SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.2 :: SUBSTRUCTURE							
12.6	***13.5 (N) .A .g.(i)-case II***	**1500,1700 &2200**	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications				
			RCC Grade M30				
			Height upto 5m				
			With Batching Plant, Transit Mixer and Concrete Pump	cum	3658.627	9,382.81	34,328,200.71
	13.5 (N) .A .g.(ii)-case II		***Height 5m to 10m***				
			With Batching Plant, Transit Mixer and Concrete Pump	cum	797.690	9,640.72	7,690,305.94
12.7	***13.5 (N) .A .h.(i)-case II***		**RCC Grade M35 (Pedestals & RB)**				
			Height 5m to 10m				
			With Batching Plant, Transit Mixer and Concrete Pump	cum	133.160	10,213.36	1,360,011.02
12.8	***13.6 (a) (i***	**1600 &2200**	**Supplying, fitting and placing TMT bar** reinforcement in sub-structure complete as per drawing and technical specifications				
			From primary source**s:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	471.966	64,921.69	30,640,803.10
12.9	***13.8***	**2200 &2706**	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing foce. Complete as per drawing and Technical specifications	each	2270.000	1,812.33	4,113,989.10

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
12.10	***13.9***	**710.1.4 of IRC:78 & 2200**	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification				
	A		*Granular material*	cum	1520.531	2,000.76	3,042,217.60
	B		*Sandy material*	cum	5017.102	2,314.44	11,611,780.94
12.11	***13.10***	**710.1.4 of IRC:78 & 2200**	**Providing and laying of Filter media** with granular materials/stone crushed aggregates satisfying the requirements laid down in clause 2504.2.2. of MoRTH specifications to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition complete as per drawing and technical specification.	cum	1666.844	2,288.73	3,814,956.90
12.12	***13.14***	**2000 & 2200**	Supplying, fitting and fixing in position true to line and level elastomeric bearing conforming to IRC: 83 (Part-II) section IX and clause 2005 of MoRTH specifications complete including all accessories as per drawing and Technical Specifications.	cubic centimetre	1039200.000	1.21	1,257,432.00
12.13	***13.16***	**2000 & 2200**	Supplying, fitting and fixing in position true to line and level POT-PTFE bearing consisting of a metal piston supported by a disc or unreinforced elastomer confined within a metal cylinder, sealing rings, dust seals, PTFE surface sliding against stainless steel mating surface, completre assembly to be of cast steel/fabricated structural steel, metal and elastomer elements to be as per IRC: 83 part-I & II respectively and other parts conforming to BS: 5400, section 9.1 & 9.2 and clause 2006 of MoRTH Specifications complete asper drawing and approved technical specifications.	tonne capacity	40800.000	441.17	17,999,736.00
TOTAL FOR B.2 :: SUBSTRUCTURE							**115,859,433.31**

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.3 :: SUPERSTRUCTURE							
12.14	***14.1 A. III.case -II(i) a***	**1500 ,1600 & 1700**	Furnishing and Placing Reinforced/Prestressed cement concrete in super-structure as per drawing and Technical Specification				
			Without plasticiser				
			RCC Grade M 30				
			Using Batching Plant, Transit Mixer and Concrete Pump.				
			For T-Beam				
			Height upto 5m	cum	4237.704	10,644.25	45,107,175.48
	14.1 A. VI .(i) a)		**PSC Grade M-45**				
			For solid slab/voided slab super-structure				
			Height upto 5m	cum	698.910	11,205.92	7,831,929.55
12.15	***14.2 (a). (i)***	**1600**	**Reinforcement in Super Structure**: Supplying, fitting and placing TMT bar reinforcement in super-structure including splicing complete as per drawing and technical specifications				
			From primary source**s:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	761.783	65,989.22	50,269,466.80
12.16	***14.3***	**1800**	High tensile steel wires/strands including all accessories for stressing, stressing operations and grouting complete as per drawing and Technical Specifications	tonne	29.000	248,618.00	7,209,922.00

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
12.17	***14.5 (A)***	**515 & 2702**	**Mastic Asphalt**				
			Providing and laying 12 mm thick mastic asphalt wearing course on top of deck slab excluding prime coat with paving grade bitumen meeting the requirements given in table 500-29, prepared by using mastic cooker and laid to required level and slope after cleaning the surface, including providing antiskid surface with bitumen precoated fine grained hard stone chipping of 9.5 mm nominal size at the rate of 0.005cum per 10 sqm and at an approximate spacing of 10 cm center to center in both directions, pressed into surface when the temperature of surfaces not less than 100 deg. C, protruding 1 mm to 4 mm over mastic surface, all complete as per clause 515.	sqm	7525.130	396.86	2,986,423.09
12.18	***5.8 (ii)***		Providing and laying Bituminious wearing course comprising of tack coat with bitumen emulsion CSS-1 h as per APWD SOR item no 5.2 & MoRT&H Specification Nos 503,6mm thick mastic asphalt as per APWD SOR item no 14.5& MoRT&H Specification no 515 &2702 and 2 layer of 25 mm thick asphalt concrete including of close Graded Premix Surfacing (CGPS) material with Type -a aggregate as per APWD SOR item no 5.11 & MoRT &H Specification Nos 512 including all lead and lift as directed.	cum	301.020	10,483.41	3,155,716.08
12.19	**5.2 (I) (a)**		**Tack coat** Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20 kg per sqm on the prepared bituminous/granular surface cleaned with mechanical broom.(Including cost of testing of materials at sitfe and laboratory as directed by the depttt.)	sqm	7525.130	9.12	68,629.19
12.20	**14. 4**		Providing and laying Cement concrete wearing coat M-30 grade including reinforcement complete as per drawing and Technical Specifications-With batchimg plant	cum	82.879	13,535.26	1,121,785.43
12.21	***14.9***	**2705**	Drainage Spouts complete as per drawing and Technical specification	each	112.000	12,114.18	1,356,788.16
12.22	***14.10***	**2700**	PCC M15 Grade leveling course below approach slab complete as per drawing and Technical specification	cum	181.994	6,719.16	1,222,843.85
12.23	***14.11 (a)***	**1500,1600, 1700 & 2704**	Reinforced cement concrete approach slab including reinforcement and formwork complete as per drawing and Technical specification				
			With TATA make TMT CRS(Fe-500) grade rebar	cum	373.656	12,014.73	4,489,375.95

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
12.24	***14.18***	**2605**	**Filler joint**				
	(i)		*Providing & fixing 2 mm thick corrugated copper plate in expansion joint complete as per drawing & Technical Specification.*	metre	396.880	1,947.93	773,094.46
	(ii)		*Providing & fixing 20 mm thick compressible fibre board in expansion joint complete as per drawing & Technical Specification.*	metre	396.880	663.21	263,214.78
	(iii)		*Providing and fixing in position 20 mm thick premoulded joint filler in expansion joint for fixed ends of simply supported spans not exceeding 10 m to cater for a horizontal movement upto 20 mm, covered with sealant complete as per drawing and technical specifications.*	metre	396.880	377.17	149,691.23
	(iv)		*Providing and filling joint sealing compound as per drawings and technical specifications with coarse sand and 6% bitumen by weight*	metre	396.880	18.44	7,318.47
12.25	***8.22 (ii)***		*RCC Crash Barrier(M 40 grade concrete)*	metre	1605.080	4,531.62	7,273,612.63
12.26	***14.6***		*Precast RCC Railing-With batching plant*	metre	736.540	2,051.15	1,510,754.02
12.27	***14.22***	**2607**	**Strip Seal Expansion Joint** (Providing and laying of a strip seal expansion joint catering to maximum horizontal movement upto 70 mm, complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation.)	metre	197.600	14,022.36	2,770,818.34
12.28			HDPE Pipe	metre	507.600	1,500.00	761,400.00
TOTAL FOR B.3 :: SUPERSTRUCTURE							**138,329,959.50**

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.4 :: PROTECTION WORKS							
12.29	***2505***	**2403**	Providing and laying Flooring complete as per drawing and Technical specifications laid over cement concert bedding.				
	A		Rubble stone laid in cement mortar 1:3	cum	179.699	6,406.09	1,151,166.69
12.30	***15.2***	**2505**	**Boulder apron laid in wire crates** (Providing and laying of boulder apron laid in wire crates made with 4mm dia GI wire conforming to IS: 280 & IS:4826 in 100mm x 100mm mesh (weaved diagonally) including 10% extra for laps and joints laid with stone boulders weighing not less than 40 kg each.)	cum	1922.804	1,920.34	3,692,437.43
12.31	***15.5***	**2507.2**	Providing and laying Filter material underneath pitching in slopes complete as per drawing and Technical specification	cum	961.400	2,429.87	2,336,077.02
12.32	***15.11***	**304**	Flexible Apron :Construction of flexible apron 750 mm thick comprising of loose stone boulders weighing not less than 40 kg beyond curtain wall.	cum	245.993	1,945.55	478,590.71
12.33	***13.5 (N) .A .b***	**1500,1700 &2200**	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications				
	12.8 A (a)		**PCC Grade M15**	cum	377.064	6,979.01	2,631,530.29
12.34	***15.10 (B)***	**2507.2**	**Curtain Wall-Cement concrete Grade M20**	cum	249.202	7,738.78	1,928,516.36
12.35	***12.1 I . B. (b).(i)***	**304**	**Excavation for Structures**	cum	1327.704	61.08	81,096.16
12.36	***15.11***	**304**	Falling Apron on River Bed	cum	910.720	1,945.55	1,771,851.30
TOTAL FOR B.4 :: PROTECTION WORKS							**14,071,265.95**
B.5:: MISCALLAENEOUS WORKS							
12.37	**8.8**	**803**	**Painting Two Coats on New Concrete Surfaces** (Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces)	sqm	5995.030	58.58	351,188.86
12.38	**8.4 (iv)**		Citizen information Board NH Project	nos	12.000	2,736.50	32,838.00
12.39	**12.5**		Brick work at median	cum	29.380	8,161.65	239,789.28
TOTAL FOR B.5:: MISCALLAENEOUS WORKS							**623,816.13**
			Total of Bill No.12				**552,602,030.65**

DETAILED COST ESTIMATES

BILL NO. 13 FOR ROB

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.1 :: FOUNDATION							
13.1	***12.1***	**304**	**Excavation for Structures** (Earth work in excavation of 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.		***Ordinary soil***				
	B.		**Mechanical Means**				
	(b)		**with dewatering**				
	(i)		*Depth upto 3 m*	cum	13173.040	63.63	838,200.54
	(ii)		*Depth 3 m to 6 m*	cum	338.610	69.81	23,638.36
13.2	***12.25A***	**1100 & 1700**	**Bored cast-in-situ M35 grade R.C.C. pile** excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (**Pile diameter-1200 mm**)	metre	10296.000	17,494.79	180,126,357.84
13.3	***12.38 (A) III.(ii)***		***RCC Pile Cap M30 -Using Batching Plant, Transit Mixer and Concrete Pump***	cum	8475.050	9,271.96	78,580,324.60
13.4	***12.39***	**1100 & 1700**	Levelling course for Pile cap	cum	1169.750	6,848.88	8,011,477.38
13.5	***12.4 0 (a). (i)***	**1600**	**Reinforcement in foundation :Supplying, fitting and placing un-coatedTMT bar reinforcement in foundation complete as per drawing and technical specifications**				
			From primary source**s:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	2090.660	67,540.82	141,204,890.74
13.6	***12.5***		Brick masonry work (1:3)	cum	141.070	8,500.62	1,199,182.46
TOTAL FOR B.1 :: FOUNDATION							**409,984,071.92**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.2 :: SUBSTRUCTURE							
13.7	***13.5 (N) .A .g.(i)- case II***	**1500,1700 &2200**	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications				
			Without plasticiser				
			RCC Grade M35				
	(i)		***Height upto 5m***				
	case II		***With Batching Plant, Transit Mixer and Concrete Pump***	cum	1806.290	10,406.87	18,797,825.21
	(ii)		***Height 5m to 10m***				
	Case II		***With Batching Plant, Transit Mixer and Concrete Pump***	cum	3413.540	10,630.08	36,286,203.28
	(iii)		***Height above 10m***				
	Case II		***With Batching Plant, Transit Mixer and Concrete Pump***	cum	1768.100	10,963.38	19,384,352.18
13.8	***13.6 (a) (i)***	**1600 &2200**	**Supplying, fitting and placing TMT bar** reinforcement in sub-structure complete as per drawing and technical specifications				
			From primary sources**:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	993.580	67,619.60	67,185,482.17
13.9			Pin Bearing	tonne capacity	10760.000	459.55	4,944,758.00
13.10	***13.13***	**2000 & 2200**	Supplying, fitting and fixing in position true to line and level sliding plate bearing with PTFE surface sliding on stainless steel complete including all accessories as per drawing and Technical Specifications and BS: 5400, section 9.1 & 9.2 (for PTFE) and clause 2004 of MoRTH Specifications.	tonne capacity	30240.000	459.55	13,896,792.00
13.11			Metallic guide bearing	tonne capacity	10760.000	459.55	4,944,758.00
13.12	***13.14***		Elastomeric bearing	CCUM	15246566.0	1.26	19,210,673.16
13.13			Reinforced/Prestressed cement concrete M40	cum	109.000	459.55	50,090.95
TOTAL FOR B.2 :: SUBSTRUCTURE							**184,700,934.95**

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.3 :: SUPERSTRUCTURE							
13.14	***14.1 A. III.case -II(i) a),***	**1500 ,1600 & 1700**	Furnishing and Placing Reinforced/Prestressed cement concrete in super-structure as per drawing and Technical Specification				
			Without plasticiser				
			RCC/PSC Grade M35				
			Using Batching Plant, Transit Mixer and Concrete Pump				
			For solid slab super-structure				
			Height upto 5m	cum	7861.490	11,133.06	87,522,439.86
	VI.		**PSC Grade M-45**				
	(i)		***For solid slab/voided slab super-structure***				
	a)		*Height upto 5m*	cum	1847.350	11,642.07	21,506,978.01
13.15	***14.2 (a). (i)***	**1600**	**Reinforcement in Super Structure**: Supplying, fitting and placing TMT bar reinforcement in super-structure including splicing complete as per drawing and technical specifications				
			From primary sources**:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	1747.590	68,731.61	120,114,674.32
13.16	***non sch***		Supply, fabrication, delivery at bridge site and erection of structural steel works as per IS 2062, including two coats of primer, one at shop and the other at site and two coats of aluminium paints including all labour, material, consumables etc.	tonne	2168.620	109,970.92	238,485,136.53

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
13.17	***14.5 (A)***	**515 & 2702**	**Mastic Asphalt**				
			Providing and laying 12 mm thick mastic asphalt wearing course on top of deck slab excluding prime coat with paving grade bitumen meeting the requirements given in table 500-29, prepared by using mastic cooker and laid to required level and slope after cleaning the surface, including providing antiskid surface with bitumen precoated fine grained hard stone chipping of 9.5 mm nominal size at the rate of 0.005cum per 10 sqm and at an approximate spacing of 10 cm center to center in both directions, pressed into surface when the temperature of surfaces not less than 100 deg. C, protruding 1 mm to 4 mm over mastic surface, all complete as per clause 515.	sqm	17467.150	396.86	6,932,013.15
13.18	***5.8 (ii)***		Providing and laying Bituminious wearing course comprising of tack coat with bitumen emulsion CSS-1 h as per APWD SOR item no 5.2 & MoRT&H Specification Nos 503,6mm thick mastic asphalt as per APWD SOR item no 14.5& MoRT&H Specification no 515 &2702 and 2 layer of 25 mm thick asphalt concrete including of close Graded Premix Surfacing (CGPS) material with Type -a aggregate as per APWD SOR item no 5.11 & MoRT &H Specification Nos 512 including all lead and lift as directed	cum	901.300	10,483.41	9,448,697.43
13.19	**5.2**		**Tack coat** Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20 kg per sqm on the prepared bituminous/granular surface cleaned with mechanical broom.(Including cost of testing of materials at sitfe and laboratory as directed by the depttt.)	sqm	17467.150	9.12	159,300.41
13.20	***14.8***		Providing, fitting and fixing mild steel railing complete as per drawing and Technical Specification	metre	1101.760	2,087.16	2,299,549.40
13.21	***14.9***	**2705**	Drainage Spouts complete as per drawing and Technical specification	each	322.000	12,618.94	4,063,298.68
13.22	***14.10***	**2700**	PCC M15 Grade leveling course below approach slab complete as per drawing and Technical specification	cum	11.700	6,991.29	81,798.09
13.23	***8.22 (ii)***	**809**	**Reinforced Cement Concrete Crash Barrier** (Provision of an Reinforced cement concrete crash barrier at the edges of the road, approaches to bridge structures and medians, constructed with M-40 grade concrete with HYSD reinforcement conforming to IRC:21 and dowel bars 25 mm dia, 450 mm long at expansion joints filled with pre-moulded asphalt filler board, keyed to the structure on which it is built and installed as per design given in the enclosure to MORT&H circular No. RW/NH - 33022/1/94-DO III dated June 1994 as per dimensions in the approved drawing and at locations directed by the Engineer, all as specified)	metre	3604.640	4,717.58	17,005,177.57

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
13.24	***14.18***	**2605**	**Filler joint**				
	(i)		*Providing & fixing 2 mm thick corrugated copper plate in expansion joint complete as per drawing & Technical Specification.*	metre	86.680	2,029.09	175,881.52
	(ii)		*Providing & fixing 20 mm thick compressible fibre board in expansion joint complete as per drawing & Technical Specification.*	metre	86.680	690.84	59,882.01
	(iii)		*Providing and fixing in position 20 mm thick premoulded joint filler in expansion joint for fixed ends of simply supported spans not exceeding 10 m to cater for a horizontal movement upto 20 mm, covered with sealant complete as per drawing and technical specifications.*	metre	86.680	392.89	34,055.71
	(iv)		*Providing and filling joint sealing compound as per drawings and technical specifications with coarse sand and 6% bitumen by weight*	metre	86.680	19.20	1,664.26
13.25	***14.22***	**2607**	**Strip Seal Expansion Joint** (Providing and laying of a strip seal expansion joint catering to maximum horizontal movement upto 70 mm, complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation)	metre	768.980	14,606.62	11,232,198.65
13.26	***8.1 (A)***		RCC M30 Kerb	M	25.140	377.81	9,498.14
13.27	***Non-Sch***		Reciever pipe for Drainage Spout	metre	1580.000	150.00	237,000.00
TOTAL FOR B.3 :: SUPERSTRUCTURE							**519,369,243.74**
B.4 :: MISCELLANEOUS							
13.28	**8.8**	**803**	**Painting Two Coats on New Concrete Surfaces** (Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces)	sqm	11831.570	58.58	693,093.37
13.29	**non sch**		Inspection ladder	tonne	10.889	109,970.92	1,197,418.36
13.30	**non sch**		Stair	tonne	234.620	109,970.92	25,801,377.25
TOTAL FOR B.4 :: MISCELLANEOUS							**27,691,888.98**
			Total of Bill No.13		**Total=**		**1,141,746,139.60**

DETAILED COST ESTIMATES

BILL NO. 14 FOR VUP

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.1 :: FOUNDATION							
14.1	***12.1***	**304**	**Excavation for Structures** (Earth work in excavation of 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.		***Ordinary soil***				
	B.		**Mechanical Means**				
	(b)		**with dewatering**				
	(i)		*Depth upto 3 m*	cum	1089.350	61.08	66,537.50
14.2	***12.8***	**1500,1700 &2100**	**Plain/Reinforced cement concrete** in open foundation complete as per drawing and technical specifications including steel shuttering forrmwork				
	A.		**Without plasticiser**				
			PCC Grade M15	cum	67.950	6,979.01	4,74,223.73
	(g)		**RCC Grade M30**				
	Case II		***Using Batching Plant, Transit Mixer and Concrete Pump***	cum	591.940	8,909.41	52,73,836.16
14.3	***12.25A***	**1100 & 1700**	**Bored cast-in-situ M35 grade R.C.C. pile** excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (**Pile diameter-1200 mm**)	metre	1146.000	16,804.55	1,92,58,014.30
14.4	***12.40(a). (i)***	**1600**	**Reinforcement in foundation :Supplying, fitting and placing un-coatedTMT bar reinforcement in foundation complete as per drawing and technical specifications**				
			From primary source**s:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	190.795	64,846.06	1,23,72,304.02
TOTAL FOR B.1 :: FOUNDATION							**3,74,44,915.70**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.2 :: SUBSTRUCTURE							
14.5	***13.5 (N) .A .g.(i)-case II***	**1500,1700 &2200**	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications				
			Without plasticiser				
			RCC Grade M30				
			Height upto 5m				
			With Batching Plant, Transit Mixer and Concrete Pump	cum	195.310	9,382.81	18,32,556.62
			Height 5m to 10m				
			With Batching Plant, Transit Mixer and Concrete Pump	cum	225.820	9,640.72	21,77,067.39
			Height above 10m				
			With Batching Plant, Transit Mixer and Concrete Pump	cum	132.230	10,008.20	13,23,384.29
			RCC Grade M35 (Pedestals & RB)				
			Height 5m to 10m				
			With Batching Plant, Transit Mixer and Concrete Pump	cum	39.610	10,213.36	4,04,551.19
14.6	***13.6(a) (i)***	**1600 &2200**	**Supplying, fitting and placing TMT bar** reinforcement in sub-structure complete as per drawing and technical specifications				
			From primary source**s:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	55.289	64,921.69	35,89,455.32
14.7	***13.9***	**710.1.4 of IRC:78 & 2200**	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification				
	A		*Granular material*	cum	187.200	2,000.76	3,74,542.27
14.8	***13.14***	**2000 & 2200**	Supplying, fitting and fixing in position true to line and level elastomeric bearing conforming to IRC: 83 (Part-II) section IX and clause 2005 of MoRTH specifications complete including all accessories as per drawing and Technical Specifications.	cubic centimetre	207840.000	1.21	2,51,486.40
14.9	***13.13***	**2000 & 2200**	Supplying, fitting and fixing in position true to line and level sliding plate bearing with PTFE surface sliding on stainless steel complete including all accessories as per drawing and Technical Specifications and BS: 5400, section 9.1 & 9.2 (for PTFE) and clause 2004 of MoRTH Specifications.	tonne capacity	9600.000	441.17	42,35,232.00
TOTAL FOR B.2 :: SUBSTRUCTURE							**1,41,88,275.48**

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.3 :: SUPERSTRUCTURE							
14.10	***14.1 A. III.case - II(i) a***	**1500 ,1600 & 1700**	Furnishing and Placing Reinforced/Prestressed cement concrete in super-structure as per drawing and Technical Specification				
			Without plasticiser				
			RCC Grade M 30				
			Using Batching Plant, Transit Mixer and Concrete Pump.				
			For T-Beam				
			Height upto 5m	cum	58.800	10,644.25	6,25,881.90
14.11	***V.***		**PSC Grade M-40**				
	Case II		***Using Batching Plant, Transit Mixer and Concrete Pump***				
	(ii)		***For T-beam & slab***				
	a)		*Height upto 5m*	cum	288.670	11,289.95	32,59,069.87
14.12	***14.1 A. VI .(i) a).***		**PSC Grade M-45**				
			For solid slab/voided slab super-structure				
			Height upto 5m	cum	545.370	11,205.92	61,11,372.59
14.13	***14.2 (a). (i)***	**1600**	**Reinforcement in Super Structure**: Supplying, fitting and placing TMT bar reinforcement in super-structure including splicing complete as per drawing and technical specifications				
			From primary source**s:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	133.926	65,989.22	88,37,672.28
14.14	***14.3***	**1800**	High tensile steel wires/strands including all accessories for stressing, stressing operations and grouting complete as per drawing and Technical Specifications	tonne	28.000	2,48,618.00	69,61,304.00

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SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
14.15	***14.5(A)***	**515 & 2702**	**Mastic Asphalt**				
			Providing and laying 12 mm thick mastic asphalt wearing course on top of deck slab excluding prime coat with paving grade bitumen meeting the requirements given in table 500-29, prepared by using mastic cooker and laid to required level and slope after cleaning the surface, including providing antiskid surface with bitumen precoated fine grained hard stone chipping of 9.5 mm nominal size at the rate of 0.005cum per 10 sqm and at an approximate spacing of 10 cm center to center in both directions, pressed into surface when the temperature of surfaces not less than 100 deg. C, protruding 1 mm to 4 mm over mastic surface, all complete as per clause 515.	sqm	1306.440	396.86	5,18,473.78
14.16	***5.8 (ii)***		Providing and laying Bituminious wearing course comprising of tack coat with bitumen emulsion CSS-1 h as per APWD SOR item no 5.2 & MoRT&H Specification Nos 503,6mm thick mastic asphalt as per APWD SOR item no 14.5& MoRT&H Specification no 515 &2702 and 2 layer of 25 mm thick asphalt concrete including of close Graded Premix Surfacing (CGPS) material with Type -a aggregate as per APWD SOR item no 5.11 & MoRT &H Specification Nos 512 including all lead and	cum	52.260	10,483.41	5,47,863.01
14.17	**5.2 (I) (a)**		**Tack coat** Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20 kg per sqm on the prepared bituminous/granular surface cleaned with mechanical broom.(Including cost of testing of materials at sitfe and laboratory as directed by the depttt.)	sqm	1306.440	9.12	11,914.73
14.18	***14.9***	**2705**	Drainage Spouts complete as per drawing and Technical specification	each	20.000	12,114.18	2,42,283.60
14.19	***14.10***	**2700**	PCC M15 Grade leveling course below approach slab complete as per drawing and Technical specification	cum	7.880	6,719.16	52,946.98

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SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
14.20	***14.18***	**2605**	**Filler joint**				
	(i)		*Providing & fixing 2 mm thick corrugated copper plate in expansion joint complete as per drawing & Technical Specification.*	metre	42.000	1,947.93	81,813.06
	(ii)		*Providing & fixing 20 mm thick compressible fibre board in expansion joint complete as per drawing & Technical Specification.*	metre	42.000	663.21	27,854.82
	(iii)		*Providing and fixing in position 20 mm thick premoulded joint filler in expansion joint for fixed ends of simply supported spans not exceeding 10 m to cater for a horizontal movement upto 20 mm, covered with sealant complete as per drawing and technical specifications*	metre	42.000	377.17	15,841.14
	(iv)		*Providing and filling joint sealing compound as per drawings and technical specifications with coarse sand and 6% bitumen by weight*	metre	42.000	18.44	774.48
	8.22 (ii)		*RCC Crash Barrier(M 40 grade concrete)*	metre	275.040	4,531.62	12,46,376.76
14.21	***14.22***	**2607**	**Strip Seal Expansion Joint** (Providing and laying of a strip seal expansion joint catering to maximum horizontal movement upto 70 mm, complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation.)	metre	63.000	14,022.36	8,83,408.68
14.22	***Non-Sch***		Reciever pipe for Drainage Spout	metre	180.000	150.00	27,000.00
TOTAL FOR B.3 :: SUPERSTRUCTURE							**2,94,51,851.68**
B.4 :: MISCALLAENEOUS WORKS							
14.23	**8.8**	**803**	**Painting Two Coats on New Concrete Surfaces** (Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces)	sqm	607.840	58.58	35,607.27
14.24	**8.4 (iv)**		Citizen information Board NH Project	nos	2.000	2,736.50	5,473.00
14.25	**12.5**		Brick masonry work (1:3)	cum	68.250	8,161.65	5,57,032.61
TOTAL FOR B.4 :: MISCALLAENEOUS WORKS							**5,98,112.88**
			Total of Bill No.14				**8,16,83,155.74**

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DETAILED COST ESTIMATES

BILL NO. 15 FOR LOW HEIGHT SUBWAY

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.1 :: FOUNDATION							
15.1	*12.1*	304	**Excavation for Structures** (Earth work in excavation of 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.		**Ordinary soil**				
	B.		**Mechanical Means**				
	(b)		**with dewatering**				
	(i)		*Depth upto 3 m*	cum	2841.365	61.08	173,550.57
	(ii)		*Depth 3 m to 6 m*	cum	999.815	69.81	69,797.09
15.2	*12.8*	1500,1700 &2100	**Plain/Reinforced cement concrete** in open foundation complete as per drawing and technical specifications including steel shuttering forrmwork				
	A.		**Without plasticiser**				
			PCC Grade M15	cum	210.339	6,979.01	1,467,957.98
	(g)		**RCC Grade M30**				
	Case II		***Using Batching Plant, Transit Mixer and Concrete Pump***	cum	486.531	8,839.84	4,300,856.20
15.3	*12.40(a). (i)*	1600	**Reinforcement in foundation :Supplying, fitting and placing un-coatedTMT bar reinforcement in foundation complete as per drawing and technical specifications**				
			From primary source**s:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	34.057	64,846.06	2,208,473.29
TOTAL FOR B.1 :: FOUNDATION							**8,220,635.13**

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.2 :: SUBSTRUCTURE							
15.4	***13.5 (N) .A .g.(i)- case II***	**1500,1700 &2200**	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications				
			Without plasticiser				
			RCC Grade M20	cum	61.600	8,089.33	498,302.73
			Height upto 5m				
			RCC Grade M30				
			Height upto 5m	cum	447.454	9,382.81	4,198,375.87
			RCC Grade M35				
			Height upto 5m	cum	255.200	9,999.08	2,551,765.22
15.5	***13.6(a) (i)***	**1600 &2200**	**Supplying, fitting and placing TMT bar** reinforcement in sub-structure complete as per drawing and technical specifications				
			From primary source**s:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	75.674	64,921.69	4,912,869.69
15.6	***13.9***	**710.1.4 of IRC:78 & 2200**	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification				
	A		*Granular material*	cum	302.953	2,000.76	606,136.24
	B		*Sandy material*	cum	2561.785	2,314.44	5,929,097.91
15.7	***13.10***	**710.1.4 of IRC:78 & 2200**	**Providing and laying of Filter media** with granular materials/stone crushed aggregates satisfying the requirements laid down in clause 2504.2.2. of MoRTH specifications to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition complete as per drawing and technical specification.	cum	941.874	2,288.73	2,155,695.55
15.8	***14.4***	**2702**	Providing and laying Cement concrete wearing coat M-30 grade including reinforcement complete as per drawing and Technical Specifications	cum	24.552	13,535.26	332,317.70
TOTAL FOR B.2 :: SUBSTRUCTURE							**21,184,560.91**

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.3 :: SUPERSTRUCTURE							
15.9	***14.1 A. III.case - II(i) a***	**1500 ,1600 & 1700**	Furnishing and Placing Reinforced/Prestressed cement concrete in super-structure as per drawing and Technical Specification				
			Without plasticiser				
	IV.		**RCC/PSC Grade M35**				
	a)		*Height upto 5m*	cum	126.052	10,696.22	1,348,278.59
15.10	***14.2 (a). (i)***	**1600**	**Reinforcement in Super Structure**: Supplying, fitting and placing TMT bar reinforcement in super-structure including splicing complete as per drawing and technical specifications				
			From primary source**s:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	17.647	65,989.22	1,164,511.77
TOTAL FOR B.3 :: SUPERSTRUCTURE							**2,512,790.35**

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SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.4 :: MISCALLAENEOUS WORKS							
15.11	**8.23 A**		**W-Metal beam crash barrier** Providing and erecting a "W" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 70 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 1.8 m high, 1.1 m below ground/road level, all steel parts and fitments to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a spacer of channel section 150 x 75 x 5 mm, 330 mm long complete as per clause 810	metre	379.600	3,613.76	1,371,783.30
15.12	***non sch***		**Structural Steel** Supply, fabrication, delivery at bridge site and erection of structural steel works as per IS 2062, including two coats of primer, one at shop and the other at site and two coats of aluminium paints including all labour, material, consumables etc.	tonne	33.239	109,970.92	3,655,323.41
15.13	**12.3**		Sand Cushion	cum	52.096	2,135.06	111,228.09
15.14	***non sch***		**Polycarbonate Sheet**	Sqm	1558.000	1,350.00	2,103,300.00
15.15			**Level Crossing Shfting cost**	Lumpsump cost			2,000,000.00
15.16			**All arrangement of rail track support and other items during construction & placing of rail track after construction of LHS with cut & cover method/cut & cover using RH girder method/TSLV or other suitable method.**	Lumpsump cost			1,000,000.00
TOTAL FOR B.4 :: MISCALLAENEOUS WORKS							**10,241,634.79**
			Total of Bill No.15				**42,159,621.18**

DETAILED COST ESTIMATES

BILL NO. 16 FOR CULVERT

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.1 :: FOUNDATION							
16.1	***12.1***	**304**	**Excavation for Structures** (Earth work in excavation of 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.		***Ordinary soil***				
	B.		**Mechanical Means**				
	(b)		**with dewatering**				
	(i)		*Depth upto 3 m*	cum	13962.509	61.08	852,830.04
16.2	***12.8***	**1500,1700 &2100**	**Plain/Reinforced cement concrete** in open foundation complete as per drawing and technical specifications including steel shuttering forrmwork				
	A.		**Without plasticiser**				
			PCC Grade M15	cum	1587.359	6,979.01	11,078,190.89
TOTAL FOR B.1 :: FOUNDATION							**11,931,020.93**

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.2 :: SUBSTRUCTURE							
16.3	***13.5 (N) .A .g.(i)-case II***	**1500,1700 &2200**	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications				
			Without plasticiser				
			RCC Grade M30				
			Height upto 5m				
			With Batching Plant, Transit Mixer and Concrete Pump	cum	6767.537	9,382.81	63,498,513.55
16.4	***13.6 (a) (i)***	**1600 &2200**	**Supplying, fitting and placing TMT bar** reinforcement in sub-structure complete as per drawing and technical specifications				
			From primary source**s:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	473.728	64,921.69	30,755,195.60
16.5	***13.8***	**2200 &2706**	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing foce. Complete as per drawing and Technical specifications	each	14604.000	1,812.33	26,467,267.32
16.6	***13.9***	**710.1.4 of IRC:78 & 2200**	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification				
	A		*Granular material*	cum	1190.132	2,000.76	2,381,168.50
	B		*Sandy material*	cum	6047.654	2,314.44	13,996,932.72
16.7	***13.10***	**710.1.4 of IRC:78 & 2200**	**Providing and laying of Filter media** with granular materials/stone crushed aggregates satisfying the requirements laid down in clause 2504.2.2. of MoRTH specifications to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition complete as per drawing and technical specification.	cum	7528.601	2,288.73	17,230,934.66
TOTAL FOR B.2 :: SUBSTRUCTURE							**154,330,012.35**

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.3 :: SUPERSTRUCTURE							
16.8	***14.1 A. III.case - II(i) a***	**1500 ,1600 & 1700**	Furnishing and Placing Reinforced/Prestressed cement concrete in super-structure as per drawing and Technical Specification				
			Without plasticiser				
			RCC Grade M 30				
			Using Batching Plant, Transit Mixer and Concrete Pump.				
			For solid slab super-structure				
			Height upto 5m	cum	1718.111	10,644.25	18,288,008.26
16.9	***14.2 (a). (i)***	**1600**	**Reinforcement in Super Structure**: Supplying, fitting and placing TMT bar reinforcement in super-structure including splicing complete as per drawing and technical specifications				
			From primary source**s:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	128.858	65,989.22	8,503,262.80
16.10	***14.5 (A)***	**515 & 2702**	**Mastic Asphalt**				
			Providing and laying 12 mm thick mastic asphalt wearing course on top of deck slab excluding prime coat with paving grade bitumen meeting the requirements given in table 500-29, prepared by using mastic cooker and laid to required level and slope after cleaning the surface, including providing antiskid surface with bitumen precoated fine grained hard stone chipping of 9.5 mm nominal size at the rate of 0.005cum per 10 sqm and at an approximate spacing of 10 cm center to center in both directions, pressed into surface when the temperature of surfaces not less than 100 deg. C, protruding 1 mm to 4 mm over mastic surface, all complete as per clause 515.	sqm	7995.520	396.86	3,173,102.07
16.11	***5.8 (ii)***		Providing and laying Bituminious wearing course comprising of tack coat with bitumen emulsion CSS-1 h as per APWD SOR item no 5.2 & MoRT&H Specification Nos 503,6mm thick mastic asphalt as per APWD SOR item no 14.5& MoRT&H Specification no 515 &2702 and 2 layer of 25 mm thick asphalt concrete including of close Graded Premix Surfacing (CGPS) material with Type -a aggregate as per APWD SOR item no 5.11 & MoRT &H Specification Nos 512 including all lead and lift as directed	cum	319.821	10,483.41	3,352,812.57
16.12	**5.2 (I) (a)**		**Tack coat** Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20 kg per sqm on the prepared bituminous/granular surface cleaned with mechanical broom.(Including cost of testing of materials at sitfe and laboratory as directed by the depttt.)	sqm	7995.520	9.12	72,919.14

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SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
16.13	***14.9***	**2705**	Drainage Spouts complete as per drawing and Technical specification	each	154.000	12,114.18	1,865,583.72
16.14	***14.10***	**2700**	PCC M15 Grade leveling course below approach slab complete as per drawing and Technical specification	cum	925.752	6,719.16	6,220,279.03
16.15	***8.22 (ii)***	**809**	**Reinforced Cement Concrete Crash Barrier** (Provision of an Reinforced cement concrete crash barrier at the edges of the road, approaches to bridge structures and medians, constructed with M-40 grade concrete with HYSD reinforcement conforming to IRC:21 and dowel bars 25 mm dia, 450 mm long at expansion joints filled with pre-moulded asphalt filler board, keyed to the structure on which it is built and installed as per design given in the enclosure to MORT&H circular No. RW/NH - 33022/1/94-DO III dated June 1994 as per dimensions in the approved drawing and at locations directed by the Engineer, all as specified)	metre	1465.800	4,531.62	6,642,448.60
16.16	***14.11***	**1500,1600, 1700 & 2704**	Reinforced cement concrete approach slab including reinforcement and formwork complete as per drawing and Technical specification				
	(a)		With TATA make TMT CRS(Fe-500) grade rebar	cum	1922.928	12,014.73	23,103,460.73
16.17	***14.18***	**2605**	**Filler joint**				
	(i)		*Providing & fixing 2 mm thick corrugated copper plate in expansion joint complete as per drawing & Technical Specification.*	metre	1852.400	1,947.93	3,608,345.53
	(ii)		*Providing & fixing 20 mm thick compressible fibre board in expansion joint complete as per drawing & Technical Specification.*	metre	1852.400	663.21	1,228,530.20
	(iii)		*Providing and fixing in position 20 mm thick premoulded joint filler in expansion joint for fixed ends of simply supported spans not exceeding 10 m to cater for a horizontal movement upto 20 mm, covered with sealant complete as per drawing and technical specifications*	metre	1852.400	377.17	698,669.71
	(iv)		*Providing and filling joint sealing compound as per drawings and technical specifications with coarse sand and 6% bitumen by weight*	metre	1852.400	18.44	34,158.26
TOTAL FOR B.3 :: SUPERSTRUCTURE							**76,791,580.61**

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.4 :: PROTECTION WORKS							
16.18	***15.11***	**2507.2**	Flexible Apron :Construction of flexible apron 1 m thick comprising of loose stone boulders weighing not less than 40 kg beyond curtain wall.	cum	3939.690	1,945.55	7,664,863.88
16.19	***13.5 (N) .A .b***	**1500,1700 &2200**	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications				
			PCC Grade M 15(Height upto 5m)	cum	590.617	6,979.01	4,121,919.68
16.20	***15.10 (B)***	**2507.2**	**Curtain Wall-Cement concrete Grade M20**	cum	4033.651	7,738.78	31,215,536.14
16.21	**8.8**	**803**	**Painting Two Coats on New Concrete Surfaces** (Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces)	sqm	3946.982	58.58	231,214.21
16.21	**12.1 I . B. (b).(i)**	**304**	**Excavation for Structures**	cum	19233.273	61.08	1,174,768.33
16.22			**Guard Stone**	Nos	900.000	646.71	582,039.00
TOTAL FOR B.4 :: PROTECTION WORKS							**44,990,341.23**
			Total of Bill No.16				**288,042,955.13**

DETAILED COST ESTIMATES
BILL NO. 17 : REPAIRING OF BRIDGE

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
17.1	**16.6**	**2800**	Patching of damaged concrete surface with polymer concrete and curing compounds, initiator and promoter, available in present formulations, to be applied as per instructions of manufacturer and as approved by the Engineer.	sqm	17.304	4,475.67	77,446.99
17.2	**8.8**	**803**	Painting Two Coats on New Concrete Surfaces (Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces)	sqm	444.498	58.58	26,038.69
			Total of Bill No.17				**103,485.69**

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Quantity Calculation for Road Works

Sl No	Chainage(m)		Length (m)	CD Length (m)	NET Length (m)	TCS Type	TCS 1A	TCS 1B	TCS 1G	TCS 1H	TCS 2	TCS 6A	TCS 6B	TCS 7	TCS 8
	From	To													
1	48655	49095	440		440.00										
2	49095	49236	141		141.00										
3	49236	49468	232	42.54	189.46	TCS 1G			189.46						
4	49468	50443	975	254.44	720.56	TCS 6A						720.56			
5	50443	54043	3600	168.7	3431.30	TCS 1B		3431.30							
6	54043	55063	1020	66.54	953.46	TCS 1G			953.46						
7	55063	56268	1205	28.50	1176.50	TCS 1A	1176.50								
8	56268	56443	175	9.54	165.46	TCS 1B		165.46							
9	56443	56993	550	71.13	478.87	TCS 1H				478.87					
10	56993	57308	315	19.04	295.96	TCS 1B		295.96							
11	57308	58343	1035	57.20	977.80	TCS 1A	977.80								
12	58343	59800	1457	19.04	1437.96	TCS 1B		1437.96							
13	59800	64243	4443	277.38	4165.62	TCS 2					4165.62				
14	64243	65378	1135	627.38	507.62	TCS 6B							507.62		
15	65378	67218	1840	76.04	1763.96	TCS 2					1763.96				
16	67218	67556	338	33.94	304.06	TCS 6A						304.06			
TCS for 2 lane portion and Bridge Appraoch															
17	0	438	438	33.94	404.06	TCS 7								404.06	
18	438	1071	633		633.00	TCS 8									633.00
	Total Length		**19391.00**	**1785.35**	**17605.65**	**m**	**2154.30**	**5330.68**	**1142.92**	**478.87**	**5929.58**	**1024.62**	**507.62**	**404.06**	**633.00**

Calculation of Quantities for Dismantling

Sl. No.	Brief Description	Unit	Chainage (km)	No.	L (m)	B / H (m)	T (m)	Quantity (cum)	Total Quantity (cum)
	Dismantling of Structures								
B) RCC (Bridges)	Abutment and parapet for existing Slab culvert H=h, Length=L, and thickness=t.	cum	49.236	4	7.50	0.80	4.00	96.00	
			49.236	2	30.00	1.00	0.25	15.00	
			56.985	3	7.57	0.80	3.50	63.59	
			56.985	2	26.00	1.00	0.25	13.00	
B) RCC (Bridges)	For Slab	cum	49.236	1	26	9.0	0.60	140.40	
			56.985	1	24	9.7	0.55	128.04	
			TOTAL FOR DISMANTLING OF RCC =						**456.03**

SUMMARY OF DISMANTLING MATERIALS

TOTAL FOR DISMANTLING OF RCC= 456.03 cum

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

Calculation of Quantities for Dismantling of Existing Flexible Pavement

TCS Type	Net Length (m)	Avg. Bituminous thickness (m)	Avg. GSB thickness (m)	Avg. Pavement width (m)	Quantity of Bituminous material (cum)	Quantity of GSB material (cum)
TCS 1B	5547.00	0.100	0.200	10.0	5547.00	11094.00
TCS 1G	1252.00	0.100	0.200	10.0	1252.00	2504.00
TCS 1H	550.00	0.100	0.200	10.0	550.00	1100.00
		Total =			**7349.00**	**14698.00**

Total Quantity of Bituminous Material= 7349.00 cum

Total Quantity of GSB Material= 14698.00 cum

Quantity of GSB material for reuse (@ 60%) = 8818.8 cum

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

Clearing and Grubbing Road Land

TCS Type	Net Length (m)	Existing Road Width (m)	Width to be cleared and grubbed (m)	Area to be cleared and grubbed (Ha)
TCS 1A	2154.3	10.0	35.0	5.4
TCS 1B	5330.7	10.0	45.0	18.7
TCS 1G	1142.9	10.0	45.0	4.0
TCS 1G	478.9	10.0	45.0	1.7
TCS 2	5929.6	0.0	45.0	26.7
TCS 6A	1024.6	0.0	45.0	4.6
TCS 6B	507.6	0.0	45.0	2.3
TCS 7	404.06	0.0	30.0	1.2
TCS 8	633.00	0.0	60.0	3.8
			Total=	**68.4**

Total area of clearing & grubbing= 68.4 Ha

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

Trees to be cut within Corridor of Impact			
Girth size of trees			
300mm-600mm	600-900mm	900-1800mm	> 1800mm
698	542	287	137

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF SEEDING & MULCHING

Mulching is provided on TCS 1A, TCS 1B, TCS 1E, TCS 1G, TCS 2

Length of Mulching for TCS 1A (Single side) =		2154.30	m
Length of Mulching for TCS 1B (Booth side) =		9686.40	m
Length of Mulching for TCS 1G (Both side) =		2285.80	m
Length of Mulching for TCS 1H (Both side) =		957.80	m
Assume ht. of embankment =	1.0		m
Width of Turfing =	2.24		m
Length of Mulching for TCS 2 (both side)=		10169.20	m
Assume ht. of embankment =	3.0		m
Width of Turfing =	6.71		m
Length of Mulching for TCS 8 (both side)=		1266.00	m
Assume ht. of embankment =	8.0		m
Width of Turfing =	17.89		m
Quantity of Seeding & Mulching =		**124672.9**	**sqm**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF CUTFILL

Chainage (m)		Cut Area (sqm)	Fill Area (sqm)	Earthwork - Cut Volume (cum)	Earthwork - Fill Volume (cum)
48655		24.1	0		
48675		17.46	0.04	Already considered in the Estimate of Road Hapachara - Tulungia Road	Already considered in the Estimate of Road Hapachara - Tulungia Road
48700		17.61	0.92		
48725		13.22	0.13		
48750		15.05	0.19		
48775		13.97	0.01		
48800		17.51	0		
48825		13.6	0		
48850		16.34	0.02		
48875		13.88	0		
48900		15.76	0.01		
48925		12.1	0.04		
48950		11.83	0.69		
48975		11.61	0.07		
49000		12.05	0.13		
49025		11.62	0.09		
49050		8.75	1.87		
49075		7.52	1.97		
49100		6.39	3.14		
49125		5.37	4.66		
49150		4.55	4.73		
49175		6.03	0.53		
49200		10.88	0		
49225		12.32	0		
49250		1.53	22.29	173.13	278.63
49275		14.02	0	194.38	278.63
49300		12.06	0.01	326.00	0.13
49325		12.01	0	300.88	0.13
49350		11	0	287.63	0.00
49375		11.55	0	281.88	0.00
49400		10.3	0	273.13	0.00
49425		2.05	1.51	154.38	18.88
49450		0	16.19	25.63	221.25

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF CUTFILL

Chainage (m)		Cut Area (sqm)	Fill Area (sqm)	Earthwork - Cut Volume (cum)	Earthwork - Fill Volume (cum)
49475		0	28.7		
49500		0	36.82		
49525		0	56.26		
49550		0	76.76		
49575		0	99.42		
49600		0	120.28		
49625		0	137.35		
49650		0	148.87		
49675		0	170.74		
49700		0	189		
49725		0	196.96		
49750		0	202.84		
49775		0	206.69		
49800		0	214.9		
49825		0	218.94		
49850		0	218.3		
49875		0	233.95		
49900		0	251.92		
49925		0	261.94		
49950		0	274.65	RE WALL	RE WALL
49975		0	297.95		
50000		0	270.5		
50025		0	268		
50050		0	269		
50075		0	272.35		
50100		0	220.89		
50125		0	259.5		
50150		0	251.36		
50175		0	220.52		
50200		0	187.57		
50225		0	167.3		
50250		0	147.42		
50275		0	136.24		
50300		0	116.66		
50325		0	90.84		
50350		0	66.26		
50375		0	44.2		
50400		0	27.71		
50425		0	12.47		
50450		3.08	6.59		
50475		6.06	2.5	114.25	113.63
50500		9.29	6.15	191.88	108.13
50525		8.87	9.72	227.00	198.38
50550		9.42	10.26	228.63	249.75
50575		8.03	4.75	218.13	187.63
50600		9.09	6.86	214.00	145.13
50625		11.51	4.25	257.50	138.88
50650		9.18	2.83	258.63	88.50
50675		9.92	1.8	238.75	57.88
50700		10.46	0	254.75	22.50
50725		12.34	0	285.00	0.00
50750		12.36	0	308.75	0.00

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF CUTFILL

Chainage (m)		Cut Area (sqm)	Fill Area (sqm)	Earthwork - Cut Volume (cum)	Earthwork - Fill Volume (cum)
50775		7	4.41	242.00	55.13
50800		11.24	6.14	228.00	131.88
50825		11.2	4.7	280.50	135.50
50850		10.95	2.88	276.88	94.75
50875		9.54	4.94	256.13	97.75
50900		9.37	6.28	236.38	140.25
50925		9.16	9.77	231.63	200.63
50950		9.55	8.87	233.88	233.00
50975		10.01	7.56	244.50	205.38
51000		10.81	2.69	260.25	128.13
51025		15.58	0	329.88	33.63
51050		17.76	0	416.75	0.00
51075		19.75	0	468.88	0.00
51100		21.64	0	517.38	0.00
51125		13.35	2.09	437.38	26.13
51150		10.97	0.93	304.00	37.75
51175		10.17	0.83	264.25	22.00
51200		10.08	2.61	253.13	43.00
51225		8.5	7.51	232.25	126.50
51250		7.03	9.75	194.13	215.75
51275		5.52	11.97	156.88	271.50
51300		4.91	13.69	130.38	320.75
51325		5.96	9.83	135.88	294.00
51350		8.77	8.47	184.13	228.75
51375		10.71	9.28	243.50	221.88
51400		11.41	9.08	276.50	229.50
51425		12.23	0.28	295.50	117.00
51450		12.03	3.29	303.25	44.63
51475		12.86	0.51	311.13	47.50
51500		12.58	4.15	318.00	58.25
51525		14.58	0.02	339.50	52.13
51550		12.43	1.11	337.63	14.13
51575		14.38	0	335.13	13.88
51600		9.94	10.44	304.00	130.50
51625		8.8	11.77	234.25	277.63
51650		7.92	16.85	209.00	357.75
51675		6.95	20.1	185.88	461.88
51700		6.94	28.71	173.63	610.13
51725		5.44	20.61	154.75	616.50
51750		3.5	22.74	111.75	541.88
51775		4.77	26.63	103.38	617.13
51800		8.16	15.1	161.63	521.63
51825		0.03	95.33	102.38	1380.38
51850		6.76	21.23	84.88	1457.00
51875		6.27	18.68	162.88	498.88
51900		5.04	17.85	141.38	456.63
51925		3.52	4.97	107.00	285.25
51950		3.11	4.26	82.88	115.38
51975		5.46	0	107.13	53.25
52000		4.58	6.31	125.50	78.88
52025		8.2	0.01	159.75	79.00
52050		12.22	0	255.25	0.13

