,843	14,960			
34	13.2	1300 & 2200	Pointing with cement mortar (1:3) on brickwork in sub-structure as per drawing & technical specification	m ²	188.10	143.00	3.00	26,898	564			
35	13.8	2200 & 2706	Providing weepholes on brick/plain/reinforced abutment, wing wall/return wall! 100mm dia AC pipe, extending through full width of the structure and slope of 1V:20H towards drawing face. Complete as per drawing & technical specification	each	172.00	325.00	7.00	55,900	1,204			
36	13.10	710.1.4 of IRC:78 & 2200	Providing and laying filter media with granular materials/crushed stone aggregates satisfying the requirements laid down in clause 2504.2.2 of MoRTH Specification to a thickness not less than 600 mm with smaller size towards the soil and bigger size towa	m ³	22.50	2,985.00	60.00	67,163	1,350			
			Sub Total					1,199,944	24,502			
			Total					15,480,238	332,364			




Chief Executive Officer
 Guwahati Metropolitan Dev. Authority

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Chief Executive Officer
Guwahati Metropolitan Dev. Authority



Days Work

**Package C - 4 : Supply, Installation, Construction and Commissioning of Rising & Transmission Main (Gravity Mains, Pressure Mains)
Reservoirs (MBR, Main Service Reservoirs & Sub Zone Reservoirs) & Pumping station for the South Central Zone.
Bill of Quantities - Days Work**

Item No	Description	Quantity	Unit	Unit rate		Total Amount	
				Local	Foreign	Local	Foreign
A	Dayworks The following Provisional items and quantities are to be priced by the Bidder. The resultant rates shall be used of any Dayworks instructed under Clause 13.5 of the Contract.						
	Daywork - Labour						
1	Skilled labour	300	man days	225		67,500	
2	Unskilled labour	500	man days	160		80,000	
3	Carpenter	50	man days	325		16,250	
4	Black smith	75	man days	325		24,375	
4	Mason	125	man days	325		40,625	
5	Pipelayer / Fitter	250	man days	325		81,250	
6	Welder	250	man days	325		81,250	
		Sub Total				391,250	



Chief Executive Officer
Guwahati Metropolitan Dev. Authority

**Package C - 4 : Supply, Installation, Construction and Commissioning of Rising & Transmission Main (Gravity Mains, Pressure Mains)
Reservoirs (MBR, Main Service Reservoirs & Sub Zone Reservoirs) & Pumping station for the South Central Zone.
Bill of Quantities - Days Work**

Item No	Description	Quantity	Unit	Unit rate		Total Amount	
				Local	Foreign	Local	Foreign
7	Daywork - Material Cement, ordinary Portland	100	Bags	4		400	
8	Tor steel reinforcing bar up to 16 mm diameter Fe - 415 for Concrete as specified in specification	5	MT	650		3,250	
9	Fine aggregate for Concrete as specified in specification	200	m ³	90		18,000	
10	specification	200	m ³	80		16,000	
11	Sand for Concrete as specified in specification	200	m ³	65		13,000	
12	Epoxy pint as specified in specification	200	m ²	100		20,000	
13	Welding rods	1	LS	2,000		2,000	
	Sub Total					72,650	




 Chief Executive Officer
 Guwahati Metropolitan Dev. Authority

**Package C - 4 : Supply, Installation, Construction and Commissioning of Rising & Transmission Main (Gravity Mains, Pressure Mains)
Reservoirs (MBR, Main Service Reservoirs & Sub Zone Reservoirs) & Pumping station for the South Central Zone.
Bill of Quantities - Days Work**

Item No	Description	Quantity	Unit	Unit rate		Total Amount	
				Local	Foreign	Local	Foreign
	Daywork - Equipment						
14	Tractor	30	day	2,000		60,000	
15	Water tank truck (2000 Gallons)	1000	Km	150		150,000	
16	Mobile crane (up to 10 T)	100	day	4,500		450,000	
17	JCB Excavator / loader	150	hour	6,000		900,000	
18	Compressor (more than 115 cfm)	100	day	4,000		400,000	
19	Generator (up to 15 kw)	15	day	2,000		30,000	
20	Dewatering Pump set up to 20HP	15	day	2,200		33,000	
21	Concrete Mixer (0.3/0.4 m ³ capacity)	250	hour	275		68,750	
22	Vibrator with needle	60	days	850		51,000	
		Sub Total				2,142,750	
		Total				2,606,650	



Chief Executive Officer
Guwahati Metropolitan Dev. Authority

Note : For per day rates of above items, per hours rates will be calculated considering 8 hours working for partial payments if working is less than 8 hour Machines to be provided with driver and fuel.

Guwahati Water Supply Project (JICA Loan No. ID-P201)

Addendum No. 1 (Contract No. C-04) South Central Zone

Dated: 08 November 2010

1. Item No. 1 – NARKASUR PUMPING STATION
2. Item No. 2 – REINFORCING BAR SIZE
3. Item No. 3 – MODIFICATIONS TO THE BILL OF QUANTITIES
4. Item No. 4 – MODIFICATION TO SECTION VIII PARTICULAR CONDITIONS,
PART B – SPECIAL PROVISIONS
5. Item No. 5 – TABLE OF CONTENTS



Project Management Consultant (PMC)

ITEM No1: NARAKASUR PUMPING STATION

Remove the following drawings from the Drawings issued:

SL-18: Narakasur Pumping Station and Site plans and Sections

SL-23: Piping Arrangement of Narkasur Pumping Station

SL-56,57,58,59: Narakasur Pumping Station Structural Details

Replaced with the seven (7) replacement drawings distributed with this Addendum No 1.

ITEM NO2: REINFORCING BAR SIZE.

Some reinforcing bars are shown on the drawings as 9 mm and 19mm. Replace these reinforcement with 10 mm and 20mm bars respectively.

ITEM NO. 3 : MODIFICATIONS TO THE BILL-OF-QUANTITIES,

- a) The Preamble to the Bill-of-Quantities and the Bill-of-Quantities has been modified in several places. Changes were made to the descriptions and quantities. The replacement Bill-of-Quantities is distributed with this Addendum.
- b) Part 1, Section IV (Bidding Forms) BOQ Item A, Dayworks . Change '*Clause 13.5*' in the original document to '*Clause 13.6 Section VII General Condition of the Contract*'

ITEM No 4: MODIFICATION TO SECTION VIII PARTICULAR CONDITIONS, PART B- SPECIAL PROVISIONS.

The revisions to Section VIII: Particular Conditions are detailed on the following pages.

The Revision includes:

- Part A Sub-Clause 14.6 – Contract Data: Change the Minimum of Interim Payment Certificate from 10% to **'2% of the Accepted Contract Amount'**
- Part B- Special Provisions: Replace with the revision attached.
- Annexure – 1: Terms and procedures of Payment, Payment Schedule for Interim Valuations.

Part B - Specific Provisions (Revised Nov 1, 2010)

Sub-Clause 1.15 Inspections and Audit by the Bank	This Sub-Clause is deleted entirely.
Sub-Clause 2.4 Employer's Financial Arrangements	Financial arrangement is Japanese ODA Loan of amount 29,453 million Japanese Yen. The loan Agreement is signed on March 31, 2009
Sub-Clause 4.18 Protection of the Environment	The Contractor shall, throughout the execution and completion of the Works and the remedying of any defects therein, comply with all provisions in the Loan Agreement between the Bank and the Borrower with respect to the protection of the environment.
Sub-Clause 8.1 Commencement of Works	Sub-paragraph (d) deleted entirely
Sub-Clause 14.1 The Contract Price	Bidders are informed that certain tax and duty exemptions are available as per the following GOI notifications: <ul style="list-style-type: none"> a) In accordance with Notification No. 108/95-CE dated 28.8.1995 (Goods Supplied to UN or an International Organization) and subsequent amendments, the Central Government has granted exemptions for all goods falling under the Schedule to the Central Excise Tariff Act 1985 when supplied to projects financed by Japan International Cooperation Agency and approved by the Government of India from the whole of (1) the duty of excise leviable thereon under Section 3 of the Central Excise Act, 1944 (1 of 1944), and (2) the additional duty of excise leviable thereon under Sub-Section (1) of Section 3 of the Additional Duties of Excise (Goods of Special Importance) Act, 1957 (58 of 1957), provided that the need for such goods are properly certified by the appropriate authorities. b) In addition, as per Notification No. 84/97-Cus. dated 11.11.1997 and subsequent amendments, and under General Exemption No. 1A, Exemptions to Imports by United Nations or International Organization for Execution of Projects in India, the Central Government has granted exemptions for all goods imported into India for execution of projects financed by an International Organization and approved by the Government of India, from (1) the whole of the duty of customs leviable thereon under First Schedule to the Customs Tariff Act, 1975 (51 of 1975), (2) the whole of the additional duty of customs leviable thereon under Section 3 of the said Act, and (3) the whole of the special duty of customs leviable under Section 68 of the Finance (No. 2) Act 1996 (33 of 1996), provided that the need for such goods is properly certified by the appropriate authorities.
Sub-Clause 16.2 Termination by Contractor	Sub-paragraph (a) is deleted].
Sub-Clause 20.2 Appointment of the Dispute Board	No change.

Annexure -1
Terms and Procedures of Payment
Payment Schedule for Interim Valuations

In accordance with the provisions of GC Clause 14 (Contract Price and Payment), the Employer shall pay the Contractor in the following manner and at the following times, on the basis of the price Breakdown given in the section on Price Schedule. Payments will be made in the currencies quoted by the Bidder unless otherwise agreed between the parties. Application for payment in respect of part deliveries may be made by the Contractor as work proceeds.

(A) Terms of Payment

Advance payment:

- a) Ten percent (10%) of the total contract price as an advance payment against an irrevocable advance payment security for the equivalent amount shall be made out in favor of the Contractor.
- b) Advance payment shall be recovered in 18 nos. of equal monthly installment, with the first installment commencing from the 7th month from the Effective Date. In case no interim payment is made in a particular month after 7th month, the recovery from the interim payment made in any particular month shall be equivalent to cumulative recovery due to but made in proceeding month.

100% of the advance payment shall stand recovered by the end of 24th month after the scheduled date of start or 85% progress payment of contract amount whichever is earlier. In case of default to repay the advance payment awaited by the end of 24th month, the mobilization advance would stand recovered in full by encasement of BGs.

Schedule No.1. Pipes, Valves, Fittings, Couplings and Accessories Supplied from Abroad

In respect of pipe materials for transmission mains supplied from abroad, the following payments shall be made:

1. Supply and delivery of pipe materials

Eighty Five percent (85%) of the total accepted price for the item upon supply, delivery to the site, proper storage and acceptance of the relevant item.

Ten percent (10%) of the total accepted price of the item upon successful completion of installation and in-situ testing specified.

Five percent (5%) of the total accepted price for the item upon successful completion of the commissioning and upon issue of the Work Contract Completion Certificate, including rectifying any defects observed during this period.

Schedule No.2. Plant and Equipment Supplied from Abroad

In respect of Plant and equipment supplied from abroad, the following payments shall be made:

1. Supply and delivery of Pumps with motor, other mechanical and electrical equipment, instrumentation, etc.

Eighty Five percent (85%) of the total accepted price for the item upon supply, delivery to the site, proper storage and acceptance of the relevant item.

Ten percent (10%) of the total accepted price of the item upon successful completion of installation and in-situ testing specified.

Five percent (5%) of the total accepted price for the item upon successful completion of the commissioning and upon issue of the Work Contract Completion Certificate, including rectifying any defects observed during this period.

2. Supply and delivery to the Site of mandatory spar parts, tools and tackles, etc.

100%-Progress payment, commensurate with the approved delivery schedule, for supply, delivery at the site, proper storage and acceptance by the Engineer.

Schedule No.3. Pipes, Valves, Fittings, Couplings and Accessories Supplied from within Employer's Country

In respect of pipe materials for transmission mains supplied from abroad, the following payments shall be made:

1. Supply and delivery of pipe materials

Eighty Five percent (85%) of the total accepted price for the item upon supply, delivery to the site, proper storage and acceptance of the relevant item.

Ten percent (10%) of the total accepted price of the item upon successful completion of installation and in-situ testing specified.

Five percent (5%) of the total accepted price for the item upon successful completion of the commissioning and upon issue of the Work Contract Completion Certificate, including rectifying any defects observed during this period.

Schedule No.4. Supply and delivery of Pumps with motor, other mechanical and electrical equipment, instrumentation, etc.**1. Supply and delivery of Pumps with motor, other mechanical and electrical equipment, instrumentation, etc.**

Eighty Five percent (85%) of the total accepted price for the item upon supply, delivery to the site, proper storage and acceptance of the relevant item.

Ten percent (10%) of the total accepted price of the item upon successful completion of installation and in-situ testing specified.

Five percent (5%) of the total accepted price for the item upon successful completion of the commissioning and upon issue of the Work Contract Completion Certificate, including rectifying any defects observed during this period.

2. Supply and delivery to the Site of mandatory spare parts, tools and tackles, etc.

100%-Progress payment, commensurate with the approved delivery schedule, for supply, delivery at the site, proper storage and acceptance by the Engineer.

Schedule No.5A. Installation and other Services

In respect of installation services for foreign and local currencies, the following payments shall be made:

1. Installation of Transmission mains (trench works, installation of pipes, valves, fittings and coupling, crossing works, reinstatement of existing pavement and utilities, etc.)

Monthly payment in accordance with the work progress measured and approved by the Engineer with reduction of Five percent (5%) for retention money.

Retention money of Five percent (5%) upon successful completion of the work and commissioning upon issue of the Work Contract Completion Certificate, including rectifying any defects observed during this period.

2. Installation of pumps with motor, other mechanical and electrical equipment and instrumentation, etc.

Monthly payment in accordance with the work progress measured and approved by the Engineer with reduction of Ten percent (10%) for retention money.

Retention money of Five percent (5%) upon successful completion of the work and commissioning upon issue of the Work Contract Completion Certificate, including rectifying any defects observed during this period.

Schedule No. 5B. Civil Works**1. General civil works (excavation, backfilling, site grading, fencing, road work including access road, drainage structures, buildings other than water retaining structures, etc.)**

Monthly payment in accordance with the work progress measured and approved by the Engineer with reduction of Five percent (5%) for retention money.