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF CUTFILL

Chainage (m)		Cut Area (sqm)	Fill Area (sqm)	Earthwork - Cut Volume (cum)	Earthwork - Fill Volume (cum)
52075		11.26	4.29	293.50	53.63
52100		11.85	6	288.88	128.63
52125		12.28	7.02	301.63	162.75
52150		11.73	7.17	300.13	177.38
52175		12.18	5.85	298.88	162.75
52200		12.12	5.1	303.75	136.88
52225		13.13	5.42	315.63	131.50
52250		13.14	4.86	328.38	128.50
52275		13.71	3.79	335.63	108.13
52300		13.76	1.6	343.38	67.38
52325		12.38	4.13	326.75	71.63
52350		10.88	4.47	290.75	107.50
52375		11.9	1.22	284.75	71.13
52400		11.22	3.77	289.00	62.38
52425		11.27	4.85	281.13	107.75
52450		11.44	5.19	283.88	125.50
52475		12.46	1.92	298.75	88.88
52500		13.08	1.51	319.25	42.88
52525		12.97	1.21	325.63	34.00
52550		11.98	3.91	311.88	64.00
52575		10.67	5.99	283.13	123.75
52600		10.12	6.9	259.88	161.13
52625		10.06	5.21	252.25	151.38
52650		10.02	4.74	251.00	124.38
52675		10.19	4.59	252.63	116.63
52700		8.89	4.66	238.50	115.63
52725		8.15	5.03	213.00	121.13
52750		8.91	2.02	213.25	88.13
52775		9.36	4.51	228.38	81.63
52800		10.25	7.86	245.13	154.63
52825		11.43	8.33	271.00	202.38
52850		11.11	7.86	281.75	202.38
52875		10.89	9.01	275.00	210.88
52900		11.89	11.99	284.75	262.50
52925		12.61	7.06	306.25	238.13
52950		14.32	3.24	336.63	128.75
52975		13.34	4.72	345.75	99.50
53000		11.58	5.11	311.50	122.88
53025		8.69	6.37	253.38	143.50
53050		7.21	14.22	198.75	257.38
53075		8.26	16.61	193.38	385.38
53100		10.31	14.33	232.13	386.75
53125		12.19	15.16	281.25	368.63
53150		10.94	15.74	289.13	386.25
53175		7.38	12.12	229.00	348.25
53200		5.84	10.07	165.25	277.38
53225		6.34	7.22	152.25	216.13
53250		6.11	10.47	155.63	221.13
53275		6.36	13.6	155.88	300.88
53300		7.91	10.56	178.38	302.00
53325		10.07	8.95	224.75	243.88
53350		11.56	8.95	270.38	223.75

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF CUTFILL

Chainage (m)		Cut Area (sqm)	Fill Area (sqm)	Earthwork - Cut Volume (cum)	Earthwork - Fill Volume (cum)
53375		11.43	8.21	287.38	214.50
53400		11.31	10.03	284.25	228.00
53425		10.47	6.51	272.25	206.75
53450		9.75	10.46	252.75	212.13
53475		10.42	7.6	252.13	225.75
53500		11.71	11.68	276.63	241.00
53525		12.72	8	305.38	246.00
53550		13.83	5.87	331.88	173.38
53575		14.19	6.28	350.25	151.88
53600		14.3	3.02	356.13	116.25
53625		13.28	3.39	344.75	80.13
53650		10.63	13.39	298.88	209.75
53675		9.94	12.26	257.13	320.63
53700		10.07	10.31	250.13	282.13
53725		12.06	9.24	276.63	244.38
53750		13.19	15.19	315.63	305.38
53775		12.43	9.51	320.25	308.75
53800		12.49	14.18	311.50	296.13
53825		12.05	10.61	306.75	309.88
53850		12.86	9.05	311.38	245.75
53875		13.57	11.72	330.38	259.63
53900		14.14	14.12	346.38	323.00
53925		14.16	12.92	353.75	338.00
53950		14.85	9.3	362.63	277.75
53975		16.49	7.63	391.75	211.63
54000		20.37	7.32	460.75	186.88
54025		14.11	11.26	431.00	232.25
54050		3.42	27.56	219.13	485.25
54075		0.85	34.87	53.38	780.38
54100		1.17	41.04	25.25	948.88
54125		2.6	43.47	47.13	1056.38
54150		4.49	45.89	88.63	1117.00
54175		6.96	18.82	143.13	808.88
54200		6.39	29.82	166.88	608.00
54225		6.3	24.42	158.63	678.00
54250		7.36	20.55	170.75	562.13
54275		9.29	20.18	208.13	509.13
54300		8.96	17.39	228.13	469.63
54325		0	78.9	112.00	1203.63
54350		0	127.35	0.00	2578.13
54375		11.19	9.09	139.88	1705.50
54400		10.31	0.6	268.75	121.13
54425		9.93	0.59	253.00	14.88
54450		8.09	0.02	225.25	7.63
54475		4.03	1.07	151.50	13.63
54500		2.25	8.39	78.50	118.25
54525		2.2	6.8	55.63	189.88
54550		4.44	2.95	83.00	121.88
54575		4.77	0.38	115.13	41.63
54600		7.65	2.78	155.25	39.50
54625		12.04	0.01	246.13	34.88
54650		13.86	0.39	323.75	5.00

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF CUTFILL

Chainage (m)		Cut Area (sqm)	Fill Area (sqm)	Earthwork - Cut Volume (cum)	Earthwork - Fill Volume (cum)
54675		17.28	0	389.25	4.88
54700		17.55	0	435.38	0.00
54725		13.69	0.02	390.50	0.25
54750		13.94	2.45	345.38	30.88
54775		13.95	3.42	348.63	73.38
54800		14.05	3.15	350.00	82.13
54825		12.73	2.63	334.75	72.25
54850		15	0	346.63	32.88
54875		12.7	0.89	346.25	11.13
54900		12.39	6.71	313.63	95.00
54925		12.92	0.04	316.38	84.38
54950		14.29	0	340.13	0.50
54975		13.84	0.16	351.63	2.00
55000		13.03	3.47	335.88	45.38
55025		15.09	5.98	351.50	118.13
55050		15.29	11.22	379.75	215.00
55075		16.93	6.11	402.75	216.63
55100		18.34	9.05	440.88	189.50
55125		16.14	6.5	431.00	194.38
55150		12.66	12.86	360.00	242.00
55175		10.27	18.96	286.63	397.75
55200		11.48	8.26	271.88	340.25
55225		13.89	2.47	317.13	134.13
55250		14.9	1.49	359.88	49.50
55275		13.53	0.27	355.38	22.00
55300		16.12	0.04	370.63	3.88
55325		15.3	0.02	392.75	0.75
55350		12.77	0.06	350.88	1.00
55375		17.89	0.02	383.25	1.00
55400		15.55	0	418.00	0.25
55425		10.65	1.93	327.50	24.13
55450		13.12	0	297.13	24.13
55475		16.95	0	375.88	0.00
55500		15.18	0	401.63	0.00
55525		14.93	0.31	376.38	3.88
55550		18.42	0	416.88	3.88
55575		18.06	0.01	456.00	0.13
55600		15.89	0.46	424.38	5.88
55625		15.64	1.68	394.13	26.75
55650		15.81	0.92	393.13	32.50
55675		14.33	0.13	376.75	13.13
55700		13.01	4.46	341.75	57.38
55725		11.08	9.62	301.13	176.00
55750		9.62	15.51	258.75	314.13
55775		9.35	7.43	237.13	286.75
55800		13.67	3.32	287.75	134.38
55825		18.61	0	403.50	41.50
55850		13.02	21.01	395.38	262.63
55875		10.54	22.66	294.50	545.88
55900		10.12	30.21	258.25	660.88
55925		11.3	20.75	267.75	637.00
55950		9.97	17.5	265.88	478.13

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF CUTFILL

Chainage (m)		Cut Area (sqm)	Fill Area (sqm)	Earthwork - Cut Volume (cum)	Earthwork - Fill Volume (cum)
55975		8.82	27.22	234.88	559.00
56000		9.85	9.81	233.38	462.88
56025		16.41	0.19	328.25	125.00
56050		16.06	0.58	405.88	9.63
56075		18.3	0	429.50	7.25
56100		22.01	0	503.88	0.00
56125		20.5	0	531.38	0.00
56150		12.97	6.04	418.38	75.50
56175		11.69	17.83	308.25	298.38
56200		11.79	18.39	293.50	452.75
56225		14.51	5.35	328.75	296.75
56250		15.53	2.39	375.50	96.75
56275		12.52	10.75	350.63	164.25
56300		9.51	24.09	275.38	435.50
56325		7.94	23.33	218.13	592.75
56350		7.12	19.55	188.25	536.00
56375		6.13	20.33	165.63	498.50
56400		5.63	21.88	147.00	527.63
56425		6.32	20.3	149.38	527.25
56450		7.37	15.29	171.13	444.88
56475		0.01	71.51	92.25	1085.00
56500		7.67	12.96	96.00	1055.88
56525		5.15	11.35	160.25	303.88
56550		2.85	12.01	100.00	292.00
56575		2.98	7.36	72.88	242.13
56600		4.25	6.64	90.38	175.00
56625		5.75	9.77	125.00	205.13
56650		6.79	6.02	156.75	197.38
56675		8.09	4.9	186.00	136.50
56700		9.13	3.72	215.25	107.75
56725		10.09	2.93	240.25	83.13
56750		7.34	6.23	217.88	114.50
56775		6.35	3.74	171.13	124.63
56800		3.19	6.03	119.25	122.13
56825		1.48	9.37	58.38	192.50
56850		0.45	9.76	24.13	239.13
56875		0.01	26.8	5.75	457.00
56900		0.32	27.61	4.13	680.13
56925		2.35	14.64	33.38	528.13
56950		2.86	10.5	65.13	314.25
56975		1.78	15.53	58.00	325.38
57000		0	82.76	22.25	1228.63
57025		1.77	13.11	22.13	1198.38
57050		0.05	21.77	22.75	436.00
57075		0	27.39	0.63	614.50
57100		0	31.58	0.00	737.13
57125		0.01	29.24	0.13	760.25
57150		0.95	24.43	12.00	670.88
57175		2.2	23.29	39.38	596.50
57200		2.44	22.44	58.00	571.63
57225		5.4	9.81	98.00	403.13
57250		7.72	9.77	164.00	244.75

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF CUTFILL

Chainage (m)		Cut Area (sqm)	Fill Area (sqm)	Earthwork - Cut Volume (cum)	Earthwork - Fill Volume (cum)
57275		9.32	10.48	213.00	253.13
57300		9.92	11.91	240.50	279.88
57325		10.74	7.32	258.25	240.38
57350		11.67	12.03	280.13	241.88
57375		11.91	12.92	294.75	311.88
57400		11.02	15.24	286.63	352.00
57425		11.15	13.55	277.13	359.88
57450		10.86	11.57	275.13	314.00
57475		12.37	7	290.38	232.13
57500		14.47	4.32	335.50	141.50
57525		17.56	5.56	400.38	123.50
57550		16.15	3.5	421.38	113.25
57575		13.66	6.32	372.63	122.75
57600		18.22	0	398.50	79.00
57625		15.3	0.9	419.00	11.25
57650		20.02	0	441.50	11.25
57675		25.51	0	569.13	0.00
57700		21.83	0	591.75	0.00
57725		14.9	4.13	459.13	51.63
57750		12.54	19.56	343.00	296.13
57775		12.85	17.17	317.38	459.13
57800		12.39	19.07	315.50	453.00
57825		12.36	15.99	309.38	438.25
57850		12.62	19.94	312.25	449.13
57875		11.78	19.89	305.00	497.88
57900		10.46	17.99	278.00	473.50
57925		10.69	19.91	264.38	473.75
57950		10.78	20.27	268.38	502.25
57975		10.93	16.15	271.38	455.25
58000		11.19	15.23	276.50	392.25
58025		10.71	19.22	273.75	430.63
58050		10.18	17.74	261.13	462.00
58075		10.32	16.74	256.25	431.00
58100		12.52	8.70	285.50	318.00
58125		12.89	19.5	317.63	352.50
58150		14.92	16.8	347.63	453.75
58175		16.26	10.13	389.75	336.63
58200		15.60	17.23	398.25	342.00
58225		12.48	18.08	351.00	441.38
58250		11.32	20.22	297.50	478.75
58275		11.072	4.7545	279.90	312.18
58300		10.97	17.09	275.53	273.06
58325		11.03	13.72	275.00	385.13
58350		11.21	7.4	278.00	264.00
58375		11.56	9.44	284.63	210.50
58400		11.79	11.56	291.88	262.50
58425		11.74	4.4	294.13	199.50
58450		11.38	8.54	289.00	161.75
58475		11.52	6.64	286.25	189.75
58500		12.29	2.47	297.63	113.88
58525		11.61	23.32	298.75	322.38
58550		13.17	2.79	309.75	326.38

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF CUTFILL

Chainage (m)		Cut Area (sqm)	Fill Area (sqm)	Earthwork - Cut Volume (cum)	Earthwork - Fill Volume (cum)
58575		11.87	14.76	313.00	219.38
58600		11.3	23.54	289.63	478.75
58625		10.86	18.45	277.00	524.88
58650		10.72	22.79	269.75	515.50
58675		10.49	22.79	265.13	569.75
58700		11.05	9	269.25	397.38
58725		9.49	28.35	256.75	466.88
58750		8.1725	33.3584	220.78	771.36
58775		8.39	35.06	207.03	855.23
58800		9.46	34.09	223.13	864.38
58825		10.9125	32.0641	254.66	826.93
58850		11.6599	31.2932	282.16	791.97
58875		11.2137	19.5613	285.92	635.68
58900		11.8	0.97	287.67	256.64
58925		10.79	5.98	282.38	86.88
58950		10.4124	24.6741	265.03	383.18
58975		12.02	29.71	280.41	679.80
59000		12.91	17.03	311.63	584.25
59025		22.74	0	445.63	212.88
59050		21.13	0	548.38	0.00
59075		17.73	0	485.75	0.00
59100		12.5	7.98	377.88	99.75
59125		11.44	23.1	299.25	388.50
59150		10.89	28.96	279.13	650.75
59175		12.01	0.5	286.25	368.25
59200		10.51	35.71	281.50	452.63
59225		9.79	20.57	253.75	703.50
59250		9.06	5.23	235.63	322.50
59275		9.82	10.46	236.00	196.13
59300		9.75	33.6	244.63	550.75
59325		9.88	11.95	245.38	569.38
59350		10.23	22.77	251.38	434.00
59375		12.42	0	283.13	284.63
59400		10.31	16.9	284.13	211.25
59425		10.94	3.89	265.63	259.88
59450		10.47	32.28	267.63	452.13
59475		10.37	18.23	260.50	631.38
59500		10.22	19.51	257.38	471.75
59525		11.52	2.63	271.75	276.75
59550		10.38	12.1	273.75	184.13
59575		7.74	29.08	226.50	514.75
59600		7.95	18.4	196.13	593.50
59625		6.22	19.32	177.13	471.50
59650		6.23	16.26	155.63	444.75
59675		9.01	13.3	190.50	369.50
59700		10.44	18.35	243.13	395.63
59725		8.47	16.53	236.38	436.00
59750		4.79	16.46	165.75	412.38
59775		1.05	45.13	73.00	769.88
59800		10.53	0	144.75	564.13
59825		1.62	2.39	151.88	29.88
59850		1.56	16.57	39.75	237.00

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF CUTFILL

Chainage (m)		Cut Area (sqm)	Fill Area (sqm)	Earthwork - Cut Volume (cum)	Earthwork - Fill Volume (cum)
59875		0.18	35.69	21.75	653.25
59900		0	81.47	2.25	1464.50
59925		0.05	60.5	0.63	1774.63
59950		0	92.85	0.63	1916.88
59975		0	55.2	0.00	1850.63
60000		0	66.22	0.00	1517.75
60025		0	68.17	0.00	1679.88
60050		0	92.69	0.00	2010.75
60075		0	98.54	0.00	2390.38
60100		0	87.11	0.00	2320.63
60125		0	108.74	0.00	2448.13
60150		0	164.76	0.00	3418.75
60175		0	195.53	0.00	4503.63
60200		0	185.06	0.00	4757.38
60225		0	159.55	0.00	4307.63
60250		0	142.79		
60275		0	335.89	Minor Bridge	Minor Bridge
60300		0	129.27		
60325		0	155.05	0.00	3554.00
60350		0	146.41	0.00	3768.25
60375		0	81.9	0.00	2853.88
60400		0	8.74	0.00	1133.00
60425		1.3	5.23	16.25	174.63
60450		0	48.52	16.25	671.88
60475		0	54.29	0.00	1285.13
60500		0	47.82	0.00	1276.38
60525		0	41.04	0.00	1110.75
60550		0	33.1	0.00	926.75
60575		0	29.94	0.00	788.00
60600		0	39.85	0.00	872.38
60625		0	55.6	0.00	1193.13
60650		0	64.67	0.00	1503.38
60675		0	74.75	0.00	1742.75
60700		0	84.7	0.00	1993.13
60725		0	95.65	0.00	2254.38
60750		0	106.1	0.00	2521.88
60775		0	112.07	0.00	2727.13
60800		0	113.67	0.00	2821.75
60825		0	108.58	0.00	2778.13
60850		0	120.77	0.00	2866.88
60875		0	170.46		
60900		0	285.76	Minor Bridge	Minor Bridge
60925		0	115.93		
60950		0	120.85	0.00	2959.75
60975		0	128.81	0.00	3120.75
61000		0	128.01	0.00	3210.25
61025		0	122.25	0.00	3128.25
61050		0	113.78	0.00	2950.38
61075		0.01	109.18	0.13	2787.00
61100		0	110.1	0.13	2741.00
61125		0	93.14	0.00	2540.50
61150		0	87.62	0.00	2259.50

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF CUTFILL

Chainage (m)		Cut Area (sqm)	Fill Area (sqm)	Earthwork - Cut Volume (cum)	Earthwork - Fill Volume (cum)
61175		0	87.38	0.00	2187.50
61200		0	73.79	0.00	2014.63
61225		0	60.77	0.00	1682.00
61250		0	66.95	0.00	1596.50
61275		0	67.74	0.00	1683.63
61300		0	76.38	0.00	1801.50
61325		0	80.7	0.00	1963.50
61350		0	81.96	0.00	2033.25
61375		0	84.65	0.00	2082.63
61400		0	81.72	0.00	2079.63
61425		0	79.72	0.00	2018.00
61450		0	83.59	0.00	2041.38
61475		0	81.92	0.00	2068.88
61500		0	76.78	0.00	1983.75
61525		0.03	64.53	0.38	1766.38
61550		0	64.32	0.38	1610.63
61575		0	123.95	0.00	2353.38
61600		0	122.77	0.00	3084.00
61625		0.01	90.77	0.13	2669.25
61650		0	75.2	0.13	2074.63
61675		0	33.71	0.00	1361.38
61700		0	108.15	0.00	1773.25
61725		0	115.16	0.00	2791.38
61750		0	166.11	0.00	3515.88
61775		0	191.47	0.00	4469.75
61800		0	212.37	0.00	5048.00
61825		0	227.09	0.00	5493.25
61850		0	237.99	0.00	5813.50
61875		0	254.42	0.00	6155.13
61900		0	268.4	0.00	6535.25
61925		0	263.75	0.00	6651.88
61950		0	251.69	0.00	6443.00
61975		0	306.03	Major Bridge	Major Bridge
62000		0	388.07		
62025		0	328.42		
62050		0	295.5	0.00	7799.00
62075		0	274.4	0.00	7123.75
62100		0	243.74	0.00	6476.75
62125		0	231.14	0.00	5936.00
62150		0	220.61	0.00	5646.88
62175		0	117.45	0.00	4225.75
62200		0	71.35	0.00	2360.00
62225		0	139.33	0.00	2633.50
62250		0	198.3	0.00	4220.38
62275		0	209.21	0.00	5093.88
62300		0	223.46	0.00	5408.38
62325		0	235.31	0.00	5734.63
62350		0	233.08	0.00	5854.88
62375		0	230.33	0.00	5792.63
62400		0	231.81	0.00	5776.75
62425		0	223.68	0.00	5693.63
62450		0	174.18	0.00	4973.25

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF CUTFILL

Chainage (m)		Cut Area (sqm)	Fill Area (sqm)	Earthwork - Cut Volume (cum)	Earthwork - Fill Volume (cum)
62475		0	184.68	0.00	4485.75
62500		0	180.55	0.00	4565.38
62525		0	197.19	0.00	4721.75
62550		0	167.25	0.00	4555.50
62575		0	139.29	0.00	3831.75
62600		0	158.55	0.00	3723.00
62625		0	160.19	0.00	3984.25
62650		0	217.22	0.00	4717.63
62675		0	175.61	0.00	4910.38
62700		0	175.21	0.00	4385.25
62725		0	206.94	0.00	4776.88
62750		0	192.24	0.00	4989.75
62775		0	140.31	0.00	4156.88
62800		0	152.62	0.00	3661.63
62825		0	128.71	0.00	3516.63
62850		0	103.38	0.00	2901.13
62875		0	88.31	0.00	2396.13
62900		0	127.57	0.00	2698.50
62925		0	145.62	0.00	3414.88
62950		0	131.4	0.00	3462.75
62975		0	125.14	0.00	3206.75
63000		0	131.65	0.00	3209.88
63025		0	145.81	0.00	3468.25
63050		0	26.26	0.00	2150.88
63075		2.61	30.18	32.63	705.50
63100		0	68.83	32.63	1237.63
63125		0	182.59	0.00	3142.75
63150		0	190.69	0.00	4666.00
63175		0	192.98	0.00	4795.88
63200		0	205.32	0.00	4978.75
63225		0	289.13	0.00	6180.63
63250		0	264.94	0.00	6925.88
63275		0	129.76	0.00	4933.75
63300		0	111.54	0.00	3016.25
63325		0	58.16	0.00	2121.25
63350		0	77.07	0.00	1690.38
63375		0	140.79	0.00	2723.25
63400		0	140.8	0.00	3519.88
63425		0.35	45.35	4.38	2326.88
63450		0	107.03	4.38	1904.75
63475		0	132.32	0.00	2991.88
63500		0	141.63	0.00	3424.38
63525		0	109.97	0.00	3145.00
63550		0	159.25	0.00	3365.25
63575		0	149.83	0.00	3863.50
63600		0	144.33	0.00	3677.00
63625		0	144.77	0.00	3613.75
63650		0	141.82	0.00	3582.38
63675		0	142.28	0.00	3551.25
63700		0	139.19	0.00	3518.38
63725		0	132.08	0.00	3390.88
63750		0	125.86	0.00	3224.25

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF CUTFILL

Chainage (m)		Cut Area (sqm)	Fill Area (sqm)	Earthwork - Cut Volume (cum)	Earthwork - Fill Volume (cum)
63775		0	114.31	0.00	3002.13
63800		13.46	74.96	168.25	2365.88
63825		0	83.28	168.25	1978.00
63850		0	138.84	0.00	2776.50
63875		0.66	109.02	8.25	3098.25
63900		5.77	112.83	80.38	2773.13
63925		4.3	91.12	125.88	2549.38
63950		10.43	73.95	184.13	2063.38
63975		40.34	41.9	634.63	1448.13
64000		0	56.23	504.25	1226.63
64025		0.84	23.68	10.50	998.88
64050		0	29.48	10.50	664.50
64075		11.73	22.21	146.63	646.13
64100		0	51.63	146.63	923.00
64125		0	134.36	0.00	2324.88
64150		0	330.51	0.00	5810.88
64175		0.01	271.8	0.13	7528.88
64200		0	62.15	0.13	4174.38
64225		0	74.72	0.00	1710.88

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QUANTITY CALCULATION OF CUTFILL

Chainage (m)		Cut Area (sqm)	Fill Area (sqm)	Earthwork - Cut Volume (cum)	Earthwork - Fill Volume (cum)
64250		0	101.44		
64275		0	89.67		
64300		0	107.03		
64325		0	123.86		
64350		0	140.36		
64375		0	153.9		
64400		0	159.57		
64425		0	195.33		
64450		0	205.87		
64475		0	257.96		
64500		0	168.74		
64525		0	146.16		
64550		0	233.3		
64575		0	261.94		
64600		0	330.02		
64625		0	342.52		
64650		0	320.94		
64675		0	329.47		
64700		0	345.16		
64725		0	339.81		
64750		0	290.54		
64775		0	303.89		
64800		0	321.1	RE WALL	RE WALL
64825		0	321.12		
64850		0	291.53		
64875		0	222.12		
64900		0	171.08		
64925		0	208.54		
64950		0	247.84		
64975		0	315.86		
65000		0	214.1		
65025		0	175.16		
65050		0	268.67		
65075		0	302.53		
65100		0	304.81		
65125		0	282.97		
65150		0	132.32		
65175		0	213.88		
65200		0.05	45.3		
65225		6.92	9.82		
65250		0	160.05		
65275		0	166.7		
65300		0	154.01		
65325		0	137.35		
65350		0	113.01		
65375		5.19	7.89		
65400		49.46	0	683.13	98.63
65425		65.07	0	1431.63	0.00
65450		91.9	0	1962.13	0.00
65475		22.31	19.82	1427.63	247.75
65500		0	202.74	278.88	2782.00
65525		0	234.54	0.00	5466.00

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QUANTITY CALCULATION OF CUTFILL

Chainage (m)		Cut Area (sqm)	Fill Area (sqm)	Earthwork - Cut Volume (cum)	Earthwork - Fill Volume (cum)
65550		0	233.43	0.00	5849.63
65575		0	236.87	0.00	5878.75
65600		0	231.33	0.00	5852.50
65625		0	184.59	0.00	5199.00
65650		0	109.46	0.00	3675.63
65675		0.02	108.48	0.25	2724.25
65700		0	173.35	0.25	3522.88
65725		0	172.97	0.00	4329.00
65750		0	170.26	0.00	4290.38
65775		0	151.95	0.00	4027.63
65800		0	141.84	0.00	3672.38
65825		0	136.25	0.00	3476.13
65850		0	128.12	0.00	3304.63
65875		0.02	140.48	0.25	3357.50
65900		0	156.61	0.25	3713.63
65925		0	144.83	0.00	3768.00
65950		0	131.73	0.00	3457.00
65975		0	112.87	0.00	3057.50
66000		0	64.23	0.00	2213.75
66025		0	98.74	0.00	2037.13
66050		0	133.63	0.00	2904.63
66075		0	145.85	0.00	3493.50
66100		0	146.65	0.00	3656.25
66125		0	128.31	0.00	3437.00
66150		0	63.89	0.00	2402.50
66175		7.43	54.82	92.88	1483.88
66200		1.66	38.92	113.63	1171.75
66225		46.26	10.7	599.00	620.25
66250		71.24	6.14	1468.75	210.50
66275		59.96	7.13	1640.00	165.88
66300		67.01	9.3	1587.13	205.38
66325		15.73	21.74	1034.25	388.00
66350		0	64	196.63	1071.75
66375		0	108.14	0.00	2151.75
66400		0	124.47	0.00	2907.63
66425		0	139.13	0.00	3295.00
66450		0	147.25	0.00	3579.75
66475		0	148.66	0.00	3698.88
66500		0	152.65	0.00	3766.38
66525		0	156.69	0.00	3866.75
66550		0	160.73	0.00	3967.75
66575		0	137.83	0.00	3732.00
66600		0	113.97	0.00	3147.50
66625		0	91.57	0.00	2569.25
66650		0	73.32	0.00	2061.13
66675		0	89.54	0.00	2035.75
66700		0	117	0.00	2581.75
66725		141.43	141.43	1767.88	3230.38
66750		0	159.87	1767.88	3766.25
66775		0	176.64	0.00	4206.38
66800		0	180.07	0.00	4458.88
66825		0	144.22	0.00	4053.63

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF CUTFILL

Chainage (m)		Cut Area (sqm)	Fill Area (sqm)	Earthwork - Cut Volume (cum)	Earthwork - Fill Volume (cum)
66850		18.73	0	234.13	1802.75
66875		169.81	0	2356.75	0.00
66900		157.56	0	4092.13	0.00
66925		25.65	15.42	2290.13	192.75
66950		0	109.44	320.63	1560.75
66975		0	230.29	0.00	4246.63
67000		0	274.61	0.00	6311.25
67025		0	256.83	Major Bridge	Major Bridge
67050		0	331.25		
67075		0	308.51		
67100		0	279.6	0.00	7351.38
67125		0	249.29	0.00	6611.13
67150		0	14.33	0.00	3295.25
67175		0	374.39	0.00	4859.00
67200		0	355.9	0.00	9128.63
67225		0	314.89	RE WALL	RE WALL
67250		0	273.02		
67275		0	141.15		
67300		0	137.31		
67325		0	99.37		
67350		0	99.55		
67375		0	113.09		
67400		0	116.75		
67425		0	120.79		
67450		0	143.53		
67475		0	151.56		
67500		0	155.39		
67525		0	161.41		
67543		0	168.38		
Cutfill For 2 lane portion and Bridge Appraoch					
0		0	161.41	RE WALL	RE WALL
25		0	168.38		
50		0	173.65		
75		0	182.36		
100		0	185.89		
125		0	143.44		
150		0	153.69		
175		0	179.05		
200		0	202.9		
225		0	227.36		
250		0	215.12		
275		0	231.71		
300		0	228.05		
325		0	236.3		
350		0	246.03		
375		0	267.9		
400		0	292.04		
425		0	302.19		
450		0	320.41		
475		0	338.52		
500		0	37.59	0.00	4701.38
525		0	57.35	0.00	1186.75

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF CUTFILL

Chainage (m)		Cut Area (sqm)	Fill Area (sqm)	Earthwork - Cut Volume (cum)	Earthwork - Fill Volume (cum)
550		0	96.58	0.00	1924.13
575		0	107.12	0.00	2546.25
600		0	95	0.00	2526.50
625		0	123.88	0.00	2736.00
650		0	147.98	0.00	3398.25
675		0	170.18	0.00	3977.00
700		0	198.66	0.00	4610.50
725		0	227.46	0.00	5326.50
750		0	254.99	0.00	6030.63
775		0	283.15	0.00	6726.75
800		0	313.92	0.00	7463.38
825		0	345.9	0.00	8247.75
850		0	376.82	0.00	9034.00
875		0	410.42	0.00	9840.50
900		0	477.48	0.00	11098.75
925		0	530.92	0.00	12605.00
950		0	548.95	0.00	13498.38
975		0	562.24	0.00	13889.88
1000		0	554.35	0.00	13957.38
1025		0	559.53	0.00	13923.50
1050		0	569.71	0.00	14115.50
1071		0	573.03	0.00	11998.77
			Total =	**91962**	**1037278**

Total Earthwork in cutting =	**91962.00**
Embankment Filling Volume =	**1037278.00**
Embankment Filling from cutting material (70% of cutting material)=	**64373.40**
Borrow area Soil is required for Embankment Filling purpose =	**972904.60**
Borrow area Soil is required for Median Filling purpose =	**25676.86**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF FLEXIBLE PAVEMENT (Existing Portion)

Design Length= **19972 m** **19.972 Km**

Total Length of Flexible Pavement= **9589 m** **9.589 Km**

Length of CD= **0.482 Km**

Length of road excluding CD= **9.107 Km**

Pavement Thickness (overlay portion):-	
Layer	**Thickness (m)**
BC	0.040
DBM	0.050
DBM for Profile Corrective Course	0.050

Pavement Thickness (Reconstruction portion):-	
Layer	**Thickness (m)**
BC	0.04
DBM	0.06
RAP	0.110
GSB (Drainage Layer)	0.150
GSB (Separation Layer)	0.150
Subgrade	0.500

Pavement Thickness (Widening portion):	
Layer	**Thickness (m)**
BC	0.040
DBM-I	0.100
WMM-I	0.125
WMM-II	0.125
GSB	0.200
Subgrade	0.500

Quantity Calculation For TCS-1A (4 LANE DIVIDED CARRIAGEWAY WITH PAVED SHOULDER IN RURAL AREA ECCENTRIC WIDENING AND OVERLAY OVER EXISTING PAVEMENT)

Chainage		**Length**	**CD Length**	**Net Length**
From	**To**			
55063	56268	1205	28.5	1176.5
57308	58343	1035	57.2	977.8

Total Length=	**2240**	**85.7**	**2154.3**	**m**
Width of Flexible Pavement=			7.0	m
Width of Kerb Shyness =			0.5	m
Width of Paved Shoulder =			2.5	m
Width of BC=	10.00 m			
Width of DBM=	10.00 m			

Quantity of Tack coat (Bituminous Layer) = **21543.00 sqm**

Quantity of BC= **861.72 cum**

Quantity of DBM= **1077.15 cum**

Quantity of DBM (for PCC) = **1077.15 cum**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

Quantity Calculation For TCS-1B (4 LANE DIVIDED CARRIAGEWAY WITH PAVED SHOULDER IN RURAL AREA) (RECONSTRUCTION OVER EXISTING PAVEMENT WITH PARTIAL GRANULAR LAYER SCARIFICATION)

Chainage		Length	CD Length	Net Length
From	To			
50443	54043	3600	168.7	3431.3
56268	56443	175	9.54	165.46
56993	57308	315	19.04	295.96
58343	59800	1457	19.04	1437.96

Total Length=		**5547**	**216.32**	**5330.68**	**m**
Width of Existing Pavement=				10.0	m
Width of Flexible Pavement=				7.0	m
Width of Kerb Shyness =				0.5	m
Width of Paved Shoulder =				2.5	m
Width of Earthen Shoulder =				1.5	m
Width of BC=	10.00	m			
Width of DBM=	10.00	m			
Width of RAP =	10.125	m			
Width of GSB (Drainage Layer) =	12.07	m			
Width of GSB (Separation Layer) =	12.37	m			
Width of Geocell=	12.37	m			

Quantity of Prime coat=	**53306.80**	**sqm**
Quantity of Tack coat (Granular Layer) =	**53306.80**	**sqm**
Quantity of BC=	**2132.27**	**cum**
Quantity of DBM=	**3198.41**	**cum**
Quantity of RAP =	**5937.04**	**cum**
Quantity of Geocell =	**65940.51**	**sqm**
Quantity of GSB (Drainage Layer) =	**9651.20**	**cum**
Quantity of GSB (Separation Layer) =	**9891.08**	**cum**

Quantity Calculation For TCS-1G (4 LANE DIVIDED CARRIAGEWAY WITH PAVED SHOULDER IN RURAL AREA) (RECONSTRUCTION OVER EXISTING PAVEMENT WITH PARTIAL GRANULAR LAYER SCARIFICATION)

Chainage		Length	CD Length	Net Length
From	To			
49236	49468	232	42.54	189.46
54043	55063	1020	66.54	953.46

Total Length=		**1252**	**109.08**	**1142.92**	**m**
Width of Existing Pavement=				10.0	m
Width of Flexible Pavement=				7.0	m
Width of Kerb Shyness =				0.5	m
Width of Paved Shoulder =				2.5	m
Width of Earthen Shoulder =				1.5	m
Width of BC=	10.00	m			
Width of DBM=	10.00	m			
Width of RAP =	10.125	m			
Width of GSB (Drainage Layer) =	12.07	m			
Width of GSB (Separation Layer) =	12.37	m			
Width of Geocell=	12.37	m			

Quantity of Prime coat=	**11429.20**	**sqm**
Quantity of Tack coat (Granular Layer) =	**11429.20**	**sqm**
Quantity of BC=	**457.17**	**cum**
Quantity of DBM=	**685.75**	**cum**
Quantity of RAP =	**1272.93**	**cum**
Quantity of Geocell =	**14137.92**	**sqm**
Quantity of GSB (Drainage Layer) =	**2069.26**	**cum**
Quantity of GSB (Separation Layer) =	**2120.69**	**cum**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

Quantity Calculation For TCS- 1H (4 LANE DIVIDED CARRIAGEWAY WITH PAVED SHOULDER IN RURAL AREA)
(RECONSTRUCTION OVER EXISTING PAVEMENT WITH PARTIAL GRANULAR LAYER SCARIFICATION)

Chainage		Length	CD Length	Net Length
From	To			
56443	56993	550	71.13	478.87

Total Length=		**550**	**71.13**	**478.87**	**m**
Width of Existing Pavement=				10.0	m
Width of Flexible Pavement=				7.0	m
Width of Kerb Shyness =				0.5	m
Width of Paved Shoulder =				2.5	m
Width of Earthen Shoulder =				1.5	m
Width of BC=		10.00	m		
Width of DBM=		10.00	m		
Width of WMM I =		10.125	m		
Width of WMM II =		10.250	m		
Width of GSB (Drainage Layer) =		12.480	m		

Quantity of Prime coat=	**4788.70**	**sqm**
Quantity of Tack coat (granular)=	**4788.70**	**sqm**
Quantity of BC=	**191.55**	**cum**
Quantity of DBM=	**478.87**	**cum**
Quantity of WMM=	**1219.62**	**cum**
Quantity of GSB (Drainage Layer) =	**1195.26**	**cum**

Total Quantity:

	Unit	Road Part			Total
Total Quantity of Prime coat=	**sqm**	69524.70			**69524.70**
Total Quantity of Tack coat (Granular Layer)=	**sqm**	69524.70			**69524.70**
Total Quantity of Tack coat (Bituminous Layer)=	**sqm**	21543.00			**21543.00**
Total Quantity of BC=	**cum**	3642.71			**3642.71**
Total Quantity of DBM=	**cum**	6517.33			**6517.33**
Total Quantity of WMM=	**cum**	1219.62			**1219.62**
Total Quantity of RAP=	**cum**	7209.97			**7209.97**
Total Quantity of GSB (Drainage Layer) =	**cum**	12915.72			**12915.72**
Total Quantity of GSB (Separation Layer) =	**cum**	12011.77			**12011.77**
Total Quantity of Geocell=	**sqm**	80078.43			**80078.43**

The 0.581km length (From Km 48.655 to Km 49.236) of the road stretch under PKG-5 is already developed in Hapachara-Tulungia Road(NH-17).The Instant Development of 4-lane stretch under PKG-5 is 18.320km and 2-lane stretch is 1.071km

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF FLEXIBLE PAVEMENT (Widening Portion)

Design Length= **19972 m** **19.972 Km**

Total Length of Flexible Pavement= **19391.00 m** **19.39 Km**

Pavement Thickness:-

Layer	Thickness (m)
BC	0.040
DBM	0.060
WMM	0.100
CT Base	0.100
CT Sub Base	0.200
SUBGRADE	0.500

Length of CD= **1.785 Km**

Length of road excluding CD= **17.606 Km**

Road Part Not Considered = **0.550 Km**

Quantity Calculation For TCS-1A (4 LANE DIVIDED CARRIAGEWAY WITH PAVED SHOULDER IN RURAL AREA ECCENTRIC WIDENING AND OVERLAY OVER EXISTING PAVEMENT)

Chainage		Length	CD Length	Net Length
From	To			
55063	56268	1205	28.5	1176.5
57308	58343	1035	57.2	977.8

Total Length= **2240** **85.7** **2154.3** **m**

Width of Flexible Pavement=	7.0	m
Width of Kerb Shyness =	0.5	m
Width of Median =	1.5	m
Width of Paved Shoulder =	2.5	m
Width of Earthen Shoulder =	1.5	m
Width of BC=	10.00	m
Width of DBM=	10.00	m
Width of WMM =	10.125	m
Width of CT Base =	10.250	m
Width of CT Sub Base =	13.80	m
Width of Subgrade=	14.50	m

Quantity of Prime coat=	**21543.00**	**sqm**
Quantity of Tack coat (Granular Layer)=	**21543.00**	**sqm**
Quantity of BC=	**861.72**	**cum**
Quantity of DBM=	**1292.58**	**cum**
Quantity of WMM=	**2181.23**	**cum**
Quantity of CT base=	**2208.16**	**cum**
Quantity of CT Sub base=	**5945.87**	**cum**
Quantity of Subgrade=	**15618.675**	**cum**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

Quantity Calculation For TCS-1B (4 LANE DIVIDED CARRIAGEWAY WITH PAVED SHOULDER IN RURAL AREA)
(RECONSTRUCTION OVER EXISTING PAVEMENT WITH PARTIAL GRANULAR LAYER SCARIFICATION)

Chainage		Length	CD Length	Net Length
From	To			
50443	54043	3600	168.7	3431.3
56268	56443	175	9.54	165.46
56993	57308	315	19.04	295.96
58343	59800	1457	19.04	1437.96

Total Length=		**5547**	**216.32**	**5330.68**	**m**
Width of Flexible Pavement=				7.0	m
Width of Kerb Shyness =				0.5	m
Width of Median =				1.5	m
Width of Paved Shoulder =				2.5	m
Width of Earthen Shoulder =				1.5	m
Width of BC=	10.00	m			
Width of DBM=	10.00	m			
Width of WMM =	10.125	m			
Width of CT Base =	10.250	m			
Width of CT Sub Base =	13.80	m			
Width of Subgrade=	14.50	m			

Quantity of Prime coat=	**53306.80**	**sqm**
Quantity of Tack coat (Granular Layer)=	**53306.80**	**sqm**
Quantity of BC=	**2132.27**	**cum**
Quantity of DBM=	**3198.41**	**cum**
Quantity of WMM=	**5397.31**	**cum**
Quantity of CT base=	**5463.95**	**cum**
Quantity of CT Sub base=	**14712.68**	**cum**
Quantity of Subgrade=	**38647.43**	**cum**

Quantity Calculation For TCS-1G (4 LANE DIVIDED CARRIAGEWAY WITH PAVED SHOULDER IN RURAL AREA)
(RECONSTRUCTION OVER EXISTING PAVEMENT WITH PARTIAL GRANULAR LAYER SCARIFICATION)

Chainage		Length	CD Length	Net Length
From	To			
49236	49468	232	42.54	189.46
54043	55063	1020	66.54	953.46

Total Length=		**1252**	**109.08**	**1142.92**	**m**
Width of Flexible Pavement=				7.0	m
Width of Kerb Shyness =				0.5	m
Width of Median =				1.5	m
Width of Paved Shoulder =				2.5	m
Width of Earthen Shoulder =				1.5	m
Width of BC=	10.00	m			
Width of DBM=	10.00	m			
Width of WMM =	10.125	m			
Width of CT Base =	10.250	m			
Width of CT Sub Base =	13.80	m			
Width of Subgrade=	14.50	m			

Quantity of Prime coat=	**11429.20**	**sqm**
Quantity of Tack coat (Granular Layer)=	**11429.20**	**sqm**
Quantity of BC=	**457.17**	**cum**
Quantity of DBM=	**685.75**	**cum**
Quantity of WMM=	**1157.21**	**cum**
Quantity of CT base=	**1171.49**	**cum**
Quantity of CT Sub base=	**3154.46**	**cum**
Quantity of Subgrade=	**8286.17**	**cum**

Quantity Calculation For TCS-1H (4 LANE DIVIDED CARRIAGEWAY WITH PAVED SHOULDER IN RURAL AREA) (RECONSTRUCTION OVER EXISTING PAVEMENT WITH PARTIAL GRANULAR LAYER SCARIFICATION)

Chainage		Length	CD Length	Net Length
From	To			
56443	56993	550	71.13	478.87

Total Length=		**550**	**71.13**	**478.87**	**m**
Width of Flexible Pavement=				7.0	m
Width of Kerb Shyness =				0.5	m
Width of Median =				1.5	m
Width of Paved Shoulder =				2.5	m
Width of Earthen Shoulder =				1.5	m
Width of BC=	10.00	m			
Width of DBM=	10.00	m			
Width of WMM =	10.125	m			
Width of CT Base =	10.250	m			
Width of CT Sub Base =	13.80	m			
Width of Subgrade=	14.50	m			

Quantity of Prime coat=	**4788.70**	**sqm**
Quantity of Tack coat (Granular Layer)=	**4788.70**	**sqm**
Quantity of BC=	**191.55**	**cum**
Quantity of DBM=	**287.32**	**cum**
Quantity of WMM=	**484.86**	**cum**
Quantity of CT base=	**490.84**	**cum**
Quantity of CT Sub base=	**1321.68**	**cum**
Quantity of Subgrade=	**3471.808**	**cum**

Quantity Calculation For TCS-2 (4 LANE DIVIDED CARRIAGEWAY WITH PAVED SHOULDER IN BYPASS STRETCH)

Chainage		Length	CD Length	Net Length
From	To			
59800	64243	4443	277.38	4165.62
65378	67218	1840	76.04	1763.96

Total Length=		**6283**	**353.42**	**5929.58**	**m**
Width of Flexible Pavement=				14.0	m
Width of Kerb Shyness (@0.5m each side)=				1.0	m
Width of Median =				4.0	m
Width of Paved Shoulder (@2.5m each side)=				5.0	m
Width of Earthen Shoulder (@1.5m each side)=				3.0	m
Width of BC=	20.00	m			
Width of DBM=	20.00	m			
Width of WMM =	20.250	m			
Width of CT Base =	20.500	m			
Width of CT Sub Base =	28.60	m			
Width of Subgrade=	30.00	m			

Quantity of Prime coat=	**118591.60**	**sqm**
Quantity of Tack coat (Granular Layer)=	**118591.60**	**sqm**
Quantity of BC=	**4743.66**	**cum**
Quantity of DBM=	**7115.50**	**cum**
Quantity of WMM=	**12007.40**	**cum**
Quantity of CT base=	**12155.64**	**cum**
Quantity of CT Sub base=	**33917.20**	**cum**
Quantity of Subgrade=	**88943.70**	**cum**

Quantity Calculation For TCS-6A (4 LANE DIVIDED CARRIAGEWAY WITH PAVED SHOULDER IN VUP/ROB APPROACHES WITH BOTH SIDE SERVICE ROAD IN BUILT UP/ RURAL AREA FOLLOWS EXISTING 2-LANE ROAD) (CONCENTRIC WIDENING)

Chainage		Length	CD Length	Net Length
From	To			
49468	50443	975	254.44	720.56
67218	67556	338	33.94	304.06

Total Length=		**1313**	**288.38**	**1024.62**	**m**
Width of Flexible Pavement (@9.5m each side)=				19.0	m
Width of Median=				4.0	m
Width of BC=	19.00	m			
Width of DBM=	19.00	m			
Width of WMM =	16.00	m			
Width of CT Base =	16.00	m			
Width of CT Sub Base =	16.00	m			
Width of Subgrade=	22.26	m			
Quantity of Prime coat=			**19467.78**	**sqm**	
Quantity of Tack coat (Granular Layer)=			**19467.78**	**sqm**	
Quantity of BC=			**778.71**	**cum**	
Quantity of DBM=			**1168.07**	**cum**	
Quantity of WMM=			**1639.39**	**cum**	
Quantity of CT base=			**1639.39**	**cum**	
Quantity of CT Sub base=			**3278.78**	**cum**	
Quantity of Subgrade=			**11404.02**	**cum**	

Quantity Calculation For TCS-6B (4 LANE DIVIDED CARRIAGEWAY WITH PAVED SHOULDER IN VUP/ROB APPROACHES WITHOUT BOTH SIDE SERVICE ROAD IN BUILT UP/ RURAL AREA FOLLOWS EXISTING 2-LANE ROAD) (CONCENTRIC WIDENING)

Chainage		Length	CD Length	Net Length
From	To			
64243	65378	1135	627.38	507.62

Total Length=		**1135**	**627.38**	**507.62**	**m**
Width of Flexible Pavement (@9.5m each side)=				19.0	m
Width of Median=				4.0	m
Width of BC=	19.00	m			
Width of DBM=	19.00	m			
Width of WMM =	16.00	m			
Width of CT Base =	16.00	m			
Width of CT Sub Base =	16.00	m			
Width of Subgrade=	22.26	m			
Quantity of Prime coat=			**9644.78**	**sqm**	
Quantity of Tack coat (Granular Layer)=			**9644.78**	**sqm**	
Quantity of BC=			**385.79**	**cum**	
Quantity of DBM=			**578.69**	**cum**	
Quantity of WMM=			**812.19**	**cum**	
Quantity of CT base=			**812.19**	**cum**	
Quantity of CT Sub base=			**1624.38**	**cum**	
Quantity of Subgrade=			**5649.81**	**cum**	

Estimate For 2-Lane Portion

Quantity Calculation For TCS-7 (2 LANE CARRIAGEWAY WITH PAVED SHOULDER IN VUP/ROB APPROACHES WITHOUT SERVICE ROAD IN BUILT UP/ RURAL AREA)

Chainage		Length	CD Length	Net Length
From	To			
0	438	438	33.94	404.06

Total Length=		**438**	**33.94**	**404.06**	**m**
Width of Flexible Pavement =				9.5	m
Width of BC=	9.50	m			
Width of DBM=	9.50	m			
Width of WMM =	6.50	m			
Width of CT Base =	6.50	m			
Width of CT Sub Base =	6.50	m			
Width of Subgrade=	8.76	m			
Quantity of Prime coat=			**3838.57**	**sqm**	
Quantity of Tack coat (Granular Layer)=			**3838.57**	**sqm**	
Quantity of BC=			**153.54**	**cum**	
Quantity of DBM=			**230.31**	**cum**	
Quantity of WMM=			**262.64**	**cum**	
Quantity of CT base=			**262.64**	**cum**	
Quantity of CT Sub base=			**525.28**	**cum**	
Quantity of Subgrade=			**1769.78**	**cum**	

Quantity Calculation For TCS-8 (2 LANE CARRIAGEWAY WITH PAVED SHOULDER IN BYPASS STRETCH)

Chainage		Length	CD Length	Net Length
From	To			
438	1071	633	0	633

Total Length=		**633**	**0**	**633**	**m**
Width of Flexible Pavement=				7.0	m
Width of Kerb Shyness (@0.5m each side)=				1.0	m
Width of Paved Shoulder (@2.0m each side)=				4.0	m
Width of Earthen Shoulder (@1.5m each side)=				3.0	m
Width of BC=	12.00	m			
Width of DBM=	12.00	m			
Width of WMM =	12.125	m			
Width of CT Base =	12.250	m			
Width of CT Sub Base =	16.60	m			
Width of Subgrade=	18.00	m			
Quantity of Prime coat=			**7596.00**	**sqm**	
Quantity of Tack coat (Granular Layer)=			**7596.00**	**sqm**	
Quantity of BC=			**303.84**	**cum**	
Quantity of DBM=			**455.76**	**cum**	
Quantity of WMM=			**767.51**	**cum**	
Quantity of CT base=			**775.43**	**cum**	
Quantity of CT Sub base=			**2101.56**	**cum**	
Quantity of Subgrade=			**5697.00**	**cum**	

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Quantity Calculation For Proposed Clover Leaf

Total Length=		**830**	**m**
Width of Flexible Pavement =		8.0	m
Width of BC=	8.00 m		
Width of DBM=	8.00 m		
Width of WMM =	5.00 m		
Width of CT Base =	5.00 m		
Width of CT Sub Base =	5.00 m		
Width of Subgrade=	7.26 m		

Quantity of Prime coat=	**6640.00 sqm**
Quantity of Tack coat (Granular Layer)=	**6640.00 sqm**
Quantity of BC=	**265.60 cum**
Quantity of DBM=	**398.40 cum**
Quantity of WMM=	**415.00 cum**
Quantity of CT base=	**415.00 cum**
Quantity of CT Sub base=	**830.00 cum**
Quantity of Subgrade=	**3012.90 cum**

Total Quantity:

	Unit	Road Part			Total
Total Quantity of Prime coat=	**sqm**	256846.43			**256846.43**
Total Quantity of Tack coat (Granular Layer)=	**sqm**	256846.43			**256846.43**
Total Quantity of BC=	**cum**	10273.85			**10273.85**
Total Quantity of DBM=	**cum**	15410.79			**15410.79**
Total Quantity of WMM=	**cum**	25124.74			**25124.74**
Total Quantity of CT base=	**cum**	25394.73			**25394.73**
Total Quantity of CT Sub base=	**cum**	67411.89			**67411.89**
Total Quantity of Subgrade=	**cum**	182501.29			**182501.29**

The 0.581km length (From Km 48.655 to Km 49.236) of the road stretch under PKG-5 is already developed in Hapachara-Tulungia Road(NH-17).The Instant Development of 4-lane stretch under PKG-5 is 18.320km and 2-lane stretch is 1.071km

QUANTITY CALCULATION OF SHOULDER FOR MAIN ROAD

For TCS 2, TCS 8 (Both Side Earthen Shoulder)

Total Length (m)	CT base	WMM (m)	DBM Thickness (m)	BC Thickness (m)	Side Offset of each Pavement Layer (m)
6562.58	0.100	0.100	0.060	0.040	0.125

Shoulder Thickness (Crust Thickness of Shoulder Portion)=	0.300	m
Top Width of Shoulder=	1.50	m
Bottom Width of Shoulder=	2.1	m
Avg. Width of Shoulder=	1.8	m

Quantity of Shoulder (cum)=

=2x (1.8 X 0.3 X 6562.58) - 2X(0.1x0.125x6562.58)-2 X (0.1x 0.25x6562.58)

6595.39

Quantity of Hard Shoulder= 2953.16 cum

Quantity of Earthen Shoulder= 3642.23 cum

For TCS 1A, TCS 1B, TCS 1G, TCS 1H (Single Side Earthen Shoulder-Widening Portion)

.

Total Length (m)	CT base	WMM (m)	DBM Thickness (m)	BC Thickness (m)	Side Offset of each Pavement Layer (m)
9106.77	0.100	0.100	0.060	0.040	0.125

Shoulder Thickness (Crust Thickness of Shoulder Portion)=	0.300	m
Top Width of Shoulder=	1.50	m
Bottom Width of Shoulder=	2.1	m
Avg. Width of Shoulder=	1.8	m

Quantity of Shoulder (cum)=

= (1.8 X 0.3 X 9106.77) - (0.1x0.125x9106.77) - (0.1x 0.25x9106.77)

4576.15

Quantity of Hard Shoulder= 2049.02 cum

Quantity of Earthen Shoulder= 2527.13 cum

For TCS 1B, TCS 1G (Single Side Earthen Shoulder-Existing portion)

Total Length (m)		RAP (m)	DBM Thickness (m)	BC Thickness (m)	Side Offset of each Pavement Layer (m)
6473.60		0.110	0.060	0.040	0.125

Shoulder Thickness (Crust Thickness of Shoulder Portion)=	0.210	m
Top Width of Shoulder=	1.50	m
Bottom Width of Shoulder=	1.92	m
Avg. Width of Shoulder=	1.71	m

Quantity of Shoulder (cum)=

= (1.71 X 0.21 X 6473.6) - (x0.125x6473.6) - (0.11x 0.25x6473.6)

2146.65

Quantity of Hard Shoulder= 1456.56 cum

Quantity of Earthen Shoulder= 690.09 cum

For TCS 1H (Single Side Earthen Shoulder-Existing portion)

Total Length (m)	WMM (m)	WMM (m)	DBM Thickness (m)	BC Thickness (m)	Side Offset of each Pavement Layer (m)
478.87	0.125	0.125	0.100	0.040	0.125

Shoulder Thickness (Crust Thickness of Shoulder Portion)=	0.390	m
Top Width of Shoulder=	1.50	m
Bottom Width of Shoulder=	2.28	m
Avg. Width of Shoulder=	1.89	m

Quantity of Shoulder (cum)=

= (1.89 X 0.39 X 478.87) - (0.125x0.125x478.87) - (0.125x 0.25x478.87)

330.53

Quantity of Hard Shoulder= 107.75 cum

Quantity of Earthen Shoulder= 222.78 cum

Quantity summary of Shoulder::

Total Quantity of Hard Shoulder= 6566.49 cum

Total Quantity of Earthen Shoulder= 7082.23 cum

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

Calculation of Extra Widening

For 0.6m EXTRA WIDENING						
HIP/CURVE NO.	ELEMENT	START	END	CHORD LENGTH (m)	LENGTH OF EXTRA WIDENING(m)	RADIUS (m)
		CHAINAGE (m)	CHAINAGE (m)			
	Transition	53043.478	53133.478	90	45.00	
1	Arc	53133.478	53202.641	69.163	69.16	250
	Transition	53202.641	53292.641	90	45.00	
	Transition	53891.218	53981.218	90	45.00	
2	Arc	53981.218	54168.119	186.9	186.90	250
	Transition	54168.119	54258.119	90	45.00	
	Transition	54980.064	55070.064	90	45.00	
3	Arc	55070.064	55101.913	31.849	31.85	250
	Transition	55101.913	55191.913	90	45.00	
	Transition	62098.598	62188.598	90	45.00	
4	Arc	62188.598	62248.481	59.883	59.88	250
	Transition	62248.481	62338.481	90	45.00	
			Total Length of 0.6m Extra Widening=		**708**	**m**

Total Length of 0.6m Extra Widening= **708** **m**

Total Area of Extra Widening= **424.8** **sqm**

Layer Thickness:-

Pavement	Thickness (m)
Subgrade	0.500
CT Sub Base	0.200
CT Base	0.100
WMM	0.100
DBM	0.060
BC	0.040

Quantity Summary Of Extra Widening::

Total Quantity of Subgrade= **212.400** **cum**
Total Quantity of CT Sub Base = **84.96** **cum**
Total Quantity of CT Base = **42.48** **cum**
Total Quantity of WMM= **42.48** **cum**
Total Quantity of DBM= **25.49** **cum**
Total Quantity of BC= **16.99** **cum**
Total Quantity of Tack Coat (Granular Layer)= **424.80** **sqm**
Total Quantity of Prime Coat= **424.80** **sqm**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

Summary of Flexible Pavement

Total Quantity:

	Unit	Road Part (Ch. 48.455 Km to Ch. 67.556 Km) & (Ch. 0.000 Km to Ch. 1.071 Km)				Re-use Material	Total
		Existing Portion	Widening Portion	Extra Widening	Shoulder (Main Road)		
Total Quantity of Prime coat=	**sqm**	69524.70	256846.43	424.80			**326795.93**
Total Quantity of Tack coat (Bituminous Layer)=	**sqm**	21543.00					**21543.00**
Total Quantity of Tack coat (Granular Layer)=	**sqm**	69524.70	256846.43	424.80			**326795.93**
Total Quantity of BC=	**cum**	3642.71	10273.85	16.99			**13933.55**
Total Quantity of DBM=	**cum**	6517.33	15410.79	25.49			**21953.61**
Total Quantity of WMM=	**cum**	1219.62	25124.74	42.48			**26386.84**
Total Quantity of CT base=	**cum**		25394.73	42.48			**25437.21**
Total Quantity of CT sub base=	**cum**		67411.89	84.96			**67496.85**
Total Quantity of GSB (Drainage/Filter Layer) =	**cum**	12915.72			6566.49	3528	**15954.21**
Total Quantity of GSB (Separation Layer) =	**cum**	12011.77				5291	**6720.77**
Total Quantity of RAP=	**cum**	7209.97				7349	**7209.97**
Total Quantity of Geocell=	**sqm**	80078.43					**80078.43**
Total Quantity of Subgrade=	**cum**	0.00	182501.29	212.40	7082.23		**189795.92**

Quantity calculation for Service Road

Pavement Layer thickness (TCS 6A):

Pavement layer	Thickness (m)
BC	0.040
WMM	0.100
CT base	0.100
CT sub base	0.200
Subgrade	0.500

TCS Type	Carriageway width (m)	Shoulder width(m)	Width of BC (m)	Width of WMM (m)	CT base (m)	CT sub base (m)	Width of Subgrade (m)
TCS 6A	15	0	15	15	15	15	15

TCS Type	Length(m)	Prime Coat (sqm)	Tack Coat (sqm)	BC (cum)	WMM (cum)	CT base (cum)	CT sub base (cum)	Subgrade (cum)
TCS 6A	1058.56	15878.40	15878.40	635.14	1587.84	1587.84	3175.68	7939.20
Total	**1058.56**	**15878.40**	**15878.40**	**635.14**	**1587.84**	**1587.84**	**3175.68**	**7939.20**

Service Road at Clover Leaf Location:

Service Road for Clover Leaf	Carriageway width (m)	Shoulder width(m)	Width of BC (m)	Width of WMM (m)	CT base (m)	CT sub base (m)	Width of Subgrade (m)
	9	0	9	9	9	9	9

	Length(m)	Prime Coat (sqm)	Tack Coat (sqm)	BC (cum)	WMM (cum)	CT base (cum)	CT sub base (cum)	Subgrade (cum)
	1025.00	9225.00	9225.00	369.00	922.50	922.50	1845.00	4612.50
Total	**1025.00**	**9225.00**	**9225.00**	**369.00**	**922.50**	**922.50**	**1845.00**	**4612.50**

Quantity Summary::

Total Quantity of Prime coat=	**25103.40**
Total Quantity of Tack coat (Granular Layer)=	**25103.40**
Total Quantity of BC=	**1004.14**
Total Quantity of WMM=	**2510.34**
Total Quantity of CT Base	**2510.34**
Total Quantity of CT Sub Base	**5020.68**
Total Quantity of Subgrade=	**12551.70**
Total Quantity of RCC Crash Barrier (M20) =	**2117.12**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

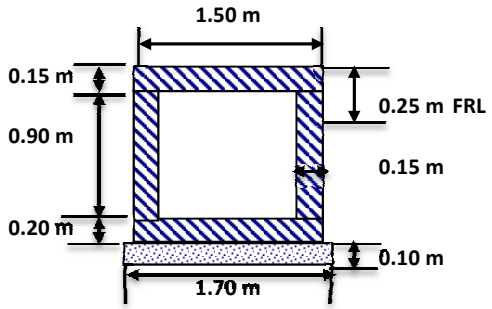
Quantity Calculation For Drain (Service Road)

Cover Drain (1.5 m Width)

Chainage(m)		CD Length	TCS Type	Side	Net Length(m)
From	To				
49468	50443	254.44	TCS 6A	Both	1441.12
67218	67556		TCS 6A	Both	676.00
				Total Length=	**2117.12** m

Outfall of 10 m length in 2 location = 20 m

Total length of drain = 2138 m



Quantity Calculation for Covered Side Drain :

Item	Component	Nos	Length (m)	Width (m)	Thickness (m)	Quantity (cum)
Earthwork		1	2138	1.800	1.100	4233.240
PCC (M15)		1	2138	1.700	0.100	363.460
RCC (M25)-substructure	Side wall	2	2138	0.900	0.150	577.260
	Bottom slab	1	2138	1.500	0.200	641.400
					Total =	**1218.660**
Reinforcement in ton	(@ 70 kg/cum of RCC)					85.306
					Total (in ton) =	**85.306**
RCC-M25	cover	1	2138	1.500	0.150	481.050
					Total =	**481.050**
Reinforcement in ton	(@ 70 kg/cum of RCC)					33.674
					Total (in ton) =	**33.674**
Weep holes (PVC pipe 50 mm dia)	no of weep holes in horizontal (per meter) X (2138 + 1) X2 =					4278
					Total =	**4278**

Quantity Summary :

Total Quantity of earthwork =	**4233.24**	**cum**
Total Quantity of PCC M15 =	**363.46**	**cum**
Total Quantity of RCC M25 (sub-structure) =	**1699.71**	**cum**
Total Quantity of Steel (sub-structure)=	**118.98**	**t**
Weep-hole=	**4278**	**no.**

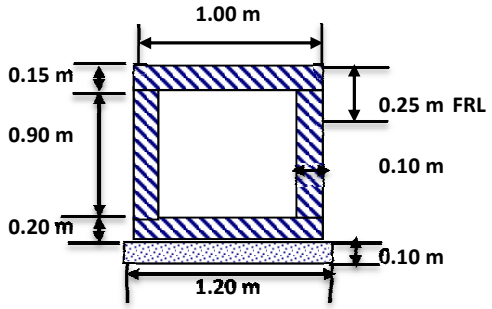
C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

Cover Drain (1.0m Width)

Service Road at Clover Leaf Location:		CD Length	TCS Type	Side	Net Length(m)	
	1025			Single	1025.00	
				Total Length=	**1025**	**m**

Outfall of 10 m length in 2 location = 20 m

Total length of drain = 1045 m



Quantity Calculation for Covered Side Drain :

Item	Component	Nos	Length	Width	Thickness	Quantity
Earthwork		1	1045	1.300	1.100	1494.350
PCC		1	1045	1.200	0.100	125.400
RCC	Side wall	2	1045	0.900	0.100	188.100
(M25)-substructure	Bottom slab	1	1045	1.000	0.200	209.000
					Total =	**397.100**
Reinforcement in ton	(@ 70 kg/cum of RCC)					27.797
					Total (in ton) =	**27.797**
RCC-M25	cover	1	1045	1.000	0.150	156.750
(super-structure)	Dudection					
					Total =	**156.750**
Reinforcement in ton	(@ 70 kg/cum of RCC)					10.973
					Total (in ton) =	**10.973**
Weep holes	no of weep holes in horizontal (per meter) X (1045 + 1) X2 =					2092
					Total =	**2092**

Quantity Summary :

Total Quantity of earthwork =	**1494.35**	**cum**
Total Quantity of PCC M15 =	**125.40**	**cum**
Total Quantity of RCC M25 (sub-structure) =	**553.85**	**cum**
Total Quantity of Steel (sub-structure)=	**38.77**	**t**
Weep-hole=	**2092**	**no.**

Total Quantity Summary :

Total Quantity of earthwork =	**5727.59**	**cum**
Total Quantity of PCC M15 =	**488.86**	**cum**
Total Quantity of RCC M25 (sub-structure) =	**2253.56**	**cum**
Total Quantity of Steel (sub-structure)=	**157.75**	**t**
Weep-hole=	**6370.00**	**no.**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

CALCULATION FOR BUS -BAY WITH PASSENGER SHELTER

Chainage of Bus bay With Passenger Shelter:

Chainage(km)	Side
57.400	Both
65.700	Both

Thickness of Layer:

Layer	Thickness
Subgrade	500
CT sub base	200
CT base	100
WMM	100
DBM	60
BC	40

Total Number of Busbay = **4** Nos

Total Number of Passenger Shelter = **4** Nos

Area required for Busbay =	0.5x100x10+30x10+0.5x100x10 =	**1300 sqm**
Area of Kerb =	30x1.5 =	**45.00 sqm**
Deducting area for kerb, Total area =		**1255 sqm**
Subgrade	4x1255x0.5 =	**2510 cum**
CT sub base	4x1255x0.2 =	**1004 cum**
CT base	4x1255x0.1 =	**502 cum**
WMM Quantity =	4x1255x0.1 =	**502 cum**
DBM Quantity =	4x1255x0.06 =	**301.2 cum**
BC Quantity =	4x1255x0.04 =	**200.8 cum**
Prime coat Quantity =	4x1255 =	**5020 sqm**
Tack coat Quantity (Granular)=	1x4x1255 =	**5020 sqm**
Kerb Length =		**252 m**
Earthwork for Median =		**51.246 cum**

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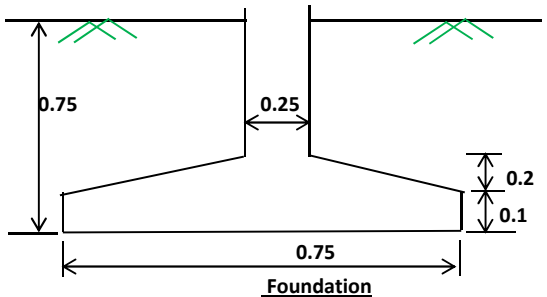
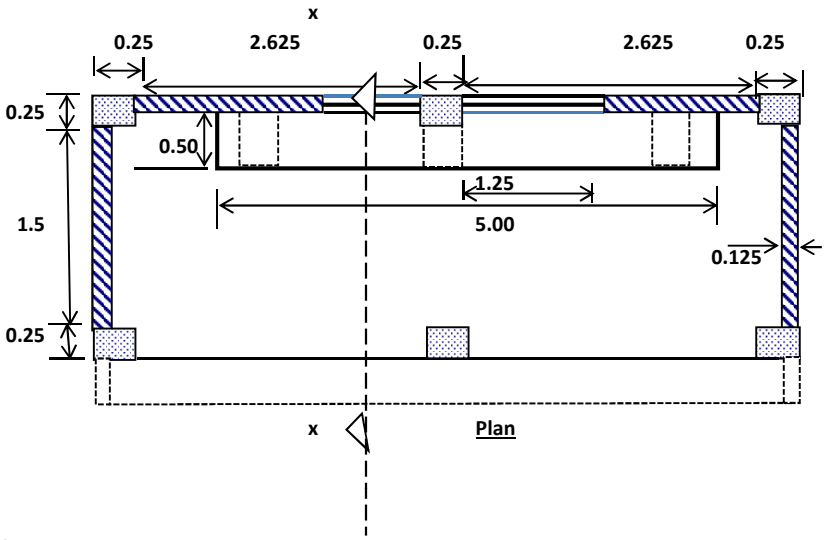
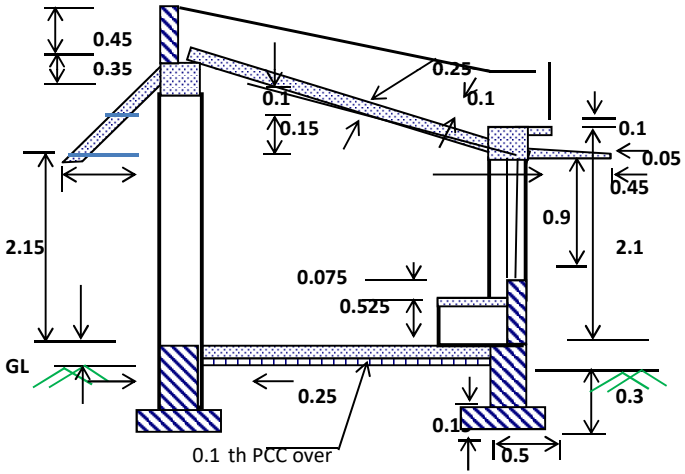
Drawing of Passenger Shelter (Not to Scale):-



Foundation



Plan



Section at X-X

Component	Description	Unit	Nos	Length	Width (w)	Thickness /height (t)	Quantity	Total Quantity
Foundation								
Earthwork	Column	cum	6	0.85	0.85	0.75	3.25	
	For Brick Wall	cum	1	13.50	0.50	0.30	2.03	
						Total =	**5.28**	**21.12**
Brick Masonry (1:4)	Lower Portion	cum	1	13.50	0.50	0.15	1.01	
	Upper Portion	cum	1	13.50	0.25	0.15	0.51	
						Total =	**1.52**	**6.08**
RCC (M-20)	Column	cum	6	0.75	0.75	0.10	0.34	
			6	0.56	0.06	0.20	0.06	
			6	0.25	0.25	0.45	0.17	
						Total =	**0.57**	**2.28**
Reinforcement	Column	ton	(@ 75 kg/cum of RCC)				0.04	
						Total =	**0.04**	**0.16**
Super structure								
Brick Masonry	Lower Portion of Side Wall & Back wall	cum	1	13.50	0.25	0.25	0.84	
	Upper Portion of Side Wall	cum	1	3.00	0.125	1.88	0.71	
	Upper Portion of back wall	cum	1	5.25	0.125	1.60	1.05	
	Railing	cum	1	9.75	0.125	0.45	0.55	
	Seating bench	cum	3	0.50	0.250	0.525	0.20	
	Deduction for Window		2	1.25	0.125	0.90	0.28	
	Plinth soling	Sqm	1	5.75	1.75	0.075	0.75	
						Total =	**4.38**	**17.52**
PCC (M15)	Floor	cum	1	5.75	1.75	0.10	1.01	
						Total =	**1.01**	**4.04**
RCC M25	Front column	cum	3	0.25	0.25	2.65	0.50	
	Back column	cum	3	0.25	0.25	2.10	0.39	
	Side beam (RB2)	cum	2	1.53	0.35	0.25	0.27	
	Side beam (RB1)	cum	4	3.00	0.35	0.25	1.05	
	Roof slab	cum	1	5.25	1.53	0.10	0.80	
	Front Chajja	cum	1	5.25	0.68	0.10	0.36	
	Back Chajja	cum	1	5.25	0.45	0.05	0.12	
	Seating bench	cum	1	5.00	0.50	0.075	0.19	
						Total =	**3.68**	**14.72**

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Reinforcement		ton	(@ 75 kg/cum of RCC)				0.28	
						Total =	**0.28**	**1.12**
Plastering	Side wall (Both Side)	sqm	4	2.00	3.83		30.64	
	Backwall (Both Side)	sqm	2	6.00	2.35		28.20	
	Roof	sqm	1	5.25	1.53		8.03	
	Dudection for Window		4	1.25	0.90		4.50	
						Total =	**62.37**	**249.48**

Summary of Quantity of Busbay with Passenger Shelter:

DESCRIPTION	QUANTITY	UNIT
Road part		
Subgrade	2510.00	cum
CT sub base	1004.00	cum
CT base	502.00	cum
WMM	502.00	cum
DBM	301.20	cum
BC	200.80	cum
Prime coat	5020.00	sqm
Tack coat (Granular)=	5020.00	sqm
Kerb	252.00	m
Earthwork (median)	51.25	cum
Foundation		
Earthwork	21.12	cum
Brick Masonry (1:4)	6.08	cum
RCC (M-25)	2.28	cum
Reinforcement	0.16	ton
Super structure		
Brick Masonry	17.52	cum
PCC (M15)	4.04	cum
RCC (M-25)	14.72	cum
Reinforcement	1.12	ton
Plastering	249.48	sqm

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

Quantity Calculation For Junction Road

Pavement Layer	Thickness (m)
BC	0.040
DBM	0.060
WMM	0.100
CT base	0.100
CT sub base	0.200
Subgrade	0.500

Quantity Calculation for Major junction:

Type of junction	No	Area per junction(sqm)	Total area(sqm)	Prime Coat (sqm)	Tack Coat (sqm)	BC (cum)	DBM (cum)	WMM (cum)	CT base (cum)	CT sub base (cum)	Subgrade (cum)
Major junction (3 Legged)	1	2000.000	2000.000	2000.00	2000.000	80.000	120.000	200.000	200.000	400.000	1000.000

Quantity Calculation for Minor junction:

Type of junction	No	Area per junction(sqm)	Total area(sqm)	Prime Coat (sqm)	Tack Coat (sqm)	BC (cum)	DBM (cum)	WMM (cum)	CT base (cum)	CT sub base (cum)	Subgrade (cum)
Minor junction (4 Legged)	5	300.000	1500.000	1500.00	1500.000	60.000	90.000	150.000	150.000	300.000	750.000
Minor junction (3 Legged)	10	200.000	2000.000	2000.00	2000.000	80.000	120.000	200.000	200.000	400.000	1000.000

Total Quantity of CT sub base=	**1100.00**	**cum**
Total Quantity of CT base=	**550.00**	**cum**
Total Quantity of WMM=	**550.00**	**cum**
Total Quantity of DBM=	**330.00**	**cum**
Total Quantity of BC=	**220.00**	**cum**
Total Quantity of Tack Coat (Granular surface)=	**5500.00**	**sqm**
Total Quantity of Prime Coat=	**5500.00**	**sqm**
Total Quantity of Subgrade=	**2750.00**	**cum**

CALCULATION FOR DELINEATOR

In Horizontal Curves (radius 1000 m or less)

HIP / CURVE NO.	ELEMENT	START CHAINAGE (m)	END CHAINAGE (m)	RADIUS (m)	Spacing on Curve (S)	Length	Nos in outside curve (s)	Nos in inner curve (2s)	1.8s beginning of curve	1.8s end of curve	3s beginning of curve	3s end of curve	6s beginning of curve	6s end of curve
2	Arc	50599.051	50656.158	600	38	57.107	4	2	2	2	2	2	2	2
3	Arc	51666.690	51688.980	600	38	22.290	2	2	2	2	2	2	2	2
4	Arc	53133.478	53202.641	250	20	69.163	8	4	2	2	2	2	2	2
5	Arc	53981.218	54168.119	250	20	186.901	20	10	2	2	2	2	2	2
6	Arc	55070.064	55101.913	250	20	31.849	4	2	2	2	2	2	2	2
7	Arc	56911.071	56925.947	500	35	14.876	2	2	2	0	2	0	2	0
8	Arc	57045.283	57157.127	500	35	111.844	8	4	0	2	2	2	0	2
9	Arc	61674.957	61800.054	350	25	125.097	12	6	2	2	2	2	2	0
10	Arc	62188.598	62248.481	250	20	59.883	6	4	2	2	2	2	0	0
11	Arc	62630.256	62852.551	350	25	222.295	18	10	2	2	2	2	0	2
12	Arc	66773.683	66948.828	700	42	175.145	10	6	2	0	2	0	2	0
For 2-Lane Portion														
13	Arc	631.074	928.363	500	35	297.289	18	10	0	0	2	0	0	0
				TOTAL =		**1373.7**	**112**	**62**	**20**	**18**	**24**	**18**	**16**	**14**

Total no. of delineator = 284 nos.

CALCULATION FOR ROAD STUD

SL. No.	Description of section	START CHAINAGE (m)	END CHAINAGE (m)	Transition length	START CH. Road Stud	END CH. Road stud	Length	Radius	Spacing on Curve (S)	HAND OF ARC	Total On Median (nos)	Total On shoulder
1	Horizontal curve :: Curve radii upto 450 , spacing =9m. Curve radii 451 to 750 , spacing =18m. Curve radii 751 to 2000m & critical sections, spacing =27m	50599.051	50656.158	80	50499.051	50756.158	257.11	600	18	Right	30	30
		51666.690	51688.980	80	51566.690	51788.98	222.29	600	18	Left	26	26
		53133.478	53202.641	90	53023.478	53312.641	289.16	250	9	Left	66	66
		53981.218	54168.119	90	53871.218	54278.119	406.90	250	9	Right	92	92
		55070.064	55101.913	90	54960.064	55211.913	251.85	250	9	Left	56	56
		56911.071	56925.947	45	56846.071	56990.947	144.88	500	18	Right	18	18
		57045.283	57157.127	45	56980.283	57222.127	241.84	500	18	Right	28	28
		61674.957	61800.054	70	61584.957	61890.054	305.10	350	9	Left	68	68
		62188.598	62248.481	90	62078.598	62358.481	279.88	250	9	Left	64	64
		62630.256	62852.551	70	62540.256	62942.551	402.29	350	9	Right	90	90
		66773.683	66948.828	35	66718.683	67003.828	285.14	700	18	Right	32	32
		For 2-Lane Portion										
		631.074	928.363	45	566.074	993.363	427.29	500	18	Left	48	48
										Total=	**618**	**618**

Total no. of Road stud = 1236 nos.

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

Quantity Calculation for Traffic sign

Sl No	Type	IRC-67 2012 Specification	Dimension	Chainage / Location	No	Remarks
1	Right Hand Side Curve	fig 15.02	900 mm Tringular	6 location	12	@ 2 per location
2	Left Hand Side Curve	fig 15.01	900 mm Tringular	6 location	12	@ 2 per location
3	School	fig 15.34	900 mm Tringular	2 location	4	@ 2 per location
4	Side road left	fig 15.10	900 mm Tringular	9 location	18	@ 2 per location
5	Side road right	fig 15.09	900 mm Tringular	2 location	4	@ 2 per location
6	Cross Road	fig 15.14	900 mm Tringular	5 nos	10	@ 2 per location
7	Bus Stop	fig 17.35	800x600 rectangular	2 Nos	8	@ 2 per location
8	Direction Sign		<.0.9 sqm		21	
9	Stop Sign	fig 14.01	900 mm Octagonal		22	
10	Horn prohibited	fig 14.18	600mm Cicular	School (2 location)	4	
11	Hazard Marker (one way)	fig 15.76 & fig 15.77	900x300 mm rectangular	Culvert,Bridge, VUP & ROB Location	316	@ 4 per structure
12	Object Marker (one way)	fig 15.76 & fig 15.77	900x300 mm rectangular	Busbay	8	@ 2per location
19	Pedestrian Crossing	Fig 15.33	900 mm Tringular		18	

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

Junction Part:

3-Legged Junction					
No of 3 legged Major Junction			**1**	**nos**	
1	Right Hand Side Curve	fig 15.02	900 mm Tringular	nosx1	**1**
2	Left Hand Side Curve	fig 15.01	900 mm Tringular	nosx1	**1**
3	Side Road	fig 15.09 & 15.10	900 mm Tringular	nosx2	**2**
4	T Intersection	fig 15.18	900 mm Tringular	nosx1	**1**
5	Pedestain Crossing	fig 15.33	900 mm Tringular	nosx3	**3**
6	Stop Sign	fig 14.01	900 mm Octagonal	nosx3	**3**
7	Speed limit	fig 14.37	600mm Cicular	nosx1	**1**
8	U-Turn prohibited	fig 14.24	600mm Cicular	nosx5	**5**
9	Rumble strip	fig 15.50	900 mm Tringular	nosx3	**3**
10	Object Marker (one way)	fig 15.76 & fig 15.77	900x300 mm rectangular	nosx5	**5**
11	Object Marker (Two way)	fig 15.78	900x450 mm rectangular	nosx1	**1**
12	Direction Sign		<.0.9 sqm	nosx3	**3**
13	Direction Sign		>0.9 sqm	nosx5	**5**

SUMMARY			
90 cm equilateral triangle			**89**
Stop Sign (90 cm high octagon)			**25**
60 cm circular			**10**
80 cm x 60 cm rectangular			**8**
Direction Sign		**<.0.9 sqm**	**25**
Direction Sign		**>0.9 sqm**	**5**
Object marker(900X300mm)			**329**

Calculation for Kilometre Stone :

Item	No.	Calculation Backup
5 th Kilometer Stone	8	Total Length /5
Kilometer stones	22	(Total Length) - No.of km 5th Stones
Hectometer stones	58	(Total Lengthx5) - No.of km 5th Stones - No.of km Stones
Boundary stones	178	(Total Lengthx5x2) + 2x1

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

Quantity Calculation for Road Marking

Effective Length of road (m)	17605.65

Length of Road for 4 Lane Portion= 16568.59 m
Length of Road for 2 Lane Portion= 1037.06 m

Lane Marking (Center Line):

Items	NO.	Length (m)	Width (m)	Area (sqm)	Remarks
Lane marking in 4 lane portion excluding junction	2	16568.59	0.15	1988.23	@3m Marking per 7.5m Length
Lane marking in 2 lane portion excluding junction	1	1037.06	0.15	62.22	@3m Marking per 7.5m Length
			Sub total=	**2050.45**	sqm

Lane marking in Mainline, Junction	**Total (in sqm)=**	**2052.450**

Edge Line Marking (Main line):

Items	Effective Length (m)	Width (m)	Area (sqm)	Remarks
Edge Line marking (For 4 Lane portion)	66274.36	0.15	9941.15	Continuous line
Edge Line marking (For 2 Lane portion)	2074.12	0.15	311.12	Continious line
		Sub total=	**10252.27**	

Total Edge Line Marking on project Road =	**Total (in sqm)=**	**10252.27**

Pedestarian Marking:

Location	No.	Marking per junction (nos)	Individual Area(sqm)	Total Area (sqm)
Bus Stop(both side)	4	20	1.5	120
Schools	2	20	1.5	60
			Total (in sqm) =	**210**

(i) Lane marking, edge marking	**sqm**	**12515**
(ii) Lettering	**sqm**	**1252**
	Total =	**13767**
	Say	**13800**

Total area of painting = 13800 sqm

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

Quantity Calculation for W-Metal Beam Crash Barrier

Description	No	Length(m)	Remarks	
Major Bridge	1	200	@ 50m length at the approach of the structure at 4 side	
Minor Bridge	9	1800	@ 50m length at the approach of the structure at 4 side	
Total langth=		**2000**	**m**	

W-Beam crash barrier above 3m high embankment

Chainage(km)		Side	CD Length (m)	Length (m)
From	To			
4 LANE PORTION				
60125	60375	Both	66.5	367
60725	61125	Both	66.5	667
61575	62150	Both	67.88	1014.24
62150	62225	RHS		75
62225	63750	Both		3050
63750	63975	LHS		225
64125	64175	Both	47.88	4.24
65500	66125	Both	9.54	1230.92
66125	66200	LHS		75
66375	66600	Both		450
66700	66825	Both		250
66950	67220	Both	66.5	407
2 LANE PORTION				
438	1071	Both		1266
		Total=		**9081.4**

Total Length of W- Beam crash barrier=	**11081**		**m**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

CALCULATION FOR STREET LIGHTING

Proposed Street light location (Median & Service Road):

TCS Type	Length	Length (m)
TCS 6A	1313.00	3939.00
	Total =	**3939**

Busbay & Passenger Shelter location= 920 m
Bridge approach= 2000.00 m
Bridge Portion= 1785.35 m
Total length = **8644 m**

Assuming , street lights @= 50 m interval

for **8644 m** **173** **nos**

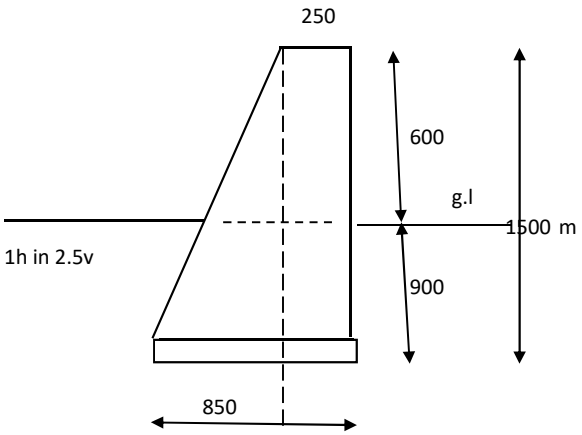
Total nos of street light= **177** **nos**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

Quantity Calculation of Toe Wall

Toe wall for 0.6m height

Top Width of Wall:	250	mm
Thickness of PCC:	100	mm
Depth Below Ground Level:	900	mm
Height:	1500	mm
Width at bottom:	850	mm
height above groundlevel :	**600**	**mm**



Per metre Quantity

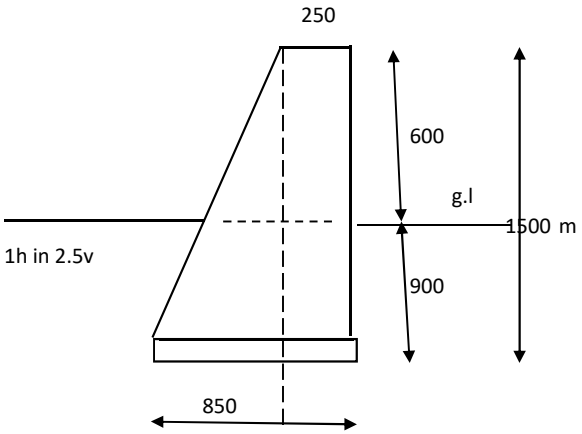
Excavation:	0.765	cum
PCC:	0.085	cum
RCC M25 :	0.770	cum

Sl. No.	Chainage		CD length	Net length	side	Total Length (m)	Earth Work (cum)	PCC M15 (cum)	RCC M25 (cum)
	from	to							
1	60175	60250		75	both	150.00	114.75	12.75	115.50
2	65500	65750	9.54	250	LHS	240.46	183.95	20.44	185.15
3	66075	66175		100	LHS	100.00	76.50	8.50	77.00
					Total =	**490.46**	**375.20**	**41.69**	**377.65**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

Toe wall for 0.6m height

Top Width of Wall:	250 mm
Thickness of PCC:	100 mm
Depth Below Ground Level:	900 mm
Height:	1500 mm
Width at bottom:	850 mm
height above groundlevel :	**600 mm**



Per metre Quantity

Excavation:	0.765 cum
PCC:	0.085 cum
RCC M25 :	0.770 cum

Sl. No.	CHAINAGE		CD length	Length	SIDE	Total Length (m)	Earth Work (cum)	PCC M15 (cum)	RCC M25 (cum)
	FROM	TO							
1	53260	53400	9.50	140	RHS	130.50	99.83	11.09	100.49
2	57550	57620	9.50	70	RHS	60.50	46.28	5.14	46.59
3	58100	58845	47.66	745	LHS	697.34	533.47	59.27	536.95
7	58840	58950		110	RHS	110.00	84.15	9.35	84.70
4	59100	59950		850	LHS	850.00	650.25	72.25	654.50
5	59285	59360		75	RHS	75.00	57.38	6.38	57.75
					Total =	**1923.34**	**1471.36**	**163.48**	**1480.98**

Quantity summary ::

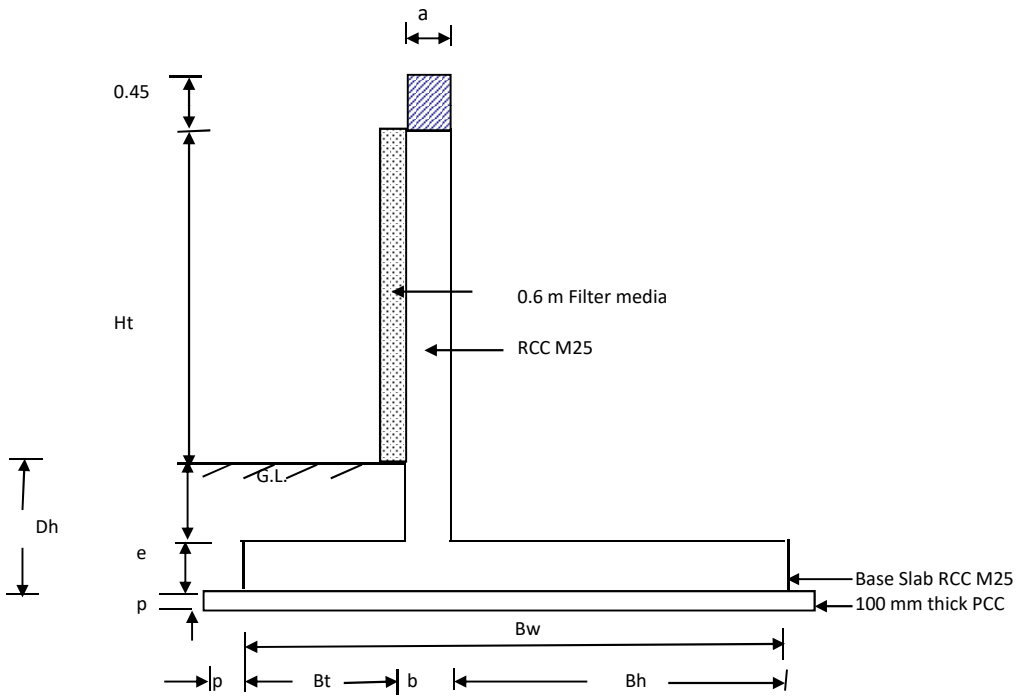
Earthwork =	**1846.56 cum**
PCC M15 =	**205.17 cum**
RCC M25 =	**1858.63 cum**
Steel	**130.10 t**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

Quantity for RCC Retaining Wall

Chainage		Side	Avg. Height	CD Length	Net Length
From	To				
60250	60350	BOTH	4	66.5	67.00
61950	62125	BOTH	3	67.88	214.24
66950	67000	LEFT	3		50.00
67000	67150	BOTH	3	66.5	167.00
				Total =	**498.24**

Length of 3.0m Retaining Wall= 431.24 m
Length of 4.0m Retaining Wall= 67.00 m



C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

Total Height =	**H**	**m**	**3.00**	**4.00**
Height of retaining Wall =	ht	m	3.00	4.00
Depth of Embankment =	Dh	m	1.00	1.00
Base Width =	Bw	m	3.30	4.15
Toe Width (Bt) =	Bt	m	1.10	1.50
Heel Width (Bh) =	Bh	m	1.85	2.20
Toe Thickness At Tip =	e	m	0.30	0.40
Toe Thickness At Junction =	f	m	0.30	0.40
Heel Thickness At Tip =	c	m	0.30	0.40
Heel Thickness At Junction =	d	m	0.30	0.40
Stem Thickness at Top =	a	m	0.20	0.20
Stem Thickness At Junction =	b	m	0.35	0.45
Reinforcement per m =		Kg	228.61	440.59
Total concrete volume (For 1m length)		m^3	2.01	3.16
Concrete volume		Kg/m^3	113.74	139.43
PCC at bed Thickness =	p	m	0.10	0.10
Length of Retaining Wall =	L	m	431.24	67
Width of Filter Media =		m	0.60	0.60
Height of Parapet Wall =		m	0.45	0.45

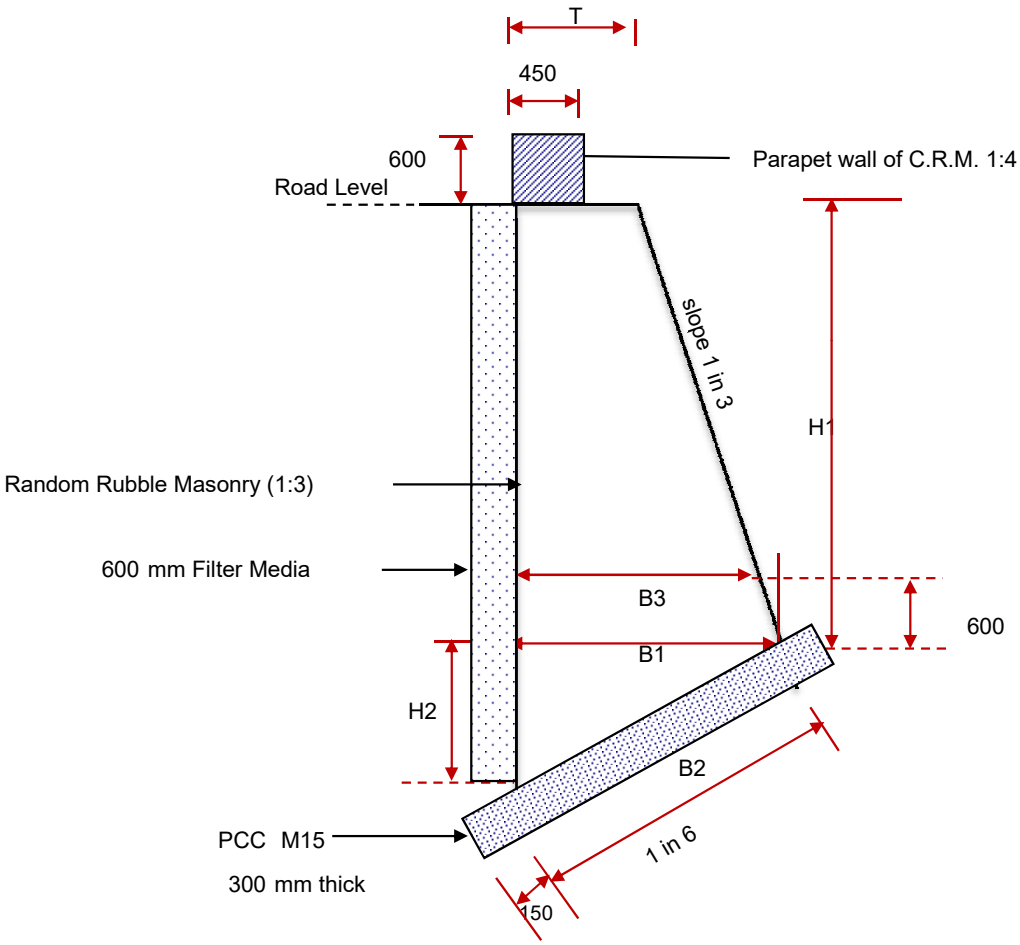
Sl. No.	**Items**	**Unit**	Calculation	Quantity For 3 m ret wall	Quantity For 4 m ret wall	**Total Quantity**
	Foundation					
1	Earth Work in Excavation	cum	=(Dh+p) x (Bw+(px2)) x L	1660.27	320.60	**3261.65**
2	PCC M15 in Foundation	cum	=p x (Bw+p+p) x L	150.93	29.15	**296.51**
3	RCC (M25) in Foundation	cum	=Dh x Bw x L	426.93	111.22	**807.68**
4	Steel in Foundation	ton	Concrete volume Kg/m^3 taken from Table	48.56	15.51	**95.21**
	Substructure					
5	RCC (M-25) upto 5m					
	For Wall	cum	=H x d x L	320.20	78.39	**568.39**
6	Steel in Sub structure	ton	Concrete volume Kg/m^3 taken from Table	37.00	9.06	**65.68**
7	No of Weepholes	R metre	@ c/c 2m hor & 1m Ver.	227.85	63	**290.85**
8	Filter Media	cum	0.6 m Filter media x ht x L	776.23	160.80	**1454.52**
	Superstructure					
9	Parapet (PCC M20)	cum	Gap 300mm in Every 10m Length	37.65	5.87	**43.52**

QUANTITY CALCULATION RETAINING WALL

RETAINING WALL HIGHT 2m

Chainage		side	Hight	CD Length	Length
From	To				
55840	55985	RHS	2.0		145
61800	61950	Both	2.0		300
62200	62350	RHS	2.0		150
62300	62850	LHS	2.0		550
63150	63300	LHS	2.0		150
65550	65725	RHS	2.0		175

Length of 2.0m Retaining Wall = 1470 m



Hight (H1)	T	B1	B2	B3	H2
2	0.6	1.27	1.288	1.1	0.212

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

Item	Calculation	Unit	Unit Quantity For 2m	Total Quantity
Earth Work in Excavation=	1/2x[(H2+0.6+0.3)+(0.6+0.3)]x(0.15+B3+0.3)	cum	0.99	1455.30
PCC M15 in Foundation =	0.3x(0.15+B2+0.15)	cum	0.48	705.60
RR Masonry (1:3) = (Foundation)	[1/2x(B3+B1)x0.6]+[1/2xH2xB1]	cum	0.85	1249.50
RR Masonry (1:3) =	1/2x(B3+T)x(H1-0.6)	cum	1.19	1749.30
Parapet wall @ 2m length & 0.6m Gap CR Masonry (1:3)	(2x0.45x0.6)	cum	0.54	305.64
Weepholes	(1/1) x (H1/1)X(B2+T)/2	nos	2.00	1470.00
Filter Media	0.6 x (H1+H2)	cum	1.33	1955.10

Quantity Summary

Earthwork in Ordinary Soil =	**1455.30**	**cum**
PCC M15 in Foundation =	**705.60**	**cum**
RR Masonry (Foundation)=	**1249.50**	**cum**
RR Masonry (1:3) =	**1749.30**	**cum**
CR Masonry (1:3) =	**305.64**	**cum**
Weepholes=	**1470.00**	**nos**
Filter Media=	**1955.10**	**cum**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION FOR RE WALL

RE Wall Facing Element

Chainage (km) From	Chainage (km) To	Total Length	CD Length	Unit	Nos	Net Length (m)	Height (m)	Quantity (sqm)
4 LANE PORTION								
49.468	50.443	975	254.440	sqm	2	720.56	7.00	10087.8
67.218	67.556	338	33.940	sqm	2	304.06	8.90	5412.3
64.243	65.378	1135	627.380	sqm	2	508	9.2	9347.2
2 LANE PORTION								
0.000	0.438	438	33.940	sqm	2	404	7.3	5898.4
Length of Clover Leaf		553		sqm	2	553	7.5	8295.0
							Total =	**39040.7**

Total Quantity of Facing Element= 39040.7 sqm

Backfilling Behind the facing Elements of RE Wall

Chainage (km) From	Chainage (km) To	Total Length	CD Length	Unit	Nos	Net Length (m)	Breadth (m)	Height (m)	Quantity (cum)
49.468	50.443	975	254.44	sqm	1	720.56	22.4	6.50	104913.54
67.218	67.556	338	33.94	sqm	1	304.06	22.4	8.40	57211.93
64.243	65.378	1135	627.38	sqm	1	508	22.4	5.40	61447.68
0.000	0.438	438	33.94	sqm	1	404	10.5	5.50	23331
Length of Clover Leaf		553	0.00	sqm	1	553	7.4	7.70	31509.94
							Total =		**278414.09**

Total Quantity of Backfilling Material= 278414.09 cum

Filter Media

Chainage (km) From	Chainage (km) To	Total Length	CD Length	Unit	Nos	Net Length (m)	Breadth (m)	Height (m)	Quantity (cum)
49.468	50.443	975	254.44	cum	2	720.56	0.6	7.00	6052.7
67.218	67.556	338	33.94	cum	2	304.06	0.6	8.90	3247.4
64.243	65.378	1135	627.38	cum	2	507.62	0.6	9.20	5604.1
0.000	0.438	438	33.94	cum	2	404.06	0.6	7.30	3539.6
Length of Clover Leaf		553	0	cum	2	553	0.6	7.50	4977.0
							Total =		**23420.8**

Total Quantity of Filter Media= 23420.8 cum

RCC Crash Barrier

Chainage (km) From	Chainage (km) To	Total Length	CD Length	Unit	Nos	Net Length (m)	Quantity (cum)
49.468	50.443	975	254.44	m	2	720.56	1441.12
67.218	67.556	338	33.94	m	2	304.06	608.12
64.243	65.378	1135	627.38	m	2	507.62	1015.24
0.000	0.438	438	33.94	m	2	404.06	808.12
Length of Clover Leaf		553	0	m	2	553	1106
					Total =		**4978.6**

Total Quantity of Crash Barrier= 4978.6 m

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Friction slab for RCC Crash Barrier

Chainage (km)		Total Length	CD Length	Unit	Nos	Net Length (m)	Area (sqm)		Quantity (cum)
From	To								
49.468	50.443	975	254.44	cum	2	720.56	0.84		1210.5408
67.218	67.556	338	33.94	cum	2	304.06	0.84		510.8208
64.243	65.378	1135	627.38	cum	2	507.62	0.84		852.8016
0	0.438	438	33.94	cum	2	404.06	0.84		678.8208
Length of Clover Leaf		553	0	cum	2	553	0.84		929.04
							Total =		**4182.024**

Total Quantity of Friction slab for RCC Crash Barrier= 4182.024 Cum

Steel Reinforcement @ 70kg / cum= **292.74168 ton**

PCC M15 under friction slab for RCC Crash Barrier

Chainage (km)		Total Length	CD Length	Unit	Nos	Net Length (m)	Breadth (m)	Height (m)	Quantity (cum)
From	To								
49.468	50.443	975	254.44	cum	2	720.56	2	0.1	288.224
67.218	67.556	338	33.94	cum	2	304.06	2	0.1	121.624
64.243	65.378	1135	627.38	cum	2	507.62	2	0.1	203.048
0	0.438	438	33.94	cum	2	404.06	2	0.1	161.624
Length of Clover Leaf		553	0	cum	2	553	2	0.1	221.2
							Total =		**995.72**

Total Quantity of PCC M15 under friction slab for RCC Crash Barrier= 996 Cum

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

Quantity Calculation For Median

Length Calculation of Median:

TCS Type	Length (m)	Median Width (m)	Kerb Width (One side) (m)	Depth (m)	Earthwork (cum)
TCS 1A	2154.30	1.5	0.165	0.675	1701.36
TCS 1B	5330.68	1.5	0.165		4209.90
TCS 1G	1142.92	1.5	0.165		902.62
TCS 1H	478.87	1.5	0.165		378.19
TCS 2	5929.58	4.0	0.165		14689.05
TCS 6A	1024.62	4.0	0.165		2538.24
TCS 6B	507.62	4.0	0.165		1257.50
Total=	**16569**				**25676.86**

Earthwork Quantity for Median= **25676.86 cum**

Length of Kerb = **33138 m**

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Quantity Calculation of Unlined Drain

Length of Unlined Drain= 31338.7 m

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Quantity Calculation for Utility Duct

Length of Road=	18.320	km
Provided Duct in Median and Both side of the Road		
The total Length of Duct=	54.96	km
	54960	m

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Guard Stone For Culvert

Guard Stone for Culvert, taking 10 Nos Guard Stone Both Side For 30 nos Culvert =	300	Nos
Taking Approach Road for Culvert (10m Both Side)=	600	m
Taking 2.0m C/C Both Side Guard Stone =	600.0	Nos
Total Nos of Guard Stone =	**900.00**	**Nos**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

Quantity Calculation For Chute Drain

For RR Masonry Chute drain:

CHAINAGE (M)		Side	CD Length (m)	Length(m)
From	To			
60150	60350	Both	66.50	267.00
61750	62150	Both	67.88	664.24
62250	62800	Both		1100.00
65500	65980	Both	9.54	940.92
66425	66575	Both		300.00
66700	66825	Both		250.00
66950	67220	Both	66.5	407.00
			Total=	**3929.16 m**

Taking 50 m interval for Chute Drain and height of Embankment is 5 m we get,

Total Length of Drain= 392.92 m

For RR Masonry Chute drain:

CHAINAGE (M)		Side	CD Length (m)	Length(m)
From	To			
438	1071	Both	0	1266.00
			Total=	**1266 m**

No of Catch Pit drain to be Provided = 2 Nos
So, Total Length = 2532 m

Taking 50 m interval for Chute Drain and height of Embankment is 10 m we get,

Total Length of Drain= 506.40 m

Item	*Unit*	*Nos*	*Length*	*Width*	*Thickness/ Depth*	*Quantity*
Earth Work	Cum	1	899	0.70	0.75	471.98
Stone Pitching	Cum	1	899	1.00	0.15	134.85
Side Portion (PCC M20)	Cum	7	129	0.15	0.6	81.27
(side wall) (PCC M20)	Cum	2	899	0.15	0.45	121.365
PCC M20 (Bottom)	Cum	1	899	1.00	0.10	89.9

Earthwork in Ordinary Soil = 471.98 cum
PCC M20 = 292.54 cum
Stone Pitching = 134.85 cum

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

Quantity Calculation for Sand Piling

Location above 8m height Where Sand Pile Required:

Chainage		CD length (m)	Net length (m)	Avg Width (m)	No of Sand Pile taking 2 m C/C Distance		Depth (m)	Total Length (m)
from	to				LengthWise	WidthWise		
For 2-Lane Portion								
0	300	33.94	266.06	12.00	134.00	7.00	10.00	9380.000
625	1171		546.00	30.00	274.00	16.00	10.00	43840.000
		Total =	**812.06**					**53220.00**

So, Total Length Of Sand Pile = 53220.00 m

Quantity Calculation For Stone Pitching

Length of Stone Pitching :-

CHAINAGE (M)		CD Length (m)	Side	Length (m)
From	To			
59970	60090	0	Both	240
61600	61750	0	Both	300
63490	63940	0	Both	900
65980	66230	0	RHS	250
			Total=	**1690**

CHAINAGE (M)		CD Length (m)	Side	Length (m)
From	To			
52060	52350	19	LHS	271
52790	52970	9.5	LHS	170.5
56740	57145	32.39	LHS	372.61
58900	59000	0	LHS	100
			Total=	**914.11**

Total Length of Stone Pitching =	**2604.11**	**m**
Average hight of embankment =	**3.50**	**m**
Embankment slope length =	**7.83**	**m**
Thickness of stone Pitching=	**0.30**	**m**
Thickness of Filter material =	**0.15**	**m**
quantity of stone Pitching=	**6117.05**	**cum**
quantity of Filter materal =	**3058.53**	**cum**
Length of Chute Drain = (50 m interval)	**52.08**	**m**

	Item No.	Length(m)	Width(m)	Thickness(m)	Quantity(cum)
Chute Drain (50 m interval)	PCC M15	52.080	1.100	0.100	5.7288
	PCC M20	52.080	@ 0.27sqm per metre		14.0616

Quantity summary of Stone Pitching

Stone Pitching=	**6117.05**	**cum**
Filter material =	**3058.53**	**cum**
PCC M15=	**5.73**	**cum**
PCC M20=	**14.06**	**cum**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

Quantity calculation for Approach Road & Approach Road

Pavement Layer thickness

Pavement	Thickness (m)
PQC	0.250
DLC	0.150
GSB	0.150
Subgrade	0.500

Pavement Quantity Calculation For Approach Road

Chainage		Length	CD Length	Net Length
From	To			
20	270	250	35.2	214.8

Total Length= **250** **35.2** **214.8** **m**

Width of Pavement= 5.50 m

Width of PQC= 5.50 m
Width of DLC = 5.50 m
Width of GSB (Drainage Layer) = 5.50 m
Width of Subgrade= 5.50 m

Quantity of PQC = 295.35 cum
Quantity of DLC = 177.21 cum
Quantity of GSB (Drainage Layer) = 177.21 cum
Quantity of Subgrade= 590.70 cum

Pavement Quantity Calculation For Approach Road (Temporary)

Length of the Approach Road =	125	m
Roadway Width =	5	m
height of Earth filling =	1	m
height of Moorum =	0.15	m
Quantity of Earth Filling =	**625.00**	**cum**
Quantity of Moorum =	**93.75**	**cum**

Quantity Calculation of Cutfill for Approach Road

Length of the Approach Road =	250	m
Roadway Width =	8	m
Avg Height of Cutting =	2.65	m
Total quantity of Cutting =	**5300.00**	**cum**

Calculation for Dismantling of Existing Flexible Pavement

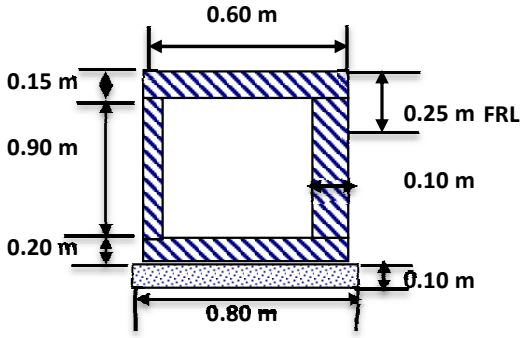
Length of the Approach Road =	250	m
Avg. Bituminous thickness =	0.100	m
Avg. GSB thickness =	0.350	m
Avg. Pavement width =	9.5	m
Total Quantity of Bituminous Material=	**237.50**	**cum**
Total Quantity of Granular Material=	**831.25**	**cum**

Cover Drain (0.6 m Width)

Drain at Approach Road:		CD Length	TCS Type	Side	Net Length(m)	
20	270	35.20		Both	429.6	
				Total Length=	**429.6**	**m**

Across Drain of 8 m length in 6 location = 48 m
Outfall of 10 m length in 2 location = 20 m

Total length of drain = 498.00 m



Quantity Calculation for Covered Side Drain :

Item	Component	Nos	Length	Width	Thickness	Quantity
Earthwork		1	498	0.900	1.100	493.020
PCC		1	498	0.800	0.100	39.840
RCC	Side wall	2	498	0.900	0.100	89.640
(M25)-	Bottom slab	1	498	0.600	0.200	59.760
					Total =	**149.400**
Reinforcemen	(@ 70 kg/cum of RCC)					10.458
					Total (in ton) =	**10.458**
RCC-M25	cover	1	498	0.600	0.150	44.820
(super-	Dudection					
					Total =	**44.820**
Reinforcemen	(@ 70 kg/cum of RCC)					3.137
					Total (in ton) =	**3.137**
Weep holes	no of weep holes in horizontal (per meter) X (498 + 1) X2 =					998
					Total =	**998**

Quantity Summary :

Total Quantity of earthwork = 493.02 cum
Total Quantity of PCC M15 = 39.84 cum
Total Quantity of RCC M25 (sub-structure) = 194.22 cum
Total Quantity of Steel (sub-structure)= 13.60 t
Weep-hole= 998 no.