Retention money of Ten percent (5%) upon successful completion of the work and commissioning upon issue of the Work Contract Completion Certificate, including rectifying any defects observed during this period.

2. Construction of water retaining structures (reservoirs, etc.)

Monthly payment in accordance with the work progress measured and approved by the Engineer with reduction of Five percent (5%) for retention money.

Retention money of Five percent (5%) upon successful completion of the work and commissioning upon issue of the Work Contract Completion Certificate, including rectifying any defects observed during this period.

Provisional Sum Items

As per Requirement

100%-Payment in full upon production of receipts for any approved expenditures

(B) Payment terms and Procedures

The Procedures to be followed in applying for certification and making payment shall be as follows:

1. All payments shall be made within 45 days after receiving invoices of appropriate elements in the price schedule, after due check by accounts & audit by the Accounts Section of Employer's representative's Office, and corrections as deemed fit for justified reasons.
2. All payments shall be treated as advances till settlement of Final Account & Billing and in the event of any over payments or wrong payments are noticed the same shall be adjusted or recovered forthwith, from the Contractor, from any amount due to him.
3. The mobilization advance shall not carry any interest
4. An interest of 4% (Four percent) per annum is payable by the Employer if the disbursement of payment is delayed beyond 60 days.
5. The payments will be as certified by the Employer's Representative and as per disbursement procedure of JICA ODA Loan.

ITEM No 5: TABLE OF CONTENTS

- a) Replace the current Table -of-Content with the modified Table of Content on the following page.
- b) Replace '*Section IV*' on all the pages of the **Technical Bid** with '*Section IVA*'.
- c) Replace '*Section IV*' in the Price Bid (Bill-of-Quantities) with '*Section IVB*'

Table of Contents of Bid Document

Invitation for bids (IFB)	
PART 1 –	Bidding Procedures
Section I	Instruction to Bidders (ITB)
Section II	Bid Data Sheet (BDS)
Section III	Evaluation and Qualification Criteria
Section IV	Bidding Forms
	Technical Bid
Section IV A	Letter of Technical Bid
	Tehchnical Schedules
	Price Bid
Section IV B	Letter of Price Bid
	Price Schedules
Section V	List of Eligible countries of Japanese ODA Loans
PART 2 – Works Requirements	
Section VI A	Scope of Works & Specifications
Section VI B	Drawings
PART 3 – Conditions Of Contract And Contract Forms	
Section VII	General Conditions (GC)
Section VIII	Particular Conditions (PC) and Annexure-1
Section IX	Contract Forms
Appendix to Part-2	
	(in separate volumes)
	-Standard Specifications (Civil Works)
	-Quality Assurance and Quality Control Manual
	-Health and Safety Manual

Guwahati Water Supply Project

(JICA Loan No. ID P-201)

BIDDING DOCUMENTS [International Competitive Bidding (ICB)]

Contract Package No.: C-04

Procurement of Works (Item Rate)

Supply, Installation, Construction and Commissioning of Rising & Transmission Main

(Gravity Mains, Pressure Mains) Reservoirs (MBR, Main Service Reservoirs &

Sub Zone Reservoirs) for the South Central Zone.

Guwahati Metropolitan Development Authority

Government of Assam, Guwahati, Assam, India.

**Office of the Chief Executive Officer,
Guwahati Metropolitan Development Authority,
3rd floor, STATFED Building, GMCH Road,
Bhangagarh, Guwahati – 781005, Assam, India**

Ph No. - +91 361 2529650

Fax No. - +91 361 2529991

IFB No.: GWSP/ICB/C-04/10-11/

Dated.: 12/11/2010

Issued to:

**Addendum No.-2
Revised Bill of Quantities
Transmission Main
Access Roads
12th November, 2010**

Bill of Quantities for Transmission Mains

Package-4 Transmission Mains for the South Central Zone

Bill of Quantities

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
1.0	EARTH WORK								
1.01	Earth work in excavation in foundation trenches, pipeline trenches, valve chamber, thrust block, WBM and asphalt road, brick and stone masonry etc. in all kinds of soils such as murum, sand, sandy silt, clay, kankar etc. including dressing, rammimg of bottoms including shoring, strutting, Dewatering whenever required taking out the excavated soil and depositing, and disposal of surplus excavated earth, sand, murum, sludge etc to a place identified by the Contractor and approved by the Engineer including loading, unloading, stacking etc complete. (Depth of excavation measured from the existing ground level to the formation level, backfilling is not included)								
A	For Pipe line trenches, pipe encasing, etc								
(a)	0 to 1.5m depth	m ³	85,325						
(b)	1.5 to 3.0 m depth	m ³	54,813						
(c)	3.0 to 4.5 m depth	m ³	5,374						
B	For Valve Chamber etc								
(a)	0 to 1.5m depth	m ³	369						
(b)	1.5 to 3.0 m depth	m ³	31						
(c)	3.0 to 4.5 m depth	m ³	18						

Package-4 Transmission Mains for the South Central Zone

Bill of Quantities

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
1.02	Earth work in excavation in foundation trenches or drains, pipeline trenches, valve chamber, thrust block, WBM and asphalt road etc. in soft rock/ordinary rock including dressing of sides, ramming of bottoms, including shoring, strutting, Dewatering whenever required taking out of excavated soil and disposing and disposal of surplus excavated earth, sand, murum, sludge etc to a place identified by the Contractor and approved by the Engineer including loading, unloading, stacking etc complete. (Depth of excavation measured from the existing ground level to the formation level, backfilling is not included).								
A	For Pipe line trench								
(a)	0 to 1.5m depth	m ³	8532						
(b)	1.5 to 3.0 m depth	m ³	5481						
(c)	3.0 to 4.5 m depth	m ³	537						
B	For Valve Chamber								
(a)	0 to 1.5m depth	m ³	41						
(b)	1.5 to 3.0 m depth	m ³	7						
(c)	3.0 to 4.5 m depth	m ³	3						
1.03	Providing and laying bouldersoling in river crossing section	m ³	8						

Package-4 Transmission Mains for the South Central Zone

Bill of Quantities

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
1.04	Filling in pipeline trenches, foundation, chambers etc. with approved excavated soil (excluding rock) including depositing in layers not exceeding 200 mm in depth, consolidating each deposited layer by ramming and watering including lead up to 50m and lift upto 4.5m, including compaction to achieve 90% Standard Proctor density etc., complete	m ³	99398						
1.05	Filling in plinth, trench with well graded river sand including watering, ramming, consolidating and dressing complete including cost of sand as per drawing and specifications around pipe to achieve Class N bedding. For soft Rock	m ³	11044.22						
1.06	WBM Base for restoration of existing asphalt road								
	Providing, Laying, Spreading and compacting stone aggregates of specific size for WBM Base 380 mm compacted thickness in three layers. In first layer 200 mm thick 90-45 mm size agg. with binding material. In Second layer 100 mm thick 60-45 mm stone screenings with binding material and in Third layers of 80 mm thick 53-22.4 mm size stone screenings with binding material as per specification and drawing.	m ³	10894						

Package-4 Transmission Mains for the South Central Zone

Bill of Quantities

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
1.07	Bituminous surface for restoration of existing asphalt road								
	Providing, Laying, Spreading and compacting stone aggregates of specific size for 100 mm compacted thickness Bituminous surface provided in two layers. In first layers 50 mm thick Spray grout consisting of coarse aggregate 53 to 2.8 mm size with bitumen spray grout at 15 kg/ 10sqm and Second layers 50 mm thick Spray grout consisting of coarse aggregate 22.4 to 2.8 mm size with bitumen spray grout at 15 kg/ 10sqm and after completion of this Providing and laying seal coat with pre mix aggregate size passing through 2.36 mm sieve at 0.06 kg / 10sqm mixed with binder 6.8 kg / 10sqm including bituminous tack coat over WBM surface and as per specification and drawings.	m ³	5447						
2.00	Concrete and Allied Works								
2.01	Providing and laying Plain cement concrete M-15 grade PCC for all types of Valve chamber, thrust block, anchor block, antifoatation block etc vibrating mix with respect with vibrations complete in all respect with 40mm/25 stone aggregate (crusher broken) including fine finish of surface to required camber / super elevation and grade including curing as per specifications.	m ³	10.54						

Package-4 Transmission Mains for the South Central Zone

Bill of Quantities

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
2.02	Providing and laying in position machine batched, machine mixed and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete structural elements , including the cost of centering and shuttering and reinforcement including rendering in cement mortar 1:3 (1 cement : 3 coarse sand) and making good the joints and admixtures in recommended proportions as per IS 9103 to accelerate retard setting of concrete improve workability without impairing strength and durability as per direction of Enginner-in charge.								
	M20 grade for all type valve chambers	m ³	227						
	M25 grade for River Crossing	m ³	21						
2.03	Providing and fabricating reinforcement for RCC work including pipe incasement straightening, cutting, bending, placing in position and binding (including cost of binding wire) all complete etc as per specifivation and drawing.								
	Thermo-mechanically Treated Bars (Fe 415 grade)	MT	8						
2.04	Providing and fixing in position precast SFRC Covers for butterfly valve chamber, Air valve chamber etc and for covering manhole of scour valve chambers in concrete grade M20 of any size and shape including all precasting work, curing etc., complete.	m ³	50						

Package-4 Transmission Mains for the South Central Zone

Bill of Quantities

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
2.05	Structural steel work in single section fixed with connecting plate including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete above plinth level upto 4.5 meter height in R.S. joist flats, tees, angles and channels.	MT	5						
		SUB TOTAL							
3.0	Pipelines, Specials and Appurtenances								
3.01	Providing, Supplying and fabricating spirally welded MS pipes of following internal diameters and thicknesses as per Specifications and as per IS 2062, IS 3589 and IS 5504. The rate shall include all local and central taxes , Third party inspection, transportation, freight charges, loading and unloading, conveyance to site and stacking the same, cost of all labour, material and giving satisfactory testing as per technical specifications. complete in all respects as per Specifications and Drawings.								
a	1700 mm ID 12 mm thick	m	380						
b	1650 mm ID 20 mm thick	m	30						
c	1500 mm ID 16 mm thick for Pumping mains	m	2,030						
d	1500 mm ID 10 mm thick for Transmission mains	m	1,190						
e	1400 mm ID 10 mm thick	m	1,030						
f	1200 mm ID 10 mm thick	m	500						
g	1200 mm ID 20 mm thick	m	30						
h	1000 mm ID 8 mm thick	m	1,770						
i	900 mm ID 8 mm thick	m	3,115						

Package-4 Transmission Mains for the South Central Zone

Bill of Quantities

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
j	800 mm ID 6 mm thick	m	7,700						
k	700 mm ID 6 mm thick	m	8,720						
l	600 mm ID 6 mm thick for railway crossing	m	10						
m	500 mm ID 6 mm thick	m	3,345						
n	300 mm ID 5 mm thick For washout	m	30						
o	250 mm ID 5 mm thick For washout	m	30						
p	150 mm ID 5 mm thick For washout	m	30						
3.02	Providing, and Supplying of All types of MS specials such as tees, tapers, tail pieces, man hole covers, bearing plates, flanges, for MS pipe to MS pipe connection, valve connections, MS Anchor bolts, Straps, Air vent pipe of different dia and dismantling joint etc of various sizes, manufactured from Fe 410 grade MS plates having thickness not less than the pipes with standard flanges not less than 16 mm thick wherever required complete in all respect as per specification and Drawings including loading, transportation to work site, unloading and stacking, etc complete with cost of third party inspection, all the material and labour, taxes and duties for all leads and lifts involved. Negative tolerance will not be allowed in respect of the thickness of MS specials.								
		MT	171						

Package-4 Transmission Mains for the South Central Zone

Bill of Quantities

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
3.03	Providing and applying fusion bonded epoxy coating in Factory applied including primer coat to the internal and external surfaces of MS pipes and specials and spray application of 2 part liquid epoxy lining and coating for field joint including blast cleaning of the surface, cost of all the material, machinery and labour, taxes and duties etc complete. Thickness of internal lining and external coating shall not be less than 400 microns								
		m ²	82,634						
3.04	Handling, aligning, laying and jointing to correct line and level pipes, and specials etc in trenches. The rate to include transportation of pipes and specials from store yard to site, loading, unloading, hoisting, lowering, marginal cutting, wherever necessary, assembling, providing temporary supports etc., all with approved equipment complete for pipes of following diameters and thickness, the rate also shall include Radiography of field joints, bend test, etc as specified. as per Specification and Drawings.								
a	1700 mm ID 12 mm thick	m	380						
b	1500 mm ID 16 mm thick for Pumping mains	m	2,030						
c	1500 mm ID 10 mm thick for Transmission mains	m	1,190						
d	1400 mm ID 10 mm thick	m	1,030						
e	1200 mm ID 10 mm thick	m	500						
f	1000 mm ID 8 mm thick	m	1,770						
g	900 mm ID 8 mm thick	m	3,115						

Package-4 Transmission Mains for the South Central Zone

Bill of Quantities

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
h	800 mm ID 6 mm thick	m	7,700						
i	700 mm ID 6 mm thick	m	8,720						
j	600 mm ID 6 mm thick for railway crossing	m	10						
k	500 mm ID 6 mm thick	m	3,345						
l	300 mm ID 5 mm thick For washout	m	10						
m	250 mm ID 5 mm thick For washout	m	10						
n	150 mm ID 5 mm thick For washout	m	10						
	VALVES AND APPURTENANCES								
3.05	Supplying and fixing in position true to line and level, following diameters and rating double flanged Butterfly valves with manually operated as per IS 13095 of approved make with accessories and as per specifications and drawings. The rate shall include loading, unloading, Third party inspection, hoisting with the help of approved equipment, supplying and fixing of seals, packing nuts, bolts etc. The rate shall include for approved anti-corrosive painting and testing and touch up at site as required.								
a	1200 mm dia PN 1.6 rating	Nos.	4						
b	1200 mm dia PN 2.5 rating	Nos.	1						
c	800 mm dia	Nos.	4						
d	700 mm dia	Nos.	1						
e	600 mm dia	Nos.	4						
f	500 mm dia	Nos.	1						