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Quantity Calculation for Road Marking for Approach Road

Effective Length of road (m)	214.80

Length of Road for 2 Lane Portion= 214.80 m

Lane Marking (Center Line):					
Items	**NO.**	**Length (m)**	**Width (m)**	**Area (sqm)**	**Remarks**
Lane marking in 2 lane portion	1	214.80	0.15	12.89	@3m Marking per 7.5m Length
			Sub total=	**12.89**	**sqm**

	Sub total=

Edge Line Marking (Main line):	**Effective Length (m)**	**Width (m)**	**Area (sqm)**	**Remarks**
Edge Line marking (For 2 Lane portion)	429.60	0.15	64.44	Continious line

(i) Lane marking, edge marking	**sqm**	**77**
(ii) Lettering	**sqm**	**8**
	Total =	**85**
	Say	**100**

Total area of painting = 100 sqm

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Sump Pit

Quantity Calculation for Sump :

Item	Component	Nos	Length	Width	Height	Quantity
Earthwork		2	2.7	1.7	2.6	23.87
					Total =	**23.87**
Drain						
PCC		2	2.6	1.55	0.075	**0.60**
RCC	side wall	2	6.80	0.2	2.5	6.80
	floor	2	3.36		0.2	1.34
					Total =	**8.14**
Reinforcement in ton	(@ 80 kg/cum of RCC)					0.65
					Total =	**0.65**
Heavy Duty Grating Cover Sump Pit @114.23kg / sqm M.S Flat (65x8) 61.23 kg and 20 dia bar 53 kg / sqm		2	3.36			**0.77**

Total Quantity For sump pit =

Total Quantity of earthwork =	**23.87**	**cum**
Total Quantity of PCC =	**0.60**	**cum**
Total Quantity of RCC M30 =	**8.14**	**cum**
Total Quantity of Steel =	**0.65**	**ton**
Heavy Duty Grating Cover =	**0.77**	**ton**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

Quantity Calculation for Structure Works

Major Bridge

JOB NO : 4146 (PACKAGE-5)

Summary sheet of Major Bridge(Quantities & amount)

		Chainage (Km)	61+999	
		Span(m)	2 x 30m_PSC T Girder	Total Quantity
Sl No.	Description	Unit		
	A. Foundation			
Item no 1(a)	Excavation (upto 3 m depth)	cum	1795.340	1795.340
Item no 1(b)	Excavation (3 m to 6 m depth)	cum	224.000	224.000
Item no 2	R.C.C M30 (Pile Cap)	cum	1061.740	1061.740
Item no 3	P.C.C (M-15)	cum	94.500	94.500
Item no 4	Bored cast-in-situ M35 grade R.C.C. Piles	m	1734.000	1734.000
Item no 5	steel liner 6mm thick	ton	9.590	9.590
Item no 6	Steel (Foundation)	ton	320.977	320.977
	B. Sub-Structure			
Item no 1(a)	R.C.C M30 (Substructure) upto 5m	cum	456.810	456.810
Item no 1(b)	R.C.C M30 (Substructure) from 5m to 10m	cum	186.160	186.160
Item no 2	R.C.C. M35 for Pedestals & RB	cum	42.060	42.060
Item no 3	Steel (Substructure)	ton	95.904	95.904
Item no 4	Weep Holes	each	378.000	378.000
Item no 5	Backfilling - Granular Material	cum	245.700	245.700
Item no 6	Backfilling - Sandy Material	cum	1019.540	1019.540
Item no 7	Filter Media	cum	285.880	285.880
Item no 8	Elastomeric Bearing	cc	639150.000	639150.000
Item no 9	POT cum PTFE Bearing	ton	9600.000	9600.000

	C. Super-Structure			
Item no 1(a)	R.C.C M30 (Superstructure) upto 5m	cum	15.250	15.250
Item no 1(e)	R.C.C M45(Superstructure) upto 5m	cum	344.930	344.930
Item no 1(f)	P.S.C M45(Superstructure) upto 5m	cum	547.030	547.030
Item no 2(a)	Steel (Superstructure)	ton	136.082	136.082
Item no 3(a)	Bituminous Concrete Wearing Coat(65mm)	cum	51.500	51.500
Item no 3(b)	Mastic Asphalt	sqm	1287.440	1287.440
Item no 3(c)	Tack Coat	sqm	1287.440	1287.440
Item no 2(b)	PSC Steel	ton	44.000	44.000
Item no 3(d)	Cement Concrete Wearing Course	cum	15.250	15.250
Item no 4	RCC railing	metre	135.520	135.520
Item no 5	Crash Barrier	metre	271.040	271.040
Item no 6	Drainage Spout	each	20.000	20.000
Item no 8	PCC below approach slab	cum	24.670	24.670
Item no 9	R.C.C. Approach Slab with steel (M30)	cum	50.610	50.610
Item no 10	Strip Seal Expansion Joint	metre	50.000	50.000
Item no 11	Filler Joint			
	(i) copper plate	metre	48.200	48.200
	(ii) fibre board	metre	48.200	48.200
	(iii) 20mm thick premoulded joint filler	metre	48.200	48.200
	(iv) joint sealing compound	metre	48.200	48.200
	D. Protection Work			
Item no 1a	Boulder Pitching	cum	820.670	820.670
Item no 1b	Filter Media	cum	410.340	410.340
Item no 2	Falling Apron on River Bed	cum	193.240	193.240
	E. Miscelleaneous			
Item no 1a	Painting	sqm	1068.820	1068.820
Item no 2	Citizen Information Board NH project	no	2.000	2.000
	Brick work at median	cum	4.740	4.740
	Brick Flat Soling (BFS) below brick wall at median	cum	4.020	4.020

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE
OF
MAJOR BRIDGE

CHAINAGE_61.999KM

QUANTITY CALCULATION OF BRIDGE AT CH._ 61.999 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA LOT-I PKG-IA IN THE STATE OF ASSAM

2 No. X 30 M SPAN **CH._ 61.999 KM**

Item Sl No.	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
FOUNDATION							
1.1	**Excavation upto 3m depth**						
	Abutment-1	cum	2	13.60	9.70	3.00	791.52
	Pier-1	cum	2	9.70	9.70	2.15	404.59
	Abutment-2	cum	2	13.60	9.70	2.25	593.64
	Return wall I at median (A1 side)	cum	1	2.00	1.30	1.87	4.86
	Return wall I at median (A2 side)	cum	1	2.00	1.30	0.28	0.73
						Total	**1795.34**
1.2	**Excavation 3.0m to 6.0m depth**						
	Abutment-1	cum	2	13.60	9.70	0.849	224.00
						Total	**224.00**
2	**Pile cap RCC M30**						
	Abutment	cum	4	12.60	8.700	1.80	789.26
	Pier	cum	2	8.70	8.700	1.80	272.48
						Total=	**1061.74**
3	**Bored Cast-in-situ Pile M35 (dia.=1.2m)**						
	Abutment-1	m	24		26.000		624.00
	Pier-1	m	18		27.000		486.00
	Abutment-2	m	24		26.000		624.00
						Total=	**1734.00**
4	**PCC M-15 levelling course**						
	Below Pile-cap for Abutment	cum	4	12.90	9.00	0.15	69.66
	Below Pile-cap for Pier	cum	2	9.00	9.00	0.15	24.30
	Below Brick wall at median	cum	2	2.98	0.90	0.10	0.54
						Total=	**94.50**
5	**Steel Liner(1.2m dia pile)**						
	Pier-1	tonne	18	3.77	0.006	3.00	9.59
						Total=	**9.59**
6	**HYSD Bars**						
	90kg/cum for pile cap & @ 130kg/m for pile	T				**Total=**	**320.977**
7	**BFS below brick wall at median**						
		cum	2	2.98	0.90	0.75	4.023
						Total=	**4.02**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH._ 61.999 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA LOT-I PKG-IA IN THE STATE OF ASSAM

2 No. X 30 M SPAN **CH._ 61.999 KM**

Item Sl No.	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
SUBSTRUCTURE							
8	**RCC M-30 upto 5.0m height**						
	Abutment wall	cum	4	12.50	1.200	4.600	276.00
	Abutment cap	cum	4	12.80	2.120	0.400	43.42
	Pier shaft (straight portion)	cum	2	7.00	1.200	5.000	84.00
	Pier shaft (circular portion)	cum	4		0.57	5.000	11.40
	Return Wall-I upto abutment cap	cum	4	3.75	0.450	4.576	30.89
	Return Wall-I above abutment cap	cum	4	2.83	0.450	0.424	2.16
	Return Wall-I at median	cum	2	0.30	2.980	5.000	8.94
						Total=	**456.81**
9	**RCC M-30 height above 5.0m upto 10.0m**						
	Pier shaft (straight portion)	cum	2	7.00	1.200	0.850	14.28
	Pier shaft (circular portion)	cum	4		0.57	0.850	1.94
	Pier cap(Trapizoidal portion)	cum	2	10.40	2.250	0.700	32.76
	Pier cap(Rectangular portion)	cum	2	12.60	3.300	0.700	58.21
	Dirt Wall	cum	4	12.80	0.400	2.394	49.03
	Bracket	cum	4	12.35	0.180		8.89
	Return Wall-I above abutment cap	cum	4	2.83	0.450	2.850	14.52
	Return wall extra fins rectangular portion	cum	4	0.30	2.500	1.000	3.00
	Return wall extra fins triangular portion	cum	4	0.30	2.081		2.50
	Return Wall at median	cum	2	2.98	0.300	0.575	1.03
						Total=	**186.160**
10	**RCC M-35 for Pedestal & Seismic Arrestor Blocks height upto 5.0m**						
	Pedestal at Abutment & Pier POT bearing	cum	4	0.80	0.800	0.150	0.38
		cum	4	0.80	0.800	0.197	0.50
		cum	4	0.80	0.800	0.272	0.70
		cum	4	0.80	0.800	0.347	0.89
	Pedestal at Abutment & Pier for POT cum PTFE bearing	cum	4	0.80	0.800	0.150	0.38
		cum	4	0.80	0.800	0.197	0.50
		cum	4	0.80	0.800	0.272	0.70
		cum	4	0.800	0.800	0.347	0.89
						Total=	**4.94**
	Block RB2	cum	16	0.700	0.550	1.400	8.62
	Block RB1	cum	16		1.299	0.800	16.63
	Block RB3	cum	8	1.060	1.000	1.400	11.87
						Total=	**42.06**
11	**HYSD Bars**						
	@ 120 kg/cum	T					95.904
						Total=	**95.904**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH._ 61.999 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA LOT-I PKG-IA IN THE STATE OF ASSAM

2 No. X 30 M SPAN **CH._ 61.999 KM**

Item Sl No.	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
12	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per abutment = 12.05/2+1 =					8	
	No of weep holes in vertical direction per abutment = 4.6/1+1 =					6	
	No of weep holes in horizental direction per return wall = (3.29)/2+1 =					3	
	No of weep holes in vertical direction per return wall = (7.85-0.3-0.15)/1+1 =					9	
	No of weep holes in horizental direction per return wall at median = (2.98)/2+1 =					3	
	No of weep holes in vertical direction per return wall at median= (5.575)/1+1 =					7	
	No of weep holes in horizental direction per return wall extra fin = (2.5)/2+1 =					3	
	No of weep holes in vertical direction per return wall extra fin = (1.8325)/2+1 =					3	
	Total no of Weep holes per abutment = 8 x 6					48	
	Total no of Weep holes per return wall = 3 x 9					27	
	Total no of Weep holes per return wall at median= 7 x 3					21	
	Total no of Weep holes per return wall extra fin portion = 3 x 3					9	
	Total no of weep holes = 48 x 4 + 27 x 4 + 21 x 2 + 9 x 4					**Total**	**378.00**

13.1	**Backfilling - Granular Material**						
	Abutment	cum	4	22.30		1.950	173.94
	Pier	cum	2	18.40		1.950	71.76
						Total	**245.70**

13.2	**Backfilling - Sandy Material**						
	Behind Abutment & Return wall-I	cum	4	11.45	3.15	7.544	1088.37
	Behind Return wall at median	cum	2	3.00	4.650	8.113	226.35
	Deduct for filter media	cum					-285.88
	Deduct for Brick wall	cum					-9.30
						Total	**1019.54**

14	**Filter media**						
	Behind Abutment	cum	4	12.050	0.60	7.544	218.17
	Behind Return wall-I	cum	4	2.690	0.60	7.400	47.77
	Behind Return at median	cum	2	2.980	0.60	5.575	19.94
						Total	**285.88**

15	**POT & POT cum PTFE Bearing**						
		ton	32	300.00			9600.00
						Total	**9600.00**

16	**Elastomeric Bearing**						
	Bearing B2	cucm	16	37.00	54.50	9.80	316187
	Bearing B3	cucm	32	27.00	42.00	8.90	322963
						Total	**639150**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH._ 61.999 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA LOT-I PKG-IA IN THE STATE OF ASSAM

2 No. X 30 M SPAN **CH. 61.999 KM**

Item Sl No.	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
SUPERSTRUCTURE							
17	**PSC M-45 Girder portion**						
	Long Girder middle portion	cum	4	21.600	3.744		323.48
	Long Girder end straight portion	cum	8	1.950	6.272		97.84
	Long Girder varying portion	cum	8	1.600	5.008		64.10
	End Cross Girder (portion in between the long girder)	cum	8	0.400	9.513		30.44
	End Cross Girder (rectangular part)	cum	8	0.400	0.520		1.66
	IntermediateCross Girder (portion in between the long girder)	cum	8	0.300	11.408		27.38
	Intermediate Cross Girder (triangular part)	cum	8	0.300	0.888		2.13
						Total	**547.03**
18	**R.C.C. Deck slab (M45)**						
	Deck Slab	cum	4	28.70	12.500	0.225	322.88
	Cantilever portion of Deck Slab	cum	8	0.630	12.500	0.350	22.05
						Total	**344.93**
19	**Kerb (M30)**						
		cum	2	67.76	0.50	0.225	15.25
						Total	**15.25**
20	**PSC Steel**						
	@11 Ton per span	TON	2		22.00		44.00
						Total	**44.00**
21	**Superstructure Steel (HYSD Bars)**						
	@ 150 kg/cum	TON					136.082
						Total=	**136.082**
22	**RCC M30 Railing**						
		m	2	67.76			135.52
						Total=	**135.52**
23	**RCC M40 Crash Barrier**						
		m	4	67.76			271.04
						Total=	**271.04**
24	**Drainage Spout**	nos.	20			**Total**	**20.00**
25	**M15 PCC below Approach Slab**						
		cum	4	3.370	12.200	0.15	24.67
						Total	**24.67**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH._ 61.999 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA LOT-I PKG-IA IN THE STATE OF ASSAM

2 No. X 30 M SPAN **CH._ 61.999 KM**

Item Sl No.	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
26	**Approach Slab(M30)**						
	Approach Slab	cum	4	3.500	12.050	0.300	50.61
						Total	**50.61**
27	**Bituminus concrete wearing course**						
		cum	2	67.76	9.50	0.040	51.50
						Total=	**51.50**
28	**Mastic asphalt**						
		sqm	2	67.76	9.50		1287.44
						Total=	**1287.44**
29	**Tack coat**						
		sqm	2	67.76	9.50		1287.44
						Total=	**1287.44**
30	**Cement Concrete wearing coarse(75mm)**						
		cum	2	67.76	1.50	0.075	15.25
						Total=	**15.25**
31	**Filler joint**						
	Providing & fixing 2 mm thick corrugated copper plate in expansion joint	m	4	12.05			**48.20**
	Providing & fixing 20 mm thick compressible fibre board in expansion joint	m	4	12.05			**48.20**
	Providing and fixing in position 20 mm thick premoulded joint filler	m	4	12.05			**48.20**
	Providing and filling joint sealing compound	m	4	12.05			**48.20**
32	**Strip Seal Expansion Joint**						
		m	4	12.500			50.00
						Total	**50.00**
33	**Brick work at median**						
	Above the abutment cap	cum	2	2.380	0.250	2.513	2.99
	Below the abutment cap	cum	2	2.380	0.368		1.75
						Total	**4.74**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH._ 61.999 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA LOT-I PKG-IA IN THE STATE OF ASSAM

2 No. X 30 M SPAN **CH._ 61.999 KM**

Item Sl No.	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
PROTECTION WORK							
34	**Pitching with Stone Blanket (A1 side)**	cum	2	500.34		0.30	300.204
	Pitching with Stone Blanket (A2 side)	cum	2	697.82		0.30	418.692
	In front of abutments	cum	2	28.00	6.058	0.30	101.774
						Total	**820.67**
35	**Floor Protection**						
	A1 & A2 side (Straight part)	cum	4	10.00	0.601		24.040
	A1 & A2 side (Curved part)	cum	4	17.00	1.127		76.636
	Infront of the abutment and return wall at median	cum	2	28.00	1.653		92.568
						Total	**193.24**
36	**Filter material below stone pitching**						
	A1 side	cum	2	500.34		0.15	150.102
	A2 side	cum	2	697.82		0.15	209.346
	In front of abutments	cum	2	28.00	6.058	0.15	50.887
						Total=	**410.34**
MISCELLANNEOUS							
37	**Painting**						
	Kerb below railing	sqm	2	0.950		67.76	128.74
	Railing(Post)	sqm	80	1.03		1.10	90.64
	Railing(Beam)	sqm	6	0.69		67.76	280.53
	Crash Barrier	sqm	4	2.099		67.76	568.91
						Total	**1068.820**
38	Citizen information Board NH Project	no				**Total**	**2.000**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

Minor Bridge

JOB NO : 4146 (PACKAGE-5)

Summary sheet of Minor Bridges (Quantities & amount)

		CHAINAGE	49+236	51+819	54+332	56+461 KM	56+985 KM
		Span Arrangement	3X8.0X4.0 RCC BOX with both side Service	3X8.8X4.0 RCC BOX	1X13.0 M + 1 X13.5 M + 1 X13.0 M INTEGRAL	1X21M INTEGRAL VOIDED SLAB	1X24M INTEGRAL VOIDED SLAB
ITEM NO.	**Description**	**Unit**					
	A. Foundation						
Item no 1(a)	Excavation (upto 3 m depth)	cum	4028.530	945.674	804.200	505.860	625.830
Item no 1(b)	Excavation (3 m to 6 m depth)	cum	157.173		54.200	37.340	
Item no 2	R.C.C M30 (Pile Cap)	cum			425.960	231.340	462.680
Item no 3	P.C.C (M-15)	cum	193.175	63.963	38.560	20.900	41.800
Item no 4	Bored cast-in-situ M35 grade R.C.C. Piles	m			504.000	288.000	800.000
Item no 5	steel liner 6mm thick	ton			0.000		
Item no 6	Steel (Foundation)	ton			103.860	58.260	150.270
	B. Sub-Structure						
Item no 1(a)	R.C.C M30 (Substructure) upto 5m	cum	1169.284	410.453	179.740	100.530	220.720
Item no 1(b)	R.C.C M30 (Substructure) from 5m to 10m	cum			1.380		
Item no 2	R.C.C. M35 for Pedestals & RB	cum					
Item no 3	Steel (Substructure)	ton	81.850	28.732	21.950	12.060	26.490
Item no 4	Weep Holes	each	372.000	180.000	116.000	120.000	222.000
Item no 5	Backfilling - Granular Material	cum	71.996	49.115	138.550	72.930	145.860
Item no 6	Backfilling - Sandy Material	cum	380.017	258.985	144.700	130.060	239.270
Item no 7	Filter Media	cum	276.961	103.643	65.950	69.950	131.250
Item no 8	Elastomeric Bearing	cc					
Item no 9	POT cum PTFE Bearing	ton					
	C. Super-Structure						
Item no 1(a)	R.C.C M30 (Superstructure) upto 5m	cum	662.950	221.903	340.130	240.370	578.040
Item no 1(e)	R.C.C M45(Superstructure) upto 5m	cum					
Item no 1(f)	P.S.C M45(Superstructure) upto 5m	cum					
Item no 2(a)	Steel (Superstructure)	ton	49.721	16.643	51.020	40.860	104.050
Item no 2(b)	PSC Steel	ton					

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

		CHAINAGE	49+236	51+819	54+332	56+461 KM	56+985 KM
		Span Arrangement	3X8.0X4.0 RCC BOX with both side Service	3X8.8X4.0 RCC BOX	1X13.0 M + 1 X13.5 M + 1 X13.0 M INTEGRAL	1X21M INTEGRAL VOIDED SLAB	1X24M INTEGRAL VOIDED SLAB
ITEM NO.	**Description**	**Unit**					
Item no 3(a)	Bituminous Concrete Wearing Coat(65mm)	cum	46.200	13.490	18.050	11.100	24.590
Item no 3(b)	Mastic Asphalt	sqm	1155.000	337.250	451.250	277.400	614.650
Item no 3(c)	Tack Coat	sqm	1155.000	337.250	451.250	277.400	614.650
Item no 3(d)	Cement Concrete Wearing Course	cum	7.425	3.994	5.340	3.290	7.280
Item no 4	RCC railing	metre	66.000	35.500	47.500	29.200	64.700
Item no 5	Crash Barrier	metre	264.000	71.000	95.000	58.400	129.400
Item no 6	Drainage Spout	each	24.000	6.000	6.000	2.000	4.000
Item no 7	HDPE Pipe	m				153.900	353.700
Item no 8	PCC below approach slab	cum	21.767	12.567	12.360	12.360	24.730
Item no 9	R.C.C. Approach Slab with steel (M30)	cum	44.268	25.788	25.370	25.370	50.740
Item no 10	Strip Seal Expansion Joint	metre					
Item no 11	Filler Joint						
	(i) copper plate	metre	84.320	24.560	24.160	24.160	48.320
	(ii) fibre board	metre	84.320	24.560	24.160	24.160	48.320
	(iii) 20mm thick premoulded joint filler	metre	84.320	24.560	24.160	24.160	48.320
	(iv) joint sealing compound	metre	84.320	24.560	24.160	24.160	48.320
	D. Protection Work						
Item no 1a	Boulder Pitching	cum			66.924	172.218	252.872
Item no 1b	Filter Media	cum			33.460	86.110	126.440
Item no 2	Falling Apron on River Bed	cum				149.180	88.360
Item no 3	Toe Wall	cum			31.180		90.730
Item no 4	300 mm thick Rubble stone flooring laid over 100mm thick cement concrete bedding	cum	75.996	103.703			
Item no 5	750 mm thick Flexible apron	cum	121.635	124.358			
Item no 6	Curtain Wall- PCC (M-20)	cum	119.998	129.203			
Item no 7	Excavation in soil	cum	660.489	667.215			
Item no 9	PCC M15	cum	59.691	72.183			
	E. Miscelleaneous						
Item no 1a	Painting	sqm	822.690	366.480	371.000	230.380	508.310
Item no 2	Citizen Information Board NH project	no				2.000	2.000
	Brick work at median	cum			0.740	1.600	1.720
	Brick flat soling (BFS) for brick wall at median	cum					

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

		CHAINAGE	60+272 KM	60+892 KM	64+159 KM	67+047 KM	
		Span Arrangement	3 X 18m_RCC T-beam	3 x 18m_RCC T-girder	1 x 40m_PSC T-girder	3 x 18m_RCC T-girder	Total Quantity
ITEM NO.	Description	Unit					
	A. Foundation						
Item no 1(a)	Excavation (upto 3 m depth)	cum	2120.960	2257.610	1159.310	1778.510	14226.484
Item no 1(b)	Excavation (3 m to 6 m depth)	cum	126.380	310.030	298.140	158.580	1141.843
Item no 2	R.C.C M30 (Pile Cap)	cum	1108.720	1108.720	789.260	1108.720	5235.400
Item no 3	P.C.C (M-15)	cum	99.360	99.360	70.200	99.360	726.677
Item no 4	Bored cast-in-situ M35 grade R.C.C. Piles	m	1488.000	1488.000	1440.000	1944.000	7952.000
Item no 5	steel liner 6mm thick	ton	0.000				0.000
Item no 6	Steel (Foundation)	ton	293.225	293.225	251.033	352.505	1502.378
	B. Sub-Structure						
Item no 1(a)	R.C.C M30 (Substructure) upto 5m	cum	384.570	384.520	382.610	426.200	3658.627
Item no 1(b)	R.C.C M30 (Substructure) from 5m to 10m	cum	184.050	177.430	89.130	345.700	797.690
Item no 2	R.C.C. M35 for Pedestals & RB	cum	37.820	37.820	19.700	37.820	133.160
Item no 3	Steel (Substructure)	ton	72.773	71.972	58.973	97.166	471.966
Item no 4	Weep Holes	each	266.000	266.000	340.000	388.000	2270.000
Item no 5	Backfilling - Granular Material	cum	289.380	289.380	173.940	289.380	1520.531
Item no 6	Backfilling - Sandy Material	cum	758.540	765.320	1222.840	1117.370	5017.102
Item no 7	Filter Media	cum	217.700	219.670	300.600	281.120	1666.844
Item no 8	Elastomeric Bearing	cc	311760.000	311760.000	103920.000	311760.000	1039200.000
Item no 9	POT cum PTFE Bearing	ton	12000.000	12000.000	4800.000	12000.000	40800.000
	C. Super-Structure						
Item no 1(a)	R.C.C M30 (Superstructure) upto 5m	cum	727.930	727.930	10.760	727.690	4237.704
Item no 1(e)	R.C.C M45(Superstructure) upto 5m	cum			228.080		228.080
Item no 1(f)	P.S.C M45(Superstructure) upto 5m	cum			470.830		470.830
Item no 2(a)	Steel (Superstructure)	ton	131.027	131.027	106.451	130.984	761.783
Item no 2(b)	PSC Steel	ton			29.000		29.000

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

		CHAINAGE	60+272 KM	60+892 KM	64+159 KM	67+047 KM	
		Span Arrangement	3 X 18m_RCC T-beam	3 x 18m_RCC T-girder	1 x 40m_PSC T-girder	3 x 18m_RCC T-girder	Total Quantity
ITEM NO.	**Description**	**Unit**					
Item no 3(a)	Bituminous Concrete Wearing Coat(65mm)	cum	50.420	50.420	36.330	50.420	301.020
Item no 3(b)	Mastic Asphalt	sqm	1260.460	1260.460	908.200	1260.460	7525.130
Item no 3(c)	Tack Coat	sqm	1260.460	1260.460	908.200	1260.460	7525.130
Item no 3(d)	Cement Concrete Wearing Course	cum	14.930	14.930	10.760	14.930	82.879
Item no 4	RCC railing	metre	132.680	132.680	95.600	132.680	736.540
Item no 5	Crash Barrier	metre	265.360	265.360	191.200	265.360	1605.080
Item no 6	Drainage Spout	each	20.000	20.000	12.000	18.000	112.000
Item no 7	HDPE Pipe	m					507.600
Item no 8	PCC below approach slab	cum	24.730	24.730	24.320	24.430	181.994
Item no 9	R.C.C. Approach Slab with steel (M30)	cum	50.740	50.740	50.530	50.110	373.656
Item no 10	Strip Seal Expansion Joint	metre	50.000	50.000	47.600	50.000	197.600
Item no 11	Filler Joint						
	(i) copper plate	metre	48.320	48.320	47.600	47.120	396.880
	(ii) fibre board	metre	48.320	48.320	47.600	47.120	396.880
	(iii) 20mm thick premoulded joint filler	metre	48.320	48.320	47.600	47.120	396.880
	(iv) joint sealing compound	metre	48.320	48.320	47.600	47.120	396.880
	D. Protection Work						
Item no 1a	Boulder Pitching	cum	216.060	200.080	550.200	464.450	1922.804
Item no 1b	Filter Media	cum	108.030	100.040	275.100	232.220	961.400
Item no 2	Falling Apron on River Bed	cum	176.900	173.480	102.570	220.230	910.720
Item no 3	Toe Wall	cum	0.000	0.000	123.280		245.190
Item no 4	300 mm thick Rubble stone flooring laid over 100mm thick cement concrete bedding	cum					179.699
Item no 5	750 mm thick Flexible apron	cum					245.993
Item no 6	Curtain Wall- PCC (M-20)	cum					249.202
Item no 7	Excavation in soil	cum					1327.704
Item no 9	PCC M15	cum					131.874
	E. Miscelleaneous						
Item no 1a	Painting	sqm	970.160	970.160	785.690	970.160	5995.030
Item no 2	Citizen Information Board NH project	no	2.000	2.000	2.000	2.000	12.000
	Brick work at median	cum	5.530	5.530	7.130	5.530	27.780
	Brick flat soling (BFS) for brick wall at median	cum	0.400	0.400	0.400	0.400	1.600

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE
OF
MINOR BRIDGE

CHAINAGE_49.236KM

QUANTITY CALCULATION OF BRIDGE AT CH. 49.236 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA IN THE STATE OF ASSAM

CH._49.236 KM

Box Size:- 3 cell of 8 m x 4 m_SR with Rigid & Flexible Apron

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
A. FOUNDATION							
Item no 1	**Excavation(up to 3m)**						
	Box Bridge	cum	1	27.000	46.100	2.958	3682.030
	Return Wall II	cum	4	5.500	5.250	3.000	346.500
						Total	**4028.530**
Item no 1(b)	**Excavation(above 3m)**						
	Shear Key	cum	2	27.000	1.550	0.600	50.220
	Return Wall	cum	4	5.500	5.250	0.926	106.953
						Total	**157.173**
Item no 2	**PCC-M15**						
	Box Bridge	cum	1	26.000	43.300	0.150	168.870
	Shear Key	cum	2	26.300	1.299	0.150	10.245
	Return Wall II	cum	4	5.150	4.550	0.150	14.060
						Total	**193.175**
B. SUBSTRUCTURE							
Item no 1(a)	**RCC-M30 (upto 5m)**						
	Bottom Slab	cum	1	26.000	45.040	0.600	702.624
	Box Side Wall	cum	2	45.040	0.600	4.219	228.015
	Box middle Wall	cum	2	45.040	0.400	4.219	152.010
	Base slab of return wall II	cum	4	5.000	4.250	0.400	34.000
	Return wall II	cum	4	5.000	0.325	4.750	30.875
	Shear key	cum	2	26.000	0.360		18.720
	Haunch	cum	6	45.040	0.011		3.040
						Total=	**1169.284**
Item no 2	**Substructure Steel (HYSD Bars)**						
	70 kg/cum of Concrete	ton	1	81.850			81.850
						Total	**81.850**
Item no 3	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per side wall =44.37/2+1 =					23	
	No of weep holes in vertical direction per side wall =4.32/1+1 =					6	
	No of weep holes in horizontal direction per return wall =5/2+1 =					4	
	No of weep holes in vertical direction per return wall =4.3/1 +1=					6	
	Total no of Weep holes per side wall = 23 x 6					138	
	Total no of Weep holes per return wall = 4 x 6					24	
	Total no of weep holes = 138 x 2 + 24 x 4						**372**
Item no 4	**Backfilling - Sandy Material**						
	Behind Side Wall &	cum	2	40.040	3.500	1.850	518.518
	Behind Return wall II	cum	4	2.300	3.500	4.300	138.460
	Deduct for filter media	cum					276.961
						Total	380.017

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH. 49.236 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA IN THE STATE OF ASSAM

CH._49.236 KM

Box Size:- 3 cell of 8 m x 4 m_SR with Rigid & Flexible Apron

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
Item no 5	**Backfilling - Granular Material**						
	Box	cum	1	73.660		0.600	44.196
	Shear key	cum	2	13.000		0.600	15.600
	Return Wall	cum	4	7.625		0.400	12.200
						Total	**71.996**
Item no 6	**Filter media**						
	Behind Side Wall	cum	2	44.640	0.600	4.319	231.347
	Behind Return Wall	cum	4	4.420	0.600	4.300	45.614
						Total	**276.961**

C. SUPERSTRUCTURE

Item no 1	**RCC-M30(up to 5m)**						
	Box Bridge	cum	1	26.000	45.040	0.550	644.072
	(+)Haunch	cum	6	45.040		0.011	3.040
	Kerb	cum	2	33.000	0.300	0.225	4.455
	Rectangular part of bracket	cum	2	42.160	0.300	0.300	7.589
	Triangular part of bracket	cum	2	42.160		0.045	3.794
						Total	**662.950**
Item no 2	**Superstructure Steel (HYSD Bars)**						
	75 kg/cum of concrete	ton	1		49.721		49.721
						Total	**49.721**
Item no 3(a)	**Wearing Course (Bituminous Concrete)**						
		cum	2	33.000	17.500	0.040	46.200
						Total	**46.200**
Item no 3(b)	**Wearing Course (Cement Concrete)**						
		cum	2	33.000	1.500	0.075	7.425
						Total	**7.425**
Item no 3(c)	**Wearing Course (Mastic Asphalt)**						
		sqm	2	33.000	17.500		1155.000
						Total	**1155.000**
Item no 3(d)	**Tack Coat**						
		sqm	2	33.000	17.500		1155.000
						Total	**1155.000**
Item no 4	**Crash Barrier**	m	8	33.000			264.000
						Total	**264.000**
Item no 5	**Railing**	m	2	33.000			66.000
						Total	**66.000**
Item no 6	**Drainage Spout**	nos.	24				**24**
Item no 7	**PCC below Approach Slab**						
		cum	2	3.370	10.730	0.150	10.848
		cum	2	3.370	10.800	0.150	10.919
						Total	**21.767**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH. 49.236 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA IN THE STATE OF ASSAM

CH._49.236 KM

Box Size:- 3 cell of 8 m x 4 m_SR with Rigid & Flexible Apron

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
Item no 8	**Approach Slab**						
		cum	2	3.500	10.580	0.300	22.218
		cum	2	3.500	10.500	0.300	22.050
						Total	**44.268**
Item no 9	**Filler Joint**						
	(i) copper plate	m	4	21.080			**84.320**
	(ii) fiber board	m	4	21.080			**84.320**
	(iii) 20mm thick premoulded joint filler	m	4	21.080			**84.320**
	(iv) joint sealing	m	4	21.080			**84.320**

D. PROTECTION WORK

Item no 1	**Rigid Appron**						
	Up stream	cum	1	36.040	3.000	0.300	32.436
	Down stream	cum	1	36.040	5.000	0.300	54.060
	Deduction due to return wall II foundation	cum	4	5.000	1.750	0.300	-10.500
						Total	**75.996**
Item no 2	**Flexible Appron**						
	Up stream	cum	1	36.040	1.500	0.750	40.545
	Down stream	cum	1	36.040	3.000	0.750	81.090
						Total	**121.635**
Item no 3	**PCC M20 Curtain Wall**						
	Up stream side	cum	1	38.540	1.480		57.039
	Down stream side	cum	1	42.540	1.480		62.959
						Total	**119.998**
Item no 4	**PCC (M-15)**						
	Below Curtain Wall (Up stream side)	cum	1	38.540	1.600	0.150	9.250
	Below Curtain Wall (Down stream side)	cum	1	42.540	1.950	0.150	12.443
	Rigid apron (Up stream side)	cum	1	36.040	3.000	0.150	16.218
	Rigid apron (Down stream side)	cum	1	36.040	5.000	0.150	27.030
	Deduction due to return wall II foundation	cum	4	5.000	1.750	0.150	-5.250
						Total	**59.691**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH. 49.236 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA IN THE STATE OF ASSAM

CH._49.236 KM

Box Size:- 3 cell of 8 m x 4 m_SR with Rigid & Flexible Apron

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
Item no 5	**Excavation in Soil**						
	Curtain Wall (upstream)	cum	1	38.540	2.600	2.150	215.439
	Curtain Wall (downstream)	cum	1	42.540	2.950	2.650	332.556
	Flexible apron up stream	cum	1	36.040	1.500	0.750	40.545
	Flexible apron down stream	cum	1	36.040	3.000	0.750	81.090
	Rigid apron up stream	cum	1	36.040	3.000	0.450	48.654
	Rigid apron down stream	cum	1	36.040	5.000	0.450	81.090
	Deduction due to Curtain Wall (up stream)	cum	1	36.040	1.300	0.750	-35.139
	Deduction due to Curtain Wall(down stream)	cum	1	36.040	1.475	0.750	-39.869
	Deduction due to Curtain Wall (up stream)	cum	1	38.540	1.300	0.450	-22.546
	Deduction due to Curtain Wall(down stream)	cum	1	38.540	1.475	0.450	-25.581
	Deduction due to return wall ll foundation	cum	4	5.000	1.750	0.450	-15.750
						Total	**660.489**

MISCELLANEOUS

Item no 1	Painting					
	Kerb below railing.	sqm	2	0.750	33.00	49.50
	Railing(Post)	sqm	46	1.05	1.10	53.13
	Railing(Beam)	sqm	6	0.69	33.00	136.62
	Crash Barrier	sqm	8	2.210	33.00	583.44
					Total	**822.690**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

CHAINAGE_51.819KM

QUANTITY CALCULATION OF BRIDGE AT CH. 51.819KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA IN THE STATE OF ASSAM

CH._51.819KM

Box Size:- 3 cell of 8.8 m x 4 m
Additional 2 lane bridge
with Rigid & Flexible Apron

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
A. FOUNDATION							
Item no 1	**Excavation(up to 3m)**						
	Box Bridge	cum	1	29.500	13.500	1.880	748.693
	Shear Key	cum	2	29.500	1.500	0.550	48.675
	Return Wall II	cum	2	5.500	5.350	2.369	139.396
	Return wall at median	cum	2	2.500	1.650	1.080	8.910
						Total=	**945.674**
Item no 2	**PCC-M15**						
	Box Bridge	cum	1	28.500	10.800	0.150	46.170
	Shear Key	cum	2	28.800	1.228	0.150	10.608
	Return Wall II	cum	2	5.150	4.650	0.150	7.184
						Total=	**63.963**
B. SUBSTRUCTURE							
Item no 1 (a)	**RCC-M30 (upto 5m)**						
	Bottom Slab	cum	1	28.500	12.500	0.650	231.563
	Box Side Wall	cum	2	12.500	0.650	4.119	66.930
	Box middle Wall	cum	2	12.500	0.400	4.119	41.188
	Base slab of return wall II	cum	2	5.000	4.350	0.400	17.400
	Return wall(at median)	cum	2	2.980	0.650	4.838	18.740
	Return wall II	cum	2	5.000	0.325	4.850	15.763
	Shear key	cum	2	28.500	0.316		18.026
	Haunch	cum	6	12.500	0.011		0.844
						Total=	**410.453**
Item no 2	**Substructure Steel (HYSD Bars)**						
	70 kg/cum of Concrete	ton	1	28.732			28.732
						Total	**28.732**
Item no 3	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per side wall =12.5/2+1 =					8	
	No of weep holes in vertical direction per side wall =4.1/1+1 =					6	
	No of weep holes in horizontal direction per return wall =5/2+1 =					4	
	No of weep holes in vertical direction per return wall =4.4/1 +1=					6	
	No of weep holes in horizontal direction per return wall at median =3/2+1 =					3	
	No of weep holes in vertical direction per return wall at median =4.8/1 +1=					6	
	Total no of Weep holes per side wall = 8 x 6					48	
	Total no of Weep holes per return wall = 4 x 6					24	
	Total no of Weep holes per return wall at median = 3 x 6					18	
	Total no of weep holes = 48 x 2 + 24 x 2 + 18 x 2						**180**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH. 51.819KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA IN THE STATE OF ASSAM

CH._51.819KM

Box Size:- 3 cell of 8.8 m x 4 m
Additional 2 lane bridge
with Rigid & Flexible Apron

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
Item no 4	**Backfilling - Sandy Material**						
	Behind Side Wall &	cum	2	10.000	3.520	3.031	213.406
	Behind Return wall II	cum	2	2.300	3.500	4.400	70.840
	Return wall(at median)	cum	2	2.980	3.500	3.758	78.382
	Deduct for filter media	cum					103.643
						Total	**258.985**
Item no 5	**Backfilling - Granular Material**						
	Box	cum	1	42.000		0.650	27.300
	Shear key	cum	2	14.250		0.550	15.675
	Return Wall	cum	2	7.675		0.400	6.140
						Total	**49.115**
Item no 6	**Filter media**						
	Behind Side Wall	cum	2	12.300	0.600	4.269	63.007
	Behind Return Wall	cum	2	4.420	0.600	4.400	23.338
	Return wall(at median)	cum	2	2.980	0.600	4.838	17.299
						Total	**103.643**

C. SUPERSTRUCTURE

Item no 1	**RCC-M30(up to 5m)**						
	Box Bridge	cum	1	28.500	12.500	0.600	213.750
	(+)Haunch	cum	6	12.500	0.011		0.844
	Kerb	cum	1	35.500	0.500	0.225	3.994
	Rectangular part of bracket	cum	2	12.280	0.300	0.300	2.210
	Triangular part of bracket	cum	2	12.280	0.045		1.105
						Total	**221.903**
Item no 2	**Superstructure Steel (HYSD Bars)**						
	75 kg/cum of concrete	ton	1	16.643			16.643
						Total	**16.643**
Item no 3(a)	**Wearing Course (Bituminous Concrete)**						
		cum	1	35.500	9.500	0.040	13.490
						Total	**13.490**
Item no 3(b)	**Wearing Course (Cement Concrete)**						
		cum	1	35.500	1.500	0.075	3.994
						Total	**3.994**
Item no 3(c)	**Wearing Course (Mastic Asphalt)**						
		sqm	1	35.500	9.500		337.250
						Total	**337.250**
Item no 3(d)	**Tack Coat**						
		sqm	1	35.500	9.500		337.250
						Total	**337.250**
Item no 4	**Crash Barrier**	m	2	35.500			71.000
						Total	**71.000**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH. 51.819KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA IN THE STATE OF ASSAM

CH._51.819KM

Box Size:- 3 cell of 8.8 m x 4 m
Additional 2 lane bridge
with Rigid & Flexible Apron

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
Item no 5	**Railing**	m	1	35.500			35.500
						Total	**35.500**
Item no 6	**Drainage Spout**	nos.	6				**6**
Item no 7	**PCC below Approach Slab**						
		cum	2	3.370	12.430	0.150	12.567
						Total	**12.567**
Item no 8	**Approach Slab**						
		cum	2	3.500	12.280	0.300	25.788
						Total	**25.788**
Item no 9	**Filler Joint**						
	(i) copper plate	m	2	12.280			**24.560**
	(ii) fibar board	m	2	12.280			**24.560**
	(iii) 20mm thick premoulded joint filler	m	2	12.280			**24.560**
	(iv) joint sealing compound	m	2	12.280			**24.560**

D. PROTECTION WORK

Item no 1	**300 mm thick Rigid Apron**						
	Up stream	cum	1	38.540	3.000	0.300	34.686
	Down stream	cum	1	33.500	5.000	0.300	50.250
	at median	cum	1	2.980	27.200	0.300	24.317
	Deduction due to return wall II foundation	cum	2	5.000	1.850	0.300	-5.550
						Total	**103.703**
Item no 2	**Flexible Apron**						
	Up stream	cum	1	38.540	1.500	0.750	43.358
	Down stream	cum	1	36.000	3.000	0.750	81.000
						Total	**124.358**
Item no 3	**PCC M20 Curtain Wall**						
	Up stream side	cum	1	40.840	1.480		60.443
	Down stream side	cum	1	36.000	1.910		68.760
						Total	**129.203**
Item no 4	**PCC (M-15)**						
	Below Curtain Wall						
	Up stream side	cum	1	40.840	1.600	0.150	9.802
	Down stream side	cum	1	36.000	1.950	0.150	10.530
	Below Rigid Appron						
	Up stream side	cum	1	38.540	3.000	0.150	17.343
	Down stream side	cum	1	33.500	5.000	0.150	25.125
	at median	cum	1	2.980	27.200	0.150	12.158
	Deduction due to return wall II foundation	cum	2	5.000	1.850	0.150	-2.775
						Total	**72.183**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH. 51.819KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA IN THE STATE OF ASSAM

CH._51.819KM

Box Size:- 3 cell of 8.8 m x 4 m
Additional 2 lane bridge
with Rigid & Flexible Apron

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
Item no 5	**Excavation in Soil**						
	Curtain Wall (up stream)	cum	1	40.840	2.600	2.150	228.296
	Curtain Wall (down stream)	cum	1	36.000	2.950	2.650	281.430
	Rigid appron up stream	cum	1	38.540	3.000	0.450	52.029
	Rigid appron down stream	cum	1	33.500	5.000	0.450	75.375
	at median	cum	1	2.980	27.200	0.450	36.475
	Flexible appron up stream	cum	1	38.540	1.500	0.750	43.358
	Flexible appron down stream	cum	1	36.000	3.000	0.750	81.000
	Deduction due to Curtain Wall (up stream)	cum	1	40.840	1.300	0.450	-23.891
	Deduction due to Curtain Wall(down stream)	cum	1	36.000	1.475	0.450	-23.895
	Deduction due to Curtain Wall (up stream)	cum	1	38.540	1.300	0.750	-37.577
	Deduction due to Curtain Wall(down stream)	cum	1	33.500	1.475	0.750	-37.059
	Deduction due to return wall II foundation	cum	2	5.000	1.850	0.450	-8.325
						Total	**667.215**

MISCELLANNEOUS

Item no 1	Painting					
	Kerb below railing.	sqm	1	0.950	35.50	33.73
	Railing(Post)	sqm	25	1.05	1.10	28.88
	Railing(Beam)	sqm	6	0.69	35.50	146.97
	Crash Barrier	sqm	2	2.210	35.50	156.91
					Total	**366.480**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

CHAINAGE_54.332KM

QUANTITY ESTIMATE OF SIMPLY SUPPORTED INTEGRAL SLAB BRIDGE

CHAINAGE - 54.332 KM **1 no x 13.0 M + 1 no x 13.5 M + 1 no x 13.0 M**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
FOUNDATION							
1	**Excavation upto 3.0m depth**						
	Abutment-1	cum	1	13.60	6.100	2.95	244.73
	Pier-1	cum	1	11.60	6.100	3.00	212.28
	Pier-2	cum	1	11.60	6.100	1.99	140.81
	Abutment-2	cum	1	13.60	6.100	2.43	201.59
	Return Wall (at median) A1 side	cum	1	2.50	1.30	0.997	3.24
	Return Wall (at median) A2 side	cum	1	2.50	1.30	0.478	1.55
						Total	**804.20**
2	**Excavation 3.0m to 6.0m depth**						
	Pier-1	cum	1	11.60	6.100	0.766	54.20
						Total	**54.20**
3	**Bored Cast-in-situ Piles M-35 (Dia-1.2 m)**						
	Abutment-1	metre	6			22.00	132.00
	Pier-1	metre	6			20.00	120.00
	Pier-2	metre	6			20.00	120.00
	Abutment-2	metre	6			22.00	132.00
						Total	**504.00**
4	**Levelling Course for Pile Cap (PCC M-15)**						
	Abutment-1	cum	1	12.900	5.400	0.15	10.45
	Pier-1	cum	1	10.900	5.400	0.15	8.83
	Pier-2	cum	1	10.900	5.400	0.15	8.83
	Abutment-2	cum	1	12.900	5.400	0.15	10.45
						Total	**38.56**
5	**RCC M-30**						
	Pile Cap (Abutment-1)	cum	1	12.600	5.100	1.80	115.67
	Pier-1	cum	1	10.600	5.100	1.80	97.31
	Pier-2	cum	1	10.600	5.100	1.80	97.31
	Pile Cap (Abutment-2)	cum	1	12.600	5.100	1.80	115.67
						Total	**425.96**
6	**HYSD Bars**						
	@ 90 kg/cum of cocrete volume for pile cap & @ 130Kg/m run pile	Tonne					103.86
						Total	**103.86**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE OF SIMPLY SUPPORTED INTEGRAL SLAB BRIDGE

CHAINAGE - 54.332 KM **1 no x 13.0 M + 1 no x 13.5 M + 1 no x 13.0 M**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
SUBSTRUCTURE							
8	**RCC M-30 upto 5 m**						
	Abutment-1 & 2	cum	2	12.500	1.100	2.857	78.57
	Pier (Straight part)	cum	2	8.700	0.900	5.000	78.30
	Pier (Circular part)	cum	2	0.636		5.000	6.36
	Bracket	cum	2	12.100	0.180		4.36
	Return Wall-I	cum	2	2.050	0.400	3.738	6.13
	Return Wall-I (at median)	cum	2	2.980	0.300	2.988	5.34
	Return Wall I extra fin portion(triangular)	cum	1	0.300	0.811		0.24
	Return Wall I extra fin portion(rectangular)	cum	1	0.300	1.470	1.000	0.44
						Total	**179.74**
9	**RCC M-30 5 m to 10 m**						
	Pier (Straight part)	cum	2	8.700	0.900	0.082	1.28
	Pier (Circular part)	cum	2	0.636		0.082	0.10
						Total	**1.38**
10	**HYSD Bars**						
	@ 120 kg/cum of concrete volume	t					21.95
						Total	**21.95**
11	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per abutment = 12.1/2+1 =					8	
	No of weep holes in vertical direction per abutment = 2.857+1 =					4	
	No of weep holes in horizontal direction per return wall =(2.05)/2+1 =					3	
	No of weep holes in vertical direction per return wall =(3.738-0.3-0.15)/1+1 =					5	
	No of weep holes in horizontal direction per return wall I (at median) =(2.98)/2+1 =					2	
	No of weep holes in vertical direction per return wall I (at median) =(2.988)/1+1 =					4	
	No of weep holes in horizontal direction per return wall extra fin portion =(1.47)/2+1 =					1	
	No of weep holes in vertical direction per return wall extra fin portion =(1.5065)/1+1 =					3	
	Total no of Weep holes per abutment = 8 x 4					32	
	Total no of Weep holes per return wall = 3 x 5					15	
	Total no of Weep holes per return wall I (at median) = 2 x 4					8	
	Total no of Weep holes per return wall extra fin portion = 2 x 4					3	
	Total no of weep holes = 32 x 2 + 15 x 2 + 8 x 2 + 3 x 2					**Total**	**116.00**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE OF SIMPLY SUPPORTED INTEGRAL SLAB BRIDGE

CHAINAGE - 54.332 KM **1 no x 13.0 M + 1 no x 13.5 M + 1 no x 13.0 M**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
12	**Backfilling - Granular Material**						
	Abutment	cum	2		18.70	1.950	72.93
	Pier	cum	2		16.70	1.950	65.13
						Total	**138.55**
13	**Backfilling - Sandy Material**						
	Behind Abutment & Return wall	cum	2	12.100	2.050	3.407	169.02
	Behind Return wall (at median)	cum	2	2.980	2.050	3.407	41.63
	Deduct for filter media	cum					-65.95
						Total	**144.70**
14	**Filter media**						
	Behind Abutment	cum	2	12.100	0.600	3.407	49.47
	Behind Return wall-I	cum	2	1.450	0.600	3.288	5.72
	Behind Return wall (at median)	cum	2	3.000	0.600	2.988	10.76
						Total	**65.95**

SUPERSTRUCTURE

15	**RCC M-30 - For Solid slab superstructure**						
For 13.5 m span	At support	cum	2	10.50	0.450	1.001	9.46
	Varying Portion	cum	2	10.50	2.925	0.801	49.20
	At mid span	cum	1	10.50	6.750	0.600	42.53
	Cantilever portion	cum	1	6.75	0.813		5.49
		cum	2	3.375	2.000	0.507	6.84
	Kerb	cum	1	13.50	0.500	0.225	1.52
						Total	**115.04**
For 13.0 m span	At support	cum	2	10.50	0.45	1.001	9.46
		cum	2	12.50	0.50	1.026	12.83
	Varying Portion	cum	2	10.50	2.80	0.801	47.10
		cum	2	10.50	2.75	0.813	46.95
	At mid span	cum	2	10.50	6.50	0.60	81.90
	Cantilever portion	cum	2	6.50	0.813		10.57
		cum	2	3.25	2.00	0.51	6.63
		cum	2	2.80	2.00	0.52	5.82
	Kerb	cum	2	17.00	0.50	0.225	3.83
						Total	**225.09**
					Total quantity		**340.13**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE OF SIMPLY SUPPORTED INTEGRAL SLAB BRIDGE

CHAINAGE - 54.332 KM **1 no x 13.0 M + 1 no x 13.5 M + 1 no x 13.0 M**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
16	**HYSD Bars**						
	@ 150 kg/cum of cocrete volume	t					51.02
						Total	**51.02**
17	**RCC M30 Railing**	rm	1	47.50			47.50
						Total	**47.50**
18	**Crash Barrier RCC M40**						
		m	2	47.50			95.00
						Total	**95.00**
19	**Drainage Spout**	nos.	6			**Total**	**6.00**
20	**PCC below Approach Slab**						
		cum	2	12.230	3.370	0.150	12.36
						Total	**12.36**
21	**Approach Slab RCC M30**						
	Approach Slab	cum	2	12.080	3.500	0.300	25.37
						Total	**25.37**
22	**Bitumenous concrete Wearing Coat**						
		cum	1	47.50	9.50	0.040	18.05
						Total	**18.05**
23	**Mastic asphalt**						
		sqm	1	47.50	9.50		451.25
						Total	**451.25**
24	**Tack coat**						
		sqm	1	47.50	9.50		451.25
						Total	**451.25**
25	**Cement concrete wearing course on footpath**						
		cum	1	47.50	1.50	0.075	5.34
						Total	**5.34**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE OF SIMPLY SUPPORTED INTEGRAL SLAB BRIDGE

CHAINAGE - 54.332 KM **1 no x 13.0 M + 1 no x 13.5 M + 1 no x 13.0 M**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
26	**Filler joint**						
	Providing & fixing 2 mm thick corrugated copper plate in expansion joint	m	2	12.08			**24.16**
	Providing & fixing 20 mm thick compressible fibre board in expansion joint	m	2	12.08			**24.16**
	Providing and fixing in position 20 mm thick premoulded joint filler	m	2	12.08			**24.16**
	Providing and filling joint sealing compound	m	2	12.08			**24.16**
27	**Brick work at median**						
		cum	2	3.00	0.125	0.988	0.74
						Total	**0.74**

PROTECTION WORK

28	**Pitching with Stone Blanket**						
	A1 side	cum	2	47.12		0.30	28.272
	A2 side	cum	2	64.42		0.30	38.652
						Total	**66.924**
29	**Toe Wall**	cum	4	0.433		18.00	31.176
						Total	**31.176**
30	**Filter Blanket below pitching**						
	A1 side	cum	2	47.12		0.15	14.136
	A2 side	cum	2	64.42		0.15	19.326
						Total	**33.462**

Miscelaneous

31	**Paint for concrete surface**						
	Kerb below railing	sqm	1	0.950		47.50	45.13
	Railing(Post)	sqm	26	1.05		1.10	30.03
	Railing(Beam)	sqm	3	0.69		47.50	98.33
	Crash Barrier	sqm	2	2.079		47.50	197.51
						Total	**371.000**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

CHAINAGE_56.461KM

QUANTITY CALCULATION OF BRIDGE AT CH. 56.461 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA IN THE STATE OF ASSAM

CHAINAGE - 56.461 KM **1 no x 21.0 M RCC Integral Voided Slab**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
FOUNDATION							
1	**Excavation upto 3.0m depth**						
	Abutment-1	cum	1	13.60	6.100	3.00	248.88
	Abutment-2	cum	1	13.60	6.100	3.00	248.88
	Return wall @ median (Abutment -A1)	cum	1	2.50	1.300	1.38	4.49
	Return wall @ median (Abutment -A2)	cum	1	2.50	1.300	1.11	3.61
						Total	**505.86**
2	**Excavation 3.0m to 6.0m depth**						
	Abutment-1	cum	1	13.60	6.100	0.36	29.87
	Abutment-2	cum	1	13.60	6.100	0.09	7.47
						Total	**37.34**
3	**Bored Cast-in-situ Piles M-35 (Dia-1.2 m)**						
	Abutment-1	metre	6			24.00	144.00
	Abutment-2	metre	6			24.00	144.00
						Total	**288.00**
4	**Levelling Course for Pile Cap (PCC M-15)**						
	Abutment-1	cum	1	12.900	5.400	0.15	10.45
	Abutment-2	cum	1	12.900	5.400	0.15	10.45
						Total	**20.90**
5	**RCC M-30**						
	Pile Cap (Abutment-1)	cum	1	12.600	5.100	1.80	115.67
	Pile Cap (Abutment-2)	cum	1	12.600	5.100	1.80	115.67
						Total	**231.34**
6	**HYSD Bars**						
	@ 90 kg/cum of cocrete volume for pile cap & @ 130Kg/m run pile	Tonne					58.26
						Total	**58.26**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH. 56.461 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA IN THE STATE OF ASSAM

CHAINAGE - 56.461 KM **1 no x 21.0 M RCC Integral Voided Slab**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
SUBSTRUCTURE							
7	**RCC M-30 upto 5 m**						
	Abutment-1 & 2	cum	2	12.500	1.200	2.787	83.61
	Return Wall-I	cum	2	1.950	0.400	3.868	6.03
	Return Wall-I (Fin portion)	cum	2	2.186		0.300	1.31
	Return Wall (at median)	cum	2	2.980	0.300	2.918	5.22
	Bracket	cum	2	12.100	0.180		4.36
						Total	**100.53**
8	**HYSD Bars**						
	@ 120 kg/cum of cocrete volume	t					12.06
						Total	**12.06**
9	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per abutment = 12.1/2+1 =					8	
	No of weep holes in vertical direction per abutment = 2.787/1+1 =					4	
	No of weep holes in horizontal direction per return wall I =(1.95)/2+1 =					2	
	No of weep holes in vertical direction per return wall I =(3.868-0.3-0.15)/1+1 =					5	
	No of weep holes in horizontal direction per return wall I fin portion =(1.57)/2+1 =					2	
	No of weep holes in vertical direction per return wall I fin portion =(1.3925)/1+1 =					3	
	No of weep holes in horizontal direction per return wall (at median) =(2.98)/2+1 =					3	
	No of weep holes in vertical direction per return wall (at median) =(2.918)/1+1 =					4	
	Total no of Weep holes per abutment = 8 x 4					32	
	Total no of Weep holes per return wall = 2 x 5					10	
	Total no of Weep holes per return wall fin portion= 2 x 3					6	
	Total no of Weep holes per return wall I (at median) = 3 x 4					12	
	Total no of weep holes = 32 x 2 + 6 x 2 + 10 x 2 + 12 x 2					**Total**	**120.00**
10	**Backfilling - Granular Material**						
	Abutment	cum	2	18.70		1.950	72.93
						Total	**72.93**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH. 56.461 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA IN THE STATE OF ASSAM

CHAINAGE - 56.461 KM **1 no x 21.0 M RCC Integral Voided Slab**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
11	**Backfilling - Sandy Material**						
	Behind Abutment & Return wall	cum	2	11.500	1.950	3.537	158.63
	Behind Return wall I (at median)	cum	2	3.000	1.950	3.537	41.38
	Deduct for filter media	cum					-69.95
						Total	**130.06**

12	**Filter media**						
	Behind Abutment	cum	2	12.100	0.600	3.537	51.36
	Behind Return wall-I	cum	2	1.350	0.600	3.418	5.54
	Behind Return Wall-I (Fin portion)	cum	2	2.186		0.600	2.62
	Behind Return wall I (at median)	cum	2	2.980	0.600	2.918	10.43
						Total	**69.95**

SUPERSTRUCTURE

13	**RCC M-30 - For Voided Slab Superstructure**						
	At support	cum	2	12.5	1.200	1.226	36.78
	Varrying Portion	cum	2	12.500	4.650	1.038	120.67
	At mid span	cum	1	10.500	10.456		109.79
	Deduction for voids volume	cum	9	0.196		17.100	-30.16
	Kerb	cum	1	29.20	0.500	0.225	3.29
						Total	**240.37**

14	**HDPE Pipe**						
		m	9	17.10			153.90
						Total	**153.90**

15	**HYSD Bars**						
	@ 170 kg/cum of concrete volume	t					40.86
						Total	**40.86**

16	**RCC M30 Railing**	rm	1	29.20			29.20
						Total	**29.20**

17	**Crash Barrier RCC M40**						
		m	2	29.20			58.40
						Total	**58.40**

18	**Drainage Spout**	nos.	2			**Total**	**2.00**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH. 56.461 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA IN THE STATE OF ASSAM

CHAINAGE - 56.461 KM **1 no x 21.0 M RCC Integral Voided Slab**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
19	**PCC below Approach Slab**						
		cum	2	12.230	3.370	0.150	12.36
						Total	**12.36**
20	**Approach Slab RCC M30**						
	Approach Slab	cum	2	12.080	3.500	0.300	25.37
						Total	**25.37**
21	**Bitumenous concrete Wearing Coat**						
		cum	1	29.20	9.50	0.040	11.10
						Total	**11.10**
22	**Mastic asphalt**						
		sqm	1	29.20	9.50		277.40
						Total	**277.40**
23	**Tack coat**						
		sqm	1	29.20	9.50		277.40
						Total	**277.40**
24	**Cement concrete wearing course on footpath**						
		cum	1	29.20	1.50	0.075	3.29
						Total	**3.29**
25	**Filler joint**						
	Providing & fixing 2 mm thick corrugated copper plate in expansion joint	m	2	12.08			**24.16**
	Providing & fixing 20 mm thick compressible fibre board in expansion joint	m	2	12.08			**24.16**
	Providing and fixing in position 20 mm thick premoulded joint filler	m	2	12.08			**24.16**
	Providing and filling joint sealing compound	m	2	12.08			**24.16**
26	**Brick Work**	cum	2	2.98	0.125	2.153	**1.60**
						Total	**1.600**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH. 56.461 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA IN THE STATE OF ASSAM

CHAINAGE - 56.461 KM **1 no x 21.0 M RCC Integral Voided Slab**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
PROTECTION WORK							
27	**Pitching with Stone Blanket**						
	A1 side	cum	2	108.44		0.30	65.064
	A2 side	cum	2	121.84		0.30	73.104
	In front of abutment	cum	2	25.000	2.270	0.30	34.050
						Total	**172.218**
28	**Floor Protection(A-1 & A-2 side)**						
	In front of abutment A1 & A2	cum	2	25.000	1.653		82.650
	Abutment A1 & A2 (circular portion)	cum	4	9.425	1.127		42.488
	Abutment A1 & A2 (straight portion)	cum	4	10.000	0.601		24.040
						Total=	**149.178**
29	**Filter Blanket below pitching**						
	A1 side	cum	2	108.44		0.15	32.532
	A2 side	cum	2	121.84		0.15	36.552
	In front of abutment	cum	2	25.000	2.270	0.15	17.025
						Total=	**86.109**
MISCELLANEOUS							
30	**Paint for concrete surface**						
	Kerb below railing	sqm	1	0.950		29.20	27.74
	Railing(Post)	sqm	18	1.05		1.10	20.79
	Railing(Beam)	sqm	3	0.69		29.20	60.44
	Crash Barrier	sqm	2	2.079		29.20	121.41
						Total	**230.380**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

CHAINAGE_56.985KM

QUANTITY CALCULATION OF BRIDGE AT CH. 56.985 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA IN THE STATE OF ASSAM

CHAINAGE - 56.985 KM **1 no x 24.0 M RCC Integral Voided Slab**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
FOUNDATION							
1	**Excavation upto 3.0m depth**						
	Abutment-1	cum	2	13.60	6.100	2.10	348.43
	Abutment-2	cum	2	13.60	6.100	1.67	277.09
	Return wall @ median (Abutment -A1)	cum	1	2.00	1.300	0.12	0.31
						Total	**625.83**
2	**Bored Cast-in-situ Piles M-35 (Dia-1.2 m)**						
	Abutment-1	metre	16			25.00	400.00
	Abutment-2	metre	16			25.00	400.00
						Total	**800.00**
3	**Levelling Course for Pile Cap (PCC M-15)**						
	Abutment-1	cum	2	12.900	5.400	0.15	20.90
	Abutment-2	cum	2	12.900	5.400	0.15	20.90
						Total	**41.80**
4	**RCC M-30**						
	Pile Cap (Abutment-1)	cum	2	12.600	5.100	1.80	231.34
	Pile Cap (Abutment-2)	cum	2	12.600	5.100	1.80	231.34
						Total	**462.68**
5	**HYSD Bars**						
	@ 100 kg/cum of cocrete volume for pile cap & @ 130Kg/m run pile	Tonne					150.27
						Total	**150.27**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH. 56.985 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA IN THE STATE OF ASSAM

CHAINAGE - 56.985 KM **1 no x 24.0 M RCC Integral Voided Slab**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
SUBSTRUCTURE							
6	**RCC M-30 upto 5 m**						
	Abutment-1	cum	2	12.500	1.350	2.900	97.88
	Abutment-2	cum	2	12.500	1.350	2.900	97.88
	Return Wall-I of Abutment-1	cum	2	1.875	0.400	4.225	6.34
	Return Wall-I of Abutment-2	cum	2	1.875	0.400	4.225	6.34
	Return Wall-I (Fin portion) of abutment-1	cum	2	2.322		0.300	1.39
	Return Wall-I (Fin portion) of abutment-2	cum	2	2.322		0.300	1.39
	Return Wall (at median) of Abutment-1	cum	1	2.980	0.300	2.875	2.57
	Return Wall (at median) of Abutment-2	cum	1	2.980	0.300	2.875	2.57
	Bracket	cum	2	12.100	0.180		4.36
						Total	**220.72**
7	**HYSD Bars**						
	@ 120 kg/cum of cocrete volume	t					26.49
						Total	**26.49**
8	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per abutment = 12.1/2+1 =					8	
	No of weep holes in vertical direction per abutment = 2.9/1+1 =					4	
	No of weep holes in horizontal direction per return wall I =(1.875)/2+1 =					2	
	No of weep holes in vertical direction per return wall I =(4.225-0.3-0.15)/1+1 =					5	
	No of weep holes in horizontal direction per return wall I fin portion =(1.645)/2+1 =					2	
	No of weep holes in vertical direction per return wall I fin portion =(1.41125)/1+1 =					3	
	No of weep holes in horizontal direction per return wall (at median) =(2.98)/2+1 =					3	
	No of weep holes in vertical direction per return wall (at median) =(3.175)/1+1 =					5	
	Total no of Weep holes per abutment = 8 x 4					32	
	Total no of Weep holes per return wall = 2 x 5					10	
	Total no of Weep holes per return wall fin portion= 2 x 3					6	
	Total no of Weep holes per return wall I (at median) = 3 x 5					15	
	Total no of weep holes = 32 x 4 + 6 x 4 + 10 x 4 + 15 x 2					**Total**	**222.00**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH. 56.985 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA IN THE STATE OF ASSAM

CHAINAGE - 56.985 KM | **1 no x 24.0 M RCC Integral Voided Slab**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
9	**Backfilling - Granular Material**						
	Abutment	cum	4	18.70		1.950	145.86
						Total	**145.86**
10	**Backfilling - Sandy Material**						
	Behind Abutment-1 & Return wall-I	cum	2	11.500	1.875	3.800	163.88
	Behind Abutment-2 & Return wall-I	cum	2	11.500	1.875	3.800	163.88
	Behind Return wall (at median) of abutment-1	cum	1	3.000	1.875	3.800	21.38
	Behind Return wall (at median) of abutment-2	cum	1	3.000	1.875	3.800	21.38
	Deduct for filter media	cum					-131.25
						Total	**239.27**
11	**Filter media**						
	Behind Abutment-1	cum	2	12.100	0.600	3.800	55.18
	Behind Abutment-2	cum	2	12.100	0.600	3.800	55.18
	Behind Return wall-I of abutment-1	cum	2	1.275	0.600	3.775	5.78
	Behind Return wall-I of abutment-2	cum	2	1.275	0.600	3.775	5.78
	Return Wall-I (Fin portion) of abutment-1	cum	2	2.322		0.600	2.79
	Return Wall-I (Fin portion) of abutment-2	cum	2	2.322		0.600	2.79
	Behind Return wall (at median) of abutmer	cum	1	2.980	0.600	1.050	1.88
	Behind Return wall (at median) of abutmer	cum	1	2.980	0.600	1.045	1.87
						Total	**131.25**

SUPERSTRUCTURE

12	**RCC M-30 - For Voided Slab Superstructure**						
	At support	cum	4	12.5	1.350	1.376	92.88
	Varrying Portion	cum	4	12.500	5.325	1.113	296.34
	At mid span	cum	2	12.000	10.453		250.87
	Deduction for voids volume	cum	18	0.196		19.650	-69.33
	Kerb	cum	2	32.35	0.500	0.225	7.28
						Total	**578.04**
13	**HDPE Pipe**						
		m	18	19.65			353.70
						Total	**353.70**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH. 56.985 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA IN THE STATE OF ASSAM

CHAINAGE - 56.985 KM **1 no x 24.0 M RCC Integral Voided Slab**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
14	**HYSD Bars**						
	@ 180 kg/cum of concrete volume	t					104.05
						Total	**104.05**
15	**RCC M30 Railing**	rm	2	32.35			64.70
						Total	**64.70**
16	**Crash Barrier RCC M40**						
		m	4	32.35			129.40
						Total	**129.40**
17	**Drainage Spout**	nos.	4			**Total**	**4.00**
18	**PCC below Approach Slab**						
		cum	4	12.230	3.370	0.150	24.73
						Total	**24.73**
19	**Approach Slab RCC M30**						
	Approach Slab	cum	4	12.080	3.500	0.300	50.74
						Total	**50.74**
20	**Bitumenous concrete Wearing Coat**						
		cum	2	32.35	9.50	0.040	24.59
						Total	**24.59**
21	**Mastic asphalt**						
		sqm	2	32.35	9.50		614.65
						Total	**614.65**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH. 56.985 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA IN THE STATE OF ASSAM

CHAINAGE - 56.985 KM **1 no x 24.0 M RCC Integral Voided Slab**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
22	**Tack coat**						
		sqm	2	32.35	9.50		614.65
						Total	**614.65**
23	**Cement concrete wearing course on footpath**						
		cum	2	32.35	1.50	0.075	7.28
						Total	**7.28**
24	**Filler joint**						
	Providing & fixing 2 mm thick corrugated copper plate in expansion joint	m	4	12.08			**48.32**
	Providing & fixing 20 mm thick compressible fibre board in expansion joint	m	4	12.08			**48.32**
	Providing and fixing in position 20 mm thick premoulded joint filler	m	4	12.08			**48.32**
	Providing and filling joint sealing compound	m	4	12.08			**48.32**
25	**Brick Work**	cum	2	2.98	0.125	2.303	**1.72**
						Total	**1.720**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH. 56.985 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA IN THE STATE OF ASSAM

CHAINAGE - 56.985 KM | **1 no x 24.0 M RCC Integral Voided Slab**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
PROTECTION WORK							
26	**Pitching with Stone Blanket**						
	A1 side	cum	2	182.29		0.30	109.374
	A2 side	cum	2	204.36		0.30	122.616
	In front of abutment	cum	2	28.000	1.243	0.30	20.882
						Total	**252.872**
27	**Toe Wall**						
	Abutment A1	cum	1	0.602		74.19	44.662
	Abutment A2	cum	1	0.602		76.53	46.071
						Total	**90.733**
28	**Falling apron**						
	Abutment A1	cum	1	0.530		26.19	13.881
	Abutment A2	cum	1	0.530		28.53	15.121
	In front of abutment	cum	2	1.060		28.00	59.360
						Total	**88.362**
29	**Filter Blanket below pitching**						
	A1 side	cum	2	182.29		0.15	54.687
	A2 side	cum	2	204.36		0.15	61.308
	In front of abutment	cum	2	28.000	1.243	0.15	10.441
						Total=	**126.436**
MISCELLANEOUS							
30	**Paint for concrete surface**						
	Kerb below railing	sqm	2	0.950		32.35	61.47
	Railing(Post)	sqm	38	1.05		1.10	43.89
	Railing(Beam)	sqm	6	0.69		32.35	133.93
	Crash Barrier	sqm	4	2.079		32.35	269.02
						Total	**508.310**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

CHAINAGE_60.272KM

QUANTITY CALCULATION OF BRIDGE AT CH._60.272 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA IN THE STATE OF ASSAM

3 No. X 18 M SPAN **CH. 60.272 KM**

Item Sl No.	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
FOUNDATION							
1.1	**Excavation upto 3m depth**						
	Abutment-1	cum	2	13.60	9.70	3.00	791.52
	Pier-1	cum	2	9.70	6.10	2.21	261.53
	Pier-2	cum	2	9.70	6.10	2.28	269.82
	Abutment-2	cum	2	13.60	9.70	3.00	791.52
	Return wall-I at Abutment-1 (at median)	cum	1	2.00	1.30	1.14	2.96
	Return wall-I at Abutment-2 (at median)	cum	1	2.00	1.30	1.39	3.61
						Total	**2120.960**
1.2	**Excavation 3.0m to 6.0m depth**						
	Abutment-1	cum	2	13.60	9.70	0.119	31.40
	Abutment-2	cum	2	13.60	9.70	0.360	94.98
						Total	**126.38**
2	**Pile cap RCC M30**						
	Abutment	cum	4	12.60	8.700	1.80	789.26
	Pier	cum	4	8.70	5.100	1.80	319.46
						Total=	**1108.720**
3	**Bored Cast-in-situ Pile M35 (dia.=1.2m)**						
	Abutment-1	m	24		20.000		480.00
	Pier-1	m	12		22.000		264.00
	Pier-2	m	12		22.000		264.00
	Abutment-2	m	24		20.000		480.00
						Total=	**1488.000**
4	**PCC M-15 levelling course**						
	Below Pile-cap for Abutment	cum	4	12.90	9.00	0.15	69.66
	Below Pile-cap for Pier	cum	4	9.00	5.40	0.15	29.16
	Below brick wall at median	cum	2	2.98	0.90	0.10	0.54
						Total=	**99.360**
5	**HYSD Bars**						
	90kg/cum for pile cap & @ 130kg/m for pile	T				**Total=**	**293.225**
6	**Brick Flat Soling (BFS) below brick wall at median**						
		cum	2	2.98	0.90	0.075	0.40
						Total=	**0.40**
SUBSTRUCTURE							
7	**RCC M-30 upto 5.0m height**						
	Abutment wall	cum	4	12.50	1.200	2.850	171.00
	Abutment cap	cum	4	12.50	1.790	1.000	89.50
	Pier shaft	cum	4		3.14	5.000	62.80
	Dirt Wall	cum	4	12.50	0.400	1.150	23.00
	Bracket	cum	4	12.10	0.045		2.18
	Return Wall-I upto abutment cap	cum	4	3.75	0.400	2.825	16.95
	Return Wall-I above abutment cap	cum	4	3.16	0.400	2.175	11.00
	Return wall at median	cum	2	2.980	0.300	3.825	6.84
	Return wall extra finch triangular portion	cum	4	0.30	1.080		1.30
						Total=	**384.570**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH._60.272 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA IN THE STATE OF ASSAM

3 No. X 18 M SPAN **CH._60.272 KM**

Item Sl No.	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
8	**RCC M-30 height above 5.0m upto 10.0m**						
	Pier shaft	cum	4		3.14	0.800	10.05
	Pier cap(Trapizoidal portion)	cum	4	7.25	2.700	0.700	54.81
	Pier cap(Rectangular portion)	cum	4	11.50	2.700	0.700	86.94
	Dirt Wall	cum	4	12.50	0.400	0.969	19.38
	Bracket	cum	4	12.10	0.135		6.53
	Return Wall-I above abutment cap	cum	4	3.16	0.400	0.826	4.18
	Return wall extra fin rectangular portion	cum	4	0.30	1.800	1.000	2.16
						Total=	**184.050**
9	**RCC M-35 for Pedestal & Seismic Arrestor Blocks height upto 5.0m**						
	Pedestal at POT cum PTFE bearing	cum	6	0.80	0.800	0.150	0.58
		cum	6	0.80	0.800	0.215	0.83
		cum	6	0.80	0.800	0.288	1.11
		cum	6	0.80	0.800	0.361	1.39
	Pedestal at POT bearing	cum	6	0.80	0.800	0.150	0.58
		cum	6	0.80	0.800	0.215	0.83
		cum	6	0.80	0.800	0.288	1.11
		cum	6	0.80	0.800	0.361	1.39
						Total=	**7.820**
	Block RB2	cum	16	0.340	0.700	1.060	4.04
	Block RB1	cum	12	0.800	0.889		8.53
	Block RB1 (a)	cum	12	0.800	1.069		10.26
	Block RB3	cum	16	0.640	0.700	1.060	7.17
						Total=	**37.820**
10	**HYSD Bars**						
	@ 120 kg/cum	T					72.773
						Total=	**72.773**
11	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per abutment = 12.1/2+1 =					8	
	No of weep holes in vertical direction per abutment = 2.85+1 =					4	
	No of weep holes in horizontal direction per return wall = (3.75)/2+1 =					3	
	No of weep holes in vertical direction per return wall = (5.826)/1+1 =					7	
	No of weep holes in horizontal direction per return wall at median= (2.98)/2+1 =					3	
	No of weep holes in vertical direction per return wall at median = (3.825)/1+1 =					5	
	No of weep holes in horizontal direction per return wall extra fin= (1.8)/2+1 =					2	
	No of weep holes in vertical direction per return wall extra fin = (1.6)/1+1 =					3	
	Total no of Weep holes per abutment = 8 x 4					32	
	Total no of Weep holes per return wall = 3 x 7					21	
	Total no of Weep holes per return wall at median= 3 x 5					15	
	Total no of Weep holes per return wall extra fin= 2 x 3					6	
	Total no of weep holes = 32 x 4 + 21 x 4 + 15 x 2 + 6 x 4					**Total**	**266.000**
12	**Backfilling - Granular Material**						
	Abutment	cum	4		22.30	1.950	173.94
	Pier	cum	4		14.80	1.950	115.44
						Total	**289.380**
13	**Backfilling - Sandy Material**						
	Behind Abutment & Return wall-I	cum	4	11.50	3.15	5.519	799.70
	Behind Return wall at median	cum	2	3.00	5.010	6.088	183.01
	Deduct for filter media	cum					-217.70
	Deduct for brick wall at median	cum					-6.470
						Total	**758.540**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH._60.272 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA IN THE STATE OF ASSAM

3 No. X 18 M SPAN **CH._60.272 KM**

Item Sl No.	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
14	**Filter media**						
	Behind Abutment	cum	4	12.100	0.60	5.519	160.27
	Behind Return wall-I	cum	4	2.855	0.60	5.376	36.84
	Behind return wall-I extra fin portion	cum	4		2.880	0.600	6.91
	Behind Return wall at median	cum	2	2.980	0.60	3.825	13.68
						Total	**217.700**
15	**POT cum PTFE Bearing**						
		ton	48	250.00			12000.00
						Total	**12000.000**
16	**Elastomeric Bearing**						
	Bearing B2	cucm	24	35.00	42.50	4.80	171360
	Bearing B3	cucm	48	25.00	30.00	3.90	140400
						Total	**311760.000**

SUPERSTRUCTURE

17	**RCC M-30**						
	For T-Girder & Slab						
	Long Girder middle straight portion With Deck slab	cum	6	14.260	5.607		479.73
	Long Girder end straight portion with Deck slab	cum	12	1.000	6.812		81.74
	Long Girder end varying portion With Deck slab	cum	12	1.200	6.210		89.42
	Cantilever portion of Deck Slab	cum	12	0.420	12.500	0.350	22.05
	End Cross Girder	cum	12	0.300	7.140		25.70
	IntermediateCross Girder	cum	6	0.300	7.980		14.36
	Kerb	cum	2	66.340	0.500	0.225	14.93
						Total	**727.930**
18	**HYSD Bars**						
	@ 180 kg/cum	T					131.027
						Total=	**131.027**
19	**RCC M30 Railing**						
		m	2	66.34			132.68
						Total=	**132.680**
20	**RCC M40 Crash Barrier**						
		m	4	66.34			265.36
						Total=	**265.360**
21	**Drainage Spout**	nos.	20			**Total**	**20.000**
22	**M15 PCC below Approach Slab**						
		cum	4	3.370	12.230	0.15	24.73
						Total	**24.730**
23	**Approach Slab(M30)**						
	Approach Slab	cum	4	3.500	12.080	0.300	50.74
						Total	**50.740**
24	**Bituminous concrete wearing course**						
		cum	2	66.34	9.50	0.040	50.42
						Total=	**50.420**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH._60.272 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA IN THE STATE OF ASSAM

3 No. X 18 M SPAN **CH._60.272 KM**

Item Sl No.	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
25	**Mastic asphalt**						
		sqm	2	66.34	9.50		1260.46
						Total=	**1260.460**
26	**Tack coat**						
		sqm	2	66.34	9.50		1260.46
						Total=	**1260.460**
27	**Cement Concrete wearing coarse(75mm)**						
		cum	2	66.34	1.50	0.075	14.93
						Total=	**14.930**
28	**Filler joint**						
	Providing & fixing 2 mm thick corrugated copper plate in expansion joint	m	4	12.08			**48.32**
	Providing & fixing 20 mm thick compressible fibre board in expansion joint	m	4	12.08			**48.32**
	Providing and fixing in position 20 mm thick premoulded joint filler	m	4	12.08			**48.32**
	Providing and filling joint sealing compound	m	4	12.08			**48.32**
29	**Strip Seal Expansion Joint**						
		m	4	12.500			50.00
						Total	**50.000**
30	**Brick work at median**						
	Above abutment cap level	cum	2	2.980	0.250	2.238	3.33
	Below abutment cap level	cum	2	2.980	0.369		2.20
						Total	**5.530**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH._60.272 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA IN THE STATE OF ASSAM

3 No. X 18 M SPAN **CH._60.272 KM**

Item Sl No.	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
PROTECTION WORK							
31	**Pitching with Stone Blanket**						
	Pitching with Stone Blanket (A1 side)	cum	2		180.69	0.30	108.414
	Pitching with Stone Blanket (A2 side)	cum	2		168.35	0.30	101.010
	In front of abutment	cum	2	28.00	0.395	0.30	6.636
						Total	**216.060**
32	**Floor Protection**						
	Abutment (straight portion)	cum	4	10.00	0.601		24.040
	Abutment A1 (curve portion)	cum	2	13.72	1.127		30.925
	Abutment A2 (curve portion)	cum	2	13.03	1.127		29.370
	In front of abutment	cum	2	28.00	1.653		92.568
						Total	**176.903**
33	**Filter Blanket below pitching**						
	A1 side	cum	2		180.69	0.15	54.207
	A2 side	cum	2		168.35	0.15	50.505
	In front of abutment	cum	2	28.00	0.395	0.15	3.318
						Total=	**108.030**
MISCELLANEOUS							
34	**Painting**						
	Kerb below railing	sqm	2		0.950	66.34	126.05
	Railing(Post)	sqm	78		0.90	1.10	77.22
	Railing(Beam)	sqm	6		0.54	66.34	214.94
	Crash Barrier	sqm	4		2.080	66.34	551.95
						Total	**970.160**
35	**Citizen information Board NH Project**	no				**Total**	**2.000**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

CHAINAGE_60.892KM

QUANTITY CALCULATION OF BRIDGE AT CH._60.892 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA LOT-I PKG-IA IN THE STATE OF ASSAM

3 No. X 18 M SPAN **CH._60.892 KM**

Item Sl No.	Description Unit nos.			Length (m)	Breadth (m)	Height (m)	Quantity
FOUNDATION							
1.1	**Excavation upto 3m depth**						
	Abutment-1	cum	2	13.60	9.70	3.00	791.52
	Pier-1	cum	2	9.70	6.10	2.63	311.23
	Pier-2	cum	2	9.70	6.10	3.00	355.02
	Abutment-2	cum	2	13.60	9.70	3.00	791.52
	Return wall-I at Abutment-1 (at median)	cum	1	2.00	1.30	1.42	3.69
	Return wall-I at Abutment-2 (at median)	cum	1	2.00	1.30	1.78	4.63
						Total	**2257.610**
1.2	**Excavation 3.0m to 6.0m depth**						
	Abutment-1	cum	2	13.60	9.70	0.391	103.16
	Pier-2	cum	2	9.70	6.10	0.076	8.99
	Abutment-2	cum	2	13.60	9.70	0.750	197.88
						Total	**310.03**
2	**Pile cap RCC M30**						
	Abutment	cum	4	12.60	8.700	1.80	789.26
	Pier	cum	4	8.70	5.100	1.80	319.46
						Total=	**1108.720**
3	**Bored Cast-in-situ Pile M35 (dia.=1.2m)**						
	Abutment-1	m	24		20.000		480.00
	Pier-1	m	12		22.000		264.00
	Pier-2	m	12		22.000		264.00
	Abutment-2	m	24		20.000		480.00
						Total=	**1488.000**
4	**PCC M-15 levelling course**						
	Below Pile-cap for Abutment	cum	4	12.90	9.00	0.15	69.66
	Below Pile-cap for Pier	cum	4	9.00	5.40	0.15	29.16
	Below brick wall at median	cum	2	2.98	0.90	0.10	0.54
						Total=	**99.360**
5	**HYSD Bars**						
	90kg/cum for pile cap & @ 130kg/m for pile	T				**Total=**	**293.225**
6	**Brick Flat Soling (BFS) below brick wall at median**						
		cum	2	2.98	0.90	0.075	0.40
						Total=	**0.40**
SUBSTRUCTURE							
7	**RCC M-30 upto 5.0m height**						
	Abutment wall	cum	4	12.50	1.200	2.900	174.00
	Abutment cap	cum	4	12.50	1.790	1.000	89.50
	Pier shaft	cum	4		3.14	5.000	62.80
	Dirt Wall	cum	4	12.50	0.400	1.100	22.00
	Return Wall-I upto abutment cap	cum	4	3.75	0.400	2.875	17.25
	Return Wall-I above abutment cap	cum	4	3.16	0.400	2.125	10.74
	Return wall at median	cum	2	2.980	0.300	3.875	6.93
	Return wall extra finch triangular portion	cum	4	0.30	1.080		1.30
						Total=	**384.520**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH._60.892 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA LOT-I PKG-IA IN THE STATE OF ASSAM

3 No. X 18 M SPAN **CH._60.892 KM**

Item Sl No.	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
8	**RCC M-30 height above 5.0m upto 10.0m**						
	Pier cap(Trapizoidal portion)	cum	4	7.25	2.700	0.700	54.81
	Pier cap(Rectangular portion)	cum	4	11.50	2.700	0.700	86.94
	Dirt Wall	cum	4	12.50	0.400	1.019	20.38
	Bracket	cum	4	12.10	0.180		8.71
	Return Wall-I above abutment cap	cum	4	3.16	0.400	0.876	4.43
	Return wall extra fin rectangular portion	cum	4	0.30	1.800	1.000	2.16
						Total=	**177.430**
9	**RCC M-35 for Pedestal & Seismic Arrestor Blocks height upto 5.0m**						
	Pedestal at POT cum PTFE bearing	cum	6	0.80	0.800	0.150	0.58
		cum	6	0.80	0.800	0.215	0.83
		cum	6	0.80	0.800	0.288	1.11
		cum	6	0.80	0.800	0.361	1.39
	Pedestal at POT bearing	cum	6	0.80	0.800	0.150	0.58
		cum	6	0.80	0.800	0.215	0.83
		cum	6	0.80	0.800	0.288	1.11
		cum	6	0.80	0.800	0.361	1.39
						Total=	**7.820**
	Block RB2	cum	16	0.340	0.700	1.060	4.04
	Block RB1	cum	12	0.800	0.889		8.53
	Block RB1 (a)	cum	12	0.800	1.069		10.26
	Block RB3	cum	16	0.640	0.700	1.060	7.17
						Total=	**37.820**
10	**HYSD Bars**						
	@ 120 kg/cum	T					71.972
						Total=	**71.972**
11	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per abutment = 12.1/2+1 =					8	
	No of weep holes in vertical direction per abutment = 2.9+1 =					4	
	No of weep holes in horizontal direction per return wall = (3.75)/2+1 =					3	
	No of weep holes in vertical direction per return wall = (5.876)/1+1 =					7	
	No of weep holes in horizontal direction per return wall at median= (2.98)/2+1 =					3	
	No of weep holes in vertical direction per return wall at median = (3.875)/1+1 =					5	
	No of weep holes in horizontal direction per return wall extra fin= (1.8)/2+1 =					2	
	No of weep holes in vertical direction per return wall extra fin = (1.6)/1+1 =					3	
	Total no of Weep holes per abutment = 8 x 4					32	
	Total no of Weep holes per return wall = 3 x 7					21	
	Total no of Weep holes per return wall at median= 3 x 5					15	
	Total no of Weep holes per return wall extra fin= 2 x 3					6	
	Total no of weep holes = 32 x 4 + 21 x 4 + 15 x 2 + 6 x 4					**Total**	**266.000**
12	**Backfilling - Granular Material**						
	Abutment	cum	4		22.30	1.950	173.94
	Pier	cum	4		14.80	1.950	115.44
						Total	**289.380**
13	**Backfilling - Sandy Material**						
	Behind Abutment & Return wall-I	cum	4	11.50	3.15	5.569	806.95
	Behind Return wall at median	cum	2	3.00	5.010	6.138	184.51
	Deduct for filter media	cum					-219.67
	Deduct for brick wall at median	cum					-6.470
						Total	**765.320**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH._60.892 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA LOT-I PKG-IA IN THE STATE OF ASSAM

3 No. X 18 M SPAN **CH._60.892 KM**

Item Sl No.	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
14	**Filter media**						
	Behind Abutment	cum	4	12.100	0.60	5.569	161.72
	Behind Return wall-I	cum	4	2.855	0.60	5.426	37.18
	Behind return wall-I extra fin portion	cum	4	2.880		0.600	6.91
	Behind Return wall at median	cum	2	2.980	0.60	3.875	13.86
						Total	**219.670**
15	**POT cum PTFE Bearing**						
		ton	48	250.00			12000.00
						Total	**12000.000**
16	**Elastomeric Bearing**						
	Bearing B2	cucm	24	35.00	42.50	4.80	171360
	Bearing B3	cucm	48	25.00	30.00	3.90	140400
						Total	**311760.000**

SUPERSTRUCTURE

17	**RCC M-30**						
	For T-Girder & Slab						
	Long Girder middle straight portion With Deck slab	cum	6	14.260	5.607		479.73
	Long Girder end straight portion with Deck slab	cum	12	1.000	6.812		81.74
	Long Girder end varying portion With Deck slab	cum	12	1.200	6.210		89.42
	Cantilever portion of Deck Slab	cum	12	0.420	12.500	0.350	22.05
	End Cross Girder	cum	12	0.300	7.140		25.70
	IntermediateCross Girder	cum	6	0.300	7.980		14.36
	Kerb	cum	2	66.340	0.500	0.225	14.93
						Total	**727.930**
18	**HYSD Bars**						
	@ 180 kg/cum	T					131.027
						Total=	**131.027**
19	**RCC M30 Railing**						
		m	2	66.34			132.68
						Total=	**132.680**
20	**RCC M40 Crash Barrier**						
		m	4	66.34			265.36
						Total=	**265.360**
21	**Drainage Spout**	nos.	20			**Total**	**20.000**
22	**M15 PCC below Approach Slab**						
		cum	4	3.370	12.230	0.15	24.73
						Total	**24.730**
23	**Approach Slab(M30)**						
	Approach Slab	cum	4	3.500	12.080	0.300	50.74
						Total	**50.740**
24	**Bituminous concrete wearing course**						
		cum	2	66.34	9.50	0.040	50.42
						Total=	**50.420**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH._60.892 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA LOT-I PKG-IA IN THE STATE OF ASSAM

3 No. X 18 M SPAN **CH._60.892 KM**

Item Sl No.	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
25	**Mastic asphalt**						
		sqm	2	66.34	9.50		1260.46
						Total=	**1260.460**
26	**Tack coat**						
		sqm	2	66.34	9.50		1260.46
						Total=	**1260.460**
27	**Cement Concrete wearing coarse(75mm)**						
		cum	2	66.34	1.50	0.075	14.93
						Total=	**14.930**
28	**Filler joint**						
	Providing & fixing 2 mm thick corrugated copper plate in expansion joint	m	4	12.08			**48.32**
	Providing & fixing 20 mm thick compressible fibre board in expansion joint	m	4	12.08			**48.32**
	Providing and fixing in position 20 mm thick premoulded joint filler	m	4	12.08			**48.32**
	Providing and filling joint sealing compound	m	4	12.08			**48.32**
29	**Strip Seal Expansion Joint**						
		m	4	12.500			50.00
						Total	**50.000**
30	**Brick work at median**						
	Above abutment cap level	cum	2	2.980	0.250	2.238	3.33
	Below abutment cap level	cum	2	2.980	0.369		2.20
						Total	**5.530**

QUANTITY CALCULATION OF BRIDGE AT CH._60.892 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA LOT-I PKG-IA IN THE STATE OF ASSAM

3 No. X 18 M SPAN **CH._60.892 KM**

Item Sl No.	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
PROTECTION WORK							
31	**Pitching with Stone Blanket**						
	Pitching with Stone Blanket (A1 side)	cum	2		169.81	0.30	101.886
	Pitching with Stone Blanket (A2 side)	cum	2		152.59	0.30	91.554
	In front of abutment	cum	2	28.00	0.395	0.30	6.636
						Total	**200.076**
32	**Floor Protection**						
	Abutment (straight portion)	cum	4	10.00	0.601		24.040
	Abutment A1 (curve portion)	cum	2	13.11	1.127		29.550
	Abutment A2 (curve portion)	cum	2	12.12	1.127		27.318
	In front of abutment	cum	2	28.00	1.653		92.568
						Total	**173.476**
33	**Filter Blanket below pitching**						
	A1 side	cum	2		169.81	0.15	50.943
	A2 side	cum	2		152.59	0.15	45.777
	In front of abutment	cum	2	28.00	0.395	0.15	3.318
						Total=	**100.038**
MISCELLANEOUS							
34	**Painting**						
	Kerb below railing	sqm	2		0.950	66.34	126.05
	Railing(Post)	sqm	78		0.90	1.10	77.22
	Railing(Beam)	sqm	6		0.54	66.34	214.94
	Crash Barrier	sqm	4		2.080	66.34	551.95
						Total	**970.160**
35	**Citizen information Board NH Project**	no				**Total**	**2.000**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

CHAINAGE_64.159KM

QUANTITY CALCULATION OF BRIDGE AT CH._64.159 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA LOT-I PKG-IA IN THE STATE OF ASSAM

1 No. X 40 M SPAN **CH._64.159 KM**

Item Sl No.	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
FOUNDATION							
1.1	**Excavation upto 3m depth**						
	Abutment-1	cum	2	13.60	9.70	3.00	791.52
	Abutment-2	cum	2	13.60	9.70	1.36	358.82
	Return wall-I at Abutment-1(median side)	cum	1	3.00	1.30	2.18	8.50
	Return wall-I at Abutment-2(median side)	cum	1	3.00	1.30	0.12	0.47
						Total	**1159.31**
1.2	**Excavation 3.0m to 6.0m depth**						
	Abutment-1	cum	2	13.60	9.70	1.130	298.14
						Total	**298.14**
2	**Pile cap RCC M30**						
	Abutment	cum	4	12.60	8.700	1.80	789.26
						Total=	**789.26**
3	**Bored Cast-in-situ Pile M35 (dia.=1.2m)**						
	Abutment-1	m	24		30.000		720.00
	Abutment-2	m	24		30.000		720.00
						Total=	**1440.00**
4	**PCC M-15 levelling course**						
	Below Pile-cap for Abutment	cum	4	12.90	9.00	0.15	69.66
	Below brick wall at median	cum	4	1.49	0.90	0.10	0.54
						Total=	**70.20**
5	**HYSD Bars**						
	90kg/cum for pile cap & @ 125kg/m for pile	T				**Total=**	**251.033**
6	**Brick Flat Soling (BFS) below brick wall at median**						
		cum	4	1.49	0.90	0.075	0.40
						Total=	**0.40**
SUBSTRUCTURE							
7	**RCC M-30 upto 5.0m height**						
	Abutment wall	cum	4	12.50	1.200	3.900	234.00
	Abutment cap	cum	4	12.50	2.120	1.000	106.00
	Dirt Wall	cum	4	12.50	0.400	0.100	2.00
	Return Wall-I upto abutment cap	cum	4	3.75	0.450	3.876	26.16
	Return Wall-I above abutment cap	cum	4	2.83	0.450	1.124	5.73
	Return Wall-I(median)	cum	4	1.49	0.300	4.875	8.72
						Total=	**382.61**
8	**RCC M-30 height above 5.0m upto 10.0m**						
	Dirt Wall	cum	4	12.50	0.400	3.093	61.86
	Bracket	cum	4	12.50	0.180		9.00
	Return Wall-I above abutment cap	cum	4	2.83	0.450	2.950	15.03
	Return Wall-I(median)	cum	4	1.49	0.300	0.025	0.04
	Return wall extra fins rectangular portion	cum	4	0.30	1.700	1.000	2.04
	Return wall extra fins triangular portion	cum	4	0.30	0.963		1.16
						Total=	**89.130**

QUANTITY CALCULATION OF BRIDGE AT CH._64.159 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA LOT-I PKG-IA IN THE STATE OF ASSAM

1 No. X 40 M SPAN **CH._64.159 KM**

Item Sl No.	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
9	**RCC M-35 for Pedestal & Seismic Arrestor Blocks height upto 5.0m**						
	Pedestal at Abutment	cum	4	0.80	0.80	0.150	0.38
		cum	4	0.80	0.80	0.213	0.55
		cum	4	0.80	0.80	0.288	0.74
		cum	4	0.80	0.80	0.363	0.93
						Total=	**2.60**
	Block RB2	cum	16	0.740	0.530	1.400	8.79
	Block RB1	cum	8	0.800	1.299		8.31
						Total=	**19.70**
10	**HYSD Bars**						
	@ 120 kg/cum	T					58.973
						Total=	**58.973**
11	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per abutment = 12.05/2+1 =					8	
	No of weep holes in vertical direction per abutment = 3.9/1+1 =					5	
	No of weep holes in horizontal direction per return wall = (3.75)/2+1 =					3	
	No of weep holes in vertical direction per return wall = (7.95-0.3-0.15)/1+1 =					9	
	No of weep holes in horizontal direction per return wall fins= (1.7)/2+1 =					2	
	No of weep holes in vertical direction per return wall fins = (1.5665)/1+1 =					3	
	No of weep holes in horizontal direction per return wall at median= (1.49)/2+1 =					2	
	No of weep holes in vertical direction per return wall at median= (4.9)/1+1 =					6	
	Total no of Weep holes per abutment = 8 x 5					40	
	Total no of Weep holes per return wall = 3 x 9					27	
	Total no of Weep holes per return wall fins = 3 x 2					6	
	Total no of Weep holes per return wall at median = 2 x 6					12	
	Total no of weep holes = 40 x 4 + 27 x 4 + 6 x 4 + 12 x 4					**Total**	**340.00**
12.1	**Backfilling - Granular Material**						
	Behind Abutment	cum	4	22.30		1.950	173.94
						Total	**173.94**
12.2	**Backfilling - Sandy Material**						
	Behind Abutment & Return wall-I	cum	4	13.55	3.75	7.500	1524.38
	Deduct for filter media	cum					-300.60
	Deduct for brick wall at median	cum					-0.940
						Total	**1222.84**
13	**Filter media**						
	Behind Abutment	cum	4	13.550	0.60	7.500	243.90
	Behind Return wall-I	cum	4	3.150	0.60	7.500	56.70
						Total	**300.60**
14	**POT & POT cum PTFE Bearing**						
		ton	16	300.00			4800.00
						Total	**4800.00**
15	**Elastomeric Bearing**						
	Bearing B2	cucm	8	35.00	42.50	4.80	57120
	Bearing B3	cucm	16	25.00	30.00	3.90	46800
						Total	**103920**

QUANTITY CALCULATION OF BRIDGE AT CH._64.159 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA LOT-I PKG-IA IN THE STATE OF ASSAM