Package-4 Transmission Mains for the South Central Zone

Bill of Quantities

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
3.06	Railway crossing with Jacking and Pushing method including construction of Jacking platform, Thrust arrangement, installation required capacity, hydraulic jack with required compressors, excavation inside the pipe line etc complete as per drawing and specification of following diameter of pipe								
a	Jacking and pushing of 1650 mm ID 20 mm thickness	m	30						
b	Jacking and pushing of 1200 mm ID 20 mm thickness	m	30						
3.07	Supply and installation of 800 mm dia Bulk flow meter propellor type suitable to measure Min flow 130 LPS and max 1200 LPS on distribution outlet for Ramsahill to distribution zone at the location as shown on Transmission system Drawings at 380 m from Ramsahill reservoir. Rates including third party inspection.	Nos.	1						
3.08	Supplying and fixing in position true to line and level, Flow Control valve of 800 mm dia PN 1.6 and as per drawing and specification. Rates including third party inspection.	Nos.	1						

Package-4 Transmission Mains for the South Central Zone

Bill of Quantities

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
3.09	Supplying and fixing in position true to line and level, kinetic double orifice cast steel air valves of following rating with flanged ends, cast steel isolating valves, with cap, ISI marked with EPDM rubber gaskets, and MS nuts & bolts as per requirements, field testing and commissioning etc complete as per specification and drawings for all leads and lifts. The rate shall include for approved anti-corrosive painting and testing, third party inspection and touch up at site as required.								
a	200 mm dia PN 1.6 rating	Nos.	6						
b	200 mm dia PN 2.5 rating	Nos.	3						
c	150 mm dia PN 1.6 rating	Nos.	30						
d	100 mm dia PN 1.6 rating	Nos.	4						
e	80 mm dia PN 1.6 rating	Nos.	2						
3.10	Supplying, hoisting, lowering in position and fixing in true to line and level following diameters scour valves / wash out of approved make with accessories as per specifications and Drawings. The rate shall include cost of spun yarn, fiber, asbestos ring, rubber packing, bolts, nuts, third party inspection etc. The rate shall include for approved anti-corrosive painting and testing.								
	300 mm Size Valve PN 1.6 rating	Nos.	2						
	300 mm Size Valve PN 2.5 rating	Nos.	2						
	200 mm Size Valve PN 1.6 rating	Nos.	3						
	150 mm Size Valve PN 1.6 rating	Nos.	18						
	80 mm Size Valve PN 1.6 rating	Nos.	2						

Package-4 Transmission Mains for the South Central Zone

Bill of Quantities

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
3.11	Manufacturing and supplying mild steel stubs with pad plates and flanges as per specifications and drawings for air valves, scour valves and fixing to the pipeline after cutting and proper finishing as directed by Engineer, including 2 coats of painting over primer.								
	For and Scour Valves	MT	2						
3.12	Providing , Laying and Jointing RCC class NP-2 Non-pressure pipes (IS-458) of approved make with collars jointed with CM 1:2 or having Spigot and Socket ends with flexible rubber rings (EPDM) joints including testing of joints etc complete.								
a	400 mm dia.	m	50						
b	300 mm dia.	m	50						
c	250 mm dia.	m	50						
d	200 mm dia.	m	50						
e	150 mm dia.	m	50						

Package-4 Transmission Mains for the South Central Zone

Bill of Quantities

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
3.13	DUCTILE IRON PIPES								
	Providing, lowering, laying and jointing K-9 Ductile Iron pipes, spigot and socket type with rubber ring joints as per IS 8329 and Specifications , with internal cement mortar lining and external Metallic Zinc Coating with Finishing layer of Epoxy coating applied per specifications for potable water supply, including cost of EPDM rubber ring as per IS 5382, including transportation, freight charges, loading and unloading, conveyance to site and stacking the same, cost of all labour, material and giving satisfactory Hydraulic field testing and Commissioning as per technical specifications & third party inspection etc complete for following nominal diameters.								
a	150 mm ID DI - K9 pipe	m	500						
3.14	Providing and Laying DI Specials and fittings as per IS 9523, 2000 Tee's, Socket, tail pieces, flanged tapers, Double flanged short pipes,all bends, dismantling joints etc and all types of specials as required for the work suitable for various sizes of DI pipes including cost of EPDM rubber ring as per IS 5382, including Third party inspection, transportation, freight, loading & unloading, stocking, jointing with jointing material etc., inclusive all. complete of sizes required for DI pipes.								
	All Specials (DI -K9)	MT	5						

Package-4 Transmission Mains for the South Central Zone

Bill of Quantities

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
3.15	Hydraustatic test as per IS 8329 at site on laid pipes and as per specification including cost of water, equipment, man power, electricity etc complete in all respect.								
a	1700 mm ID 12 mm thick	m	380						
b	1500 mm ID 16 mm thick for Pumping mains	m	2,030						
c	1500 mm ID 10 mm thick for Transmission mains	m	1,190						
d	1400 mm ID 10 mm thick	m	1,030						
e	1200 mm ID 10 mm thick	m	500						
f	1000 mm ID 8 mm thick	m	1,770						
g	900 mm ID 8 mm thick	m	3,115						
h	800 mm ID 6 mm thick	m	7,700						
i	700 mm ID 6 mm thick	m	8,720						
j	600 mm ID 6 mm thick for railway croosing	m	10						
k	500 mm ID 6 mm thick	m	3,345						
l	150 mm ID DI - K9 pipe	m	500						
3.16	Disinfecting water mains by flushing with water containing bleaching powder as per specification and cleaning the same with fresh water, including getting the sample of water from the disinfected main tested in the municipal laboratory.								
a	1700 mm ID 12 mm thick	m	380						
b	1500 mm ID 16 mm thick for Pumping mains	m	2,030						
c	1500 mm ID 10 mm thick for Transmission mains	m	1,190						
d	1400 mm ID 10 mm thick	m	1,030						
e	1200 mm ID 10 mm thick	m	500						

Package-4 Transmission Mains for the South Central Zone

Bill of Quantities

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
f	1000 mm ID 8 mm thick	m	1,770						
g	900 mm ID 8 mm thick	m	3,115						
h	800 mm ID 6 mm thick	m	7,700						
i	700 mm ID 6 mm thick	m	8,720						
j	600 mm ID 6 mm thick for railway crossing	m	10						
k	500 mm ID 6 mm thick	m	3,345						
l	150 mm ID DI - K9 pipe	m	500						
			SUB TOTAL						
			GRAND TOTAL						

Bill of Quantities for Reservoir Access Roads

Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Amiya Nagar - Access Road
Bill of Quantities (Structures/Drains)

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
Foundation									
1	Excavation for Structures Earthwork Excavation for foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterous matter, dressing of sides and bottom and backfilling with approved material								
i	upto 3 m height	Cum	2400						
2	Sand Filling in foundation trenches as per drawing and technical specification	Cum	530						
3	Providing brick soling in foundation and under floor with stone/ best quality picked jhama brick, sand packed and laid to level and in panel after preparing the subgrade as directed including all labour and materials and if necessary dewatering, complete. (c).Stone soling 150mm thick	sqm	1700						
4	PCC 1:3:6 in Foundation Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregates 40mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days	cum	100						
Sub-Structure:									
5	Plain/Reinforced Cement Concrete in sub-structure complete as per drawing and technical specification and steel shuttering								
	A. P.C.C. Grade M-20 Height upto 5m	cum	75						
6	Stone Masonry work in cement mortar 1:3 in sub-structure complete as per drawing and technical specification								
	A. Random Rubble Masonry	Cum	1250						
7	Plastering with cement mortar (1:3) on brick work in sub-structure as per Technical Specifications	sqm	2400						
8	Back Filling behind abutment, wing wall and return wall complete as per drawing & technical specification								
	A. Ganular Material	Cum	100						
SUB TOTAL									

**Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Amiya Nagar - Access Road
Bill of Quantities (Structures/Drains)**

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
SITE CLEARENCE									
9	Cutting of Trees, Including Cutting of Trunks, Branches and Removal								
	Cutting of Trees, Including Cutting of Trunks, Branches and Removal of stumps, roots, stacking of serviceable material and upto a lead of 1000 mts and earth filling in depression/pit (I) Girth from 300 mm to 600 mm	each	40						
10	Clearing and Grubbing Road Land:								
	Clearing and grubbing road land including uprooting rank vegetation, grass, brush, shrubs sapling and trees of girth upto 300mm removal of stumps, disposal of unserviceable materials and slaking of serviceable material to be used or auctioned upto a lead of 1000m including removal and disposal of top organic and not exceeding 150 mm in thickness. A) In area of non thorny jungle	Hect	1						
11	Dismantling of Structures								
	Dismantling of existing structures like culverts, bridges, retaining wall, and other structure comprising of masonry, cement concrete, wood work, steel work, including T&P and scyrfing wherever necessary, sorting the dismantled material, disposal of unserviceable material with all lifts and leads of 1000 metres								
	a) Lime Concrete, cement concrete M10 grade and below b) Rubble Masonry in cement mortar	cum cum	1 15						
EARTHWORK, EROSION CONTROL AND DRAINAGE									
12	Excavation in Soil with Dozer with lead upto 100 m								
	Excavation for roadway in Soil by mechanical means including cutting and pushing the earth to site of embankment upto a distance of 100 metres (average lead of 50 m), including trimming bottom of side slopes in accordance with requirements of lines, grades and cross sections	cum	32700						
13	Removal of Unserviceable Soil with Disposal upto 1000 metres								
	Removal of Unserviceable Soil with Disposal upto 1000 metres lead but excluding replacement by suitable soil which shall be paid seperately as per clause 305)	cum	27550						
14	Embankment Construction with Materials obtained from Roadway Cutting								
	Construction of embankment with approved materials deposited at site from roadway cutting and excavation of drains and foundations of other structures graded and compacted to meet requirement of table 300-2	cum	5154						

**Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Amiya Nagar - Access Road
Bill of Quantities (Structures/Drains)**

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
SUB-BASES, BASES (NON-BITUMINOUS) AND SHOULDERS									
Sub-Base									
15	Construction of sub-base coarse 150mm compacted thickness by stone dust in single layer of 180 mm loose thickness including collection and supply stone dust coming out as by product during crusher running consisting of hard quarry chipping, machine broken and of size 10mm down as per IRC grading free from dust, dirt and other organic and deleterous constituents including payments of Forest Royalaty and Sales Tax, including preparation of sub-base to specified profile and grade after removal of all vegetation and extraneous material if any, dressing, cambering lightly sprinkling with water and rolling with adequate passes of 8-10T roller till the stone dust sub-grade is properly compacted. Spreading the granular materials between prepared shoulders in layers not exceeding 150mm(loose thickness, dressing, watering to bring the moisture content to \pm 2% of OMC for the entire depth of the layer and compacting the same with hpower roller 8-10T capacity, adding or removing materials if necessary to keep the longitudinal and cross profile of the surface within permissible tolerance, checking the same with templates and straight edges, continue rolling and correcting surface irregularities as they appear within permissible tolerance checking the same with template and straight edges continue rolling and correcting surface irregularities as they appera controlling moisture content of maintaining the same above the OMC and compacting to 95% proctor density (collection of stone dust to be made from barpathar stone quarry) and measurement will be taken on the finished compacted work in position	cum	735						
16	Water Bound Macadam Providing, Laying, Spreading and compacting stone aggrigates of specific size to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 80-100 kN in stages to proper grade and camber, applying and brooming, stone screening/binding materials to fill up the interstices of coarses aggregate, watering and compacting to the required density (with an initial lead of 5 km)								
	(b) Using Screening Type-A (13.2 mm Agg.)	cum	491						
	(a) Using Screening Crushable type such as Moorum or Gravel	cum	368						

**Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Amiya Nagar - Access Road
Bill of Quantities (Structures/Drains)**

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
BASES & SURFACE COURSES (BITUMINOUS)									
17	Prime Coat Providing and applying primer coat with Bituminous emulsion on prepared surface of granular base including cleaning of road surface and spraying primer at the rate of 0.60kg/sqm using mechanical means.(including cost of testing of materials at site and at laboratory as directed by the deptt.)								
	I)With bitumen emulsion-CSS-1h	sqm	4892						
18	Tack Coat i) Providing and applying Tack Coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20kg per sqm. on the prepared bituminous surface cleaned with mechanical broom as per Technical Specification Clause 503(including cost of testing of materials at site and at laboratory as directed by the deptt.)	sqm	4892						
	a) Normal bituminous surface	sqm	4892						
19	Open Graded Premix Surfacing Providing, laying and rolling of open - graded premix surfacing of 20 mm thickness of 13.2 mm to 5.6 mm aggregates either using penetration grade bitumen (60/70 grade) or bitumen emulsion to required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a smooth wheeled roller 8-10 T static roller capacity to required level and grades (Including carriage upto initial lead of 5 km from quarry and carriage of mixed materials upto 10.0 km initial lead from mixing plant)(including cost of testing of materials at site and at laboratory as directed by the deptt.)								
	I) Case I: Mechanical Method using Penetration grade Bitumen and HMP of appropriate capacity not less than 75 tonnes/hour	sqm	4892						
20	Seal Coat Providing and laying seal coat sealing the voids in a bituminous surface laid to the specified levels, grade and cross fall using Type A & B seal coats(including cost of testing of materials at site and at laboratory as directed by the deptt.)								
	I) Case I: Type A providing and laying liquid seal coat comprising of a layer of bituminous binder (paving bitumen 60/70 grade) followed by a cover of crushed stone chipping of specified grade (including carriage upto initial lead of 5 km from quarry)	sqm	4892						
				SUB TOTAL					
				GRAND TOTAL					

Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Geeta Nagar (I) - Access Road
Bill of Quantities (Structures/Drains)

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
Foundation									
1	Excavation for Structures Earthwork Excavation for foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterous matter, dressing of sides and bottom and backfilling with approved material								
i	upto 3 m height	Cum	850						
2	Sand Filling in foundation trenches as per drawing and technical specification	Cum	150						
3	Providing brick soling in foundation and under floor with stone/ best quality picked jhama brick, sand packed and laid to level and in panel after preparing the subgrade as directed including all labour and materials and if necessary dewatering, complete. (c).Stone soling 150mm thick	sqm	500						
4	PCC 1:3:6 in Foundation Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregates 40mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days	cum	50						
Sub-Structure:									
5	Plain/Reinforced Cement Concrete in sub-structure complete as per drawing and technical specification and steel shuttering A. P.C.C. Grade M-20 Height upto 5m	cum	50						
6	Stone Masonry work in cement mortar 1:3 in sub-structure complete as per drawing and technical specification A. Random Rubble Masonry	Cum	550						
7	Plastering with cement mortar (1:3) on brick work in sub-structure as per Technical Specifications	sqm	800						
8	Back Filling behind abutment, wing wall and return wall complete as per drawing & technical specification A. Ganular Material	Cum	50						
			SUB TOTAL						

Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Geeta Nagar (I) - Access Road
Bill of Quantities (Structures/Drains)

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
SITE CLEARENCE									
Cutting of Trees, Including Cutting of Trunks, Branches and Removal									
9	Cutting of Trees, Including Cutting of Trunks, Branches and Removal of stumps, roots, stacking of serviceable material and upto a lead of 1000 mts and earth filling in depression/pit (I) Girth from 300 mm to 600 mm	each	40						
Clearing and Grubbing Road Land:									
10	Clearing and grabbing road land including uprooting rank vegetation, grass, brush, shrubs sapling and trees of girth upto 300mm removal of stumps, disposal of unserviceable materials and slaking of serviceable material to be used or auctioned upto a lead of 1000m including removal and disposal of top organic and not exceeding 150 mm in thickness. A) In area of non thorny jungle	Hect	1						
Dismantling of Structures									
11	Dismantling of existing structures like culverts, bridges, retaining wall, and other structure comprising of masonry, cement concrete, wood work, steel work, including T&P and scaryfing wherever necessary, sorting the dismantled material, disposal of unserviceable material with all lifts and leads of 1000 metres a) Lime Concrete, cement concrete M10 grade and below b) Rubble Masonry in cement mortar	cum cum	1 15						
EARTHWORK, EROSION CONTROL AND DRAINAGE									
Excavation in Soil with Dozer with lead upto 100 m									
12	Excavation for roadway in Soil by mechanical means including cutting and pushing the earth to site of embankment upto a distance of 100 metres (average lead of 50 m), including trimming bottom of side slopes in accordance with requirements of lines, grades and cross sections	cum	10677						
Removal of Unserviceable Soil with Disposal upto 1000 metres									
13	Removal of Unserviceable Soil with Disposal upto 1000 metres lead but excluding replacement by suitable soil which shall be paid seperately as per clause 305)	cum	10590						
Embankment Construction with Materials obtained from Roadway Cutting									
14	Construction of embankment with approved materials deposited at site from roadway cutting and excavation of drains and foundations of other structures graded and compacted to meet requirement of table 300-2	cum	90						

Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Geeta Nagar (I) - Access Road
Bill of Quantities (Structures/Drains)

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
SUB-BASES, BASES (NON-BITUMINOUS) AND SHOULDERS									
Sub-Base									
15	Construction of sub-base coarse 150mm compacted thickness by stone dust in single layer of 180 mm loose thickness including collection and supply stone dust coming out as by product during crusher running consisting of hard quarry chipping, machine broken and of size 10mm down as per IRC grading free from dust, dirt and other organic and deleterous constituents including payments of Forest Royalty and Sales Tax, including preparation of sub-base to specified profile and grade after removal of all vegetation and extraneous material if any, dressing, cambering lightly sprinkling with water and rolling with adequate passes of 8-10T roller till the stone dust sub-grade is properly compacted. Spreading the granular materials between prepared shoulders in layers not exceeding 150mm(loose thickness, dressing, watering to bring the moisture content to $\pm 2\%$ of OMC for the entire depth of the layer and compacting the same with power roller 8-10T capacity, adding or removing materials if necessary to keep the longitudinal and cross profile of the surface within permissible tolerance, checking the same with templates and straight edges, continue rolling and correcting surface irregularities as they appear within permissible tolerance checking the same with template and straight edges continue rolling and correcting surface irregularities as they appear controlling moisture content of maintaining the same above the OMC and compacting to 95% proctor density (collection of stone dust to be made from barpathar stone quarry) and measurement will be taken on the finished compacted work in position	cum	155						
16	Water Bound Macadam Providing, Laying, Spreading and compacting stone aggregates of specific size to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 80-100 kN in stages to proper grade and camber, applying and brooming, stone screening/binding materials to fill up the interstices of coarser aggregate, watering and compacting to the required density (with an initial lead of 5 km)								
	(b) Using Screening Type-A (13.2 mm Agg.)	cum	103						
	(a) Using Screening Crushable type such as Moorum or Gravel	cum	77						

Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Geeta Nagar (I) - Access Road
Bill of Quantities (Structures/Drains)

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
BASES & SURFACE COURSES (BITUMINOUS)									
17	Prime Coat Providing and applying primer coat with Bituminous emulsion on prepared surface of granular base including cleaning of road surface and spraying primer at the rate of 0.60kg/sqm using mechanical means.(including cost of testing of materials at site and at laboratory as directed by the deptt.)								
	I)With bitumen emulsion-CSS-1h	sqm	1015						
18	Tack Coat i) Providing and applying Tack Coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20kg per sqm. on the prepared bituminous surface cleaned with mechanical broom as per Technical Specification Clause 503(including cost of testing of materials at site and at laboratory as directed by the deptt.)								
	a) Normal bituminous surface	sqm	1015						
19	Open Graded Premix Surfacing Providing, laying and rolling of open - graded premix surfacing of 20 mm thickness of 13.2 mm to 5.6 mm aggregates either using penetration grade bitumen (60/70 grade) or bitumen emulsion to required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a smooth wheeled roller 8-10 T static roller capacity to required level and grades (Including carriage upto initial lead of 5 km from quarry and carriage of mixed materials upto 10.0 km initial lead from mixing plant)(including cost of testing of materials at site and at laboratory as directed by the deptt.)								
	I) Case I: Mechanical Method using Penetration grade Bitumen and HMP of appropriate capacity not less than 75 tonnes/hour	sqm	1015						
20	Seal Coat Providing and laying seal coat sealing the voids in a bituminous surface laid to the specified levels, grade and cross fall using Type A & B seal coats(including cost of testing of materials at site and at laboratory as directed by the deptt.)								
	I) Case I: Type A providing and laying liquid seal coat comprising of a layer of bituminous binder (paving bitumen 60/70 grade) followed by a cover of crushed stone chipping of specified grade (including carriage upto initial lead of 5 km from quarry)	sqm	1015						
				SUB TOTAL					
				GRAND TOTAL					

Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Geeta Nagar (II) - Access Road
Bill of Quantities (Structures/Drains)

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
Foundation									
1	Excavation for Structures Earthwork Excavation for foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material								
i	upto 3 m height	Cum	2350						
2	Sand Filling in foundation trenches as per drawing and technical specification	Cum	550						
3	Providing brick soling in foundation and under floor with stone/ best quality picked jhama brick, sand packed and laid to level and in panel after preparing the subgrade as directed including all labour and materials and if necessary dewatering, complete. (c).Stone soling 150mm thick	sqm	1650						
4	PCC 1:3:6 in Foundation Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregates 40mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days	cum	100						
Sub-Structure:									
5	Plain/Reinforced Cement Concrete in sub-structure complete as per drawing and technical specification and steel shuttering A. P.C.C. Grade M-20 Height upto 5m	cum	100						
6	Stone Masonry work in cement mortar 1:3 in sub-structure complete as per drawing and technical specification A. Random Rubble Masonry	Cum	1250						
7	Plastering with cement mortar (1:3) on brick work in sub-structure as per Technical Specifications	sqm	2350						
8	Back Filling behind abutment, wing wall and return wall complete as per drawing & technical specification A. Ganular Material	Cum	100						
		SUB TOTAL							

**Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Geeta Nagar (II) - Access Road
Bill of Quantities (Structures/Drains)**

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
SITE CLEARENCE									
9	Cutting of Trees, Including Cutting of Trunks, Branches and Removal Cutting of Trees, Including Cutting of Trunks, Branches and Removal of stumps, roots, stacking of serviceable material and upto a lead of 1000 mts and earth filling in depression/pit (I) Girth from 300 mm to 600 mm	each	80						
10	Clearing and Grubbing Road Land: Clearing and grabbing road land including uprooting rank vegetation, grass, brush, shrubs sapling and trees of girth upto 300mm removal of stumps, disposal of unserviceable materials and slaking of serviceable material to be used or auctioned upto a lead of 1000m including removal and disposal of top organic and not exceeding 150 mm in thickness. A) In area of non thorny jungle	Hect	1						
11	Dismantling of Structures Dismantling of existing structures like culverts, bridges, retaining wall, and other structure comprising of masonry, cement concrete, wood work, steel work, including T&P and scaryfing wherever necessary, sorting the dismantled material, disposal of unserviceable material with all lifts and leads of 1000 metres a) Lime Concrete, cement concrete M10 grade and below b) Rubble Masonry in cement mortar	cum cum	1 15						
EARTHWORK, EROSSION CONTROL AND DRAINAGE									
12	Excavation in Soil with Dozer with lead upto 100 m Excavation for roadway in Soil by mechanical means including cutting and pushing the earth to site of embankment upto a distance of 100 metres (average lead of 50 m), including trimming bottom of side slopes in accordance with requirements of lines, grades and cross sections	cum	17512						
13	Removal of Unserviceable Soil with Disposal upto 1000 metres Removal of Unserviceable Soil with Disposal upto 1000 metres lead but excluding replacement by suitable soil which shall be paid seperately as per clause 305)	cum	14010						
14	Embankment Construction with Materials obtained from Borrow Pits Construction of embankment with materials obtained from borrow pits with all lifts and leads, transporting to site, spreading, grading to required slope and compacting to meet requirement of table 300-2 (including compensation of earth) (Including cost of testing of materials at site and laboratory as directed by the deptt.) (b) from Govt. Land	cum	4845						

**Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Geeta Nagar (II) - Access Road
Bill of Quantities (Structures/Drains)**

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
15	Embankment Construction with Materials obtained from Roadway Cutting Construction of embankment with approved materials deposited at site from roadway cutting and excavation of drains and foundations of other structures graded and compacted to meet requirement of table 300-2	cum	3503						
SUB-BASES, BASES (NON-BITUMINOUS) AND SHOULDERS									
Sub-Base									
16	Construction of sub-base coarse 150mm compacted thickness by stone dust in single layer of 180 mm loose thickness including collection and supply stone dust coming out as by product during crusher running consisting of hard quarry chipping, machine broken and of size 10mm down as per IRC grading free from dust, dirt and other organic and deleterious constituents including payments of Forest Royalaty and Sales Tax, including preparation of sub-base to specified profile and grade after removal of all vegetation and extraneous material if any, dressing, cambering lightly sprinkling with water and rolling with adequate passes of 8-10T roller till the stone dust sub-grade is properly compacted. Spreading the granular materials between prepared shoulders in layers not exceeding 150mm(loose thickness, dressing, watering to bring the moisture contern to ± 2% of OMC for the entire depth of the layer and compacting the same wit hpower roller 8-10T capacity, adding or removing materials if necessary to keep the longitudinal and cross profile of the surface within permissible tollerence, checking the same with templates and straight edges, continue rolling and correcting surface irregularities as the appear within permissible tolerance checking the same with template and straight edges continue rolling and correcting surface irregularities as they appera controlling moisture content of maintaining the same above the OMC and compacting to 95% proctor density (collection of stone dust to be made from barpathar stone quarry) and measurement will be taken on the finished compacted work in position	cum	420						
17	Water Bound Macadam Providing, Laying, Spreading and compacting stone aggregates of specific size to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 80-100 kN in stages to proper grade and camber, applying and brooming, stone screening/binding materials to fill up the interstices of coarses aggregate, watering and compacting to the required density (with an initial lead of 5 km)								

Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Lichubagan - Access Road
Bill of Quantities (Structures/Drains)

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
Foundation									
1	Excavation for Structures Earthwork Excavation for foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material								
i	upto 3 m height	Cum	2000						
2	Sand Filling in foundation trenches as per drawing and technical specification	Cum	500						
3	Providing brick soling in foundation and under floor with stone/ best quality picked jhama brick, sand packed and laid to level and in panel after preparing the subgrade as directed including all labour and materials and if necessary dewatering, complete. (c).Stone soling 150mm thick	sqm	1400						
4	PCC 1:3:6 in Foundation Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregates 40mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days	cum	100						
Sub-Structure:									
5	Plain/Reinforced Cement Concrete in sub-structure complete as per drawing and technical specification and steel shuttering A. P.C.C. Grade M-20 Height upto 5m	cum	60						
6	Stone Masonry work in cement mortar 1:3 in sub-structure complete as per drawing and technical specification A. Random Rubble Masonry	Cum	1050						
7	Plastering with cement mortar (1:3) on brick work in sub-structure as per Technical Specifications	sqm	1950						
8	Back Filling behind abutment, wing wall and return wall complete as per drawing & technical specification A. Ganular Material	Cum	100						
			SUB TOTAL						

**Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Lichubagan - Access Road
Bill of Quantities (Structures/Drains)**

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
SITE CLEARENCE									
9	Cutting of Trees, Including Cutting of Trunks, Branches and Removal								
	Cutting of Trees, Including Cutting of Trunks, Branches and Removal of stumps, roots, stacking of serviceable material and upto a lead of 1000 mts and earth filling in depression/pit								
	(I) Girth from 300 mm to 600 mm	each	50						
	(II) Girth from 600 mm to 900 mm	each	20						
	(III) Girth from 900 mm to 1800 mm	each	5						
10	Clearing and Grubbing Road Land:								
	Clearing and grubbing road land including uprooting rank vegetation, grass, brush, shrubs sapling and trees of girth upto 300mm removal of stumps, disposal of unserviceable materials and slaking of serviceable material to be used or auctioned upto a lead of 1000m including removal and disposal of top organic and not exceeding 150 mm in thickness.								
	A) In area of non thorny jungle	Hect	1						
11	Dismantling of Structures								
	Dismantling of existing structures like culverts, bridges, retaining wall, and other structure comprising of masonry, cement concrete, wood work, steel work, including T&P and scyrfing wherever necessary, sorting the dismantled material, disposal of unserviceable material with all lifts and leads of 1000 metres								
	a) Lime Concrete, cement concrete M10 grade and below	cum	1						
	b) Rubble Masonry in cement mortar	cum	15						
EARTHWORK, EROSSION CONTROL AND DRAINAGE									
12	Excavation in Soil with Dozer with lead upto 100 m								
	Excavation for roadway in Soil by mechanical means including cutting and pushing the earth to site of embankment upto a distance of 100 metres (average lead of 50 m), including trimming bottom of side slopes in accordance with requirements of lines, grades and cross sections	cum	31126						
13	Removal of Unserviceable Soil with Disposal upto 1000 metres								
	Removal of Unserviceable Soil with Disposal upto 1000 metres lead but excluding replacement by suitable soil which shall be paid seperately as per clause 305)	cum	29773						

**Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Lichubagan - Access Road
Bill of Quantities (Structures/Drains)**

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
14	Embankment Construction with Materials obtained from Roadway Cutting Construction of embankment with approved materials deposited at site from roadway cutting and excavation of drains and foundations of other structures graded and compacted to meet requirement of table 300-2	cum	1355						
SUB-BASES, BASES (NON-BITUMINOUS) AND SHOULDERS									
Sub-Base									
15	Construction of sub-base coarse 150mm compacted thickness by stone dust in single layer of 180 mm loose thickness including collection and supply stone dust coming out as by product during crusher running consisting of hard quarry chipping, machine broken and of size 10mm down as per IRC grading free from dust, dirt and other organic and deleterous constituents including payments of Forest Royalaty and Sales Tax, including preparation of sub-base to specified profile and grade after removal of all vegetation and extraneous material if any, dressing, cambering lightly sprinkling with water and rolling with adequate passes of 8-10T roller till the stone dust sub-grade is properly compacted. Spreading the granular materials between prepared shoulders in layers not exceeding 150mm(loose thickness, dressing, watering to bring the moisture content to $\pm 2\%$ of OMC for the entire depth of the layer and compacting the same with power roller 8-10T capacity, adding or removing materials if necessary to keep the longitudinal and cross profile of the surface within permissible tolerance, checking the same with templates and straight edges, continue rolling and correcting surface irregularities as they appear within permissible tolerance checking the same with template and straight edges continue rolling and correcting surface irregularities as they appear controlling moisture content of maintaining the same above the OMC and compacting to 95% proctor density (collection of stone dust to be made from barpathar stone quarry) and measurement will be taken on the finished compacted work in position	cum	375						
16	Water Bound Macadam Providing, Laying, Spreading and compacting stone aggregates of specific size to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 80-100 kN in stages to proper grade and camber, applying and brooming, stone screening/binding materials to fill up the interstices of coarses aggregate, watering and compacting to the required density (with an initial lead of 5 km)								
	(b) Using Screening Type-A (13.2 mm Agg.)	cum	250						
	(a) Using Screening Crushable type such as Moorum or Gravel	cum	190						

**Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Lichubagan - Access Road
Bill of Quantities (Structures/Drains)**

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
BASES & SURFACE COURSES (BITUMINOUS)									
17	Prime Coat Providing and applying primer coat with Bituminous emulsion on prepared surface of granular base including cleaning of road surface and spraying primer at the rate of 0.60kg/sqm using mechanical means.(including cost of testing of materials at site and at laboratory as directed by the deptt.)								
	I)With bitumen emulsion-CSS-1h	sqm	2490						
18	Tack Coat i) Providing and applying Tack Coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20kg per sqm. on the prepared bituminous surface cleaned with mechanical broom as per Technical Speification Clause 503(including cost of testing of materials at site and at laboratory as directed by the deptt.)								
	a) Normal bituminous surface	sqm	2490						
19	Open Graded Premix Surfacing Providing, laying and rolling of open - graded premix surfacing of 20 mm thickness of 13.2 mm to 5.6 mm aggregates either using penetration grade bitumen (60/70 grade) or bitumen emulsion to required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a smooth wheeled roller 8-10 T static roller capacity to required levl and grades (Including carriage upto initial lead of 5 km from quarry and carriage of mixed materials upto 10.0 km initial lead from mixing plant)(including cost of testing of materials at site and at laboratory as directed by the deptt.)								
	I) Case I: Mechanical Method using Penetration grade Bitumen and HMP of appropriate capacity not less than 75 tonnes/hour	sqm	2490						
20	Seal Coat Providing and laying seal coat sealing the voids in a bituminous surface laid to the specified levels, grade and cross fall using Type A & B seal coats(including cost of testing of materials at site and at laboratory as directed by the deptt.)								
	I) Case I: Type A providing and laying liquid seal coat comprising of a layer of bituminous binder (paving bitumen 60/70 grade) followed by a cover of crushed stone chipping of specified grade (including carriage upto initial lead of 5 km from quarry)	sqm	2490						
		SUB TOTAL							
		GRAND TOTAL							

Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Narakasur - Access Road
Bill of Quantities (Structures/Drains)

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
Foundation									
1	Excavation for Structures Earthwork Excavation for foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterous matter, dressing of sides and bottom and backfilling with approved material								
i	upto 3 m height	Cum	6500						
2	Sand Filling in foundation trenches as per drawing and technical specification	Cum	1450						
3	Providing brick soling in foundation and under floor with stone/ best quality picked jhama brick, sand packed and laid to level and in panel after preparing the subgrade as directed including all labour and materials and if necessary dewatering, complete. (c).Stone soling 150mm thick	sqm	4600						
4	PCC 1:3:6 in Foundation Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregates 40mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days	cum	300						
Sub-Structure:									
5	Plain/Reinforced Cement Concrete in sub-structure complete as per drawing and technical specification and steel shuttering								
	A. P.C.C. Grade M-20 Height upto 5m	cum	200						
6	Stone Masonry work in cement mortar 1:3 in sub-structure complete as per drawing and technical specification								
	A. Random Rubble Masonry	Cum	3400						
7	Plastering with cement mortar (1:3) on brick work in sub-structure as per Technical Specifications	sqm	6460						
8	Back Filling behind abutment, wing wall and return wall complete as per drawing & technical specification								
	A. Ganular Material	Cum	250						
			SUB TOTAL						

**Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Narakasur - Access Road
Bill of Quantities (Structures/Drains)**

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
SITE CLEARENCE									
9	Cutting of Trees, Including Cutting of Trunks, Branches and Removal								
	Cutting of Trees, Including Cutting of Trunks, Branches and Removal of stumps, roots, stacking of serviceable material and upto a lead of 1000 mts and earth filling in depression/pit (I) Girth from 300 mm to 600 mm	each	40						
10	Clearing and Grubbing Road Land:								
	Clearing and grubbing road land including uprooting rank vegetation, grass, brush, shrubs sapling and trees of girth upto 300mm removal of stumps, disposal of unserviceable materials and slaking of serviceable material to be used or auctioned upto a lead of 1000m including removal and disposal of top organic and not exceeding 150 mm in thickness. A) In area of non thorny jungle	Hect	1						
11	Dismantling of Structures								
	Dismantling of existing structures like culverts, bridges, retaining wall, and other structure comprising of masonry, cement concrete, wood work, steel work, including T&P and scarrying wherever necessary, sorting the dismantled material, disposal of unserviceable material with all lifts and leads of 1000 metres								
	a) Lime Concrete, cement concrete M10 grade and below b) Rubble Masonry in cement mortar	cum cum	1 15						
EARTHWORK, EROSION CONTROL AND DRAINAGE									
12	Excavation in Soil with Dozer with lead upto 100 m								
	Excavation for roadway in Soil by mechanical means including cutting and pushing the earth to site of embankment upto a distance of 100 metres (average lead of 50 m), including trimming bottom of side slopes in accordance with requirements of lines, grades and cross sections	cum	172505						
13	Removal of Unserviceable Soil with Disposal upto 1000 metres								
	Removal of Unserviceable Soil with Disposal upto 1000 metres lead but excluding replacement by suitable soil which shall be paid seperately as per clause 305)	cum	169680						
14	Embankment Construction with Materials obtained from Roadway Cutting								
	Construction of embankment with approved materials deposited at site from roadway cutting and excavation of drains and foundations of other structures graded and compacted to meet requirement of table 300-2	cum	2825						

**Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Narakasur - Access Road
Bill of Quantities (Structures/Drains)**

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
SUB-BASES, BASES (NON-BITUMINOUS) AND SHOULDERS									
Sub-Base									
15	Construction of sub-base coarse 150mm compacted thickness by stone dust in single layer of 180 mm loose thickness including collection and supply stone dust coming out as by product during crusher running consisting of hard quarry chipping, machine broken and of size 10mm down as per IRC grading free from dust, dirt and other organic and deleterous constituents including payments of Forest Royalty and Sales Tax, including preparation of sub-base to specified profile and grade after removal of all vegetation and extraneous material if any, dressing, cambering lightly sprinkling with water and rolling with adequate passes of 8-10T roller till the stone dust sub-grade is properly compacted. Spreading the granular materials between prepared shoulders in layers not exceeding 150mm(loose thickness, dressing, watering to bring the moisture content to $\pm 2\%$ of OMC for the entire depth of the layer and compacting the same with power roller 8-10T capacity, adding or removing materials if necessary to keep the longitudinal and cross profile of the surface within permissible tolerance, checking the same with templates and straight edges, continue rolling and correcting surface irregularities as they appear within permissible tolerance checking the same with template and straight edges continue rolling and correcting surface irregularities as they appear controlling moisture content of maintaining the same above the OMC and compacting to 95% proctor density (collection of stone dust to be made from barpathar stone quarry) and measurement will be taken on the finished compacted work in position	cum	1140						
16	Water Bound Macadam Providing, Laying, Spreading and compacting stone aggregates of specific size to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 80-100 kN in stages to proper grade and camber, applying and brooming, stone screening/binding materials to fill up the interstices of coarse aggregate, watering and compacting to the required density (with an initial lead of 5 km)								
	(b) Using Screening Type-A (13.2 mm Agg.)	cum	760						
	(a) Using Screening Crushable type such as Moorum or Gravel	cum	570						

**Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Narakasur - Access Road
Bill of Quantities (Structures/Drains)**

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
BASES & SURFACE COURSES (BITUMINOUS)									
17	Prime Coat Providing and applying primer coat with Bituminous emulsion on prepared surface of granular base including cleaning of road surface and spraying primer at the rate of 0.60kg/sqm using mechanical means.(including cost of testing of materials at site and at laboratory as directed by the deptt.)								
	I)With bitumen emulsion-CSS-1h	sqm	7580						
18	Tack Coat i) Providing and applying Tack Coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20kg per sqm. on the prepared bituminous surface cleaned with mechanical broom as per Technical Specification Clause 503(including cost of testing of materials at site and at laboratory as directed by the deptt.)								
	a) Normal bituminous surface	sqm	7580						
19	Open Graded Premix Surfacing Providing, laying and rolling of open - graded premix surfacing of 20 mm thickness of 13.2 mm to 5.6 mm aggregates either using penetration grade bitumen (60/70 grade) or bitumen emulsion to required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a smooth wheeled roller 8-10 T static roller capacity to required level and grades (Including carriage upto initial lead of 5 km from quarry and carriage of mixed materials upto 10.0 km initial lead from mixing plant)(including cost of testing of materials at site and at laboratory as directed by the deptt.)								
	I) Case I: Mechanical Method using Penetration grade Bitumen and HMP of appropriate capacity not less than 75 tonnes/hour	sqm	7580						
20	Seal Coat Providing and laying seal coat sealing the voids in a bituminous surface laid to the specified levels, grade and cross fall using Type A & B seal coats(including cost of testing of materials at site and at laboratory as directed by the deptt.)								
	I) Case I: Type A providing and laying liquid seal coat comprising of a layer of bituminous binder (paving bitumen 60/70 grade) followed by a cover of crushed stone chipping of specified grade (including carriage upto initial lead of 5 km from quarry)	sqm	7580						
				SUB TOTAL					
				GRAND TOTAL					

Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Ramsahill - Access Road
Bill of Quantities (Structures/Drains)

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
Foundation									
1	Excavation for Structures Earthwork Excavation for foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material								
i	upto 3 m height	Cum	3400						
2	Sand Filling in foundation trenches as per drawing and technical specification	Cum	650						
3	Providing brick soling in foundation and under floor with stone/ best quality picked jhama brick, sand packed and laid to level and in panel after preparing the subgrade as directed including all labour and materials and if necessary dewatering, complete. (c).Stone soling 150mm thick	sqm	2100						
4	PCC 1:3:6 in Foundation Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregates 40mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days	cum	150						
Sub-Structure:									
5	Plain/Reinforced Cement Concrete in sub-structure complete as per drawing and technical specification and steel shuttering								
	A. P.C.C. Grade M-20 Height upto 5m	cum	100						
6	Stone Masonry work in cement mortar 1:3 in sub-structure complete as per drawing and technical specification								
	A. Random Rubble Masonry	Cum	2200						
7	Plastering with cement mortar (1:3) on brick work in sub-structure as per Technical Specifications	sqm	3300						
8	Back Filling behind abutment, wing wall and return wall complete as per drawing & technical specification								
	A. Ganular Material	Cum	100						
		SUB TOTAL							

**Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Ramsahill - Access Road
Bill of Quantities (Structures/Drains)**

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
SITE CLEARENCE									
9	Cutting of Trees, Including Cutting of Trunks, Branches and Removal								
	Cutting of Trees, Including Cutting of Trunks, Branches and Removal of stumps, roots, stacking of serviceable material and upto a lead of 1000 mts and earth filling in depression/pit (I) Girth from 300 mm to 600 mm	each	40						
10	Clearing and Grubbing Road Land:								
	Clearing and grabbing road land including uprooting rank vegetation, grass, brush, shrubs sapling and trees of girth upto 300mm removal of stumps, disposal of unserviceable materials and slaking of serviceable material to be used or auctioned upto a lead of 1000m including removal and disposal of top organic and not exceeding 150 mm in thickness. A) In area of non thorny jungle	Hect	2						
11	Dismantling of Structures								
	Dismantling of existing structures like culverts, bridges, retaining wall, and other structure comprising of masonry, cement concrete, wood work, steel work, including T&P and scaryfing wherever necessary, sorting the dismantled material, disposal of unserviceable material with all lifts and leads of 1000 metres								
	a) Lime Concrete, cement concrete M10 grade and below b) Rubble Masonry in cement mortar	cum cum	1 15						
EARTHWORK, EROSION CONTROL AND DRAINAGE									
12	Excavation in Soil with Dozer with lead upto 100 m								
	Excavation for roadway in Soil by mechanical means including cutting and pushing the earth to site of embankment upto a distance of 100 metres (average lead of 50 m), including trimming bottom of side slopes in accordance with requirements of lines, grades and cross sections	cum	60455						
13	Removal of Unserviceable Soil with Disposal upto 1000 metres								
	Removal of Unserviceable Soil with Disposal upto 1000 metres lead but excluding replacement by suitable soil which shall be paid seperately as per clause 305)	cum	48365						
14	Embankment Construction with Materials obtained from Borrow Pits								
	Construction of embankment with materials obtained from borrow pits with all lifts and leads, transporting to site, spreading, grading to required slope and compacting to meet requirement of table 300-2 (including compensation of earth) (Including cost of testing of materials at site and laboratory as directed by the deptt.) (b) from Govt. Land	cum	10550						

**Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Ramsahill - Access Road
Bill of Quantities (Structures/Drains)**

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
15	Embankment Construction with Materials obtained from Roadway Cutting Construction of embankment with approved materials deposited at site from roadway cutting and excavation of drains and foundations of other structures graded and compacted to meet requirement of table 300-2	cum	12092						
SUB-BASES, BASES (NON-BITUMINOUS) AND SHOULDERS									
	Sub-Base								
16	Construction of sub-base coarse 150mm compacted thickness by stone dust in single layer of 180 mm loose thickness including collection and supply stone dust coming out as by product during crusher running consisting of hard quarry chipping, machine broken and of size 10mm down as per IRC grading free from dust, dirt and other organic and deleterious constituents including payments of Forest Royalaty and Sales Tax, including preparation of sub-base to specified profile and grade after removal of all vegetation and extraneous material if any, dressing, cambering lightly sprinkling with water and rolling with adequate passes of 8-10T roller till the stone dust sub-grade is properly compacted. Spreading the granular materials between prepared shoulders in layers not exceeding 150mm(loose thickness, dressing, watering to bring the moisture content to $\pm 2\%$ of OMC for the entire depth of the layer and compacting the same with power roller 8-10T capacity, adding or removing materials if necessary to keep the longitudinal and cross profile of the surface within permissible tolerance, checking the same with templates and straight edges, continue rolling and correcting surface irregularities as they appear within permissible tolerance checking the same with template and straight edges continue rolling and correcting surface irregularities as they appear controlling moisture content of maintaining the same above the OMC and compacting to 95% proctor density (collection of stone dust to be made from barpathar stone quarry) and measurement will be taken on the finished compacted work in position	cum	750						
17	Water Bound Macadam Providing, Laying, Spreading and compacting stone aggregates of specific size to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 80-100 kN in stages to proper grade and camber, applying and brooming, stone screening/binding materials to fill up the interstices of coarser aggregate, watering and compacting to the required density (with an initial lead of 5 km)								
	(b) Using Screening Type-A (13.2 mm Agg.)	cum	500						
	(a) Using Screening Crushable type such as Moorum or Gravel	cum	375						

Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Ramsahill - Access Road
Bill of Quantities (Structures/Drains)

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
BASES & SURFACE COURSES (BITUMINOUS)									
18	Prime Coat Providing and applying primer coat with Bituminous emulsion on prepared surface of granular base including cleaning of road surface and spraying primer at the rate of 0.60kg/sqm using mechanical means.(including cost of testing of materials at site and at laboratory as directed by the deptt.)								
	l)With bitumen emulsion-CSS-1h	sqm	4990						
19	Tack Coat i) Providing and applying Tack Coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20kg per sqm. on the prepared bituminous surface cleaned with mechanical broom as per Technical Specification Clause 503(including cost of testing of materials at site and at laboratory as directed by the deptt.)								
	a) Normal bituminous surface	sqm	4990						
20	Open Graded Premix Surfacing Providing, laying and rolling of open - graded premix surfacing of 20 mm thickness of 13.2 mm to 5.6 mm aggregates either using penetration grade bitumen (60/70 grade) or bitumen emulsion to required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a smooth wheeled roller 8-10 T static roller capacity to required level and grades (Including carriage upto initial lead of 5 km from quarry and carriage of mixed materials upto 10.0 km initial lead from mixing plant)(including cost of testing of materials at site and at laboratory as directed by the deptt.)								
	l) Case I: Mechanical Method using Penetration grade Bitumen and HMP of appropriate capacity not less than 75 tonnes/hour	sqm	4990						
21	Seal Coat Providing and laying seal coat sealing the voids in a bituminous surface laid to the specified levels, grade and cross fall using Type A & B seal coats(including cost of testing of materials at site and at laboratory as directed by the deptt.)								
	l) Case I: Type A providing and laying liquid seal coat comprising of a layer of bituminous binder (paving bitumen 60/70 grade) followed by a cover of crushed stone chipping of specified grade (including carriage upto initial lead of 5 km from quarry)	sqm	4990						
				SUB TOTAL					
				GRAND TOTAL					

**Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Sonaighuli - Access Road
Bill of Quantities (Structures/Drains)**

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
Foundation									
1	Excavation for Structures Earthwork Excavation for foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterous matter, dressing of sides and bottom and backfilling with approved material								
i	upto 3 m height	Cum	3050						
2	Sand Filling in foundation trenches as per drawing and technical specification	Cum	600						
3	Providing brick soling in foundation and under floor with stone/ best quality picked jhama brick, sand packed and laid to level and in panel after preparing the subgrade as directed including all labour and materials and if necessary dewatering, complete. (c).Stone soling 150mm thick	sqm	1900						
4	PCC 1:3:6 in Foundation Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregates 40mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days	cum	150						
Sub-Structure:									
5	Plain/Reinforced Cement Concrete in sub-structure complete as per drawing and technical specification and steel shuttering								
	A. P.C.C. Grade M-20 Height upto 5m	cum	100						
6	Stone Masonry work in cement mortar 1:3 in sub-structure complete as per drawing and technical specification								
	A. Random Rubble Masonry	Cum	1950						
7	Plastering with cement mortar (1:3) on brick work in sub-structure as per Technical Specifications	sqm	2950						
8	Back Filling behind abutment, wing wall and return wall complete as per drawing & technical specification								
	A. Ganular Material	Cum	100						
				SUB TOTAL					

**Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Sonaighuli - Access Road
Bill of Quantities (Structures/Drains)**

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
SITE CLEARENCE									
9	Cutting of Trees, Including Cutting of Trunks, Branches and Removal								
	Cutting of Trees, Including Cutting of Trunks, Branches and Removal of stumps, roots, stacking of serviceable material and upto a lead of 1000 mts and earth filling in depression/pit (l) Girth from 300 mm to 600 mm	each	40						
10	Clearing and Grubbing Road Land:								
	Clearing and grubbing road land including uprooting rank vegetation, grass, brush, shrubs sapling and trees of girth upto 300mm removal of stumps, disposal of unserviceable materials and slaking of serviceable material to be used or auctioned upto a lead of 1000m including removal and disposal of top organic and not exceeding 150 mm in thickness. A) In area of non thorny jungle	Hect	1						
11	Dismantling of Structures								
	Dismantling of existing structures like culverts, bridges, retaining wall, and other structure comprising of masonry, cement concrete, wood work, steel work, including T&P and scarrying wherever necessary, sorting the dismantled material, disposal of unserviceable material with all lifts and leads of 1000 metres								
	a) Lime Concrete, cement concrete M10 grade and below b) Rubble Masonry in cement mortar	cum cum	1 15						
EARTHWORK, EROSION CONTROL AND DRAINAGE									
12	Excavation in Soil with Dozer with lead upto 100 m								
	Excavation for roadway in Soil by mechanical means including cutting and pushing the earth to site of embankment upto a distance of 100 metres (average lead of 50 m), including trimming bottom of side slopes in accordance with requirements of lines, grades and cross sections	cum	12265						
13	Removal of Unserviceable Soil with Disposal upto 1000 metres								
	Removal of Unserviceable Soil with Disposal upto 1000 metres lead but excluding replacement by suitable soil which shall be paid seperately as per clause 305)	cum	10475						
14	Embankment Construction with Materials obtained from Roadway Cutting								
	Construction of embankment with approved materials deposited at site from roadway cutting and excavation of drains and foundations of other structures graded and compacted to meet requirement of table 300-2	cum	1792						

**Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Sonaighuli - Access Road
Bill of Quantities (Structures/Drains)**

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
SUB-BASES, BASES (NON-BITUMINOUS) AND SHOULDERS									
Sub-Base									
15	Construction of sub-base coarse 150mm compacted thickness by stone dust in single layer of 180 mm loose thickness including collection and supply stone dust coming out as by product during crusher running consisting of hard quarry chipping, machine broken and of size 10mm down as per IRC grading free from dust, dirt and other organic and deleterous constituents including payments of Forest Royalaty and Sales Tax, including preparation of sub-base to specified profile and grade after removal of all vegetation and extraneous material if any, dressing, cambering lightly sprinkling with water and rolling with adequate passes of 8-10T roller till the stone dust sub-grade is properly compacted. Spreading the granular materials between prepared shoulders in layers not exceeding 150mm(loose thickness, dressing, watering to bring the moisture contern to ± 2% of OMC for the entire depth of the layer and compacting the same wit hpower roller 8-10T capacity, adding or removing materials if necessary to keep the longitudinal and cross profile of the surface within permissible tollerence, checking the same with templates and straight edges, continue rolling and correcting surface irregularities as the appear within permissible tolerance checking the same with template and straight edges continue rolling and correcting surface irregularities as they appera controlling moisture content of maintaining the same above the OMC and compacting to 95% proctor density (collection of stone dust to be made from barpathar stone quarry) and measurement will be taken on the finished compacted work in position	cum	380						
16	Water Bound Macadam Providing, Laying, Spreading and compacting stone aggrigates of specific size to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 80-100 kN in stages to proper grade and camber, applying and brooming, stone screening/binding materials to fill up the interstices of coarses aggregate, watering and compacting to the required density (with an initial lead of 5 km)								
	(b) Using Screening Type-A (13.2 mm Agg.)	cum	253						
	(a) Using Screening Crushable type such as Moorum or Gravel	cum	190						

**Contract-4 Reservoirs, Transmission main, Access Road - South Central Zone
Sonaighuli - Access Road
Bill of Quantities (Structures/Drains)**

Item No.	Description	Unit	Quantity	Rate			Amount		
				Local		Foreign	Local		Foreign
				Basic Rate	Applicable taxes and duties etc.		Basic Rate	Applicable taxes and duties etc.	
BASES & SURFACE COURSES (BITUMINOUS)									
17	Prime Coat Providing and applying primer coat with Bituminous emulsion on prepared surface of granular base including cleaning of road surface and spraying primer at the rate of 0.60kg/sqm using mechanical means.(including cost of testing of materials at site and at laboratory as directed by the deptt.)								
	I)With bitumen emulsion-CSS-1h	sqm	2510						
18	Tack Coat i) Providing and applying Tack Coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20kg per sqm. on the prepared bituminous surface cleaned with mechanical broom as per Technical Speification Clause 503(including cost of testing of materials at site and at laboratory as directed by the deptt.)								
	a) Normal bituminous surface	sqm	2510						
19	Open Graded Premix Surfacing Providing, laying and rolling of open - graded premix surfacing of 20 mm thickness of 13.2 mm to 5.6 mm aggregates either using penetration grade bitumen (60/70 grade) or bitumen emulsion to required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a smooth wheeled roller 8-10 T static roller capacity to required levl and grades (Including carriage upto initial lead of 5 km from quarry and carriage of mixed materials upto 10.0 km initial lead from mixing plant)(including cost of testing of materials at site and at laboratory as directed by the deptt.)								
	I) Case I: Mechanical Method using Penetration grade Bitumen and HMP of appropriate capacity not less than 75 tonnes/hour	sqm	2510						
20	Seal Coat Providing and laying seal coat sealing the voids in a bituminous surface laid to the specified levels, grade and cross fall using Type A & B seal coats(including cost of testing of materials at site and at laboratory as directed by the deptt.)								
	I) Case I: Type A providing and laying liquid seal coat comprising of a layer of bituminous binder (paving bitumen 60/70 grade) followed by a cover of crushed stone chipping of specified grade (including carriage upto initial lead of 5 km from quarry)	sqm	2510						
		SUB TOTAL							
		GRAND TOTAL							

Guwahati Water Supply Project (JICA Loan No. ID-P201)

Addendum No. 3 (Contract No. C-04) South Central Zone

Dated: November 15, 2010

Item No 1

This Addendum No.3 transmits the Electrical design for the reservoir sites and primarily details the internal and external lighting. The design also includes lightning arrestor and earthing (grounding) details.

These designs are prepared for Ramsa Hill reservoir. They are very typical for all the other reservoirs. Installation at all the other reservoirs sites will be similar depending on the size and topography of the site. Final installation for the individual sites will be determined during construction and in general, will follow the Bill-of-Quantities for the site included in Addendum No1.

The following drawings are included as part of this Addendum No 3:

- a) GWSP/C-04/E/01 – Typical Lighting Arrangement Service Building Ground Floor
- b) GWSP/C-04/E/02 - Typical Lighting Arrangement Service Building Basement Floor
- c) GWSP/C-04/E/03 – Typical SLD of Lighting, Ramsa Hill Service Building, Distribution Board
- d) GWSP/C-04/E/04 – Typical Outside Lighting Arrangement at Ramsa Hill Reservoir
- e) GWSP/C-04/E/05 – Typical Lightning Arrestor and Earthing Arrangement at Ramsa Hill

Item No 2

Revised BQ items 1.07, Page no. 4 of 15 (Issued in Addendum 2) Change*Providing, Laying,through 2.36 mm sieve at **0.06 kg / 10sqm** mixed with binder 6.8 kg / 10sqm and as per specification and drawings.*

To read :

Providing, Laying,..... through 2.36 mm sieve at **0.6 kg / 10sqm** mixed with binder 6.8 kg / 10sqm **including bituminous tack coat over WBM surface** and as per specification and drawings.