1 No. X 40 M SPAN **CH._64.159 KM**

Item Sl No.	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
SUPERSTRUCTURE							
16	**PSC M-45 Girder portion**						
	Long Girder middle portion	cum	2	31.600	4.704		297.29
	Long Girder straight portion	cum	4	1.950	8.992		70.14
	Long Girder varying portion	cum	4	1.600	6.848		43.83
	End Cross Girder (portion in between the long girder)	cum	4	0.400	14.595		23.35
	End Cross Girder (rectangular part)	cum	4	0.400	0.840		1.34
	Intermediate Cross Girder (portion in between the long girder)	cum	6	0.300	17.889		32.20
	Intermediate Cross Girder (Trapezoidal part)	cum	6	0.300	1.488		2.68
						Total	**470.83**
17	**R.C.C. Deck slab (M45)**						
	Deck Slab	cum	2	38.20	12.50	0.225	214.88
	Cantilever portion of Deck Slab	cum	4	0.880	12.50	0.300	13.20
						Total	**228.08**
18	**Kerb(M30)**						
		cum	2	47.80	0.50	0.225	10.76
						Total	**10.76**
19	**PSC Steel**						
	@14.5ton/span	TON	2		14.50		29.00
						Total	**29.00**
20	**Superstructure Steel (HYSD Bars)**						
	@ 150 kg/cum	TON					106.451
						Total=	**106.451**
21	**RCC M30 Railing**						
		m	2	47.80			95.60
						Total=	**95.60**
22	**RCC M40 Crash Barrier**						
		m	4	47.80			191.20
						Total=	**191.20**
23	**Drainage Spout**	nos.	12			**Total**	**12.00**
24	**M15 PCC below Approach Slab**						
		cum	4	3.370	12.030	0.15	24.32
						Total	**24.32**
25	**Approach Slab(M30)**						
	Approach Slab	cum	4	3.500	12.030	0.300	50.53
						Total	**50.53**
26	**Bituminous concrete wearing course**						
		cum	2	47.80	9.50	0.040	36.33
						Total=	**36.33**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH._64.159 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA LOT-I PKG-IA IN THE STATE OF ASSAM

1 No. X 40 M SPAN **CH._64.159 KM**

Item Sl No.	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
27	**Mastic asphalt**						
		sqm	2	47.80	9.50		908.20
						Total=	**908.20**
28	**Tack coat**						
		sqm	2	47.80	9.50		908.20
						Total=	**908.20**
29	**Cement Concrete wearing coarse(75mm)**						
		cum	2	47.80	1.50	0.075	10.76
						Total=	**10.76**
30	**Filler joint**						
	Providing & fixing 2 mm thick corrugated copper plate in expansion joint	m	4	11.90			**47.60**
	Providing & fixing 20 mm thick compressible fibre board in expansion joint	m	4	11.90			**47.60**
	Providing and fixing in position 20 mm thick premoulded joint filler	m	4	11.90			**47.60**
	Providing and filling joint sealing compound	m	4	11.90			**47.60**
31	**Strip Seal Expansion Joint**						
		m	4	11.900			47.60
						Total	**47.60**
32	**Brick work at median**						
	Above abutment cap level	cum	4	1.490	0.250	3.312	4.93
	Below abutment cap level	cum	4	1.49	0.369		2.20
						Total	**7.130**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH._64.159 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA LOT-I PKG-IA IN THE STATE OF ASSAM

1 No. X 40 M SPAN **CH._64.159 KM**

Item Sl No.	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
PROTECTION WORK							
33	**Pitching with Stone Blanket (A1 side)**	cum	2	345.79		0.30	207.474
	Pitching with Stone Blanket (A2 side)	cum	2	571.21		0.30	342.726
						Total	**550.20**
34	**Toe Wall**						
	A1 side	cum	2	0.610		34.54	42.139
	A2 side	cum	2	0.610		66.51	81.142
						Total	**123.28**
35	**Floor Protection**						
	A1 side	cum	2	16.74	0.526		17.610
	A1 side (Infront of abutment)	cum	2	14.10	1.052		29.666
	A2 side	cum	2	24.36	0.526		25.627
	A2 side (Infront of abutment)	cum	2	14.10	1.052		29.666
						Total	**102.57**
36	**Filter material below stone pitching**						
	A1 side	cum	2	345.79		0.15	103.737
	A2 side	cum	2	571.21		0.15	171.363
						Total=	**275.10**
MISCELLANEOUS							
37	**Painting**						
	Kerb below railing	sqm	2	0.950		47.80	90.82
	Railing(Post)	sqm	56	1.05		1.10	64.68
	Railing(Beam)	sqm	6	0.69		47.80	197.89
	Crash Barrier	sqm	4	2.261		47.80	432.30
						Total	**785.690**
38	Citizen information Board NH Project	no				**Total**	**2.000**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

CHAINAGE_67.047KM

QUANTITY CALCULATION OF BRIDGE AT CH._67.047 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA LOT-I PKG-IA IN THE STATE OF ASSAM

3 No. X 18 M SPAN **CH._67.047 KM**

Item Sl No.	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
FOUNDATION							
1.1	**Excavation upto 3m depth**						
	Abutment-1	cum	2	13.60	9.70	1.79	472.27
	Pier-1	cum	2	9.70	6.10	1.98	234.31
	Pier-2	cum	2	9.70	6.10	3.00	355.02
	Abutment-2	cum	2	13.60	9.70	2.71	715.01
	Return wall-I at Abutment-2 (at median)	cum	1	2.00	1.30	0.73	1.90
						Total	**1778.510**
1.2	**Excavation 3.0m to 6.0m depth**						
	Pier-2	cum	2	9.70	6.10	1.340	158.58
						Total	**158.580**
2	**Pile cap RCC M30**						
	Abutment	cum	4	12.60	8.700	1.80	789.26
	Pier	cum	4	8.70	5.100	1.80	319.46
						Total=	**1108.720**
3	**Bored Cast-in-situ Pile M35 (dia.=1.2m)**						
	Abutment-1	m	24		27.000		648.00
	Pier-1	m	12		27.000		324.00
	Pier-2	m	12		27.000		324.00
	Abutment-2	m	24		27.000		648.00
						Total=	**1944.000**
4	**PCC M-15 levelling course**						
	Below Pile-cap for Abutment	cum	4	12.90	9.00	0.15	69.66
	Below Pile-cap for Pier	cum	4	9.00	5.40	0.15	29.16
	Below brick wall at median	cum	2	2.98	0.90	0.10	0.54
						Total=	**99.360**
5	**HYSD Bars**						
	90kg/cum for pile cap & @ 130kg/m for pile	T				**Total=**	**352.505**
6	**Brick Flat Soling (BFS) below brick wall at median**						
		cum	2	2.98	0.90	0.075	0.40
						Total=	**0.40**
SUBSTRUCTURE							
7	**RCC M-30 upto 5.0m height**						
	Abutment wall	cum	4	12.50	1.200	5.000	300.00
	Pier shaft	cum	4		3.80	5.000	76.00
	Return Wall-I upto abutment cap	cum	2	3.75	0.550	5.000	20.63
	Return Wall-I(another side) upto abutment cap	cum	2	3.75	0.550	5.000	20.63
	Return wall at median	cum	2	2.980	0.300	5.000	8.94
						Total=	**426.200**

QUANTITY CALCULATION OF BRIDGE AT CH._67.047 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA LOT-I PKG-IA IN THE STATE OF ASSAM

3 No. X 18 M SPAN **CH._67.047 KM**

Item Sl No.	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
8	**RCC M-30 height above 5.0m upto 10.0m**						
	Abutment wall	cum	2	12.50	1.200	0.350	10.50
	Abutment cap	cum	4	12.50	1.790	1.000	89.50
	Pier shaft	cum	4		3.80	1.700	25.84
	Pier cap(Trapizoidal portion)	cum	4	7.25	2.700	0.700	54.81
	Pier cap(Rectangular portion)	cum	4	11.50	2.700	0.700	86.94
	Dirt Wall	cum	4	12.50	0.400	2.119	42.38
	Bracket	cum	4	11.95	0.180		8.60
	Return Wall-I upto abutment cap	cum	2	3.75	0.550	0.325	1.34
	Return Wall-I above abutment cap	cum	2	3.16	0.550	3.001	10.43
	Return Wall-I(another side) upto abutment cap	cum	2	3.75	0.550	0.325	1.34
	Return Wall-I(another side) above abutment cap	cum	2	3.16	0.550	3.001	10.43
	Return wall extra fin rectangular portion	cum	4	0.30	0.800	1.000	0.96
	Return wall extra fin triangular portion	cum	4	0.30	0.213		0.26
	Return wall at median	cum	2	2.98	0.300	1.325	2.37
						Total=	**345.700**
9	**RCC M-35 for Pedestal & Seismic Arrestor Blocks height upto 5.0m**						
	Pedestal at POT cum PTFE bearing	cum	6	0.80	0.800	0.150	0.58
		cum	6	0.80	0.800	0.215	0.83
		cum	6	0.80	0.800	0.288	1.11
		cum	6	0.80	0.800	0.361	1.39
	Pedestal at POT bearing	cum	6	0.80	0.800	0.150	0.58
		cum	6	0.80	0.800	0.215	0.83
		cum	6	0.80	0.800	0.288	1.11
		cum	6	0.80	0.800	0.361	1.39
						Total=	**7.820**
	Block RB2	cum	16	0.340	0.700	1.060	4.04
	Block RB1	cum	12	0.800	0.889		8.53
	Block RB1 (a)	cum	12	0.800	1.069		10.26
	Block RB3	cum	16	0.640	0.700	1.060	7.17
						Total=	**37.820**
10	**HYSD Bars**						
	@ 120 kg/cum	T					97.166
						Total=	**97.166**
11	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per abutment = 11.95/2+1 =					7	
	No of weep holes in vertical direction per abutment = 5.35+1 =					7	
	No of weep holes in horizontal direction per return wall = (3.75)/2+1 =					3	
	No of weep holes in vertical direction per return wall = (8.326)/1+1 =					10	
	No of weep holes in horizontal direction per return wall at median= (2.98)/2+1 =					3	
	No of weep holes in vertical direction per return wall at median = (6.325)/1+1 =					8	
	No of weep holes in horizontal direction per return wall extra fin= (0.8)/2+1 =					2	
	No of weep holes in vertical direction per return wall extra fin = (1.2665)/1+1 =					3	
	Total no of Weep holes per abutment = 7 x 7					49	
	Total no of Weep holes per return wall = 3 x 10					30	
	Total no of Weep holes per return wall at median= 3 x 8					24	
	Total no of Weep holes per return wall extra fin= 2 x 3					6	
	Total no of weep holes = 49 x 4 + 30 x 4 + 24 x 2 + 6 x 4					**Total**	**388.000**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH._67.047 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA LOT-I PKG-IA IN THE STATE OF ASSAM

3 No. X 18 M SPAN **CH._67.047 KM**

Item Sl No.	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
12	**Backfilling - Granular Material**						
	Abutment	cum	4		22.30	1.950	173.94
	Pier	cum	4		14.80	1.950	115.44
						Total	**289.380**
13	**Backfilling - Sandy Material**						
	Behind Abutment & Return wall-I	cum	4	11.35	3.15	8.019	1146.80
	Behind Return wall at median	cum	2	3.00	5.010	8.588	258.16
	Deduct for filter media	cum					-281.12
	Deduct for brick wall at median	cum					-6.470
						Total	**1117.370**
14	**Filter media**						
	Behind Abutment	cum	4	11.950	0.60	8.019	229.98
	Behind Return wall-I	cum	2	2.855	0.60	7.876	26.98
	Behind return wall-I extra fin portion	cum	2		1.280	0.600	1.54
	Behind Return wall at median	cum	2	2.980	0.60	6.325	22.62
						Total	**281.120**
15	**POT cum PTFE Bearing**						
		ton	48	250.00			12000.00
						Total	**12000.000**
16	**Elastomeric Bearing**						
	Bearing B2	cucm	24	35.00	42.50	4.80	171360
	Bearing B3	cucm	48	25.00	30.00	3.90	140400
						Total	**311760.000**

SUPERSTRUCTURE

17	**RCC M-30**						
	For T-Girder & Slab						
	Long Girder middle straight portion With Deck slab	cum	6	14.260	5.607		479.73
	Long Girder end straight portion with Deck slab	cum	12	1.000	6.812		81.74
	Long Girder end varying portion With Deck slab	cum	12	1.200	6.210		89.42
	Cantilever portion of Deck Slab	cum	12	0.420	12.500	0.350	22.05
	End Cross Girder	cum	12	0.300	7.071		25.46
	IntermediateCross Girder	cum	6	0.300	7.977		14.36
	Kerb	cum	2	66.340	0.500	0.225	14.93
						Total	**727.690**
18	**HYSD Bars**						
	@ 180 kg/cum	T					130.984
						Total=	**130.984**
19	**RCC M30 Railing**						
		m	2	66.34			132.68
						Total=	**132.680**
20	**RCC M40 Crash Barrier**						
		m	4	66.34			265.36
						Total=	**265.360**
21	**Drainage Spout**	nos.	18			**Total**	**18.000**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH._67.047 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA LOT-I PKG-IA IN THE STATE OF ASSAM

3 No. X 18 M SPAN **CH._67.047 KM**

Item Sl No .	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
22	**M15 PCC below Approach Slab**						
		cum	4	3.370	12.080	0.15	24.43
						Total	**24.430**
23	**Approach Slab(M30)**						
	Approach Slab	cum	4	3.500	11.930	0.300	50.11
						Total	**50.110**
24	**Bituminous concrete wearing course**						
		cum	2	66.34	9.50	0.040	50.42
						Total=	**50.420**
25	**Mastic asphalt**						
		sqm	2	66.34	9.50		1260.46
						Total=	**1260.460**
26	**Tack coat**						
		sqm	2	66.34	9.50		1260.46
						Total=	**1260.460**
27	**Cement Concrete wearing coarse(75mm)**						
		cum	2	66.34	1.50	0.075	14.93
						Total=	**14.930**
28	**Filler joint**						
	Providing & fixing 2 mm thick corrugated copper plate in expansion joint	m	4	11.78			**47.12**
	Providing & fixing 20 mm thick compressible fibre board in expansion joint	m	4	11.78			**47.12**
	Providing and fixing in position 20 mm thick premoulded joint filler	m	4	11.78			**47.12**
	Providing and filling joint sealing compound	m	4	11.78			**47.12**
29	**Strip Seal Expansion Joint**						
		m	4	12.500			50.00
						Total	**50.000**
30	**Brick work at median**						
	Above abutment cap level	cum	2	2.980	0.250	2.238	3.33
	Below abutment cap level	cum	2	2.980	0.369		2.20
						Total	**5.530**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH._67.047 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA LOT-I PKG-IA IN THE STATE OF ASSAM

3 No. X 18 M SPAN **CH. 67.047 KM**

Item Sl No.	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
PROTECTION WORK							
31	**Pitching with Stone Blanket**						
	Pitching with Stone Blanket (A1 side)	cum	2		413.14	0.30	247.884
	Pitching with Stone Blanket (A2 side)	cum	2		349.88	0.30	209.928
	In front of abutment	cum	2	28.00	0.395	0.30	6.636
						Total	**464.448**
32	**Floor Protection**						
	Abutment (straight portion)	cum	4	10.00	0.601		24.040
	Abutment A1 (curve portion)	cum	2	24.25	1.127		54.660
	Abutment A2 (curve portion)	cum	2	21.72	1.127		48.957
	In front of abutment	cum	2	28.00	1.653		92.568
						Total	**220.225**
33	**Filter Blanket below pitching**						
	A1 side	cum	2		413.14	0.15	123.942
	A2 side	cum	2		349.88	0.15	104.964
	In front of abutment	cum	2	28.00	0.395	0.15	3.318
						Total=	**232.224**
MISCELLANEOUS							
34	**Painting**						
	Kerb below railing	sqm	2		0.950	66.34	126.05
	Railing(Post)	sqm	78		0.90	1.10	77.22
	Railing(Beam)	sqm	6		0.54	66.34	214.94
	Crash Barrier	sqm	4		2.080	66.34	551.95
						Total	**970.160**
35	**Citizen information Board NH Project**	no				**Total**	**2.000**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ROB

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

JOB NO : 4146 (PACKAGE-5)

Summary sheet of ROB (Quantities & amount)

		CHAINAGE	49+988 Km	64.763 Km	
		SPAN ARRANGEMENT	(18.0M+4x36.0M)_RDSO+(3X24.0M+21.0M)_20 SK	(3X36.0M)RDSO+(19X24.0M)+(1X18.0M)	TOTAL QTY
ITEM NO.	Description	Unit			
	FOUNDATION				
1	Excavation upto 3.0m depth	CUM	3196.520	9976.520	13,173.04
2	Excavation 3.0m to 6.0m depth	CUM	0.000	338.610	338.61
3	Bored Cast-in-situ Pile **M35**	M	3712.000	6584.000	10,296.00
4	RCC **M35** Pile Cap	CUM	2258.290	6216.760	8,475.05
5	Brick foundation for approach slab	CUM	72.610	68.460	141.07
6	Levelling Course for Foundation	CUM	597.620	572.130	1,169.75
7	Steel Reinforcement	TON	683.070	1407.590	2,090.66
	SUBSTRUCTURE				
8	RCC **M35** upto 5 m	CUM	637.200	1169.090	1,806.29
9	RCC **M35** 5 m to 10 m	CUM	1246.480	1731.910	2,978.39
10	RCC **M35** above 10 m	CUM	523.860	1244.240	1,768.10
11	RCC **M40** above 5 m for pedestal	CUM	33.400	75.600	109.00
12	RCC **M35** above 5 m for REACTION BLOCK	CUM	72.530	362.620	435.15
13	Steel Reinforcement	TON	351.890	641.690	993.58
14	POT CUM PTFE Bearing	TON CAPACITY	4960.000	25280.000	30,240.00
16	Metallic guide bearing	TON CAPACITY	3000.000	7760.000	10,760.00
17	Elastomeric bearing	CCUM	4624469.000	10622097.000	15,246,566.00
18	Pin bearing	TON CAPACITY	3000.000	7760.000	10,760.00
	SUPERSTRUCTURE				
18	RCC **M35**	CUM	1333.980	6527.510	7,861.49
19	RCC **M45**	CUM	1108.560	738.790	1,847.35
21	Steel Reinforcement	TON	439.660	1307.930	1,747.59
23	Supply, fabrication, delivery at	TON	1285.630	882.990	2,168.62
24	Bituminous Concrete Wearing Coat	CUM	307.280	594.020	901.30
25	Tack Coat	SQM	5586.790	11880.360	17,467.15
26	Mastic Asphalt	SQM	5586.790	11880.360	17,467.15
27	PCC **M15** below approach slab	CUM	6.030	5.670	11.70
29	RCC **M30** Kerb	M	15.100	10.040	25.14
30	Crash Barrier RCC **M40**	M	1106.880	2497.760	3,604.64
31	Steel railing	M	614.960	486.800	1,101.76
32	Drainage Spout	NO.	86.000	236.000	322.00
33	Strip Seal Expansion Joint	M	248.980	520.000	768.98
34	Receiver Pipe for drainage spout	M	430.000	1150.000	1,580.00
35	Filler joint				
	Providing & fixing 2 mm thick corrugated copper plate in expansion joint	M	44.680	42.000	86.68
	Providing & fixing 20 mm thick compressible fibre board in expansion joint	M	44.680	42.000	86.68
	Providing and fixing in position 20 mm thick premoulded joint filler	M	44.680	42.000	86.68
	Providing and filling joint sealing compound	M	44.680	42.000	86.68
	Miscellaneous				
36	Paint for concrete surface	SQM	4098.190	7733.380	11,831.57
37	Stair	TON	201.100	33.520	234.62
38	Inspection ladder	TON	9.333	1.556	10.89

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE
OF ROB

CHAINAGE_49.988KM

ESTIMATE OF QUANTITY OF ROB

Chainage:- 49.988 KM **ROB**

BOQ Sl No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
FOUNDATION							
1	**Excavation upto 3.0m depth**						
	Pier 3	cum	2	13.30	6.10	1.97	319.65
	Pier 4	cum	2	13.30	6.10	1.94	314.78
	Pier 5	cum	2	13.30	6.10	1.77	287.20
	Pier 6	cum	2	13.30	6.10	1.03	167.13
						Total	**1088.76**
2	**Bored Cast-in-situ Pile M35**						
		m	64			24.00	1536.00
						Total	**1536.00**
3	**RCC M35 Pile Cap**						
	Pile cap for Pier 3 & Pier 6	cum	4	12.30	5.10	1.80	451.66
	Pile cap for Pier 4 & Pier 5	cum	4	12.30	5.10	1.80	451.66
						Total=	**903.32**
4	**Levelling Course for Foundation slab M15 below pile cap**						
	Pile cap for Pier 3 & Pier 6	cum	4	12.60	5.400	0.15	40.82
	Pile cap for Pier 4 & Pier 5	cum	4	12.60	5.400	0.15	40.82
						Total=	**81.64**
5	**Steel Reinforcement**						
	@ 80 kg/cum for pile cap consists of 2 rows pile, @ 90 kg/cum for pile cap consists of more than 2 rows pile & @ 150 kg/m for pile	t					302.67
						Total=	**302.67**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF ROB

Chainage:- 49.988 KM **ROB**

BOQ Sl No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
SUBSTRUCTURE							
6	**RCC M35 upto 5 m(ROB Portion)**						
	Pier 3 circular portion	cum	8	1.77		5.000	70.80
	Pier 4 circular portion	cum	8	1.77		5.000	70.80
	Pier 5 circular portion	cum	8	1.77		5.000	70.80
	Pier 6 circular portion	cum	8	1.77		5.000	70.80
						Total=	**283.20**
7	**RCC M35 5 m to 10 m**						
	Pier 3 circular portion	cum	8	1.77		3.100	43.90
	Pier 4 circular portion	cum	8	1.77		3.600	50.98
	Pier 5 circular portion	cum	8	1.77		4.100	58.06
	Pier 6 circular portion	cum	8	1.77		1.100	15.58
	Pier 3 cap rectangular portion	cum	2	2.87	12.800	0.900	66.12
	Pier 4 cap rectangular portion	cum	2	2.87	12.800	0.400	29.39
	Pier 6 cap rectangular portion	cum	2	2.87	12.800	1.000	73.47
	Pier 3 cap trapezoidal portion	cum	2	2.23	11.950	1.000	53.30
	Pier 4 cap trapezoidal portion	cum	2	2.23	11.950	1.000	53.30
	Pier 5 cap trapezoidal portion	cum	2	2.23	11.950	0.900	47.97
	Pier 6 cap trapezoidal portion	cum	2	2.23	11.950	1.000	53.30
	Extra cap part in P3 & P6	cum	2	1.44	12.80	0.716	26.39
	Inspection polatform for P3 & P4	cum	4	32.67	1.20	0.200	31.36
						Total=	**603.12**
8	**RCC M35 above 10 m(ROB Portion)**						
	Pier 3 cap rectangular portion	cum	2	2.87	12.80	0.100	7.35
	Pier 4 cap rectangular portion	cum	2	2.87	12.80	0.600	44.08
	Pier 5 cap rectangular portion	cum	2	2.87	12.80	1.000	73.47
	Pier 5 cap trapezoidal portion	cum	2	2.23	11.95	0.100	5.33
	Inspection polatform for P5 & P6	cum	4	32.67	1.200	0.200	31.36
						Total=	**161.59**
9	**RCC M40 upto 5 m for pedestal**						
	Pedestal below 18m RDSO Span	cum	4	0.900	0.650	0.150	0.35
		cum	4	0.900	0.650	0.213	0.50
		cum	4	0.900	0.650	0.276	0.65
		cum	4	0.900	0.650	0.339	0.79
		cum	4	0.900	0.650	0.402	0.94
	Pedestal below 36m RDSO Span	cum	12	1.050	0.650	0.150	1.23
		cum	12	1.050	0.650	0.213	1.74
		cum	12	1.050	0.650	0.276	2.26
		cum	12	1.050	0.650	0.339	2.78
		cum	12	1.050	0.650	0.402	3.29
	Metallic guide bearing(18m span)	cum	2	0.880	1.015	0.365	0.65
	Pin bearing (18m span)	cum	2	0.880	1.015	0.365	0.65
	Metallic guide bearing(36m span)	cum	6	1.070	1.325	0.441	3.75
	Pin bearing (36m span)	cum	6	1.070	1.325	0.441	2.13
						Total =	**21.71**
10	**Steel Reinforcement**						
	@ 140kg/cum	t					149.75
						Total =	**149.75**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF ROB

Chainage:- 49.988 KM **ROB**

BOQ Sl No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
11	**Elastomeric Bearing**						
	for 36 m span (Composite)	cc	60	35.00	75.00	14.90	2346750.00
	for 18 m span (Composite)	cc	20	35.00	60.00	14.90	625800.00
						Total =	**2972550.00**
12	**Metallic guide bearing**						
	for 36 m span (Composite)	one tonne capacity	6	240.00			1440.0
	for 18 m span (Composite)	one tonne capacity	2	160.000			320.00
						Total	**1760**
13	**Pin bearing**						
	for 36 m span (Composite)	one tonne capacity	6	240.00			1440.0
	for 18 m span (Composite)	one tonne capacity	2	160.00			320.00
						Total	**1760.00**

SUPERSTRUCTURE

14	**RCC M45 (ROB Portion)**						
	For 36.0 m RDSO superstructure deck	cum	8	3.31		37.20	985.06
	For 18.0 m RDSO superstructure deck	cum	2	3.25		19.00	123.50
						Total	**1108.56**
15	**Steel Reinforcement**						
	@ 180kg/cum	t					199.54
						Total=	**199.54**
16	**Supply, fabrication, delivery at bridge site and erection of structural steel works**						
	For 36 m span	t	8			147.165	1177.32
	For 18 m span	t	2			54.155	108.31
						Total=	**1285.63**
17	**Bituminous Concrete Wearing Coat**						
	For 36 m span	cum	8	10.11	37.20	0.055	165.48
	For 18 m span	cum	2	10.11	19.00	0.055	21.13
						Total=	**186.61**
18	**Mastic Asphalt**						
	For 36 m span	sqm	8	10.11	37.20		3008.74
	For 18 m span	sqm	2	10.11	19.00		384.18
						Total=	**3392.92**
19	**Tack Coat**						
	For 36 m span	sqm	8	10.11	37.20		3008.74
	For 18 m span	sqm	2	10.11	19.00		384.18
						Total=	**3392.92**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF ROB

Chainage:- 49.988 KM **ROB**

BOQ Sl No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
20	**RCC M30 Kerb**	cum	2	167.80	0.30	0.150	15.10
						Total	**15.10**
21	**Crash Barrier RCC M40**						
		m	4	167.80			671.20
						Total	**671.20**
22	**Steel railing for inspection Platform**						
	Steel railing for P3 & P4	m	4	34.92			139.68
	Steel railing for P5 & P6	m	4	34.92			139.68
	Steel railing for footpath	m	2	167.80			335.60
						Total	**614.96**
23	**Drainage Spout**	nos.	54			**Total**	**54.00**
24	**Strip Seal Expansion Joint**						
		m	12	13.302			159.62
						Total	**159.62**
25	**Receiver Pipe for drainage spout**						
	For 36 span	m	12			20.00	240.00
						Total	**240.00**

Miscallaeneous

27	**Paint for concrete surface**						
	For ROB portion (kerb)	sqm	2	167.80	0.600		969.88
	For ROB portion (crash barrier)	sqm	4	167.80	2.890		1939.77
						Total=	**2909.65**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF VIADUCT

Chainage:- 49.988 KM **Viaduct**

BOQ Sl No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
FOUNDATION							
30	**Excavation upto 3.0m depth**						
	Pier 1	cum	2	13.30	6.10	2.29	371.58
	Pier 2	cum	2	13.30	6.10	2.08	337.50
	Pier 7	cum	2	13.30	6.10	1.36	220.67
	Pier 8	cum	2	13.30	6.10	2.10	340.75
	Pier 9	cum	2	13.30	6.10	2.40	389.42
	Pier 10	cum	2	13.30	6.10	2.76	447.84
						Total	**2107.76**
31	**Bored Cast-in-situ Pile M35**						
	Pier-1,8,9,10	m	64			22.00	1408.00
	Pier-2 & 7	m	32			24.00	768.00
						Total	**2176.00**
32	**RCC M35 Pile Cap(Viaduct Portion)**						
	Pile cap for P1,P8,P9,P10	cum	8	12.30	5.10	1.80	903.31
	Pile cap for P2 & P7	cum	4	12.30	5.10	1.80	451.66
						Total=	**1354.97**
33	**Levelling Course for Foundation slab M15 below pile cap**						
	Pile cap for P1,P8,P9,P10	cum	8	12.60	5.40	0.15	81.65
	Pile cap for P2 & P7	cum	4	12.60	5.40	1.15	312.98
	Below brick foundation	cum	4	11.47	2.300	1.15	121.35
						Total=	**515.98**
34	**Steel Reinforcement**						
	@ 80 kg/cum for pile cap consists of 2 rows pile, @ 90 kg/cum for pile cap consists of more than 2 rows pile & @ 125 kg/m for pile	t					380.40
						Total=	**380.40**
35	**Brick foundation for Solid slab**						
		cum	4	11.17	1.625		72.61
						Total=	**72.61**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF VIADUCT

Chainage:- 49.988 KM **Viaduct**

BOQ Sl No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
SUBSTRUCTURE							
36	**RCC M30 upto 5 m**						
	Pier 1 circular portion	cum	6		1.77	5.000	53.10
	Pier 2 circular portion	cum	8		1.77	5.000	70.80
	Pier 7 circular portion	cum	8		1.77	5.000	70.80
	Pier 8 circular portion	cum	6		1.77	5.000	53.10
	Pier 9 circular portion	cum	6		1.77	5.000	53.10
	Pier 10 circular portion	cum	6		1.77	5.000	53.10
						Total=	**354.00**
37	**RCC M30 5 m to 10 m**						
	Pier 1 circular portion	cum	6		1.77	2.000	21.24
	Pier 2 circular portion	cum	8		1.77	2.000	28.32
	Pier 7 circular portion	cum	8		1.77	4.100	58.06
	Pier 8 circular portion	cum	6		1.77	4.500	47.79
	Pier 9 circular portion	cum	6		1.77	4.500	47.79
	Pier 10 circular portion	cum	6		1.77	4.500	47.79
	Pier 1 cap rectangular portion	cum	2	2.06	10.50	1.000	43.26
	Pier 2 cap rectangular portion	cum	2	3.41	12.80	1.000	87.30
	Pier 1 cap trapezoidal portion	cum	2	1.83	9.00	1.000	32.94
	Pier 2 cap trapezoidal portion	cum	2	2.50	11.95	1.000	59.75
	Pier 7 cap trapezoidal portion	cum	2	2.50	11.95	0.900	53.78
	Pier 8 cap trapezoidal portion	cum	2	2.23	9.00	0.500	20.07
	Pier 9 cap trapezoidal portion	cum	2	2.23	9.00	0.500	20.07
	Pier 10 cap trapezoidal portion	cum	2	1.83	9.00	0.500	16.47
	Extra cap part in P2	cum	2	1.70	12.80	1.144	49.79
	Dirt Wall(P1)	cum	2	11.17	0.400	1.000	8.94
						Total=	**643.36**
38	**RCC M30 above 10m**						
	Pier 7 cap rectangular portion	cum	2	3.41	12.800	1.000	87.30
	Pier 8 cap rectangular portion	cum	2	2.87	10.500	1.000	60.27
	Pier 9 cap rectangular portion	cum	2	2.87	10.500	1.000	60.27
	Pier 10 cap rectangular portion	cum	2	2.06	10.500	1.000	43.26
	Pier 7 cap trapezoidal portion	cum	2	2.50	11.950	0.100	5.98
	Pier 8 cap trapezoidal portion	cum	2	2.23	9.000	0.500	20.07
	Pier 9 cap trapezoidal portion	cum	2	2.23	9.000	0.500	20.07
	Pier 10 cap trapezoidal portion	cum	2	1.83	9.000	0.500	16.47
	Dirt Wall(P1)	cum	2	11.17	0.400	1.819	16.25
	Dirt Wall(P10)	cum	2	11.17	0.400	2.819	8.94
	Bracket(P1)	cum	2	11.17	0.180		4.02
	Bracket(P10)	cum	2	11.17	0.180		4.02
	Extra cap part in P7	cum	2	1.70	10.500	0.430	15.35
						Total=	**362.27**
39	**RCC M40 above 5 m for pedestal**						
	Pedestal below 24m RCC Span	cum	6	0.800	0.800	0.150	0.58
		cum	6	0.800	0.800	0.216	0.83
		cum	6	0.800	0.800	0.282	1.08
		cum	6	0.800	0.800	0.348	1.34
	Pedestal below 21m RCC Span	cum	2	0.800	0.800	0.150	0.19
		cum	2	0.800	0.800	0.216	0.28
		cum	2	0.800	0.800	0.282	0.36
		cum	2	0.800	0.800	0.348	0.45
	Metallic guide bearing(24m span)	cum	6	0.800	0.800	0.643	2.47
	Pin bearing (24m span)	cum	6	0.800	0.800	0.643	2.47
	Metallic guide bearing(21m span)	cum	2	0.800	0.800	0.643	0.82
	Pin bearing (21m span)	cum	2	0.800	0.800	0.643	0.82
						Total=	**11.69**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF VIADUCT

Chainage:- 49.988 KM **Viaduct**

BOQ Sl No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
40	**RCC M35 above 10m for Reaction Block**						
	Reaction block 1 (RB1)	cum	32	0.800	0.873		22.35
	Reaction block 2 (RB2)	cum	64	0.800	0.700	1.400	50.18
						Total=	**72.53**
41	**Steel Reinforcement**						
	@ 140kg/cum	t					202.14
						Total=	**202.14**
42	**Pot cum PTFE Bearing**						
	for 24 m span	one tonne capacity	24	160.000			3840.00
	for 21 m span	one tonne capacity	8	140.000			1120.00
						Total	**4960.00**
43	**Elastomeric Bearing**						
	Bearing B2	cc	32	54.80	37.00	9.80	635855
	Bearing B3	cc	64	42.00	42.00	9.00	1016064
						Total	**1651919**
44	**Metallic guide bearing**						
	for 24 m span	one tonne capacity	6	160.00			960.00
	for 21 m span	one tonne capacity	2	140.000			280.00
						Total	**1240.00**
45	**Pin bearing**						
	for 24 m span	one tonne capacity	6	160.00			960.00
	for 21 m span	one tonne capacity	2	140.00			280.00
						Total	**1240.00**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF VIADUCT

Chainage:- 49.988 KM **Viaduct**

BOQ Sl No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
SUPERSTRUCTURE							
46	**RCC M35**						
for 24 m span	Deck Slab_T Beam_24(End)	cum	6	2.000	7.81		93.72
	Deck Slab_T Beam_24(Middle)	cum	6	20.260	5.87		713.56
	Deck Slab_T Beam_24(Varrying)	cum	6	2.400	6.84		98.50
	Cantilever of Deck	cum	12	0.600	11.17	0.467	37.56
	T beam cross girder middle	cum	6	0.300	11.373		20.47
	T beam cross girder end	cum	12	0.300	9.990		35.96
for 21 m span	Deck Slab_T Beam_21(End)	cum	2	2.000	7.06		28.24
	Deck Slab_T Beam_21(Middle)	cum	2	17.260	5.48		189.17
	Deck Slab_T Beam_21(Varrying)	cum	2	2.400	6.27		30.10
	Cantilever of Deck	cum	4	0.420	11.17	0.467	8.76
	T beam cross girder middle	cum	2	0.300	9.282		5.57
	T beam cross girder end	cum	4	0.300	8.169		9.80
	Solid Slab in Approach	cum	4	11.174	4.000	0.350	62.57
						Total	**1333.98**
47	**Steel Reinforcement**						
	@ 180kg/cum	t					240.12
						Total=	**240.12**
48	**Bituminous Concrete Wearing Coat**						
	For 24 m span	cum	6	10.11	25.86	0.055	86.28
	For 21 m span	cum	2	10.11	22.50	0.055	25.02
	For dirt wall portion	cum	2	10.11	0.42	0.055	0.47
	For solid slab	cum	4	10.11	4.00	0.055	8.90
						Total=	**120.67**
49	**Mastic Asphalt**						
	For 24 m span	sqm	6	10.11	25.86		1568.67
	For 21 m span	sqm	2	10.11	22.50		454.95
	For dirt wall portion	sqm	2	10.11	0.42		8.49
	For solid slab	sqm	4	10.11	4.00		161.76
						Total=	**2193.87**
50	**Tack coat**						
	For 24 m span	sqm	6	10.11	25.86		1568.67
	For 21 m span	sqm	2	10.11	22.50		454.95
	For dirt wall portion	sqm	2	10.11	0.42		8.49
	For solid slab	sqm	4	10.11	4.00		161.76
						Total=	**2193.87**
51	**PCC M15 below solid slab**						
		cum	4	11.17	0.90	0.15	6.03
						Total=	**6.03**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF VIADUCT

Chainage:- 49.988 KM **Viaduct**

BOQ Sl No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
52	**Crash Barrier RCC M40**	m	4	108.92			435.68
						Total	**435.68**
53	**Drainage Spout**	nos.	32			**Total**	**32.00**
54	**Strip Seal Expansion Joint**	m	8	11.17			89.36
						Total	**89.36**
55	**Receiver Pipe for drainage spout**						
	For 24 m span	m	6.00			25.00	150.00
	For 21 m span	m	2.00			20.00	40.00
						Total	**190.00**
56	**Filler joint**						
	Providing & fixing 2 mm thick corrugated copper plate in expansion joint	m	4	11.17			**44.68**
	Providing & fixing 20 mm thick compressible fibre board in expansion joint	m	4	11.17			**44.68**
	Providing and fixing in position 20 mm thick premoulded joint filler	m	4	11.17			**44.68**
	Providing and filling joint sealing compound	m	4	11.17			**44.68**

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57	**Paint for concrete surface**						
	For Viaduct portion (crash barrier)	sqm	4	108.92	2.728		1188.54
						Total=	**1188.54**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

MEASUREMENT SHEET

STRUCTURAL STEEL WORKS FOR STAIRCASE

Sl. No.	Description	Nos.	Length (m)	Breadth (m)	Thickness (m)	Volume (m^3) / Length (m)	Unit Weight	Total Weight (kg)
28	**Stair**							
	Stair Columns (ISMB 250)	4	11.000				47.55	2092.20
	Stair Case inclined beam (ISMC 200)	8	5.000				28.21	1128.40
	Floor Beams 1 (ISMC 200)	5	10.500				28.21	1481.03
	Floor Beams 2 (ISMC 200)	10	4.500				28.21	1269.45
	Gratings (4 X 1.5)	5	4.200	2.000			40	1680.00
	Stair Gratings (1.6 X 0.3)	74	1.800	0.300			40	1598.40
	Railing for various platform & Stair (32NB)		300				3.1	930.00
	Railing for various platform & Stair (40NB)		250				3.56	890.00
	15 % extra for Int. X Frames, Splices, Nuts, Bolts, Gusset plate							2010.97
	10% Wastage Due to Non Avaiability of required legth of member							1340.65
							GRAND TOTAL for 1 stair =	**16758.10**
							GRAND TOTAL for 12 stair =	**201097.20**
							GRAND TOTAL for 4 stair (in ton) =	**201.10**

29	**Inspection ladder**							
	Inclined member (ISMC 200)	2	3.831				28.21	216.15
	Stair Gratings (1.6 X 0.3)	26	1.800	0.300			40	561.60
							GRAND TOTAL for 1 Ladder =	**777.75**
	No of ladder =	12				**Total in tonne =**		**9.333**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

CHAINAGE_64.763KM

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF ROB

Chainage:- 64.763 KM **ROB**

BOQ Sl No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
FOUNDATION							
1	**Excavation upto 3.0m depth**						
	Pier 8	cum	2	10.50	10.50	2.19	482.90
	Pier 9	cum	2	9.70	13.30	2.22	572.80
	Pier 10	cum	2	9.70	13.30	2.22	572.80
	Pier 11	cum	2	10.50	10.50	3.00	661.50
						Total	**2290.00**
1(ii)	**Excavation 3.0m to 6.0m depth**						
	Pier 11	cum	2	10.50	10.50	0.099	21.83
						Total	**21.83**
2	**Bored Cast-in-situ Pile M35**						
		m	84			27.00	2268.00
						Total	**2268.00**
3	**RCC M35 Pile Cap**						
	Pile cap for Pier 8 & Pier 11	cum	4	9.50	9.50	1.80	649.80
	Pile cap for Pier 9 & Pier 10	cum	4	8.70	12.30	1.80	770.47
						Total=	**1420.27**
4	**Levelling Course for Foundation slab M15 below pile cap**						
	Pile cap for Pier 8 & Pier 11	cum	4	9.80	9.800	0.15	57.62
	Pile cap for Pier 9 & Pier 10	cum	4	9.00	12.600	0.15	68.04
						Total=	**125.66**
5	**Steel Reinforcement**						
	@ 80 kg/cum for pile cap consists of 2 rows pile, @ 90 kg/cum for pile cap consists of more than 2 rows pile & @ 150 kg/m for pile	t					468.02
						Total=	**468.02**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF ROB

Chainage:- 64.763 KM **ROB**

BOQ Sl No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
SUBSTRUCTURE							
6	**RCC M35 upto 5 m(ROB Portion)**						
	Pier 8 circular portion	cum	2		3.58	5.000	35.80
	Pier 9 circular portion	cum	2		3.58	5.000	35.80
	Pier 10 circular portion	cum	2		3.58	5.000	35.80
	Pier 11 circular portion	cum	2		3.58	5.000	35.80
						Total=	**143.20**
7	**RCC M35 5 m to 10 m**						
	Pier 8 circular portion	cum	2		3.58	5.000	35.80
	Pier 9 circular portion	cum	2		3.58	5.000	35.80
	Pier 10 circular portion	cum	2		3.58	5.000	35.80
	Pier 11 circular portion	cum	2		3.58	5.000	35.80
						Total=	**143.20**
8	**RCC M35 above 10 m(ROB Portion)**						
	Pier 8 circular portion	cum	2		3.58	1.600	11.46
	Pier 9 circular portion	cum	2		3.58	0.400	2.86
	Pier 10 circular portion	cum	2		3.58	0.400	2.86
	Pier 11 circular portion	cum	2		3.58	1.600	11.46
	Pier 8 cap rectangular portion	cum	2	2.90	12.00	1.000	69.60
	Pier 9 cap rectangular portion	cum	2	2.70	12.00	1.000	64.80
	Pier 10 cap rectangular portion	cum	2	2.70	12.00	1.000	64.80
	Pier 11 cap rectangular portion	cum	2	2.90	12.00	1.000	69.60
	Pier 8 cap trapezoidal portion	cum	2	2.45	7.00	1.000	34.30
	Pier 9 cap trapezoidal portion	cum	2	2.35	7.00	1.000	32.90
	Pier 10 cap trapezoidal portion	cum	2	2.35	7.00	1.000	32.90
	Pier 11 cap trapezoidal portion	cum	2	2.45	7.00	1.000	34.30
	Extra part of pier cap of Pier 8 & Pier 11	cum	4	1.27	12.00	0.417	25.42
	Inspection polatform for P8 & P11	cum	4	29.30	1.200	0.200	28.13
	Inspection polatform for P9 & P10	cum	4	31.50	1.200	0.200	30.24
						Total=	**515.63**
9	**RCC M35 above 10 m for pedestal**						
	Pedestal below 36m RDSO Span	cum	12	1.050	0.650	0.150	1.23
		cum	12	1.050	0.650	0.213	1.74
		cum	12	1.050	0.650	0.276	2.26
		cum	12	1.050	0.650	0.339	2.78
		cum	12	1.050	0.650	0.402	3.29
	Metallic guide bearing(36m span)	cum	6	1.070	1.325	0.441	3.75
	Pin bearing (36m span)	cum	6	1.070	1.325	0.441	2.13
						Total =	**17.18**
10	**Steel Reinforcement**						
	@ 140kg/cum	t					114.69
						Total =	**114.69**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF ROB

Chainage:- 64.763 KM **ROB**

BOQ Sl No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
11	**Elastomeric Bearing**						
	for 36 m span (Composite)	cc	60	35.00	75.00	15.00	2362500.00
						Total =	**2362500.00**
12	**Metallic guide bearing**						
	for 36 m span (Composite)	one tonne capacity	6	240.00			1440.0
						Total	**1440**
13	**Pin bearing**						
	for 36 m span (Composite)	one tonne capacity	6	240.00			**1440.00**
						Total	**1440.00**

SUPERSTRUCTURE

14	**RCC M45 (ROB Portion)**						
	For 36.0 m RDSO superstructure deck	cum	6	3.31		37.20	738.79
						Total	**738.79**
15	**Steel Reinforcement**						
	@ 180kg/cum	t					132.98
						Total=	**132.98**
16	**Supply, fabrication, delivery at bridge site and erection of structural steel works**						
	For 36 m span	t	6			147.165	882.99
						Total=	**882.99**
17	**Bituminas Concrete Wearing Coat**						
	For 36 m span	cum	6	9.50	37.20	0.050	106.02
						Total=	**106.02**
18	**Mastic Asphalt**						
	For 36 m span	sqm	6	9.50	37.20		2120.40
						Total=	**2120.40**
19	**Tack Coat**						
	For 36 m span	sqm	6	9.50	37.20		2120.40
						Total=	**2120.40**
20	**RCC M30 Kerb**	cum	2	111.60	0.30	0.150	10.04
						Total	**10.04**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF ROB

Chainage:- 64.763 KM **ROB**

BOQ Sl No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
21	**Crash Barrier RCC M40**						
		m	4	111.60			446.40
						Total	**446.40**
22	**Steel railing for inspection Platform**						
	Steel railing for P8 & P11	m	4	31.70			126.80
	Steel railing for P9 & P10	m	4	34.20			136.80
	Steel railing for footpath	m	2	111.60			223.20
						Total	**486.80**
23	**Drainage Spout**	nos.	36			**Total**	**36.00**
24	**Strip Seal Expansion Joint**						
		m	8	12.500			100.00
						Total	**100.00**
25	**Receiver Pipe for drainage spout**						
	For 36 span	m	8			20.00	160.00
						Total	**160.00**

Miscallaeneous

26	**Paint for concrete surface**						
	For ROB portion (kerb)	sqm	2	111.60	0.600		756.87
	For ROB portion (crash barrier)	sqm	4	111.60	3.391		1513.74
						Total=	**2270.61**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF VIADUCT

Chainage:- 64.763 KM **Viaduct**

BOQ Sl No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
FOUNDATION							
29	**Excavation upto 3.0m depth**						
	Pier 1	cum	2	6.10	13.30	1.31	212.56
	Pier 2	cum	2	6.10	13.30	2.68	434.86
	Pier 3	cum	2	6.10	13.30	1.50	243.39
	Pier 4	cum	2	9.70	9.70	2.27	427.17
	Pier 5	cum	2	9.70	9.70	2.07	389.53
	Pier 6	cum	2	9.70	9.70	1.41	265.33
	Pier 7	cum	2	9.70	9.70	2.91	547.60
	Pier 12	cum	2	9.70	9.70	2.06	387.65
	Pier 13	cum	2	9.70	9.70	3.00	564.54
	Pier 14	cum	2	6.10	13.30	2.19	355.35
	Pier 15	cum	2	6.10	13.30	2.67	433.23
	Pier 16	cum	2	6.10	13.30	2.45	397.54
	Pier 17	cum	2	6.10	13.30	2.74	444.59
	Pier 18	cum	2	6.10	13.30	1.99	322.90
	Pier 19	cum	2	6.10	13.30	2.68	434.86
	Pier 20	cum	2	6.10	13.30	3.00	486.78
	Pier 21	cum	2	6.10	13.30	1.98	321.27
	Pier 22	cum	2	6.10	13.30	2.24	363.46
	Pier 23	cum	2	6.10	13.30	2.01	326.14
	Pier 24	cum	2	6.10	13.30	2.02	327.77
						Total	**7686.52**
29(ii)	**Excavation 3.0m to 6.0m depth**						
	Pier 13	cum	2	9.70	9.70	1.448	272.48
	Pier 20	cum	2	6.10	13.30	0.273	44.30
						Total	**316.78**
30	**Bored Cast-in-situ Pile M35**						
		m	166			26.00	4316.00
						Total	**4316.00**
31	**RCC M35 Pile Cap(Viaduct Portion)**						
	Pile cap for P1 to P3 & P14 to P24	cum	28	5.10	12.30	1.80	3161.59
	Pile cap for P4 to P7 & P12 to P13	cum	12	8.70	8.70	1.80	1634.90
						Total=	**4796.49**
32	**Levelling Course for Foundation slab M15 below pile cap**						
	Pile cap for P1 to P3 & P14 to P24	cum	28	5.40	12.60	0.15	285.77
	Pile cap for P4 to P7 & P12 to P13	cum	12	9.00	9.00	0.15	145.80
	Below brick foundation	cum	4	10.80	2.300	0.15	14.90
						Total=	**446.47**
33	**Steel Reinforcement**						
	@ 80 kg/cum for pile cap consists of 2 rows pile, @ 90 kg/cum for pile cap consists of more than 2 rows pile & @ 125 kg/m for pile	t					939.57
						Total=	**939.57**
34	**Brick foundation for Solid slab**						
		cum	4	10.50	1.63		68.46
						Total=	**68.46**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF VIADUCT

Chainage:- 64.763 KM **Viaduct**

BOQ Sl No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
SUBSTRUCTURE							
35	**RCC M35 upto 5 m**						
	Pier 1 circular portion	cum	6		1.77	3.500	37.17
	Pier 2 circular portion	cum	6		1.77	5.000	53.10
	Pier 3 circular portion	cum	6		1.77	5.000	53.10
	Pier 4 circular portion	cum	2		3.58	5.000	35.80
	Pier 5 circular portion	cum	2		3.58	5.000	35.80
	Pier 6 circular portion	cum	2		3.58	5.000	35.80
	Pier 7 circular portion	cum	2		3.58	5.000	35.80
	Pier 12 circular portion	cum	2		3.58	5.000	35.80
	Pier 13 circular portion	cum	2		3.58	5.000	35.80
	Pier 14 circular portion	cum	6		1.77	5.000	53.10
	Pier 15 circular portion	cum	6		1.77	4.000	42.48
	Pier 16 circular portion	cum	6		1.77	5.000	53.10
	Pier 17 circular portion	cum	6		1.77	5.000	53.10
	Pier 18 circular portion	cum	6		1.77	5.000	53.10
	Pier 19 circular portion	cum	6		1.77	4.900	52.04
	Pier 20 circular portion	cum	6		1.77	5.000	53.10
	Pier 21 circular portion	cum	6		1.77	5.000	53.10
	Pier 22 circular portion	cum	6		1.77	5.000	53.10
	Pier 23 circular portion	cum	6		1.77	5.000	53.10
	Pier 24 circular portion	cum	6		1.77	5.000	53.10
	Pier 1 cap rectangular portion	cum	2	1.94	10.90	0.500	21.15
	Pier 1 cap trapezoidal portion	cum	2	1.72	9.20	1.000	31.65
	Pier 15 cap trapezoidal portion	cum	2	2.10	9.20	1.000	38.64
	Pier 19 cap trapezoidal portion	cum	2	2.10	9.20	0.100	3.86
						Total=	**1025.89**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF VIADUCT

Chainage:- 64.763 KM **Viaduct**

BOQ Sl No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
36	**RCC M35 5 m to 10 m**						
	Pier 2 circular portion	cum	6		1.77	2.100	22.30
	Pier 3 circular portion	cum	6		1.77	3.400	36.11
	Pier 4 circular portion	cum	2		3.58	5.000	35.80
	Pier 5 circular portion	cum	2		3.58	5.000	35.80
	Pier 6 circular portion	cum	2		3.58	5.000	35.80
	Pier 7 circular portion	cum	2		3.58	5.000	35.80
	Pier 12 circular portion	cum	2		3.58	5.000	35.80
	Pier 13 circular portion	cum	2		3.58	5.000	35.80
	Pier 14 circular portion	cum	6		1.77	0.300	3.19
	Pier 15 circular portion	cum	6		1.77	0.000	0.00
	Pier 16 circular portion	cum	6		1.77	0.300	3.19
	Pier 17 circular portion	cum	6		1.77	0.300	3.19
	Pier 18 circular portion	cum	6		1.77	0.100	1.06
	Pier 19 circular portion	cum	6		1.77	0.000	0.00
	Pier 20 circular portion	cum	6		1.77	2.600	27.61
	Pier 21 circular portion	cum	6		1.77	3.300	35.05
	Pier 22 circular portion	cum	6		1.77	4.000	42.48
	Pier 23 circular portion	cum	6		1.77	4.300	45.67
	Pier 24 circular portion	cum	6		1.77	1.800	19.12
	Pier 1 cap rectangular portion	cum	2	1.94	10.90	0.500	21.15
	Pier 2 cap rectangular portion	cum	2	2.70	10.90	1.000	58.86
	Pier 3 cap rectangular portion	cum	2	2.70	10.90	0.600	35.32
	Pier 14 cap rectangular portion	cum	2	2.70	10.90	1.000	58.86
	Pier 15 cap rectangular portion	cum	2	2.70	10.90	1.000	58.86
	Pier 16 cap rectangular portion	cum	2	2.70	10.90	1.000	58.86
	Pier 17 cap rectangular portion	cum	2	2.70	10.90	1.000	58.86
	Pier 18 cap rectangular portion	cum	2	2.70	10.90	1.000	58.86
	Pier 19 cap rectangular portion	cum	2	2.70	10.90	1.000	58.86
	Pier 20 cap rectangular portion	cum	2	2.70	10.90	1.000	58.86
	Pier 21 cap rectangular portion	cum	2	2.70	10.90	0.700	41.20
	Pier 24 cap rectangular portion	cum	2	1.94	10.90	1.000	42.29
	Pier 2 cap trapezoidal portion	cum	2	2.10	9.20	1.000	38.64
	Pier 3 cap trapezoidal portion	cum	2	2.10	9.20	1.000	38.64
	Pier 14 cap trapezoidal portion	cum	2	2.10	9.20	1.000	38.64
	Pier 16 cap trapezoidal portion	cum	2	2.10	9.20	1.000	38.64
	Pier 17 cap trapezoidal portion	cum	2	2.10	9.20	1.000	38.64
	Pier 18 cap trapezoidal portion	cum	2	2.10	9.20	1.000	38.64
	Pier 19 cap trapezoidal portion	cum	2	2.10	9.20	0.900	34.78
	Pier 20 cap trapezoidal portion	cum	2	2.10	9.20	1.000	38.64
	Pier 21 cap trapezoidal portion	cum	2	2.10	9.20	1.000	38.64
	Pier 22 cap trapezoidal portion	cum	2	2.10	9.20	1.000	38.64
	Pier 23 cap trapezoidal portion	cum	2	2.10	9.20	0.700	27.05
	Pier 24 cap trapezoidal portion	cum	2	1.72	9.20	1.000	31.65
	Extra cap part in P18 & P19	cum	4	1.00	10.90	0.593	25.85
	Dirt Wall	cum	4	10.90	0.400	2.819	49.16
	Bracket	cum	4	10.90	0.180		7.85
						Total=	**1588.71**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF VIADUCT

Chainage:- 64.763 KM **Viaduct**

BOQ Sl No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
37	**RCC M35 above 10m**						
	Pier 5 circular portion	cum	2	3.58		1.450	10.38
	Pier 7 circular portion	cum	2	3.58		1.600	11.46
	Pier 3 cap rectangular portion	cum	2	2.70	10.900	0.400	23.54
	Pier 4 cap rectangular portion	cum	2	2.70	10.900	1.000	58.86
	Pier 5 cap rectangular portion	cum	2	2.70	10.900	1.000	58.86
	Pier 6 cap rectangular portion	cum	2	2.70	10.900	1.000	58.86
	Pier 7 cap rectangular portion	cum	2	2.70	10.900	1.000	58.86
	Pier 12 cap rectangular portion	cum	2	2.70	10.900	1.000	58.86
	Pier 13 cap rectangular portion	cum	2	2.70	10.900	1.000	58.86
	Pier 21 cap rectangular portion	cum	2	2.70	10.900	0.300	17.66
	Pier 22 cap rectangular portion	cum	2	2.70	10.900	1.000	58.86
	Pier 23 cap rectangular portion	cum	2	2.70	10.900	1.000	58.86
	Pier 4 cap trapezoidal portion	cum	2	2.35	6.450	1.000	30.32
	Pier 5 cap trapezoidal portion	cum	2	2.35	6.450	1.000	30.32
	Pier 6 cap trapezoidal portion	cum	2	2.35	6.450	1.000	30.32
	Pier 7 cap trapezoidal portion	cum	2	2.35	6.450	1.000	30.32
	Pier 12 cap trapezoidal portion	cum	2	2.35	6.450	1.000	30.32
	Pier 13 cap trapezoidal portion	cum	2	2.35	6.450	1.000	30.32
	Pier 23 cap trapezoidal portion	cum	2	2.10	9.200	0.300	11.59
						Total=	**728.61**
38	**RCC M40 above 5 m for pedestal**						
	Pedestal below 24m & 18m RCC Span	cum	40	0.800	0.800	0.150	3.84
		cum	40	0.800	0.800	0.216	5.53
		cum	40	0.800	0.800	0.282	7.22
		cum	40	0.800	0.800	0.348	8.91
	Metallic guide bearing(24m span)	cum	38	0.800	0.800	0.643	15.64
	Pin bearing (24m span)	cum	38	0.800	0.800	0.643	15.64
	Metallic guide bearing(18m span)	cum	2	0.800	0.800	0.643	0.82
	Pin bearing (18m span)	cum	2	0.800	0.800	0.643	0.82
						Total=	**58.42**
39	**RCC M35 above 5m for Reaction Block**						
	Reaction block 1 (RB1)	cum	160	0.800	0.873		111.74
	Reaction block 2 (RB2)	cum	320	0.800	0.700	1.400	250.88
						Total=	**362.62**
40	**Steel Reinforcement**						
	@ 140kg/cum	t					527.00
						Total=	**527.00**
41	**Pot cum PTFE Bearing**						
	for 24 m span	one tonne capacity	152	160.000			24320.00
	for 18 m span	one tonne capacity	8	120.000			960.00
						Total	**25280.00**

ESTIMATE OF QUANTITY OF VIADUCT

Chainage:- 64.763 KM **Viaduct**

BOQ Sl No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
42	**Elastomeric Bearing**						
	Bearing B2	cc	160	54.80	37.00	9.80	3179277
	Bearing B3	cc	320	42.00	42.00	9.00	5080320
						Total	**8259597**
43	**Metallic guide bearing**						
	for 24 m span	one tonne capacity	38	160.00			6080.00
	for 18 m span	one tonne capacity	2	120.000			240.00
						Total	**6320.00**
44	**Pin bearing**						
	for 24 m span	one tonne capacity	38	160.00			6080.00
	for 18 m span	one tonne capacity	2	120.000			240.00
						Total	**6320.00**

SUPERSTRUCTURE

45	**RCC M35**						
	Deck Slab_T Beam_24(End)	cum	38	2.000	7.81		593.56
	Deck Slab_T Beam_24(Middle)	cum	38	20.260	5.87		4519.20
	Deck Slab_T Beam_24(Varrying)	cum	38	2.400	6.84		623.81
	T beam cross girder middle_24	cum	38	0.300	11.373		129.65
	T beam cross girder end_24	cum	76	0.300	9.990		227.77
	Deck Slab_T Beam_18(End)	cum	2	2.000	6.313		25.25
	Deck Slab_T Beam_18(Middle)	cum	2	14.260	5.087		145.08
	Deck Slab_T Beam_18(Varrying)	cum	2	2.400	5.70		27.36
	T beam cross girder middle_18	cum	2	0.300	7.188		4.31
	T beam cross girder end_18	cum	4	0.300	6.345		7.61
	Cantilever of Deck	cum	80	0.420	10.50	0.468	165.11
	Solid Slab in Approach	cum	4	10.500	4.000	0.350	58.80
						Total	**6527.51**

46	**Steel Reinforcement**						
	@ 180kg/cum	t					1174.95
						Total=	**1174.95**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF VIADUCT

Chainage:- 64.763 KM **Viaduct**

BOQ Sl No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
47	**Bituminas Concrete Wearing Coat**						
	For 24 m & 18 m span with dirt wall	cum	2	9.50	504.84	0.050	479.60
	For solid slab	cum	4	10.50	4.00	0.050	8.40
						Total=	**488.00**
48	**Mastic Asphalt**						
	For 24 m & 18 m span with dirt wall	sqm	2	9.50	504.84		9591.96
	For solid slab	sqm	4	10.50	4.00		168.00
						Total=	**9759.96**
49	**Tack coat**						
	For 24 m & 18 m span with dirt wall	sqm	2	9.50	504.84		9591.96
	For solid slab	sqm	4	10.50	4.00		168.00
						Total=	**9759.96**
50	**PCC M15 below solid slab**						
		cum	4	10.50	0.90	0.15	5.67
						Total=	**5.67**
51	**Crash Barrier RCC M40**	m	4	512.84			2051.36
						Total	**2051.36**
52	**Drainage Spout**	nos.	200			**Total**	**200.00**
53	**Strip Seal Expansion Joint**	m	40	10.50			420.00
						Total	**420.00**
54	**Receiver Pipe for drainage spout**						
	For 24 m span	m	38.00			25.00	950.00
	For 18 m span	m	2.00			20.00	40.00
						Total	**990.00**
55	**Filler joint**						
	Providing & fixing 2 mm thick corrugated copper plate in expansion joint	m	4	10.50			**42.00**
	Providing & fixing 20 mm thick compressible fibre board in expansion joint	m	4	10.50			**42.00**
	Providing and fixing in position 20 mm thick premoulded joint filler	m	4	10.50			**42.00**
	Providing and filling joint sealing compound	m	4	10.50			**42.00**

Miscallaeneous

56	**Paint for concrete surface**						
	For Viaduct portion (crash barrier)	sqm	4	512.84	2.663		5462.77
						Total=	**5462.77**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

MEASUREMENT SHEET

STRUCTURAL STEEL WORKS FOR STAIRCASE

Sl. No.	Description	Nos.	Length (m)	Breadth (m)	Thickness (m)	Volume (m^3) / Length (m)	Unit Weight	Total Weight (kg)
27	**Stair**							
	Stair Columns (ISMB 250)	4	11.000				47.55	2092.20
	Stair Case inclined beam (ISMC 200)	8	5.000				28.21	1128.40
	Floor Beams 1 (ISMC 200)	5	10.500				28.21	1481.03
	Floor Beams 2 (ISMC 200)	10	4.500				28.21	1269.45
	Gratings (4 X 1.5)	5	4.200	2.000			40	1680.00
	Stair Gratings (1.6 X 0.3)	74	1.800	0.300			40	1598.40
	Railing for various platform & Stair (32NB)		300				3.1	930.00
	Railing for various platform & Stair (40NB)		250				3.56	890.00
	15 % extra for Int. X Frames, Splices, Nuts, Bolts, Gusset plate							2010.97
	10% Wastage Due to Non Avaiability of required legth of member							1340.65
							GRAND TOTAL for 1 stair =	**16758.10**
							GRAND TOTAL for 2 stair =	**33516.20**
							GRAND TOTAL for 2 stair (in ton) =	**33.52**

28	**Inspection ladder**							
	Inclined member (ISMC 200)	2	3.831				28.21	216.15
	Stair Gratings (1.6 X 0.3)	26	1.800	0.300			40	561.60
							GRAND TOTAL for 1 Ladder =	**777.75**
	No of ladder =	2					**Total in tonne =**	**1.5555**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

VUP, LVUP & PUP

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

JOB NO : 4146 (PACKAGE-5)

Summary sheet of VUP,LVUP,PUP (Quantities & amount)

		CHAINAGE	67+556 km	
		Span Arrangement	2 x 30m_PSC	Total Quantity
ITEM NO.	Description	Unit		
	A. Foundation			
Item no 1(a)	Excavation (upto 3 m depth)	cum	1089.350	1089.350
Item no 2	R.C.C M30 (Pile Cap)	cum	591.940	591.940
Item no 3	P.C.C (M-15)	cum	67.950	67.950
Item no 4	Bored cast-in-situ M35 grade R.C.C. Piles	m	1146.000	1146.000
Item no 6	Steel (Foundation)	ton	190.795	190.795
	B. Sub-Structure			
Item no 1(a)	R.C.C M30 (Substructure) upto 5m	cum	195.310	195.310
Item no 1(b)	R.C.C M30 (Substructure) from 5m to 10m	cum	225.820	225.820
Item no 1(c)	R.C.C M30 (Substructure) above 10m	cum	132.230	132.230
Item no 2	R.C.C. M35 for Pedestals & RB	cum	39.610	39.610
Item no 3	Steel (Substructure)	ton	55.289	55.289
Item no 5	Backfilling - Granular Material	cum	187.200	187.200
Item no 8	Elastomeric Bearing	cc	207840.000	207840.000
Item no 9	POT cum PTFE Bearing	ton	9600.000	9600.000

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

	C. Super Structure			
Item no 1(a)	R.C.C M30 (Superstructure) upto 5m	cum	58.800	58.800
Item no 1(d)	R.C.C M40(Superstructure) upto 5m	cum	288.670	288.670
Item no 1(e)	P.S.C M45(Superstructure) upto 5m	cum	545.370	545.370
Item no 2(a)	Steel (Superstructure)	ton	133.926	133.926
Item no 2(b)	PSC Steel	ton	28.000	28.000
Item no 3(a)	Bituminous Concrete Wearing Coat(40mm)	cum	52.260	52.260
Item no 3(b)	Mastic Asphalt (12mm)	sqm	1306.440	1306.440
Item no 3(c)	Tack Coat	sqm	1306.440	1306.440
Item no 5	Crash Barrier	metre	275.040	275.040
Item no 6	Drainage Spout	each	20.000	20.000
Item no 7	Reciever pipe for Drainage Spout	m	180.000	180.000
Item no 8	PCC below approach slab	cum	7.880	7.880
Item no 10	Strip Seal Expansion Joint	metre	63.000	63.000
	(i) copper plate	metre	42.000	42.000
	(ii) fibre board	metre	42.000	42.000
	(iii) 20mm thick premoulded joint filler	metre	42.000	42.000
	(iv) joint sealing compound	metre	42.000	42.000
	E. MISCELLANNEOUS			
Item no 1a	Painting	sqm	607.840	607.840
Item no 2	Citizen Information Board NH project	no	2.000	2.000
	Brick foundation	cum	68.250	68.250

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE
OF VUP

CHAINAGE_67.556KM

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH._67.556 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA IN THE STATE OF ASSAM

2 No. X 30 M SPAN **CH._67.556 KM**

Item Sl No.	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
FOUNDATION							
1	**Excavation upto 3m depth**						
	Abutment-1 & 1A	cum	2	9.70	6.10	2.77	327.80
	Pier-1 & 1A	cum	2	9.70	9.70	2.72	511.85
	Abutment-2 & 2A	cum	2	9.70	6.10	2.11	249.70
						Total	**1089.35**
2	**Pile cap RCC M30**						
	Abutment	cum	4	8.70	5.100	1.80	319.46
	Pier	cum	2	8.70	8.700	1.80	272.48
						Total=	**591.94**
3	**Bored Cast-in-situ Pile M35 (dia.=1.2m)**						
	Abutment-1 & 1A	m	12		29.000		348.00
	Pier-1 & 1A	m	18		25.000		450.00
	Abutment-2 & 2A	m	12		29.000		348.00
						Total=	**1146.00**
4	**PCC M-15 levelling course**						
	Below Pile-cap for Abutment	cum	4	9.00	5.40	0.15	29.16
	Below Pile-cap for Pier	cum	2	9.00	9.00	0.15	24.30
	Below brick foundation	cum	4	10.50	2.300	0.15	14.49
						Total=	**67.95**
5	**HYSD Bars**						
	90kg/cum for pile cap & @ 120kg/m for pile	T				**Total=**	**190.795**
6	**Brick foundation**						
	Solid Slab	cum	4	10.50	1.625		**68.250**
						Total	**68.250**
SUBSTRUCTURE							
7	**RCC M-30 upto 5.0m height**						
	Abutment wall (straight portion)	cum	4	5.20	1.200	5.000	124.80
	Pier shaft (straight portion)	cum	2	5.20	1.000	4.600	47.84
	Pier shaft (semi circular portion)	cum	4		0.39	4.600	7.18
	Pier cap(Trapezoidal Portion)	cum	2	8.80	2.200	0.400	15.49
						Total=	**195.31**
8	**RCC M-30 height above 5.0m upto 10.0m**						
	Abutment wall (straight portion)	cum	4	5.20	1.200	4.400	109.82
	Abutment cap (Trapizoidal portion)	cum	4	9.85	2.120	0.600	50.12
	Pier cap(Rectangular portion)	cum	2	11.40	3.400	0.700	54.26
	Pier cap(Trapizoidal portion)	cum	2	8.80	2.200	0.300	11.62
						Total=	**225.820**
9	**RCC M-30 height above 10.0m**						
	Abutment cap (Rectangular portion)	cum	4	11.40	2.120	0.700	67.67
	Abutment cap (Trapizoidal portion)	cum	4	9.85	2.120	0.100	8.35
	Dirt Wall	cum	4	11.40	0.40	2.389	43.58
	Bracket	cum	4	11.40	0.277		12.63
						Total=	**132.230**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH._67.556 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA IN THE STATE OF ASSAM

2 No. X 30 M SPAN **CH._67.556 KM**

Item Sl No.	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
10	**RCC M-35 for Pedestal & Seismic Arrestor Blocks height above 5.0m**						
	Pedestal at Abutment & Pier	cum	8	0.80	0.80	0.150	0.77
		cum	8	0.80	0.80	0.215	1.10
		cum	8	0.80	0.80	0.280	1.43
		cum	8	0.80	0.80	0.345	1.77
						Total=	**5.07**
	Block RB2	cum	16	0.740	0.550	1.400	9.12
	Block RB1	cum	16	0.800	1.299		16.63
	Block RB3	cum	8	1.060	0.740	1.400	8.79
						Total=	**39.61**

11	**HYSD Bars**						
	@ 120 kg/cum	T					55.289
						Total=	**55.289**

12	**Backfilling - Granular Material**						
	In Foundation trench (for Abutment)	cum	4		14.80	1.950	115.44
	In Foundation trench (for pier)	cum	2		18.40	1.950	71.76
						Total	**187.20**

13	**POT & POT cum PTFE Bearing**						
		ton	32	300.00			9600.00
						Total	**9600.00**

14	**Elastomeric Bearing**						
	Bearing B2	cucm	16	35.00	42.50	4.80	114240
	Bearing B3	cucm	32	25.00	30.00	3.90	93600
						Total	**207840**

SUPERSTRUCTURE

15	**PSC M-45 Girder portion**						
	Long Girder middle portion	cum	4	21.600	3.840		331.78
	Long Girder straight portion	cum	8	1.950	6.288		98.09
	Long Girder varying portion	cum	8	1.600	5.064		64.82
	End Cross Girder (portion in between the long girder)	cum	8	0.400	7.599		24.32
	End Cross Girder (trapezoidal part)	cum	8	0.400	0.516		1.65
	Intermediate Cross Girder (portion in between the long girder)	cum	8	0.300	9.435		22.64
	Intermediate Cross Girder (trapezoidal part)	cum	8	0.300	0.864		2.07
						Total	**545.37**

16	**R.C.C. Deck slab (M40)**						
	Deck Slab	cum	4	28.20	10.50	0.225	266.49
	Cantilever portion of Deck Slab	cum	8	0.880	10.50	0.300	22.18
						Total	**288.67**

17	**PSC Steel**						
	@7 ton/span	TON	4		7.00		28.00
						Total	**28.00**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY CALCULATION OF BRIDGE AT CH._67.556 KM ON BILASIPURA-GUWAHATI STRETCH BHARATMALA IN THE STATE OF ASSAM

2 No. X 30 M SPAN **CH._67.556 KM**

Item Sl No.	Description	Unit	nos.	Length (m)	Breadth (m)	Height (m)	Quantity
18	**Superstructure Steel (HYSD Bars)**						
	@ 150 kg/cum	TON					133.926
						Total=	**133.926**
19	**RCC M40 Crash Barrier**						
		m	4		68.76		275.04
						Total=	**275.04**
20	**Drainage Spout**	nos.	20			**Total**	**20.00**
21	**Reciever Pipe**						
		m	4		45.00		180.00
						Total	**180.00**
22	**M15 PCC below Solid Slab**						
		cum	4	1.250	10.500	0.15	7.88
						Total	**7.88**
23	**Solid Slab(M30)**						
	Solid Slab	cum	4	4.000	10.500	0.350	58.80
						Total	**58.80**
24	**Bituminous concrete wearing course**						
		cum	2	68.76	9.50	0.040	52.26
						Total=	**52.26**
25	**Mastic asphalt**						
		sqm	2	68.76	9.50		1306.44
						Total=	**1306.44**
26	**Tack coat**						
		sqm	2	68.76	9.50		1306.44
						Total=	**1306.44**
27	**Filler joint**						
	Providing & fixing 2 mm thick corrugated copper plate in expansion joint	m	4	10.50			**42.00**
	Providing & fixing 20 mm thick compressible fibre board in expansion joint	m	4	10.50			**42.00**
	Providing and fixing in position 20 mm thick premoulded joint filler	m	4	10.50			**42.00**
	Providing and filling joint sealing compound	m	4	10.50			**42.00**
28	**Strip Seal Expansion Joint**						
		m	6	10.500			63.00
						Total	**63.00**

MISCELLANEOUS

29	**Painting**						
	Crash Barrier	sqm	4		2.210	68.76	607.84
						Total	**607.840**
30	Citizen information Board NH Project	no				**Total**	**2.000**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

LOW HEIGHT SUBWAY

JOB NO : 4146 (PACKAGE-5)

Summary sheet of Low Height Subway (Quantities & amount)

		CHAINAGE	49.988	
		Span Arrangement	1X5.5X3.6 PRECAST RCC BOX	Total Quantity
ITEM NO.	Description	Unit		
	A. Foundation			
Item no 1(a)	Excavation (upto 3 m depth)	cum	2841.365	2841.365
Item no 1(b)	Excavation (3 m to 6 m depth)	cum	999.815	999.815
Item no 2	R.C.C M30 (Foundation slab)	cum	486.531	486.531
Item no 3	P.C.C (M-15)	cum	210.339	210.339
Item no 4	Steel (Foundation)	ton	34.057	34.057
	B. Sub-Structure			
Item no 1(a)	R.C.C M30 (Substructure) upto 5m	cum	447.454	447.454
Item no 1(b)	Precast R.C.C M35 (Substructure) upto 5m	cum	255.200	255.200
Item no 1(c)	Precast R.C.C M20 (Substructure) upto 5m	cum	61.600	61.600
Item no 2	CC Wearing coat	cum	24.552	24.552
Item no 3	Steel (Substructure)	ton	75.674	75.674
Item no 4	Backfilling - Granular Material	cum	302.953	302.953
Item no 5	Backfilling - Sandy Material	cum	2561.785	2561.785
Item no 6	Filter Media	cum	941.874	941.874
	C. Super-Structure			
Item no 1	Precast R.C.C M35 (Superstructure) upto 5m	cum	126.052	126.052
Item no 2	Steel (Superstructure)	ton	17.647	17.647
	D. Miscelleaneous			
Item no 1	Structural Steel	ton	33.239	33.239
Item no 2	W-Metal Beam Crash Barrier	m	379.600	379.600
Item no 3	Sand Cushion	cum	52.096	52.096
Item no 4	Polycarbonate Sheet	sqm	1558.000	1558.000

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE
OF
LOW HEIGHT SUBWAY

ESTIMATE OF QUANTITY OF LHS

Box Size:- **1 cell RCC Box of 5.5 m x 3.6 m**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
A. FOUNDATION							
Item no 1(a)	**Excavation(up to 3m)**						
	Box Bridge	cum	1	8.400	36.200	3.000	912.240
	Retaining Wall (5.25m Height)	cum	1	133.100	6.200	1.150	949.003
	Retaining Wall (3.4m Height)	cum	1	156.600	3.900	1.150	702.351
	Retaining Wall (1.5m Height)	cum	1	92.900	2.600	1.150	277.771
						Total	**2841.365**
Item no 1(b)	**Excavation(above 3m)**						
	Box Bridge	cum	1	8.400	36.200	3.288	999.815
						Total	**999.815**
Item no 2	**PCC-M15**						
	Retaining Wall (5.25m Height)	cum	1	132.400	5.500	0.150	109.230
	Retaining Wall (3.4m Height)	cum	1	155.900	3.200	0.150	74.832
	Retaining Wall (1.5m Height)	cum	1	92.200	1.900	0.150	26.277
						Total	**210.339**
Item no 3	**Sand cushion**						
	below box	cum	1	7.400	35.200	0.200	52.096
						Total	**52.096**
Item no 4	**RCC-M30**						
	Retaining Wall Foundation (5.25m Height)	cum	1	132.100	2.130		281.373
	Retaining Wall Foundation (3.4m Height)	cum	1	155.600	1.035		161.046
	Retaining Wall Foundation (1.5m Height)	cum	1	91.900	0.480		44.112
						Total=	**486.531**
Item no 5	**Foundation Steel (HYSD Bars)**						
	@ 70 kg per cubic meter	ton				**Total=**	**34.057**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF LHS

Box Size:- **1 cell RCC Box of 5.5 m x 3.6 m**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
B. SUBSTRUCTURE							
Item no 1(a)	**RCC-M30**						
	Retaining Wall (5.25m Height)	cum	1	132.100	1.900		250.990
	Retaining Wall (3.4m Height)	cum	1	155.600	1.050		163.380
	Retaining Wall (1.5m Height)	cum	1	91.900	0.360		33.084
						Total=	**447.454**
Item no 1(b)	**Precast RCC-M35 (upto 5m)**						
	Bottom Slab	cum	1	6.500	35.200	0.500	114.400
	Box Side Wall	cum	2	35.200	0.500	3.750	132.000
	Haunch	cum	2	35.200	0.125		8.800
						Total=	**255.200**
Item no 1(c)	**Precast RCC-M20 (upto 5m)**						
	Precast RCC Slab below Box	cum	1	7.000	35.200	0.250	61.600
						Total=	**61.600**
Item no 2	**CC Wearing coat**						
		cum	1	35.200	4.650	0.150	24.552
						Total=	**24.552**
Item no 3	**Substructure Steel (HYSD Bars)**						
	@ 140 Kg per cubic meter for precast box & 70 Kg per cubic meter for Return Wall	t					
						Total	**75.674**
Item no 4	**Backfilling - Granular Material**						
	At bottom slab of box	cum	1	75.280		1.100	82.808
	Retaining Wall Foundation (5.25m Height)	cum	1	138.300		0.650	89.895
	Retaining Wall Foundation (3.4m Height)	cum	1	159.500		0.550	87.725
	Retaining Wall Foundation (1.5m Height)	cum	1	94.500		0.450	42.525
						Total	**302.953**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF LHS

Box Size:- **1 cell RCC Box of 5.5 m x 3.6 m**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
Item no 5	**Backfilling - Sandy Material**						
	Behind Side Wall	cum	2	35.200	0.500	5.188	182.618
	Behind Retaining Wall (5.25m Height)	cum	1	132.100	2.500	4.750	1568.688
	Behind Retaining Wall (3.4m Height)	cum	1	155.600	1.500	3.000	700.200
	Behind Retaining Wall (1.5m Height)	cum	1	91.900	1.000	1.200	110.280
						Total	**2561.785**
Item no 6	**Filter media**						
	Behind Abutment	cum	2	35.200	0.600	5.188	219.141
	Behind Retaining Wall (5.25m Height)	cum	1	132.100	0.600	4.750	376.485
	Behind Retaining Wall (3.4m Height)	cum	1	155.600	0.600	3.000	280.080
	Behind Retaining Wall (1.5m Height)	cum	1	91.900	0.600	1.200	66.168
						Total	**941.874**

C. SUPERSTRUCTURE

Item no 1	**Precast RCC-M35 (upto 5m)**						
	Box Bridge	cum	1	6.500	35.200	0.500	114.400
	Haunch	cum	2	35.200	0.125		8.800
	Parapet	cum	2	6.500	0.219		2.852
						Total	**126.052**

Item no 2	**Superstructure Steel (HYSD Bars)**						
	@ 140 kg per meter	ton					
						Total	**17.647**

D.MISCELLANEOUS

Item no 1	**Structural Steel**					
	Height Gauge	ton	2	1.500		3.000
	Roof Truss	ton	1	30.239		30.239
					Total	**33.239**

Item no 2	**W-Metal Beam Crash Barrier**					
		m	1	379.600		379.600
					Total	**379.600**

Item no 3	**Polycarbonate Sheet**					
		sqm	1	1558.000		1558.000
					Total	**1558.000**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

Culvert

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

JOB NO : 4146 (PACKAGE-5)

Summary sheet of Culverts (Quantities & amount)

		TYPE	1	2	3	4	5	6	7	8
		Span (m) x Height (m) =	TW-24.5M FA NC 2x2x1cell	TW-41.0M FA NC With Service Road 2x2x1cell	TW-24.5 M FA SE 2x2x1cell	TW-24 M FA & NC EC upto 4m 2x2x1cell	TW-24.5 M FA & NC EC upto 3m 2x2x1cell	TW-25.2 M FA & NC EC upto 3m 2x2x1cell	TW-26.0 M FA & NC EC upto 3m 2x2x1cell	TW-27.0 M FA & NC EC upto 3m 2x2x1cell
	No. of Culverts =		**18**	**1**	**1**	**1**	**5**	**1**	**1**	**8**
ITEM NO.	**Description**	**Unit**	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**
	A. Foundation									
Item no 1(a)	Excavation (upto 3 m depth)	cum	236.51	276.030	275.59	155.87	145.07	145.00	144.01	150.06
Item no 2	P.C.C (M-15)	cum	18.58	27.144	17.87	25.27	24.71	24.70	24.50	25.71
	B. SubStructure									
Item no 1(a)	R.C.C M30 (Substructure) upto 5m	cum	71.79	107.159	78.00	107.70	93.89	93.83	93.08	97.72
Item no 3	Steel (Substructure)	ton	5.03	7.501	5.46	7.54	6.57	6.57	6.52	6.84
Item no 4	Weep Holes	each	152.00	180.000	152.00	248.00	228.00	228.00	228.00	238.00
Item no 5	Backfilling - Granular Material	cum	24.17	28.425	14.25	12.78	12.83	12.83	12.83	12.83
Item no 6	Backfilling - Sandy Material	cum	92.49	104.081	62.19					
Item no 7	Filter Media	cum	69.02	118.119	78.23	129.72	121.25	121.16	120.07	126.74

		TYPE	1	2	3	4	5	6	7	8
		Span (m) x Height (m) =	TW-24.5M FA NC 2x2x1cell	TW-41.0M FA NC With Service Road 2x2x1cell	TW-24.5 M FA SE 2x2x1cell	TW-24 M FA & NC EC upto 4m 2x2x1cell	TW-24.5 M FA & NC EC upto 3m 2x2x1cell	TW-25.2 M FA & NC EC upto 3m 2x2x1cell	TW-26.0 M FA & NC EC upto 3m 2x2x1cell	TW-27.0 M FA & NC EC upto 3m 2x2x1cell
	No. of Culverts =		**18**	**1**	**1**	**1**	**5**	**1**	**1**	**8**
ITEM NO.	**Description**	**Unit**	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**
	C. Super Structure									
Item no 1(a)	R.C.C M30 (Superstructure) upto 5m	cum	22.48	37.618	22.48	28.67	23.77	23.75	23.51	24.99
Item no 2	Steel (Superstructure)	ton	1.69	2.821	1.69	2.15	1.78	1.78	1.76	1.87
Item no 3(a)	Bituminous Concrete Wearing Coat(40mm)	cum	8.36	12.920	8.36					
Item no 3(b)	Mastic Asphalt (12mm)	sqm	209.00	323.000	209.00					
Item no 3(c)	Tack Coat	sqm	209.00	323.000	209.00					
Item no 4	Crash Barrier	metre	38.00	76.000	38.00					
Item no 5	Drainage Spout	each	4.00	8.000	4.00					
Item no 6	PCC below approach slab	cum	23.62	40.804	24.16					
Item no 7	R.C.C. Approach Slab with steel	cum	49.06	84.756	50.19					
Item no 8	Filler Joint									
	(i) copper plate	metre	46.72	82.000	49.00					
	(ii) fibre board	metre	46.72	82.000	49.00					
	(iii) 20mm thick premoulded joint filler	metre	46.72	82.000	49.00					
	(iv) joint sealing compound	metre	46.72	82.000	49.00					
	D. Protection Work									
Item no 2	750 mm thick Flexible apron	cum	57.12	58.275	43.125	57.525	57.32	57.32	57.32	57.32
Item no 3	Curtain Wall- PCC (M-20)	cum	58.92	59.598	48.75	59.12	58.92	58.92	58.92	58.92
Item no 4	PCC M15	cum	8.70	8.801	7.19	8.73	8.70	8.70	8.70	8.70
Item no 5	Excavation	cum	278.72	288.366	263.89	280.99	280.13	280.13	280.13	280.13
	E. Miscellaneous									
Item no 1	Painting	sqm	99.18	198.36	99.18	4.35	4.25	4.25	4.25	4.25

		TYPE	9	10	11	12	13	14	15
		Span (m) x Height (m) =	TW-27.0 M FA & NC EC upto 4m 2x2x1cell	TW-18.50 M FA & NC EC upto 3m With Service Road (in RE Wall) 2x2x1cell	TW-40.00 M FA & NC EC upto 4m With Service Road (in RE Wall) 2x2x1cell	TW-27 M FA & SE EC upto 5m 2x2x1cell	TW-27 M FA & SE EC upto 3m 2x2x1cell	TW-27 M FA & SE EC upto 4m 2x2x1cell	TW-24.5M FA NC 2x3x1cell
	No. of Culverts =		**2**	**1**	**1**	**2**	**3**	**2**	**9**
ITEM NO.	**Description**	**Unit**	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**
	A. Foundation								
Item no 1(a)	Excavation (upto 3 m depth)	cum	168.83	83.43	171.47	178.21	152.80	173.54	247.79
Item no 2	P.C.C (M-15)	cum	27.70	13.28	27.95	29.25	26.08	28.40	23.05
	B. SubStructure								
Item no 1(a)	R.C.C M30 (Substructure) upto 5m	cum	118.57	53.10	120.75	129.37	99.83	122.51	109.73
Item no 3	Steel (Substructure)	ton	8.30	3.72	8.45	9.06	6.99	8.58	7.68
Item no 4	Weep Holes	each	356.00	124.00	258.00	324.00	288.00	324.00	210.00
Item no 5	Backfilling - Granular Material	cum	12.78	9.19	12.92	12.84	12.83	12.78	17.69
Item no 6	Backfilling - Sandy Material	cum		62.20	120.09		0.00	0.00	233.00
Item no 7	Filter Media	cum	143.81	56.92	123.91	153.48	129.76	148.93	115.69

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

		TYPE	9	10	11	12	13	14	15
		Span (m) x Height (m) =	TW-27.0 M FA & NC EC upto 4m 2x2x1cell	TW-18.50 M FA & NC EC upto 3m With Service Road (in RE Wall) 2x2x1cell	TW-40.00 M FA & NC EC upto 4m With Service Road (in RE Wall) 2x2x1cell	TW-27 M FA & SE EC upto 5m 2x2x1cell	TW-27 M FA & SE EC upto 3m 2x2x1cell	TW-27 M FA & SE EC upto 4m 2x2x1cell	TW-24.5M FA NC 2x3x1cell
	No. of Culverts =		**2**	**1**	**1**	**2**	**3**	**2**	**9**
ITEM NO.	**Description**	**Unit**	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**
	C. Super Structure								
Item no 1(a)	R.C.C M30 (Superstructure) upto 5m	cum	32.19	11.98	29.57	37.13	25.66	33.46	23.97
Item no 2	Steel (Superstructure)	ton	2.41	0.90	2.22	2.79	1.92	2.51	1.80
Item no 3(a)	Bituminous Concrete Wearing Coat(40mm)	cum		2.66	5.35				8.40
Item no 3(b)	Mastic Asphalt (12mm)	sqm		66.50	133.84				209.88
Item no 3(c)	Tack Coat	sqm		66.50	133.84				209.88
Item no 4	Crash Barrier	metre		19.00	38.24				38.16
Item no 5	Drainage Spout	each		2.00	4.00				4.00
Item no 6	PCC below approach slab	cum		7.85	15.69				24.16
Item no 7	R.C.C. Approach Slab with steel	cum		16.30	32.59				50.19
Item no 8	Filler Joint								
	(i) copper plate	metre		16.00	32.00				49.00
	(ii) fibre board	metre		16.00	32.00				49.00
	(iii) 20mm thick premoulded joint filler	metre		16.00	32.00				49.00
	(iv) joint sealing compound	metre		16.00	32.00				49.00
	D. Protection Work								
Item no 2	750 mm thick Flexible apron	cum	57.53	60.05	57.72	56.82	56.34	56.55	66.795
Item no 3	Curtain Wall- PCC (M-20)	cum	59.12	61.40	59.12	59.26	58.92	59.12	68.55
Item no 4	PCC M15	cum	8.73	9.03	8.73	8.75	8.70	8.73	9.62
Item no 5	Excavation	cum	280.99	282.43	279.28	280.54	278.96	279.82	320.85
	E. Miscellaneous								
Item no 1	Painting	sqm	4.35	49.59	99.81	4.42	4.25	4.35	99.60

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

		TYPE	16	17	18	19	20	
		Span (m) x Height (m) =	TW-27M FA NC 2x3x1cell	TW-41M FA NC 2x3x1cell	TW-24.5 M FA SE 2x3x1cell	TW-27 M FA & SE EC upto 4m 2x3x1cell	TW-27 M FA & SE EC upto 5m 2x3x1cell	Total Quantity
	No. of Culverts =		**4**	**1**	**2**	**1**	**2**	**66**
ITEM NO.	**Description**	**Unit**	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**	
	A. Foundation							
Item no 1(a)	Excavation (upto 3 m depth)	cum	207.33	339.18	436.59	249.70	253.51	13962.509
Item no 2	P.C.C (M-15)	cum	24.76	31.81	25.75	40.27	41.94	1587.359
	B. SubStructure							
Item no 1(a)	R.C.C M30 (Substructure) upto 5m	cum	116.86	158.83	127.75	221.86	219.42	6767.537
Item no 3	Steel (Substructure)	ton	8.18	11.12	8.94	15.53	15.36	473.728
Item no 4	Weep Holes	each	214.00	300.00	210.00	356.00	356.00	14604.000
Item no 5	Backfilling - Granular Material	cum	17.10	22.97	32.18	18.27	18.33	1190.132
Item no 6	Backfilling - Sandy Material	cum	260.61	428.22	233.35			6047.654
Item no 7	Filter Media	cum	124.56	179.77	120.17	222.51	227.08	7528.601

		TYPE	16	17	18	19	20	
		Span (m) x Height (m) =	TW-27M FA NC 2x3x1cell	TW-41M FA NC 2x3x1cell	TW-24.5 M FA SE 2x3x1cell	TW-27 M FA & SE EC upto 4m 2x3x1cell	TW-27 M FA & SE EC upto 5m 2x3x1cell	Total Quantity
	No. of Culverts =		**4**	**1**	**2**	**1**	**2**	**66**
ITEM NO.	**Description**	**Unit**	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**	
	C. Super Structure							
Item no 1(a)	R.C.C M30 (Superstructure) upto 5m	cum	26.41	40.11	23.97	41.42	41.86	1718.111
Item no 2	Steel (Superstructure)	ton	1.98	3.01	1.80	3.11	3.14	128.858
Item no 3(a)	Bituminous Concrete Wearing Coat(40mm)	cum	8.40	14.12	8.40			319.821
Item no 3(b)	Mastic Asphalt (12mm)	sqm	209.88	352.98	209.88			7995.520
Item no 3(c)	Tack Coat	sqm	209.88	352.98	209.88			7995.520
Item no 4	Crash Barrier	metre	38.16	38.16	38.16			1465.800
Item no 5	Drainage Spout	each	4.00	4.00	4.00			154.000
Item no 6	PCC below approach slab	cum	26.65	40.84	23.62			925.752
Item no 7	R.C.C. Approach Slab with steel	cum	55.36	84.84	49.06			1922.928
Item no 8	Filler Joint							
	(i) copper plate	metre	54.00	82.00	46.72			1852.400
	(ii) fibre board	metre	54.00	82.00	46.72			1852.400
	(iii) 20mm thick premoulded joint filler	metre	54.00	82.00	46.72			1852.400
	(iv) joint sealing compound	metre	54.00	82.00	46.72			1852.400
	D. Protection Work							
Item no 2	750 mm thick Flexible apron	cum	66.795	66.795	60.195	69.525	69.63	3939.690
Item no 3	Curtain Wall- PCC (M-20)	cum	65.16	68.55	61.77	66.72	66.58	4033.651
Item no 4	PCC M15	cum	9.62	9.62	9.12	9.86	9.84	590.617
Item no 5	Excavation	cum	319.89	320.85	311.07	330.05	329.77	19233.273
	E. Miscellaneous							
Item no 1	Painting	sqm	99.60	99.60	99.60	4.76	4.69	3946.982

QUANTITY ESTIMATE
OF
CULVERT

TYPE - 1

ESTIMATE OF QUANTITY OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron NC**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
A. FOUNDATION							
1	**Excavation(up to 3m)**						
	Box Bridge	cum	1	4.500	25.500	1.367	156.863
	Shear Key	cum	2	4.500	1.800	0.900	14.580
	Return Wall-II	cum	4	3.400	3.500	1.367	65.069
						Total	**236.512**
2	**PCC-M15**						
	Box Bridge	cum	1	3.500	22.100	0.150	11.603
	Shear Key	cum	2	3.700	1.673	0.150	1.857
	Return Wall-II	cum	4	3.050	2.800	0.150	5.124
						Total	**18.583**
B. SUBSTRUCTURE							
3	**RCC-M30 (upto 5m)**						
	Bottom Slab	cum	1	3.500	24.500	0.300	25.725
	Box Side Wall	cum	2	24.500	0.250	2.138	26.184
	Base slab of return wall II	cum	4	2.900	2.500	0.250	7.250
	Return wall I	cum	4	0.500	0.300	2.250	1.350
	Return wall II	cum	4	2.900	0.225	2.300	6.003
	Shear key	cum	2	3.500	0.675		4.725
	Haunch	cum	2	24.500	0.011		0.551
						Total=	**71.789**
4	**Substructure Steel (HYSD Bars)**						
	70 kg/cum of Concrete	ton	1	5.025			5.025
						Total	**5.025**
5	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per side wall =23.9/2+1 =					13	
	No of weep holes in vertical direction per side wall =2.1/1+1 =					4	
	No of weep holes in horizontal direction per return wall =3.4/2+1 =					3	
	No of weep holes in vertical direction per return wall =2.3/1 +1=					4	
	Total no of Weep holes per side wall= 13 x 4					52	
	Total no of Weep holes per return wall = 3 x 4					12	
	Total no of weep holes = 52 x 2 + 12 x 4						**152**
6	**Backfilling - Granular Material**						
	Box	cum	1	29.000		0.450	13.050
	Shear key	cum	2	1.750		1.050	3.675
	Return Wall-II	cum	4	4.650		0.400	7.440
						Total	**24.165**
7	**Backfilling - Sandy Material**						
	Behind the side wall and return wall	cum	2	23.900	3.400	0.994	161.504
	Deduct for the filter media	cum					69.019
						Total	**92.485**
8	**Filter media**						
	Behind Abutment	cum	2	23.900	0.600	1.938	55.568
	Behind Return Wall	cum	4	2.820	0.600	1.988	13.451
						Total	**69.019**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron NC**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
C. SUPERSTRUCTURE							
9	**RCC-M30(up to 5m)**						
	Box Bridge	cum	1	2.500	24.500	0.250	15.313
	(+)Haunch	cum	2	24.500	0.011		0.551
	Rectangular part of bracket	cum	2	24.500	0.300	0.300	4.410
	Triangular part of bracket	cum	2	24.500	0.045		2.205
						Total	**22.479**
10	**Superstructure Steel (HYSD Bars)**						
	75 kg/cum of concrete	ton	1		1.686		1.686
						Total	**1.686**
11	**Bituminous Concrete Wearing Coat(40mm)**						
		cum	1	9.500	22.000	0.040	8.360
						Total	**8.360**
12	**Mastic Asphalt**						
		sqm	1	9.500	22.000		209.000
						Total	**209.000**
13	**Tack Coat**						
		sqm	1	9.500	22.000		209.000
						Total	**209.000**
14	**Crash Barrier R.C.C. M40**	m	4	9.500			38.000
						Total	**38.000**
15	**Drainage Spout**	nos.	4				**4**
16	**PCC below Approach Slab**						
		cum	2	3.370	23.360	0.150	23.617
						Total	**23.617**
17	**Approach Slab**						
		cum	2	3.500	23.360	0.300	49.056
						Total	**49.056**
18	**Filler Joint**						
	(i) copper plate	m	2	23.360			**46.720**
	(ii) fibar board	m	2	23.360			**46.720**
	(iii) 20mm thick premoulded joint filler	m	2	23.360			**46.720**
	(iv) joint sealing compound	m	2	23.360			**46.720**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron NC**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
19	**750 mm thick Flexible apron**						
	Upstream	cum	1	9.300	3.000	0.750	20.925
	Downstream	cum	1	9.300	6.000	0.750	41.850
	Deduction due to return wall II foundation		4	2.900	0.650	0.750	5.655
						Total	**57.120**
20	**Curtain Wall- PCC (M-20)**						
	Downstream side	cum	1	21.300	1.910		40.683
	Upstream side	cum	1	15.300	1.480		22.644
	Deduction due to return wall II foundation (D/S)	cum	2	0.650	1.910		2.483
	Deduction due to return wall II foundation (U/S)	cum	2	0.650	1.480		1.924
						Total	**58.920**
21	**Excavation in Soil**						
	Curtain Wall (downstream)	cum	1	21.300	2.850	2.650	160.868
	Curtain Wall (upstream)	cum	1	15.300	2.500	2.150	82.238
	Flexible appron(downstream)	cum	1	8.300	2.000	0.750	12.450
	Flexible appron(upstream)	cum	1	8.300	5.000	0.750	31.125
	Deduction due to return wall II foundation	cum	4	3.400	0.650	0.900	7.956
						Total	**278.725**
22	**PCC (M-15)**						
	Below Curtain Wall						
	Downstream side	cum	1	21.300	1.850	0.150	5.911
	Upstream side		1	15.300	1.500	0.150	3.443
	Deduction due to return wall II foundation	cum	4	0.650	1.675	0.150	0.653
						Total	**8.700**

E. MISCELLANEOUS WORK

23	**Painting**						
	Crash Barrier	sqm	4	9.50	2.610		99.18
						Total	**99.18**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

TYPE - 2

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron With Service road_NC**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
A. FOUNDATION							
1.(a)	**Excavation(up to 3m)**						
	Box Bridge	cum	1	4.500	42.000	0.950	179.550
	Shear Key	cum	2	4.500	1.800	0.900	14.580
	Return Wall-II (Service Road)	cum	4	3.000	3.500	1.950	81.900
						Total	**276.030**
2	**PCC-M15**						
	Box Bridge	cum	1	3.500	38.600	0.150	20.265
	Shear Key	cum	2	3.700	1.673	0.150	1.857
	Return Wall-II (Service Road)	cum	4	3.100	2.700	0.150	5.022
						Total	**27.144**
B. SUBSTRUCTURE							
3	**RCC-M30 (upto 5m)**						
	Bottom Slab	cum	1	3.500	41.000	0.300	43.050
	Box Side Wall (Main structure)	cum	2	24.000	0.250	2.306	27.675
	Box Side Wall (Service Road)	cum	2	17.000	0.250	2.094	17.797
	Return wall I (Service Road)	cum	4	0.500	0.300	2.250	1.350
	Base slab of return wall II(Service Road)	cum	4	3.000	2.500	0.250	7.500
	Return wall II (Service Road)	cum	4	2.000	0.225	2.300	4.140
	Shear key	cum	2	3.500	0.675		4.725
	Haunch	cum	2	41.000	0.011		0.923
						Total=	**107.159**
4	**Substructure Steel (HYSD Bars)**						
	70 kg/cum of Concrete	ton	1	7.501			7.501
						Total	**7.501**
5	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per side wall =40.4/2+1 =					22	
	No of weep holes in vertical direction per side wall =1.9/1+1 =					3	
	No of weep holes in horizontal direction per return wall (service road) =3.5/2+1 =					3	
	No of weep holes in vertical direction per return wall (service road) =2.3/1 +1=					4	
	Total no of Weep holes per side wall = 22 x 3					66	
	Total no of Weep holes per return wall (service road) = 3 x 4					12	
	Total no of weep holes = 66 x 2 + 12 x 4						**180**
6	**Backfilling - Granular Material**						
	Box	cum	1	45.500		0.450	20.475
	Shear key	cum	2	1.750		0.900	3.150
	At Return wall II (Service Road)	cum	4	3.000		0.400	4.800
						Total	**28.425**
7	**Backfilling - Sandy Material**						
	Behind the side wall and return wall	cum	2	40.40	2.500	1.100	222.200
	Deduct for the filter media	cum					-118.119
						Total	**104.081**
8	**Filter media**						
	Behind side wall	cum	2	40.400	0.600	2.106	102.111
	Behind Return Wall	cum	4	2.900	0.600	2.300	16.008
						Total	**118.119**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron With Service road_NC**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
C. SUPERSTRUCTURE							
9	**RCC-M30(up to 5m)**						
	Box Bridge	cum	1	2.500	41.000	0.250	25.625
	Rectangular part of bracket	cum	2	41.000	0.300	0.300	7.380
	Triangular part of bracket	cum	2	41.000	0.045		3.690
	(+)Haunch	cum	2	41.000	0.011		0.923
						Total	**37.618**
10	**Superstructure Steel (HYSD Bars)**						
	75 kg/cum of concrete	ton	1		2.821		2.821
						Total	**2.821**
11	**Bituminous concrete wearing course**						
	For Main structure	cum	2	9.500	9.500	0.040	7.220
	For Service Road	cum	2	9.500	7.500	0.040	5.700
						Total	**12.920**
12	**Mastic Asphalt**						
	For Main structure	sqm	2	9.500	9.500		180.500
	For Service Road	sqm	2	9.500	7.500		142.500
						Total	**323.000**
13	**Tack Coat**						
	For Main structure	sqm	2	9.500	9.500		180.500
	For Service Road	sqm	2	9.500	7.500		142.500
						Total	**323.000**
14	**Crash Barrier R.C.C. M40**	m	8	9.500			76.000
						Total	**76.000**
15	**Drainage Spout**	nos.	8				**8**
16	**PCC below Approach Slab**						
		cum	2	3.370	40.360	0.150	40.804
						Total	**40.804**
17	**Approach Slab**						
		cum	2	3.500	40.360	0.300	84.756
						Total	**84.756**
18	**Filler Joint**						
	(i) copper plate	m	2	41.000			**82.000**
	(ii) fibar board	m	2	41.000			**82.000**
	(iii) 20mm thick premoulded joint filler	m	2	41.000			**82.000**
	(iv) joint sealing compound	m	2	41.000			**82.000**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron With Service road_NC**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
D. PROTECTION WORK							
19	**750 mm thick Flexible appron**						
	Upstream	cum	1	9.500	3.000	0.750	21.375
	Downstream	cum	1	9.500	6.000	0.750	42.750
	Deduction for Return wall 2	cum	4	3.000	0.650	0.750	-5.850
						Total	**58.275**
20	**Curtain Wall- PCC (M-20)**						
	Downstream side	cum	1	20.200	1.910		38.582
	Upstream side	cum	1	14.200	1.480		21.016
						Total	**59.598**
21	**Excavation in Soil**						
	Curtain Wall (downstream)	cum	1	21.500	2.850	2.650	162.379
	Curtain Wall (upstream)	cum	1	15.500	2.500	2.150	83.313
	Flexible apron(downstream)	cum	1	8.500	2.000	0.750	12.750
	Flexible apron(upstream)	cum	1	8.500	5.000	0.750	31.875
	Deduction for Return wall 2	cum	4	3.000	0.650	0.250	-1.950
						Total	**288.366**
22	**PCC (M-15)**						
	Below Curtain Wall						
	Downstream side	cum	1	20.200	1.850	0.150	5.606
	Upstream side	cum	1	14.200	1.500	0.150	3.195
						Total	**8.801**
E. MISCELLANEOUS WORK							
23	**Painting**						
	Crash Barrier	sqm	8	9.50	2.610		198.36
						Total	**198.36**