END OF ADDENDUM No 3

**Clarifications for Tender for Guwahati Water Supply Project
Contract Package No. : C#04**

Larsen & Toubro

Sl. No.	Volume/Part	Clause No.	Page No.	Subject	Query	Clarification by GMDA
1	Part – 2 Section VIA/subsection7: Electrical Equipment	7.1.5	6 of 71	HV Substation	The referred clause says” 33KV or 11KV SUPPLY will be provided by the employer to the proposed substation” Whereas Bill of Quantities for Pumping Station at Narakasur refer 11KV Equipments, hence we presume that 11KV power supply shall be made available by Employer to the proposed substation at NBPS & RH2PS sites. Kindly Confirm.	You may assume 11kv power will be supplied to the reservoir and pumping station sites by the Employer. The Contractor will be responsible for supplying and installing step down (to 0.433kv) transformers at the various sites.
2	Part – 2 Section VIA/subsection7: Electrical Equipment	7.1.5	6 of 71	HV Substation	The referred clause says” 33KV or 11KV SUPPLY will be provided by the employer to the proposed substation the NBPS AND RH2PS”, hence we understand a separate 33/0.433kv or 11 kv/0.433kv substation has to be provided in RH2PS, But the same is found missing in schedule “BILL of QUANTITIES”. Kindly Confirm.	Bill-of-Quantities items have been added in this Addendum for the transformers to be supplied to each reservoir site and the Narakasur Pumping Station .
3	Part – 2 Section VIA/subsection7: Electrical Equipment	7.1.6	7 of 71	Electrical System for the NBPS	The referred clause says” Above 33/3.45 transformers shall feed the 3.3kv switchboards in WTP complex...” whereas Bill of Quantities for Pumping Station at Narkasur pumping station says only the requirement of 11kv/0.433KV system, Kindly Confirm us.	Delete all references to the WTP. See the revised specifications attached to this Addendum
4	Part – 2 Section VIA/subsection7: Electrical Equipment	7.1.5	7 of 71	Single line diagram	It is mentioned that SLD is attached, whereas it is not available in the list of drawings. Request to furnish the same.	The SLD for the Narakasur and Amiya Nagar (Ramsa Hill 2) pumping Stations are attached to this Addendum.
5	Part – 2 Section VIA/subsection4	4.2.3	16 of 33	Internal Lining of MS Pipe	Indigenous MS pipe manufacturers have expressed their inability to line internal of MS pipe with FBE, so kindly consider liquid coal tar epoxy for internal lining.	A revised specification for lining and coating for the MS pipes are included in this Addendum. This revision permits the use of Liquid Epoxy Coating and Lining System

Sl. No.	Volume/Part	Clause No.	Page No.	Subject	Query	Clarification by GMDA
6	Part – 1 Part 3/Section VIII	14.3	2 of 12	Retention	We understand that we can provide bank guarantee in lieu of cash retention from our running bills. Please Confirm.	There is NO change to the Retention Clause 14.3 Section VII and VIII Part 3. Cash retention will be retained.
7				Submission of Price Bid	Since the MS excel version of the price bid has been provided to the bidders, we understand that the price bid can be submitted in printed form. Please Confirm.	The priced bid may be submitted in printed form.
				Extension of time	On review of Addendum 1&2, we understand that there has been several revisions in the scope of work. Therefore we request to kindly extend the date of bid submission by at least 4 weeks in order to enable us prepare a comprehensive technical and commercial bid.	The closing Date has been extended to December 16th, 2010. The time of submission and opening of Technical Bids remains same.

**Clarifications for Tender for Guwahati Water Supply Project
Contract Package No. : C#04**

ISOLUX CORSAN

Sl. No.	Volume/Part	Clause No.	Page No.	Subject	Query	Clarification by GMDA
1	Part – 2 Section VIA/subsection 4: Piping	4.3.1	2 of 33		Longitudinal welding for MS pipe manufacturing shall also be allowed.	Pipes shall be manufactured according to IS 3589. Pipes shall be manufactured from plate, strip, or sheet welded continuously by the passage of an electric current across the abutting edges <u>longitudinally</u> or <u>spirally</u>.
2				Drawings	Drawing for the alignment of transmission line.	The alignment of the Transmission Main is shown on Sheet 2 of 61. An A-1 size print of this sheet is included in this Addendum.
3				Extension of time	Extend the last date for bid submission by at least 2 weeks i.e., up till 17 th December 2010	The closing Date has been extended to December 16th, 2010. The time of submission and opening of Technical Bids remains same.

**Clarifications for Tender for Guwahati Water Supply Project
Contract Package No. : C#04**

Gammon

Sl. No.	Volume/Part	Clause No.	Page No.	Subject	Query	Clarification by GMDA
1	Part – 2 Section VIA/subsection 4: Piping	4.3.23	16 of 33		<p>Please clarify Clause no. 4.3.23 of page no. 16 of 33 of subsection 4 Piping and specials of section-VIA Technical Specification of Vol. 2 Work requirement.</p> <p>We enquired with reputed pipe manufacturers about the Fusion bonded epoxy internal lining to M.S. pipe manufacturers about the Fusion bonded epoxy internal lining to M.S. pipe and all are declined to provide the same, since Fusion bonded epoxy internal lining is a very complicated process and there is no facility in India equipped to do the same.</p> <p>In lieu of fusion bonded epoxy lining we would recommend 100% Solids Highbuild Liquid Epoxy coating with NSF certifications for potable water. The epoxy shall be applied to minimum thickness of 400microns as per tender requirement.</p> <p>Hence, we kindly request you to change it to liquid epoxy coating instead of fusion bonded epoxy internal lining.</p> <p>Please confirm the same.</p>	<p>A revised specification for lining and coating for the MS pipes are included in this Addendum. This revision permits the use of Liquid Epoxy Coating and Lining System</p>

**Clarifications for Tender for Guwahati Water Supply Project
Contract Package No. : C#04**

SPML

Sl. No.	Volume/Part	Clause No.	Page No.	Subject	Query	Clarification by GMDA
1	Part – 2 Section VIA/subsection 4: Piping	4.3.23	16 of 33		<p>As pre the tender specification the Internal lining and External coating of the MS pipelines is to be done with Fusion Bonded Epoxy in a plant to an applied thickness of 400 microns.</p> <p><u>SUGGESTIONS:</u></p> <p>External coating: Use plant applied Polyolefin cold applied tapes conforming to AWWA C 214, with girth weld joints with Heat Shrink Sleeves as per AWWA C 216.</p> <p>Internal lining: Use 100% Solid Liquid epoxy with NSF certification to applied thickness of 406 micron as per AWWA C 210. Internal joints with brush grade epoxy applied to the required thickness.</p>	A revised specification for lining and coating for the MS pipes are included in this Addendum. This revision permits the use of Liquid Epoxy Coating and Lining System

Addendum to the Bidding Documents for Contract#04

Sl. No.	Part / Section / Sub-section	Clause No. / Page No.	As per Original Bidding Document	Revised Version (to be read as)
	Part-1/Section IV	Form PER-2	Summarize professional experience over the last 20 years , in reverse chronological order....	Summarize professional experience over the last 10 years , in reverse chronological order....
	Part-1/Section IV	Form CON	Under Non-Performing Contracts following are mentioned: <input type="checkbox"/> Contract non-performance did not occur during the stipulated period, in accordance with Criteria 2.2.1 of Section III (Evaluation and Qualification Criteria) <input type="checkbox"/> Contract non-performance during the stipulated period, in accordance with Criteria 2.2.1 of Section III (Evaluation and Qualification Criteria)	Under Non-Performing Contracts following are to be mentioned: <input type="checkbox"/> Contract non-performance did not occur during the last 5 years <input type="checkbox"/> Contract non-performance during the last 5 years
	Part-1/Section IV	Form CON	Under Pending Litigation following are mentioned: <input type="checkbox"/> No pending litigation in accordance with Criteria 2.2.2 of Section III (Evaluation and Qualification Criteria) <input type="checkbox"/> Pending litigation in accordance with Criteria 2.2.2 of Section III (Evaluation and Qualification Criteria)	Under Pending Litigation following are to be mentioned: <input type="checkbox"/> No pending litigation over the last 5 years <input type="checkbox"/> Pending litigation over the last 5 years
	Part-1/Section IV	Form FIN-1	Financial Data for Previous 3 Years [INR or equivalent in JPY]	Financial Data for Previous 5 Years [INR or equivalent in JPY]
	Part-1/Section IV	Form FIN-2	Annual Turnover Data for the Last 3 Years (Construction only)	Annual Turnover Data for the Last 5 Years (Construction only)
	Part-1/Section IV	Form of Bid Security	Replace the Form of Bid Security with the revised on enclosed herewith	
	Part-1/Section IV	Schedule of Adjustment Data	In Tables A and B below, the Bidder shall.....	In Table A below, the Bidder shall.....

Internal Lining and Exterior Coatings for MS Pipe

A. Internal Lining

The internal lining for the mild steel (MS) pipe shall be one (1) coat of a 2-part chemically cured epoxy primer, followed by two (2) coats of a 2-part chemically cured epoxy topcoat. The epoxy coatings shall be in accordance with IS 3589 (2001) Annex B, unless modified herein.

The one coat of epoxy primer shall be applied to a minimum dry film thickness (DFT) of 30 microns. The two topcoats shall be applied to a total combined minimum DFT of 400 microns.

All lining epoxy coatings shall be factory spray applied and repaired as required in the field during installation. Welded field joints shall be field coated to the same total DFT as specified above.

B. Exterior Coatings

The pipes shall be cleaned and sand blasted at the factory before the application of primer, coating or lining. MS pipe shall be externally coated with one (1) coat of coal tar epoxy primer applied to a minimum DFT of 30 microns, followed by two (2) coats of two component coal tar epoxy to build a minimum total topcoat DFT of 600 micron. Humidity checking shall be maintained during the coating process. The coal tar epoxy coatings shall be certified for potable water service. The coatings shall be in conformance with IS 14948 or AWWA C-210 standard or international equivalent.

After the coal tar epoxy coatings have been applied:

- a. For Piping to be Buried: An extruded polyethylene or polyolefin tape wrapped or extruded coating shall be factory applied. The polyolefin tape coating shall be of a minimum of 2,032 μ (80 mils) in thickness.
- b. For Piping to be Exposed: After delivery of the coal tar epoxy coated pipes to the Project Site and prior to installation a 2-part epoxy coating shall be field applied by spraying. The epoxy coating shall be of a single coat of a minimum DFT of 200 microns.

The Contractor shall take extreme care and precautions during handling (loading/unloading, shipping and storage) to avoid damaging the factory applied coatings. Any damages to the factory applied coating or lining shall be repaired by brush cleaning and recoating prior to applying the field coating.

Tape Coating for MS Pipe

The buried MS pipeline shall be protected with cold applied tape protective coating conforming to AWWA C214 (Cold Applied Tape Coating Systems for Exterior of Steel Water Pipelines). Protective coating shall consist of a coating system consisting of primer, and outer wrap. The coating system shall be factory applied. The materials provided shall meet the provisions of AWWA C214. Work or material that fails to conform to this standard may be rejected at any time before final acceptance.

System Components

The factory applied prefabricated polyolefin tape coating system shall be applied in two (2) layers consisting of the following:

- a. A liquid adhesive layer
- b. An outer-layer tape for mechanical protection

Liquid Adhesive

The liquid adhesive shall consist of a mixture of suitable rubber and synthetic compounds and a solvent. The liquid adhesive shall be applied to the properly prepared pipe surface before application of the inner-layer tape. The function of the liquid adhesive is to provide a bonding medium between the pipe surface and the outer-layer tape.

The properties of the liquid adhesive shall be as follows:

<u>Color</u>	<u>Base</u>	<u>Properties</u>	<u>Weight</u>	<u>Flash Point</u>
Black	Rubber and Synthetic Resins	Flammable	0.72 – 0.965 kg/l	-17°C or greater
		Non Flammable	1.20 – 1.44 kg/l	none

The liquid adhesive shall be supplied by the manufacturer that supplies the tape. The liquid adhesive shall comply with all code and regulatory requirements in effect at the point of application. The liquid adhesive shall not settle in the container forming a cake or sludge that cannot be easily mixed by hand or mechanical agitation and it shall have good machine-application properties.

Outer-layer Tape

The tape shall be applied in one-layer consisting of a polyolefin (only) backing layer with a laminated butyl adhesive layer. The manufacturer shall certify that the backing material shall be polyolefin only containing not less than 3.0 percent or more than 7.0 percent, by weight, of non-polyolefin material consisting of pigments, antioxidants and stabilizers. The outer-layer tape shall be compatible with the liquid adhesive. The primary functions of the outer-layer tape shall be to provide mechanical and outdoor weathering protection, and secondarily, to contribute to the overall corrosion-protection properties of the system. The outer-layer tape backing shall be compounded so that it will be resistant to outdoor weathering. The outer-layer should be of suitable quality for the local environment, as follows:

Storage Temperature	0° to 50° C.
Over-ground Condition	0° to 50° C.
Under-ground Condition	7° C to 35° C.
Underground Water Table	Assume to be above the pipe crown during the monsoon season
Ultraviolet-ray Protection	Required

Materials used in the outer-layer tape shall provide electrical resistivity, low moisture absorption and permeability, and resistance to corrosive environments. Materials used shall provide mechanical protection during handling and outdoor storage. The outer-layer tape shall be sufficiently pliable for normal application operations and shall form an effective bond to the liquid adhesive. The properties of the outer-layer tape shall conform to the appropriate values stated in Table 1.

Table 1 Physical Properties of Tape Coating System

Property	Requirement		Test Method (Ref AWWA C 214-00)
	Minimum	Maximum	
Width Deviation	-5% or 6 mm, whichever is smaller	+5%	Sec. 5.3.1
Thickness (762 μ) Nominal	686 μ	838 μ	Sec. 5.3.2
Adhesion to Inner Layer	200 N/m width		Sec. 5.3.3
Tensile Strength	7000 N/m width		Sec. 5.3.8
Elongation	100%		Sec. 5.3.9
Nonpolyolefinic Material Percent by Weight	1.0%	3.5%	Sec. 5.3.12

Tests

The tape coating shall conform to the physical properties stated in Table 1. The tape manufacturer shall provide the Employer’s Representative with certified test reports on each order of tape supplied.

Each coated pipe section shall be electrically tested for flaws in the coating using a suitable holiday detector approved by the Employer’s Representative. The detector shall impress a minimum of

6,000 volts DC. Reference should be made to NACE RP-02-74 (National Association of Corrosion Engineers). If a holiday is detected, it shall be repaired.

Surface Preparation

The pipe's bare surface shall be free from mud, mill scale, lacquer, wax, paint, coal tar, asphalt, oil, grease, or any other foreign material. Before blast cleaning, surfaces shall be inspected and, if required, pre-cleaned according to SSPC-SP1 (Society for Protective Coatings) to remove oil, grease, and loosely adhering deposits. Only solvents that do not leave a residue shall be used. Preheating to remove oil, grease, mill scale, and water may be used, provided all surfaces are preheated in a uniform manner to avoid distortion. Welds shall be cleaned of all welding slag, spatter and scale and shall be allowed to cool before the coating is applied. Sharp edges or burns that could puncture or cut the coating shall be removed by grinding or filling.

All metal surfaces shall be blast cleaned to achieve a surface preparation equivalent to SSPC-SP 6/ NACE No.3.

Blast-cleaned surface shall be protected from conditions of high humidity, rainfall or surface moisture and shall not be allowed to flash rust before the coating is applied. If rust occurs, the surface must be prepared again by blast cleaning in the mill or shop or by either blast cleaning or wire-brush cleaning in the field. At the time of coating/adhesive application the steel substrate shall be at least 3°C above the dew point.

Surfaces that have been blast cleaned in a mill or shop before shipment to a field location shall be cleaned using a solvent wash and wire brushing or other approved means at the time the heat-shrinkable coating is applied. All wire brushed metal surfaces shall be prepared according to SSPC-SP 2 or SSPC-SP 3.

Coating and Wrapping

The manufacturer/Contractor shall provide the Employer's Representative with the specific application procedure used for the coating system. The total thickness applied shall as specified with consideration of the manufacturer's recommendations, but in no instance shall the total thickness be less than the minimum thickness stated in Table 1.

The tape coating shall bond to and overlap the mill coating by a minimum of 50 mm after final application. The supplied width should be a minimum of 127 mm wider than the exposed steel area to be covered. Maximum and minimum temperatures for applying and handling coatings specified by the manufacturer shall be followed.

Coating Repair

All damaged or flawed areas, holidays, and mislays shall be repaired by using Type I and Type II coatings (as specified under *Coating of Field Welded Joints*). Alternatively, cold-applied tape coatings conforming to AWWA C209 or polyethylene patch sticks or patch materials as recommended by the manufacturer and approved by Employer's Representative may also be used. The damaged area shall be covered with a minimum of 50 mm overlap around the damaged area by using either a pre-cut patch or wraparound coating. The repaired area shall be tested with a holiday detector after the repair is completed.

Outdoor Storage

The Contractor shall consult with the manufacturer as to the specific conditions, including ultraviolet light exposure, to which the coated pipe can be subjected when it is stored above ground prior to installation. The Contractor shall cover the MS pipe as required to protect the coating prior to laying.

Electrical Inspection for Continuity

After the coating has been properly applied, the Contractor shall conduct an electrical inspection of all tape wrapped surfaces with an electrical holiday detector. Any defect in the coating shall be satisfactorily repaired at the expense of the Contractor.

The electrical equipment used to coat the tape coating in the shop and in the field shall be a portable, low-amperage, adjustable-voltage pulse holiday detector that employs an audible signaling device. The holiday detector shall use coil spring electrode or a brush electrode.

The primary input power shall be no higher than 20 watts, and the minimum pulses at crest voltage shall be 20 Hz. The operating voltage of the detector shall be determined by the following formula:

$$V = 1,250 t^{0.5}$$

Where:

V = the inspection voltage

t - average coating system thickness in mils (1 mil = 25 microns)

Because of variables, such as relative humidity and temperature, the detector voltage shall be checked no less than twice daily that is before starting work in the morning and before resuming work in the afternoon. To ensure proper inspection voltage the equipment shall be properly grounded and the voltage adjusted according to the instructions of the equipment manufacturer.

After the voltage has been properly checked, the electrode shall be passed over the coated surface one time only, at a rate of approximately 9 to 18 m/min. If the electrode is stopped while passing over the coated surface, the current to the electrode should be cut off immediately to avoid possible damage to the coating.

Holiday Detection and Repair

Any holidays will be indicated by an electric spark between the electrode and the metal surface and by an audible signal. The tape coating shall pass the electrical inspection test if no electrical spark occurs. If an electric spark occurs between the electrode and the metal surface, the holiday shall be marked with a suitable indicator such as chalk or crayon to identify the area for repair.

Coating of Field Welded Joints

This section provides the requirements for heat-shrinkable type coating, including material application, inspection, testing, marking and packaging requirements. Heat-shrinkable type coating shall be used to coat all field welded joints.

All materials provided by the Contractor shall be of the specified quality. The entire operation of applying the heat shrinkable coating shall be performed by workers trained in the application of heat-shrinkable coating system. The materials provided shall meet the provisions of AWWA C216. Work or material that fails to conform to this standard may be rejected at any time before final acceptance

Heat-shrinkable coatings consist of material fabricated from cross-linked polyolefin sheet or tubing pre-coated with an adhesive. After they are installed, the coating shall conform to all surface contours of the pipe. Heat shrinkable polyolefin material shall conform to the following requirements:

a. Material

The Heat Shrinkable polyolefin coating shall be a laminate that consists of a cross linked polyolefin backing and a homogeneous adhesive layer. The adhesive may be either a tack, pressure-sensitive amorphous adhesive (mastic) or a non-tacky, semi crystalline adhesive (hot melt). The prefabricated heat-shrinkable polyolefin coating shall be one of the following types:

- Type I, Tubular-type Coatings: These are installed before joining the pipe ends by sliding the coating from a free end of the pipe onto the area to be coated.
- Type II, Wraparound-type Coatings: These are wrapped circumferentially around the pipe area to be coated. Each wraparound coating is provided with either a separate or a built-in closure, as supplied by the manufacturer that secures the overlap during the shrinking process.

The physical properties shall meet the technical requirements given in Table 2.

Table 2 Physical Properties of Heat-shrinkable Coatings

Property	Minimum	Maximum	Test Method (Ref AWWA C 216)
Width Deviation	± 10% width or 6 mm, whichever is smaller	-	Sec 5.3.1
Thickness (as supplied)	Type I: 1.5 mm Type II: 1.5 mm	- -	Sec 5.3.2 Sec 5.3.2
Water-vapor Transmission	-	0.05 g/h/m ²	Sec 5.3.3
Dielectric Strength	15 volts/μ		Sec 5.3.4
Volume Resistivity	10 ¹⁴ ohm cm	-	Sec 5.3.5
Adhesion to Steel	1.43 kg/cm	-	Sec 5.3.6
Heat Shock (test for cross linking of backing)	No visual cracking, flowing, or dipping	-	Sec 5.3.7
Tensile Strength	15.2 MPa	-	Sec 5.3.8
Elongation	400%	-	Sec 5.3.9
Impact Resistance	282 cm-N	-	Sec 5.3.11

Type I coatings are provided in sleeves of predetermined diameters to fit the steel pipe. Type II coatings may be supplied in individually precut sizes or in roll form. A roll form product is wound on hollow cores with a minimum inside diameter of 75 mm.

b. Dimensions

The manufacturer shall provide precut coatings in standard widths as specified by Employer's Representative but not less than 450 mm. They shall be adequate to provide the stipulated overlaps on the pipe/fittings coating.

Guwahati Water Supply Project (JICA Loan No. ID-P201)

Addendum No. 4 (Contract No. C-04) South Central Zone

Dated: November, 22nd 2010

Item No 1. Changes to Revised Bill-of-Quantities in Addendum 1.

Note: Page Nos here refer to the pages of the Revised Bill-of-Quantities in Addendum 1.

Narakasur Pumping Station:

- a) Page 10 of 15 Item 3.03 - Main Transformer. Change quantity from '1' to '2'

Ramsa Hill (Main Reservoir):

- b) Page 18 of 18: Add Item 3.13 – Supply Install test and commissioning 11kv /0.433kv 3 phase main transformer (with neutral in secondary side) complete with design/construction of support
- c) Page 18 of 18: Add Item 3.14 Supply and install ceiling fan (1200mm sweep) complete with double ball bearing capacitor starter with regulator and other accessories for complete operation.

Ramsa Hill 2 Reservoir:

- d) Page 3 of 13: Delete in its entirety Item 1.10 a - *Provide and fixing IPS Flooring.....*
- e) Page 13 of 13: Add Item 3.12 – Supply, install test and commissioning 11kv /0.433kv 3 phase main transformer (with neutral in secondary side) complete with design/construction of support

Sonaghuli Reservoir:

- f) Page 4 of 15. Delete in its entirety Item 1.13 a - *Provide and fixing IPS Flooring.....*
- g) Page 15 of 15: Add Item 3.12 – Supply, install test and commissioning 11kv /0.433kv 3 phase main transformer (with neutral in secondary side) complete with design/construction of support
- h) Page 15 of 15: Add Item 3.13 Supply and install ceiling fan (1200mm sweep) complete with double ball bearing capacitor starter with regulator and other accessories for complete operation.

NarakasurReservoir:

- i) Page 15 of 15: Add Item 3.14 – Supply, install test and commissioning 11kv /0.433kv 3 phase main transformer (with neutral in secondary side) complete with design/construction of support
- j) Page 15 of 15: Add Item 3.15 Supply and install ceiling fan (1200mm sweep) complete with double ball bearing capacitor starter with regulator and other accessories for complete operation.

Lichubagan Reservoir:

- k) Page 15 of 15: Add Item 3.12 – Supply, install test and commissioning 11kv /0.433kv 3 phase main transformer (with neutral in secondary side) complete with design/construction of support

- l) Page 15 of 15: Add Item 3.13 Supply and install ceiling fan (1200mm sweep) complete with double ball bearing capacitor starter with regulator and other accessories for complete operation.

Amiya Nagar Reservoir:

- m) Page 15 of 15: Add Item 3.13 – Supply, install test and commissioning 11kv /0.433kv 3 phase main transformer (with neutral in secondary side) complete with design/construction of support
- n) Page 15 of 15: Add Item 3.14 Supply and install ceiling fan (1200mm sweep) complete with double ball bearing capacitor starter with regulator and other accessories for complete operation.

Geeta Negar 1 Reservoir:

- o) Page 6 of 16, Chain Linked Fence: Change Quantity form '4500' to '220'
- p) Page 16 of 16: Add Item 3.12 – Supply, install test and commissioning 11kv /0.433kv 3 phase main transformer (with neutral in secondary side) complete design/construction of with support
- q) Page 16 of 16: Add Item 3.13 Supply and install ceiling fan (1200mm sweep) complete with double ball bearing capacitor starter with regulator and other accessories for complete operation.

Geeta Negar 2 Reservoir:

- r) Page 16 of 16: Add Item 3.13 – Supply Install test and commissioning 11kv /0.433kv 3 phase main transformer (with neutral in secondary side) complete with design/construction of support

Replacement sheets with these changes are attached to this Addendum No 4.

- s) All Reservoirs with Chlorinators: Change Description of the Chlorination System to read...'Supplying and installing complete chlorination system **including two (2) 30 cm exhaust fans.**'

Item No 2. Electrical Single Line Diagram (SLD)

The single line diagram (SLD) for the Narkasur Pumping Station and Amiya Negar (Ramsa Hill 2) Pumping Stations are attached to this Addendum.

Item No 3. Changes to Electrical Specifications

1. Part 2, Section VIA, Subsection 7.15 Page 7 of 71 – Change the sixth paragraph to **“Two (2) 11kV/0.433 kV auxiliary transformers shall be provided to supply power to the LV auxiliary loads of the NBPS, which includes loads such as the pumps, valves, battery chargers, control and instrumentation panels, EOT crane, LV auxiliary motors and indoor and outdoor lighting loads. Suitable space in the electrical room shall be provided for future expansion of switchboards (i.e. for Phase 1 and Phase 2 requirements). The 0.433kv switchboards shall receive power from the auxiliary 11/0.433kv transformers to feed the individual auxiliary loads.”**
2. Part 2, Section VIA, Subsection 7.16 Page 7 of 71 – Change the first paragraph to **“The 11/0.433kV transformers described above shall feed the 433 v indoor switchboard in the NBPS. The cables to the switchboard shall be suitable for an outdoor application.**

The cables emanating from the secondary shall be rated to accommodate the entire load including the future Phase 2 loads. In the future, an additional set of cables emanating from the secondary will be installed by the Employer, under a separate Contract. Suitable provision shall however be made in the 433 v switchboards, under the present Contract, to cater to this future connection.”

3. Part 2, Section VIA, Subsection 7.16 Page 7 of 71 – Change the first sentence of the second paragraph to **“The 433 v indoor switchboard shall consist of two incomer VCBs (with line VTs), a bus coupler VCB and VTs on both the bus sections.”**

Item 4. Changes to the Transmission Main Bill-of-Quantities

- a) Page 6 of 15 Item 3.01 Add the following sentence to the Description; **Unit Rate shall include lining and coating.**
- b) Page 7 of 15, Item 3.02 Add the following sentence to the Description; **Unit Rate shall include lining and coating.**
- c) Page 8 of 15: Item 3.03: Delete this Item in its entirety.

Item 5. Extension of Bid Submission Date

The Bid Submission date has been extended to Friday December 17th, 2010 at 4.00pm

Bill-of-Quantities for 7800 cum Capacity Reservoir at Geeta Nagar I (Revised November 4, 2010)

Item No.	Description	Unit	Quantity	Rate				Amount	
				Local		Foreign		Local	Foreign
				Basic Rate	Applicable taxes and duties etc.	Basic Rate	Applicable taxes and duties etc.		
Service Buildings Out-Side Lighting System									
3.07	Supply, erection, testing and commissioning of 7 mtr high Mild steel swaged tubular pole conforming to IS: 2713-1980 (part I to II) with galvanised base plate of size 400mm x 400mm x 7mm in position including excavation of the pit and filling the same with C.C. of M-20 grade from base plate to 50cm above ground level, with the help of steel frame not less than 40 cm dia up to 114.3mm outer dia and 50 cm beyond 114.3mm outer dia around the pole. Duly finished with cement plaster, earthing terminals, cable entry, GI cable sleeve complete as required. The pole shall be galvanised using ISI mark seamless tube for structural purpose.	Nos.	7						
3.08	Providing, fixing, Testing and commissioning of IP-54 protected street light luminaire suitable for HPSV/ MH lamp, made out from powder coated single piece die cast aluminium housing, electrochemically brightened and anodized POT optics aluminium reflector, UV stabilised acrylic bowl cover/toughened glass cover and accessories like copper ballast, electronic ignitor, capacitor, holder prewired up to terminal block etc. as required including making connection testing etc. as required.								
a	70 Watt HPSV	Nos.	5						
b	150 Watt HPSV	Nos.	2						