TYPE - 3

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron with SE**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
A. FOUNDATION							
1	**Excavation(up to 3m)**						
	Box Bridge	cum	1	4.500	25.500	1.750	200.813
	Shear Key	cum	2	4.500	1.800	0.900	14.580
	Return Wall-II	cum	4	2.000	4.300	1.750	60.200
						Total	**275.593**
2	**PCC-M15**						
	Box Bridge	cum	1	3.500	22.100	0.150	11.603
	Shear Key	cum	2	3.700	1.673	0.150	1.857
	Return Wall-II	cum	4	2.100	3.500	0.150	4.410
						Total	**17.869**
B. SUBSTRUCTURE							
3	**RCC-M30 (upto 5m)**						
	Bottom Slab	cum	1	3.500	24.500	0.300	25.725
	Box Side Wall	cum	2	24.500	0.250	2.550	31.238
	Base slab of return wall II	cum	4	2.000	3.300	0.300	7.920
	Return wall I	cum	4	0.500	0.300	2.800	1.680
	Return wall II	cum	4	2.000	0.275	2.800	6.160
	Shear key	cum	2	3.500	0.675		4.725
	Haunch	cum	2	24.500	0.011		0.551
						Total=	**77.999**
4	**Substructure Steel (HYSD Bars)**						
	70 kg/cum of Concrete	ton	1	5.460			5.460
						Total	**5.460**
5	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per side wall =23.9/2+1 =					13	
	No of weep holes in vertical direction per side wall=2.8/1+1 =					4	
	No of weep holes in horizontal direction per return wall =3/2+1 =					3	
	No of weep holes in vertical direction per return wall =2.8/1 +1=					4	
	Total no of Weep holes per side wall = 13 x 4					52	
	Total no of Weep holes per return wall = 3 x 4					12	
	Total no of weep holes = 52 x 2 + 12 x 4						**152**
6	**Backfilling - Granular Material**						
	Box	cum	1	29.000		0.300	8.700
	Shear key	cum	2	1.750		0.900	3.150
	Return Wall-II	cum	4	2.000		0.300	2.400
						Total	**14.250**
7	**Backfilling - Sandy Material**						
	Behind the side wall and return wall	cum	2	23.90	2.500	1.175	140.413
	Deduct for the filter media	cum					78.227
						Total	**62.186**
8	**Filter media**						
	Behind Abutment	cum	2	23.900	0.600	2.350	67.398
	Behind Return Wall	cum	4	1.920	0.600	2.350	10.829
						Total	**78.227**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron with SE**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
C. SUPERSTRUCTURE							
9	**RCC-M30(up to 5m)**						
	Box Bridge	cum	1	2.500	24.500	0.250	15.313
	(+)Haunch	cum	2	24.500	0.011		0.551
	Rectangular part of bracket	cum	2	24.500	0.300	0.300	4.410
	Triangular part of bracket	cum	2	24.500	0.045		2.205
						Total	**22.479**
10	**Superstructure Steel (HYSD Bars)**						
	75 kg/cum of concrete	ton	1		1.686		1.686
						Total	**1.686**
11	**Bituminous conceret wearing course**						
		cum	1	9.500	22.000	0.040	8.360
						Total	**8.360**
12	**Mastic Asphalt**						
		sqm	1	9.500	22.000		209.000
						Total	**209.000**
13	**Tack Coat**						
		sqm	1	9.500	22.000		209.000
						Total	**209.000**
14	**Crash Barrier R.C.C. M40**	m	4	9.500			38.000
						Total	**38.000**
15	**Drainage Spout**	nos.	4				**4**
16	**PCC below Approach Slab**						
		cum	2	3.370	23.900	0.150	24.163
						Total	**24.163**
17	**Approach Slab**						
		cum	2	3.500	23.900	0.300	50.190
						Total	**50.190**
18	**Filler Joint**						
	(i) copper plate	m	2	24.500			**49.000**
	(ii) fibar board	m	2	24.500			**49.000**
	(iii) 20mm thick premoulded joint filler	m	2	24.500			**49.000**
	(iv) joint sealing compound	m	2	24.500			**49.000**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron with SE**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
D. PROTECTION WORK							
19	**750 mm thick Flexible appron**						
	Upstream	cum	1	7.500	3.000	0.750	16.875
	Downstream	cum	1	7.500	6.000	0.750	33.750
	Deduction for Return wall	cum	4	2.000	1.250	0.750	-7.500
						Total	**43.125**
20	**Curtain Wall- PCC (M-20)**						
	Downstream side	cum	1	19.500	1.910		37.245
	Upstream side	cum	1	13.500	1.480		19.980
	Deduction due to return wall ll foundation (D/S)	cum	2	1.250	1.910		4.775
	Deduction due to return wall ll foundation (U/S)	cum	2	1.250	1.480		3.700
						Total	**48.750**
21	**Excavation in Soil**						
	Curtain Wall (downstream)	cum	1	20.500	2.850	2.650	154.826
	Curtain Wall (upstream)	cum	1	14.500	2.500	2.150	77.938
	Flexible appron(downstream)	cum	1	6.500	2.000	0.750	9.750
	Flexible appron(upstream)	cum	1	6.500	5.000	0.750	24.375
	Deduction for Return wall	cum	4	2.000	1.250	0.300	-3.000
						Total	**263.889**
22	**PCC (M-15)**						
	Below Curtain Wall						
	Downstream side	cum	1	19.500	1.850	0.150	5.411
	Upstream side	cum	1	13.500	1.500	0.150	3.038
	Deduction due to return wall ll	cum	4	1.250	1.675	0.150	1.256
						Total	**7.193**
E. MISCELLANEOUS WORK							
23	**Painting**						
	Crash Barrier	sqm	4	9.50	2.610		99.18
						Total	**99.18**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

TYPE - 4

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron_EC**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
A. FOUNDATION							
1.(a)	**Excavation(up to 3m)**						
	Box Bridge	cum	1	3.560	37.640	0.800	107.199
	Shear Key	cum	2	3.560	1.750	0.850	10.591
	Return Wall-II (Main structure)	cum	4	3.400	3.500	0.800	38.080
						Total	**155.870**
2	**PCC-M15**						
	Box Bridge	cum	1	3.560	34.340	0.150	18.338
	Shear Key	cum	2	3.760	1.602	0.150	1.807
	Return Wall-II (Main structure)	cum	4	3.050	2.800	0.150	5.124
						Total	**25.269**
B. SUBSTRUCTURE							
3	**RCC-M30 (upto 5m)**						
	Bottom Slab	cum	1	3.560	36.640	0.350	45.653
	Box Side Wall (Main structure)	cum	2	36.640	0.280	2.000	41.037
	Return wall I (Main structure)	cum	4	0.500	0.300	2.580	1.548
	Base slab of return wall II (Main structure)	cum	4	2.900	2.500	0.250	7.250
	Return wall II (Main structure)	cum	4	2.900	0.225	2.680	6.995
	Shear key	cum	2	3.560	0.616		4.388
	Haunch	cum	2	36.640	0.011		0.824
						Total=	**107.695**
4	**Substructure Steel (HYSD Bars)**						
	70 kg/cum of Concrete	ton	1	7.539			7.539
						Total	**7.539**
5	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per side wall =36/2+1 =					20	
	No of weep holes in vertical direction per side wall =3.1/1+1 =					5	
	No of weep holes in horizontal direction per return wall (main str.)=3.4/2+1 =					3	
	No of weep holes in vertical direction per return wall (main str.)=2.6/1 +1=					4	
	Total no of Weep holes per side wall = 20 x 5					100	
	Total no of Weep holes per return wall (main str.) = 3 x 4					12	
	Total no of weep holes = 100 x 2 + 12 x 4 + 0 x 4						**248**
6	**Backfilling - Granular Material**						
	Box	cum	1	3.560		0.500	1.780
	Shear key	cum	2	1.780		1.000	3.560
	At Return wall II (Main structure)	cum	4	4.650		0.400	7.440
						Total	**12.780**
7	**Filter media**						
	Behind side wall	cum	2	36.040	0.600	2.580	111.580
	Behind Return Wall	cum	4	2.820	0.600	2.680	18.138
						Total	**129.718**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron_EC**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
C. SUPERSTRUCTURE							
8	**RCC-M30(up to 5m)**						
	Box Bridge	cum	1	2.560	36.640	0.293	27.464
	Kerb over Top Slab	cum	2	2.560	0.250	0.300	0.384
	(+)Haunch	cum	2	36.640	0.011		0.824
						Total	**28.673**
9	**Superstructure Steel (HYSD Bars)**						
	75 kg/cum of concrete	ton	1		2.150		2.150
						Total	**2.150**
D. PROTECTION WORK							
10	**750 mm thick Flexible apron**						
	Upstream	cum	1	9.360	3.000	0.750	21.060
	Downstream	cum	1	9.360	6.000	0.750	42.120
	Deduction for Return wall 2	cum	4	2.900	0.650	0.750	5.655
						Total	**57.525**
11	**Curtain Wall- PCC (M-20)**						
	Downstream side	cum	1	21.360	1.910		40.798
	Upstream side	cum	1	15.360	1.480		22.733
	Deduction due to return wall II foundation (D/S)	cum	2	0.650	1.910		2.483
	Deduction due to return wall II foundation (U/S)	cum	2	0.650	1.480		1.924
						Total	**59.123**
12	**Excavation in Soil**						
	Curtain Wall (downstream)	cum	1	21.360	2.850	2.650	161.321
	Curtain Wall (upstream)	cum	1	15.360	2.500	2.150	82.560
	Flexible apron(downstream)	cum	1	8.360	2.000	0.750	12.540
	Flexible apron(upstream)	cum	1	8.360	5.000	0.750	31.350
	Deduction for Return wall 2	cum	4	2.900	0.650	0.900	6.786
						Total	**280.985**
13	**PCC (M-15)**						
	Below Curtain Wall						
	Downstream side	cum	1	21.360	1.850	0.150	5.927
	Upstream side	cum	1	15.360	1.500	0.150	3.456
	Deduction due to return wall II	cum	4	0.650	1.675	0.150	0.653
						Total	**8.730**
E. MISCELLANEOUS WORK							
14	**Painting**						
	Kerb	sqm	2	2.56	0.850		4.35
						Total	**4.352**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

TYPE - 5

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron_EC**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
A. FOUNDATION							
1.(a)	**Excavation(up to 3m)**						
	Box Bridge	cum	1	3.700	35.472	0.750	98.435
	Shear Key	cum	2	3.700	1.800	0.900	11.988
	Return Wall-II (Main structure)	cum	4	3.300	3.500	0.750	34.650
						Total	**145.073**
2	**PCC-M15**						
	Box Bridge	cum	1	3.700	32.072	0.150	17.800
	Shear Key	cum	2	3.900	1.673	0.150	1.957
	Return Wall-II (Main structure)	cum	4	2.950	2.800	0.150	4.956
						Total	**24.713**
B. SUBSTRUCTURE							
3	**RCC-M30 (upto 5m)**						
	Bottom Slab	cum	1	3.700	34.472	0.300	38.264
	Box Side Wall (Main structure)	cum	2	34.472	0.250	2.000	34.472
	Return wall I (Main structure)	cum	4	0.600	0.300	2.550	1.836
	Base slab of return wall II (Main structure)	cum	4	2.800	2.500	0.250	7.000
	Return wall II (Main structure)	cum	4	2.800	0.225	2.600	6.552
	Shear key	cum	2	3.700	0.675		4.995
	Haunch	cum	2	34.472	0.011		0.776
						Total=	**93.895**
4	**Substructure Steel (HYSD Bars)**						
	70 kg/cum of Concrete	ton	1	6.573			6.573
						Total	**6.573**
5	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per side wall =33.9/2+1 =					18	
	No of weep holes in vertical direction per side wall =3.1/1+1 =					5	
	No of weep holes in horizontal direction per return wall (main str.)=3.4/2+1 =					3	
	No of weep holes in vertical direction per return wall (main str.)=2.6/1 +1=					4	
	Total no of Weep holes per side wall = 18 x 5					90	
	Total no of Weep holes per return wall (main str.) = 3 x 4					12	
	Total no of weep holes = 90 x 2 + 12 x 4 + 0 x 4						**228**
6	**Backfilling - Granular Material**						
	Box	cum	1	3.700		0.450	1.665
	Shear key	cum	2	1.850		1.050	3.885
	At Return wall II (Main structure)	cum	4	4.550		0.400	7.280
						Total	**12.830**
7	**Filter media**						
	Behind side wall	cum	2	33.872	0.600	2.550	103.648
	Behind Return Wall	cum	4	2.820	0.600	2.600	17.597
						Total	**121.245**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron_EC**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
C. SUPERSTRUCTURE							
8	**RCC-M30(up to 5m)**						
	Box Bridge	cum	1	2.500	34.472	0.263	22.622
	Kerb over Top Slab	cum	2	2.500	0.250	0.300	0.375
	(+)Haunch	cum	2	34.472	0.011		0.776
						Total	**23.773**
9	**Superstructure Steel (HYSD Bars)**						
	75 kg/cum of concrete	ton	1		1.783		1.783
						Total	**1.783**
D. PROTECTION WORK							
10	**750 mm thick Flexible apron**						
	Upstream	cum	1	9.300	3.000	0.750	20.925
	Downstream	cum	1	9.300	6.000	0.750	41.850
	Deduction for Return wall 2	cum	4	2.800	0.650	0.750	5.460
						Total	**57.315**
11	**Curtain Wall- PCC (M-20)**						
	Downstream side	cum	1	21.300	1.910		40.683
	Upstream side	cum	1	15.300	1.480		22.644
	Deduction due to return wall II foundation (D/S)	cum	2	0.650	1.910		2.483
	Deduction due to return wall II foundation (U/S)	cum	2	0.650	1.480		1.924
						Total	**58.920**
12	**Excavation in Soil**						
	Curtain Wall (downstream)	cum	1	21.300	2.850	2.650	160.868
	Curtain Wall (upstream)	cum	1	15.300	2.500	2.150	82.238
	Flexible apron(downstream)	cum	1	8.300	2.000	0.750	12.450
	Flexible apron(upstream)	cum	1	8.300	5.000	0.750	31.125
	Deduction for Return wall 2	cum	4	2.800	0.650	0.900	6.552
						Total	**280.129**
13	**PCC (M-15)**						
	Below Curtain Wall						
	Downstream side	cum	1	21.300	1.850	0.150	5.911
	Upstream side	cum	1	15.300	1.500	0.150	3.443
	Deduction due to return wall II	cum	4	0.650	1.675	0.150	0.653
						Total	**8.700**
E. MISCELLANEOUS WORK							
14	**Painting**						
	Kerb	sqm	2	2.50	0.850		4.25
						Total	**4.250**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

TYPE - 6

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron_EC**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
A. FOUNDATION							
1.(a)	**Excavation(up to 3m)**						
	Box Bridge	cum	1	3.700	35.444	0.750	98.357
	Shear Key	cum	2	3.700	1.800	0.900	11.988
	Return Wall-II (Main structure)	cum	4	3.300	3.500	0.750	34.650
						Total	**144.995**
2	**PCC-M15**						
	Box Bridge	cum	1	3.700	32.044	0.150	17.784
	Shear Key	cum	2	3.900	1.673	0.150	1.957
	Return Wall-II (Main structure)	cum	4	2.950	2.800	0.150	4.956
						Total	**24.698**
B. SUBSTRUCTURE							
3	**RCC-M30 (upto 5m)**						
	Bottom Slab	cum	1	3.700	34.444	0.300	38.233
	Box Side Wall (Main structure)	cum	2	34.444	0.250	2.000	34.444
	Return wall I (Main structure)	cum	4	0.600	0.300	2.550	1.836
	Base slab of return wall II (Main structure)	cum	4	2.800	2.500	0.250	7.000
	Return wall II (Main structure)	cum	4	2.800	0.225	2.600	6.552
	Shear key	cum	2	3.700	0.675		4.995
	Haunch	cum	2	34.444	0.011		0.775
						Total=	**93.835**
4	**Substructure Steel (HYSD Bars)**						
	70 kg/cum of Concrete	ton	1	6.568			6.568
						Total	**6.568**
5	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per side wall =33.8/2+1 =					18	
	No of weep holes in vertical direction per side wall =3.1/1+1 =					5	
	No of weep holes in horizontal direction per return wall (main str.)=3.4/2+1 =					3	
	No of weep holes in vertical direction per return wall (main str.)=2.6/1 +1=					4	
	Total no of Weep holes per side wall = 18 x 5					90	
	Total no of Weep holes per return wall (main str.) = 3 x 4					12	
	Total no of weep holes = 90 x 2 + 12 x 4 + 0 x 4						**228**
6	**Backfilling - Granular Material**						
	Box	cum	1	3.700		0.450	1.665
	Shear key	cum	2	1.850		1.050	3.885
	At Return wall II (Main structure)	cum	4	4.550		0.400	7.280
						Total	**12.830**
7	**Filter media**						
	Behind side wall	cum	2	33.844	0.600	2.550	103.563
	Behind Return Wall	cum	4	2.820	0.600	2.600	17.597
						Total	**121.159**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron_EC**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
C. SUPERSTRUCTURE							
8	**RCC-M30(up to 5m)**						
	Box Bridge	cum	1	2.500	34.444	0.263	22.604
	Kerb over Top Slab	cum	2	2.500	0.250	0.300	0.375
	(+)Haunch	cum	2	34.444	0.011		0.775
						Total	**23.754**
9	**Superstructure Steel (HYSD Bars)**						
	75 kg/cum of concrete	ton	1		1.782		1.782
						Total	**1.782**
D. PROTECTION WORK							
10	**750 mm thick Flexible apron**						
	Upstream	cum	1	9.300	3.000	0.750	20.925
	Downstream	cum	1	9.300	6.000	0.750	41.850
	Deduction for Return wall 2	cum	4	2.800	0.650	0.750	5.460
						Total	**57.315**
11	**Curtain Wall- PCC (M-20)**						
	Downstream side	cum	1	21.300	1.910		40.683
	Upstream side	cum	1	15.300	1.480		22.644
	Deduction due to return wall ll foundation (D/S)	cum	2	0.650	1.910		2.483
	Deduction due to return wall ll foundation (U/S)	cum	2	0.650	1.480		1.924
						Total	**58.920**
12	**Excavation in Soil**						
	Curtain Wall (downstream)	cum	1	21.300	2.850	2.650	160.868
	Curtain Wall (upstream)	cum	1	15.300	2.500	2.150	82.238
	Flexible apron(downstream)	cum	1	8.300	2.000	0.750	12.450
	Flexible apron(upstream)	cum	1	8.300	5.000	0.750	31.125
	Deduction for Return wall 2	cum	4	2.800	0.650	0.900	6.552
						Total	**280.129**
13	**PCC (M-15)**						
	Below Curtain Wall						
	Downstream side	cum	1	21.300	1.850	0.150	5.911
	Upstream side	cum	1	15.300	1.500	0.150	3.443
	Deduction due to return wall ll	cum	4	0.650	1.675	0.150	0.653
						Total	**8.700**
E. MISCELLANEOUS WORK							
14	**Painting**						
	Kerb	sqm	2	2.50	0.850		4.25
						Total	**4.250**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

TYPE - 7

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron_EC**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
A. FOUNDATION							
1.(a)	**Excavation(up to 3m)**						
	Box Bridge	cum	1	3.700	35.088	0.750	97.369
	Shear Key	cum	2	3.700	1.800	0.900	11.988
	Return Wall-II (Main structure)	cum	4	3.300	3.500	0.750	34.650
						Total	**144.007**
2	**PCC-M15**						
	Box Bridge	cum	1	3.700	31.688	0.150	17.587
	Shear Key	cum	2	3.900	1.673	0.150	1.957
	Return Wall-II (Main structure)	cum	4	2.950	2.800	0.150	4.956
						Total	**24.500**
B. SUBSTRUCTURE							
3	**RCC-M30 (upto 5m)**						
	Bottom Slab	cum	1	3.700	34.088	0.300	37.838
	Box Side Wall (Main structure)	cum	2	34.088	0.250	2.000	34.088
	Return wall I (Main structure)	cum	4	0.600	0.300	2.550	1.836
	Base slab of return wall II (Main structure)	cum	4	2.800	2.500	0.250	7.000
	Return wall II (Main structure)	cum	4	2.800	0.225	2.600	6.552
	Shear key	cum	2	3.700	0.675		4.995
	Haunch	cum	2	34.088	0.011		0.767
						Total=	**93.076**
4	**Substructure Steel (HYSD Bars)**						
	70 kg/cum of Concrete	ton	1	6.515			6.515
						Total	**6.515**
5	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per side wall =33.5/2+1 =					18	
	No of weep holes in vertical direction per side wall =3.1/1+1 =					5	
	No of weep holes in horizontal direction per return wall (main str.)=3.4/2+1 =					3	
	No of weep holes in vertical direction per return wall (main str.)=2.6/1 +1=					4	
	Total no of Weep holes per side wall = 18 x 5					90	
	Total no of Weep holes per return wall (main str.) = 3 x 4					12	
	Total no of weep holes = 90 x 2 + 12 x 4 + 0 x 4						**228**
6	**Backfilling - Granular Material**						
	Box	cum	1	3.700		0.450	1.665
	Shear key	cum	2	1.850		1.050	3.885
	At Return wall II (Main structure)	cum	4	4.550		0.400	7.280
						Total	**12.830**
7	**Filter media**						
	Behind side wall	cum	2	33.488	0.600	2.550	102.473
	Behind Return Wall	cum	4	2.820	0.600	2.600	17.597
						Total	**120.070**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron_EC**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
C. SUPERSTRUCTURE							
8	**RCC-M30(up to 5m)**						
	Box Bridge	cum	1	2.500	34.088	0.263	22.370
	Kerb over Top Slab	cum	2	2.500	0.250	0.300	0.375
	(+)Haunch	cum	2	34.088	0.011		0.767
						Total	**23.512**
9	**Superstructure Steel (HYSD Bars)**						
	75 kg/cum of concrete	ton	1		1.763		1.763
						Total	**1.763**
D. PROTECTION WORK							
10	**750 mm thick Flexible apron**						
	Upstream	cum	1	9.300	3.000	0.750	20.925
	Downstream	cum	1	9.300	6.000	0.750	41.850
	Deduction for Return wall 2	cum	4	2.800	0.650	0.750	5.460
						Total	**57.315**
11	**Curtain Wall- PCC (M-20)**						
	Downstream side	cum	1	21.300	1.910		40.683
	Upstream side	cum	1	15.300	1.480		22.644
	Deduction due to return wall II foundation (D/S)	cum	2	0.650	1.910		2.483
	Deduction due to return wall II foundation (U/S)	cum	2	0.650	1.480		1.924
						Total	**58.920**
12	**Excavation in Soil**						
	Curtain Wall (downstream)	cum	1	21.300	2.850	2.650	160.868
	Curtain Wall (upstream)	cum	1	15.300	2.500	2.150	82.238
	Flexible apron(downstream)	cum	1	8.300	2.000	0.750	12.450
	Flexible apron(upstream)	cum	1	8.300	5.000	0.750	31.125
	Deduction for Return wall 2	cum	4	2.800	0.650	0.900	6.552
						Total	**280.129**
13	**PCC (M-15)**						
	Below Curtain Wall						
	Downstream side	cum	1	21.300	1.850	0.150	5.911
	Upstream side	cum	1	15.300	1.500	0.150	3.443
	Deduction due to return wall II	cum	4	0.650	1.675	0.150	0.653
						Total	**8.700**
E. MISCELLANEOUS WORK							
14	**Painting**						
	Kerb	sqm	2	2.50	0.850		4.25
						Total	**4.250**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

TYPE - 8

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron_EC**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
A. FOUNDATION							
1.(a)	**Excavation(up to 3m)**						
	Box Bridge	cum	1	3.700	37.364	0.750	103.685
	Shear Key	cum	2	3.700	1.800	0.900	11.988
	Return Wall-II (Main structure)	cum	4	3.300	3.500	0.750	34.650
						Total	**150.323**
2	**PCC-M15**						
	Box Bridge	cum	1	3.700	33.964	0.150	18.850
	Shear Key	cum	2	3.900	1.673	0.150	1.957
	Return Wall-II (Main structure)	cum	4	2.950	2.800	0.150	4.956
						Total	**25.763**
B. SUBSTRUCTURE							
3	**RCC-M30 (upto 5m)**						
	Bottom Slab	cum	1	3.700	36.364	0.300	40.364
	Box Side Wall (Main structure)	cum	2	36.364	0.250	2.000	36.364
	Return wall I (Main structure)	cum	4	0.600	0.300	2.550	1.836
	Base slab of return wall II (Main structure)	cum	4	2.800	2.500	0.250	7.000
	Return wall II (Main structure)	cum	4	2.800	0.225	2.600	6.552
	Shear key	cum	2	3.700	0.675		4.995
	Haunch	cum	2	36.364	0.011		0.818
						Total=	**97.929**
4	**Substructure Steel (HYSD Bars)**						
	70 kg/cum of Concrete	ton	1	6.855			6.855
						Total	**6.855**
5	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per side wall =35.8/2+1 =					19	
	No of weep holes in vertical direction per side wall =3.9/1+1 =					5	
	No of weep holes in horizontal direction per return wall (main str.)=3.4/2+1 =					3	
	No of weep holes in vertical direction per return wall (main str.)=2.6/1 +1=					4	
	Total no of Weep holes per side wall = 19 x 5					95	
	Total no of Weep holes per return wall (main str.) = 3 x 4					12	
	Total no of weep holes = 95 x 2 + 12 x 4 + 0 x 4						**238**
6	**Backfilling - Granular Material**						
	Box	cum	1	3.700		0.450	1.665
	Shear key	cum	2	1.850		1.050	3.885
	At Return wall II (Main structure)	cum	4	4.550		0.400	7.280
						Total	**12.830**
7	**Filter media**						
	Behind side wall	cum	2	35.764	0.600	2.550	109.438
	Behind Return Wall	cum	4	2.820	0.600	2.600	17.597
						Total	**127.035**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron_EC**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
C. SUPERSTRUCTURE							
8	**RCC-M30(up to 5m)**						
	Box Bridge	cum	1	2.500	36.364	0.263	23.864
	Kerb over Top Slab	cum	2	2.500	0.250	0.300	0.375
	(+)Haunch	cum	2	36.364	0.011		0.818
						Total	**25.057**
9	**Superstructure Steel (HYSD Bars)**						
	75 kg/cum of concrete	ton	1		1.879		1.879
						Total	**1.879**
D. PROTECTION WORK							
10	**750 mm thick Flexible apron**						
	Upstream	cum	1	9.300	3.000	0.750	20.925
	Downstream	cum	1	9.300	6.000	0.750	41.850
	Deduction for Return wall 2	cum	4	2.800	0.650	0.750	5.460
						Total	**57.315**
11	**Curtain Wall- PCC (M-20)**						
	Downstream side	cum	1	21.300	1.910		40.683
	Upstream side	cum	1	15.300	1.480		22.644
	Deduction due to return wall ll foundation (D/S)	cum	2	0.650	1.910		2.483
	Deduction due to return wall ll foundation (U/S)	cum	2	0.650	1.480		1.924
						Total	**58.920**
12	**Excavation in Soil**						
	Curtain Wall (downstream)	cum	1	21.300	2.850	2.650	160.868
	Curtain Wall (upstream)	cum	1	15.300	2.500	2.150	82.238
	Flexible apron(downstream)	cum	1	8.300	2.000	0.750	12.450
	Flexible apron(upstream)	cum	1	8.300	5.000	0.750	31.125
	Deduction for Return wall 2	cum	4	2.800	0.650	0.900	6.552
						Total	**280.129**
13	**PCC (M-15)**						
	Below Curtain Wall						
	Downstream side	cum	1	21.300	1.850	0.150	5.911
	Upstream side	cum	1	15.300	1.500	0.150	3.443
	Deduction due to return wall ll	cum	4	0.650	1.675	0.150	0.653
						Total	**8.700**
E. MISCELLANEOUS WORK							
14	**Painting**						
	Kerb	sqm	2	2.50	0.850		4.25
						Total	**4.250**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

TYPE - 9

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron_EC**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
A. FOUNDATION							
1.(a)	**Excavation(up to 3m)**						
	Box Bridge	cum	1	3.560	42.192	0.800	120.163
	Shear Key	cum	2	3.560	1.750	0.850	10.591
	Return Wall-II (Main structure)	cum	4	3.400	3.500	0.800	38.080
						Total	**168.834**
2	**PCC-M15**						
	Box Bridge	cum	1	3.560	38.892	0.150	20.768
	Shear Key	cum	2	3.760	1.602	0.150	1.807
	Return Wall-II (Main structure)	cum	4	3.050	2.800	0.150	5.124
						Total	**27.699**
B. SUBSTRUCTURE							
3	**RCC-M30 (upto 5m)**						
	Bottom Slab	cum	1	3.560	41.192	0.350	51.325
	Box Side Wall (Main structure)	cum	2	41.192	0.280	2.000	46.135
	Return wall I (Main structure)	cum	4	0.500	0.300	2.580	1.548
	Base slab of return wall II (Main structure)	cum	4	2.900	2.500	0.250	7.250
	Return wall II (Main structure)	cum	4	2.900	0.225	2.680	6.995
	Shear key	cum	2	3.560	0.616		4.388
	Haunch	cum	2	41.192	0.011		0.927
						Total=	**118.568**
4	**Substructure Steel (HYSD Bars)**						
	70 kg/cum of Concrete	ton	1	8.300			8.300
						Total	**8.300**
5	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per side wall =40.6/2+1 =					22	
	No of weep holes in vertical direction per side wall =5.1/1+1 =					7	
	No of weep holes in horizontal direction per return wall (main str.)=3.4/2+1 =					3	
	No of weep holes in vertical direction per return wall (main str.)=2.6/1 +1=					4	
	Total no of Weep holes per side wall = 22 x 7					154	
	Total no of Weep holes per return wall (main str.) = 3 x 4					12	
	Total no of weep holes = 154 x 2 + 12 x 4 + 0 x 4						**356**
6	**Backfilling - Granular Material**						
	Box	cum	1	3.560		0.500	1.780
	Shear key	cum	2	1.780		1.000	3.560
	At Return wall II (Main structure)	cum	4	4.650		0.400	7.440
						Total	**12.780**
7	**Filter media**						
	Behind side wall	cum	2	40.592	0.600	2.580	125.673
	Behind Return Wall	cum	4	2.820	0.600	2.680	18.138
						Total	**143.811**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron_EC**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
C. SUPERSTRUCTURE							
8	**RCC-M30(up to 5m)**						
	Box Bridge	cum	1	2.560	41.192	0.293	30.876
	Kerb over Top Slab	cum	2	2.560	0.250	0.300	0.384
	(+)Haunch	cum	2	41.192	0.011		0.927
						Total	**32.187**
9	**Superstructure Steel (HYSD Bars)**						
	75 kg/cum of concrete	ton	1		2.414		2.414
						Total	**2.414**
D. PROTECTION WORK							
10	**750 mm thick Flexible apron**						
	Upstream	cum	1	9.360	3.000	0.750	21.060
	Downstream	cum	1	9.360	6.000	0.750	42.120
	Deduction for Return wall 2	cum	4	2.900	0.650	0.750	5.655
						Total	**57.525**
11	**Curtain Wall- PCC (M-20)**						
	Downstream side	cum	1	21.360	1.910		40.798
	Upstream side	cum	1	15.360	1.480		22.733
	Deduction due to return wall II foundation (D/S)	cum	2	0.650	1.910		2.483
	Deduction due to return wall II foundation (U/S)	cum	2	0.650	1.480		1.924
						Total	**59.123**
12	**Excavation in Soil**						
	Curtain Wall (downstream)	cum	1	21.360	2.850	2.650	161.321
	Curtain Wall (upstream)	cum	1	15.360	2.500	2.150	82.560
	Flexible apron(downstream)	cum	1	8.360	2.000	0.750	12.540
	Flexible apron(upstream)	cum	1	8.360	5.000	0.750	31.350
	Deduction for Return wall 2	cum	4	2.900	0.650	0.900	6.786
						Total	**280.985**
13	**PCC (M-15)**						
	Below Curtain Wall						
	Downstream side	cum	1	21.360	1.850	0.150	5.927
	Upstream side	cum	1	15.360	1.500	0.150	3.456
	Deduction due to return wall II	cum	4	0.650	1.675	0.150	0.653
						Total	**8.730**
E. MISCELLANEOUS WORK							
14	**Painting**						
	Kerb	sqm	2	2.56	0.850		4.35
						Total	**4.352**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

TYPE - 10

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron & Earth Cushion**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
A. FOUNDATION							
1.(a)	**Excavation(up to 3m)**						
	Box Bridge	cum	1	3.700	19.500	0.750	54.112
	Shear Key	cum	2	3.700	1.800	0.900	11.988
	Return Wall-II (Service Road)	cum	2	3.300	3.500	0.750	17.325
						Total	**83.425**
2	**PCC-M15**						
	Box Bridge	cum	1	3.700	16.100	0.150	8.936
	Shear Key	cum	2	3.900	1.673	0.150	1.957
	Return Wall-II (Service Road)	cum	2	2.950	2.700	0.150	2.390
						Total	**13.282**
B. SUBSTRUCTURE							
3	**RCC-M30 (upto 5m)**						
	Bottom Slab	cum	1	3.700	18.500	0.300	20.535
	Box Side Wall (Main structure)	cum	2	10.500	0.250	2.175	11.419
	Box Side Wall (Service Road)	cum	2	8.000	0.250	2.088	8.350
	Return wall I (Service Road)	cum	2	0.600	0.300	2.250	0.810
	Base slab of return wall II(Service Road)	cum	2	2.800	2.500	0.250	3.500
	Return wall II (Service Road)	cum	2	2.800	0.225	2.300	2.898
	Shear key	cum	2	3.700	0.675		4.995
	Haunch	cum	2	26.500	0.011		0.596
						Total=	**53.103**
4	**Substructure Steel (HYSD Bars)**						
	70 kg/cum of Concrete	ton	1	3.717			3.717
						Total	**3.717**
5	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per side wall =17.9/2+1 =					10	
	No of weep holes in vertical direction per side wall =3.9/1+1 =					5	
	No of weep holes in horizontal direction per return wall (service road) =3.4/2+1 =					3	
	No of weep holes in vertical direction per return wall (service road) =2.3/1 +1=					4	
	Total no of Weep holes per side wall = 10 x 5					50	
	Total no of Weep holes per return wall (service road) = 3 x 4					12	
	Total no of weep holes = 50 x 2 + 12 x 2						**124**
6	**Backfilling - Granular Material**						
	Box	cum	1	3.700		0.450	1.665
	Shear key	cum	2	1.850		1.050	3.885
	At Return wall II (Service Road)	cum	2	4.550		0.400	3.640
						Total	**9.190**
7	**Backfilling - Sandy Material**						
	Behind the side wall and return wall	cum	2	7.70	3.400	2.275	119.119
	Deduct for the filter media	cum					-56.923
						Total	**62.196**
8	**Filter media**						
	Behind side wall	cum	2	18.200	0.600	2.250	49.140
	Behind Return Wall	cum	2	2.820	0.600	2.300	7.783
						Total	**56.923**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron & Earth Cushion**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
C. SUPERSTRUCTURE							
9	**RCC-M30(up to 5m)**						
	Box Bridge	cum	1	2.500	18.500	0.250	11.563
	(+)Haunch	cum	2	18.500	0.011		0.416
	Rectangular part of bracket	cum	2	8.000	0.300	0.300	1.440
	Triangular part of bracket	cum	2	8.000	0.045		0.720
						Total	**11.979**
10	**Superstructure Steel (HYSD Bars)**						
	75 kg/cum of concrete	ton	1		0.898		0.898
						Total	**0.898**
11	**Bituminous concrete wearing course**						
	For Service Road	cum	1	9.500	7.000	0.040	2.660
						Total	**2.660**
12	**Mastic Asphalt**						
	For Service Road	sqm	1	9.500	7.000		66.500
						Total	**66.500**
13	**Tack Coat**						
	For Service Road	sqm	1	9.500	7.000		66.500
						Total	**66.500**
14	**Crash Barrier R.C.C. M40**	m	2	9.500			19.000
						Total	**19.000**
15	**Drainage Spout**	nos.	2				**2**
16	**PCC below Approach Slab**						
		cum	2	3.370	7.760	0.150	7.845
						Total	**7.845**
17	**Approach Slab**						
		cum	2	3.500	7.760	0.300	16.296
						Total	**16.296**
18	**Filler Joint**						
	(i) copper plate	m	2	8.000			**16.000**
	(ii) fibar board	m	2	8.000			**16.000**
	(iii) 20mm thick premoulded joint filler	m	2	8.000			**16.000**
	(iv) joint sealing compound	m	2	8.000			**16.000**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron & Earth Cushion**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
D. PROTECTION WORK							
19	**750 mm thick Flexible apron**						
	Upstream	cum	1	9.300	3.000	0.750	20.925
	Downstream	cum	1	9.300	6.000	0.750	41.850
	Deduction for Return wall 2	cum	2	2.800	0.650	0.750	2.730
						Total	**60.045**
20	**Curtain Wall- PCC (M-20)**						
	Downstream side	cum	1	21.300	1.910		40.683
	Upstream side	cum	1	15.300	1.480		22.644
	Deduction due to return wall II foundation (U/S)	cum	2	0.650	1.480		1.924
						Total	**61.403**
21	**Excavation in Soil**						
	Curtain Wall (downstream)	cum	1	21.300	2.850	2.650	160.868
	Curtain Wall (upstream)	cum	1	15.300	2.500	2.150	82.238
	Flexible apron(downstream)	cum	1	8.300	2.000	0.750	12.450
	Flexible apron(upstream)	cum	1	8.300	5.000	0.750	31.125
	Deduction for Return wall 2	cum	2	3.630	0.650	0.900	4.247
						Total	**282.434**
22	**PCC (M-15)**						
	Below Curtain Wall						
	Downstream side	cum	1	21.300	1.850	0.150	5.911
	Upstream side	cum	1	15.300	1.500	0.150	3.443
	Deduction due to return wall II	cum	2	0.650	1.675	0.150	0.327
						Total	**9.027**
E. MISCELLANEOUS WORK							
23	**Painting**						
	Crash Barrier	sqm	2	9.50	2.610		49.59
						Total	**49.59**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

TYPE - 11

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron & Earth Cushion**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
A. FOUNDATION							
1.(a)	**Excavation(up to 3m)**						
	Box Bridge	cum	1	3.760	41.000	0.800	123.328
	Shear Key	cum	2	3.760	1.750	0.850	11.186
	Return Wall-II (Service Road)	cum	4	3.300	3.500	0.800	36.960
						Total	**171.474**
2	**PCC-M15**						
	Box Bridge	cum	1	3.760	37.700	0.150	21.263
	Shear Key	cum	2	3.960	1.602	0.150	1.903
	Return Wall-II (Service Road)	cum	4	2.950	2.700	0.150	4.779
						Total	**27.945**
B. SUBSTRUCTURE							
3	**RCC-M30 (upto 5m)**						
	Bottom Slab	cum	1	3.760	40.000	0.350	52.640
	Box Side Wall (Main structure)	cum	2	24.000	0.280	2.175	29.232
	Box Side Wall (Service Road)	cum	4	8.000	0.280	2.088	18.704
	Return wall I (Service Road)	cum	4	0.600	0.300	2.280	1.642
	Base slab of return wall II(Service Road)	cum	4	2.800	2.500	0.250	7.000
	Return wall II (Service Road)	cum	4	2.800	0.225	2.380	5.998
	Shear key	cum	2	3.760	0.616		4.634
	Haunch	cum	2	40.000	0.011		0.900
						Total=	**120.749**
4	**Substructure Steel (HYSD Bars)**						
	70 kg/cum of Concrete	ton	1	8.452			8.452
						Total	**8.452**
5	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per side wall =39.4/2+1 =					21	
	No of weep holes in vertical direction per side wall =3.8/1+1 =					5	
	No of weep holes in horizontal direction per return wall (service road) =3.4/2+1 =					3	
	No of weep holes in vertical direction per return wall (service road) =2.3/1 +1=					4	
	Total no of Weep holes per side wall = 21 x 5					105	
	Total no of Weep holes per return wall (service road) = 3 x 4					12	
	Total no of weep holes = 105 x 2 + 12 x 4						**258**
6	**Backfilling - Granular Material**						
	Box	cum	1	3.760		0.500	1.880
	Shear key	cum	2	1.880		1.000	3.760
	At Return wall II (Service Road)	cum	4	4.550		0.400	7.280
						Total	**12.920**
7	**Backfilling - Sandy Material**						
	Behind the side wall and return wall	cum	2	15.40	3.400	2.330	243.998
	Deduct for the filter media	cum					-123.906
						Total	**120.091**
8	**Filter media**						
	Behind side wall	cum	2	39.400	0.600	2.280	107.798
	Behind Return Wall	cum	4	2.820	0.600	2.380	16.108
						Total	**123.906**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron & Earth Cushion**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
C. SUPERSTRUCTURE							
9	**RCC-M30(up to 5m)**						
	Box Bridge	cum	1	2.560	40.000	0.280	28.672
	(+)Haunch	cum	2	40.000	0.011		0.900
	Rectangular part of bracket	cum	4	8.000	0.300	0.300	2.880
	Triangular part of bracket	cum	4	8.000	0.045		1.440
						Total	**29.572**
10	**Superstructure Steel (HYSD Bars)**						
	75 kg/cum of concrete	ton	1		2.218		2.218
						Total	**2.218**
11	**Bituminous concrete wearing course**						
	For Service Road	cum	2	9.560	7.000	0.040	5.354
						Total	**5.354**
12	**Mastic Asphalt**						
	For Service Road	sqm	2	9.560	7.000		133.840
						Total	**133.840**
13	**Tack Coat**						
	For Service Road	sqm	2	9.560	7.000		133.840
						Total	**133.840**
14	**Crash Barrier R.C.C. M40**	m	4	9.560			38.240
						Total	**38.240**
15	**Drainage Spout**	nos.	4				**4**
16	**PCC below Approach Slab**						
		cum	4	3.370	7.760	0.150	15.691
						Total	**15.691**
17	**Approach Slab**						
		cum	4	3.500	7.760	0.300	32.592
						Total	**32.592**
18	**Filler Joint**						
	(i) copper plate	m	4	8.000			**32.000**
	(ii) fibar board	m	4	8.000			**32.000**
	(iii) 20mm thick premoulded joint filler	m	4	8.000			**32.000**
	(iv) joint sealing compound	m	4	8.000			**32.000**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron & Earth Cushion**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
D. PROTECTION WORK							
19	**750 mm thick Flexible apron**						
	Upstream	cum	1	9.360	3.000	0.750	21.060
	Downstream	cum	1	9.360	6.000	0.750	42.120
	Deduction for Return wall 2	cum	4	2.800	0.650	0.750	5.460
						Total	**57.720**
20	**Curtain Wall- PCC (M-20)**						
	Downstream side	cum	1	21.360	1.910		40.798
	Upstream side	cum	1	15.360	1.480		22.733
	Deduction due to return wall II foundation (D/S)	cum	2	0.650	1.910		2.483
	Deduction due to return wall II foundation (U/S)	cum	2	0.650	1.480		1.924
						Total	**59.123**
21	**Excavation in Soil**						
	Curtain Wall (downstream)	cum	1	21.360	2.850	2.650	161.321
	Curtain Wall (upstream)	cum	1	15.360	2.500	2.150	82.560
	Flexible apron(downstream)	cum	1	8.360	2.000	0.750	12.540
	Flexible apron(upstream)	cum	1	8.360	5.000	0.750	31.350
	Deduction for Return wall 2	cum	4	3.630	0.650	0.900	8.494
						Total	**279.277**
22	**PCC (M-15)**						
	Below Curtain Wall						
	Downstream side	cum	1	21.360	1.850	0.150	5.927
	Upstream side	cum	1	15.360	1.500	0.150	3.456
	Deduction due to return wall II	cum	4	0.650	1.675	0.150	0.653
						Total	**8.730**
E. MISCELLANEOUS WORK							
23	**Painting**						
	Crash Barrier	sqm	4	9.56	2.610		99.81
						Total	**99.81**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

TYPE - 12

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron_EC SE**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
A. FOUNDATION							
1.(a)	**Excavation(up to 3m)**						
	Box Bridge	cum	1	3.600	44.936	0.800	129.416
	Shear Key	cum	2	3.600	1.750	0.850	10.710
	Return Wall-II (Main structure)	cum	4	3.400	3.500	0.800	38.080
						Total	**178.206**
2	**PCC-M15**						
	Box Bridge	cum	1	3.600	41.636	0.150	22.483
	Shear Key	cum	2	3.800	1.602	0.150	1.826
	Return Wall-II (Main structure)	cum	4	3.050	2.700	0.150	4.941
						Total	**29.251**
B. SUBSTRUCTURE							
3	**RCC-M30 (upto 5m)**						
	Bottom Slab	cum	1	3.600	43.936	0.350	55.359
	Box Side Wall (Main structure)	cum	2	43.936	0.300	2.000	52.723
	Return wall I (Main structure)	cum	4	0.500	0.300	2.600	1.560
	Base slab of return wall II (Main structure)	cum	4	2.900	2.500	0.250	7.250
	Return wall II (Main structure)	cum	4	2.900	0.225	2.700	7.047
	Shear key	cum	2	3.600	0.616		4.437
	Haunch	cum	2	43.936	0.011		0.989
						Total=	**129.365**
4	**Substructure Steel (HYSD Bars)**						
	70 kg/cum of Concrete	ton	1	9.056			9.056
						Total	**9.056**
5	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per side wall =43.3/2+1 =					23	
	No of weep holes in vertical direction per side wall =4.2/1+1 =					6	
	No of weep holes in horizontal direction per return wall (main str.)=3.4/2+1 =					3	
	No of weep holes in vertical direction per return wall (main str.)=2.7/1 +1=					4	
	Total no of Weep holes per side wall = 23 x 6					138	
	Total no of Weep holes per return wall (main str.) = 3 x 4					12	
	Total no of weep holes = 138 x 2 + 12 x 4 + 0 x 4						**324**
6	**Backfilling - Granular Material**						
	Box	cum	1	3.600		0.500	1.800
	Shear key	cum	2	1.800		1.000	3.600
	At Return wall II (Main structure)	cum	4	4.650		0.400	7.440
						Total	**12.840**
7	**Filter media**						
	Behind side wall	cum	2	43.336	0.600	2.600	135.208
	Behind Return Wall	cum	4	2.820	0.600	2.700	18.274
						Total	**153.482**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron_EC SE**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
C. SUPERSTRUCTURE							
8	**RCC-M30(up to 5m)**						
	Box Bridge	cum	1	2.600	43.936	0.313	35.755
	Kerb over Top Slab	cum	2	2.600	0.250	0.300	0.390
	(+)Haunch	cum	2	43.936	0.011		0.989
						Total	**37.134**
9	**Superstructure Steel (HYSD Bars)**						
	75 kg/cum of concrete	ton	1		2.785		2.785
						Total	**2.785**
D. PROTECTION WORK							
10	**750 mm thick Flexible appron**						
	Upstream	cum	1	9.400	3.000	0.750	21.150
	Downstream	cum	1	9.400	6.000	0.750	42.300
	Deduction for Return wall 2	cum	4	3.400	0.650	0.750	6.630
						Total	**56.820**
11	**Curtain Wall- PCC (M-20)**						
	Downstream side	cum	1	21.400	1.910		40.874
	Upstream side	cum	1	15.400	1.480		22.792
	Deduction due to return wall II foundation (D/S)	cum	2	0.650	1.910		2.483
	Deduction due to return wall II foundation (U/S)	cum	2	0.650	1.480		1.924
						Total	**59.259**
12	**Excavation in Soil**						
	Curtain Wall (downstream)	cum	1	21.400	2.850	2.650	161.624
	Curtain Wall (upstream)	cum	1	15.400	2.500	2.150	82.775
	Flexible apron(downstream)	cum	1	8.400	2.000	0.750	12.600
	Flexible apron(upstream)	cum	1	8.400	5.000	0.750	31.500
	Deduction for Return wall 2	cum	4	3.400	0.650	0.900	7.956
						Total	**280.543**
13	**PCC (M-15)**						
	Below Curtain Wall						
	Downstream side	cum	1	21.400	1.850	0.150	5.939
	Upstream side	cum	1	15.400	1.500	0.150	3.465
	Deduction due to return wall II	cum	4	0.650	1.675	0.150	0.653
						Total	**8.750**
E. MISCELLANEOUS WORK							
14	**Painting**						
	Kerb	sqm	2	2.60	0.850		4.42
						Total	**4.420**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

TYPE - 13

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron_ECSE**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
A. FOUNDATION							
1.(a)	**Excavation(up to 3m)**						
	Box Bridge	cum	1	3.700	38.256	0.750	106.160
	Shear Key	cum	2	3.700	1.800	0.900	11.988
	Return Wall-II (Main structure)	cum	4	3.300	3.500	0.750	34.650
						Total	**152.798**
2	**PCC-M15**						
	Box Bridge	cum	1	3.700	34.856	0.150	19.345
	Shear Key	cum	2	3.900	1.673	0.150	1.957
	Return Wall-II (Main structure)	cum	4	2.950	2.700	0.150	4.779
						Total	**26.081**
B. SUBSTRUCTURE							
3	**RCC-M30 (upto 5m)**						
	Bottom Slab	cum	1	3.700	37.256	0.300	41.354
	Box Side Wall (Main structure)	cum	2	37.256	0.250	2.000	37.256
	Return wall I (Main structure)	cum	4	0.600	0.300	2.550	1.836
	Base slab of return wall II (Main structure)	cum	4	2.800	2.500	0.250	7.000
	Return wall II (Main structure)	cum	4	2.800	0.225	2.600	6.552
	Shear key	cum	2	3.700	0.675		4.995
	Haunch	cum	2	37.256	0.011		0.838
						Total=	**99.831**
4	**Substructure Steel (HYSD Bars)**						
	70 kg/cum of Concrete	ton	1	6.988			6.988
						Total	**6.988**
5	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per side wall =36.7/2+1 =					20	
	No of weep holes in vertical direction per side wall =4.2/1+1 =					6	
	No of weep holes in horizontal direction per return wall (main str.)=3.4/2+1 =					3	
	No of weep holes in vertical direction per return wall (main str.)=2.6/1 +1=					4	
	Total no of Weep holes per side wall = 20 x 6					120	
	Total no of Weep holes per return wall (main str.) = 3 x 4					12	
	Total no of weep holes = 120 x 2 + 12 x 4 + 0 x 4						**288**
6	**Backfilling - Granular Material**						
	Box	cum	1	3.700		0.450	1.665
	Shear key	cum	2	1.850		1.050	3.885
	At Return wall II (Main structure)	cum	4	4.550		0.400	7.280
						Total	**12.830**
7	**Filter media**						
	Behind side wall	cum	2	36.656	0.600	2.550	112.167
	Behind Return Wall	cum	4	2.820	0.600	2.600	17.597
						Total	**129.764**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron_EC SE**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
C. SUPERSTRUCTURE							
8	**RCC-M30(up to 5m)**						
	Box Bridge	cum	1	2.500	37.256	0.263	24.449
	Kerb over Top Slab	cum	2	2.500	0.250	0.300	0.375
	(+)Haunch	cum	2	37.256	0.011		0.838
						Total	**25.663**
9	**Superstructure Steel (HYSD Bars)**						
	75 kg/cum of concrete	ton	1		1.925		1.925
						Total	**1.925**
D. PROTECTION WORK							
10	**750 mm thick Flexible appron**						
	Upstream	cum	1	9.300	3.000	0.750	20.925
	Downstream	cum	1	9.300	6.000	0.750	41.850
	Deduction for Return wall 2	cum	4	3.300	0.650	0.750	6.435
						Total	**56.340**
11	**Curtain Wall- PCC (M-20)**						
	Downstream side	cum	1	21.300	1.910		40.683
	Upstream side	cum	1	15.300	1.480		22.644
	Deduction due to return wall II foundation (D/S)	cum	2	0.650	1.910		2.483
	Deduction due to return wall II foundation (U/S)	cum	2	0.650	1.480		1.924
						Total	**58.920**
12	**Excavation in Soil**						
	Curtain Wall (downstream)	cum	1	21.300	2.850	2.650	160.868
	Curtain Wall (upstream)	cum	1	15.300	2.500	2.150	82.238
	Flexible apron(downstream)	cum	1	8.300	2.000	0.750	12.450
	Flexible apron(upstream)	cum	1	8.300	5.000	0.750	31.125
	Deduction for Return wall 2	cum	4	3.300	0.650	0.900	7.722
						Total	**278.959**
13	**PCC (M-15)**						
	Below Curtain Wall						
	Downstream side	cum	1	21.300	1.850	0.150	5.911
	Upstream side	cum	1	15.300	1.500	0.150	3.443
	Deduction due to return wall II	cum	4	0.650	1.675	0.150	0.653
						Total	**8.700**
E. MISCELLANEOUS WORK							
14	**Painting**						
	Kerb	sqm	2	2.50	0.850		4.25
						Total	**4.250**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

TYPE - 14

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron_ECSE**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
A. FOUNDATION							
1.(a)	**Excavation(up to 3m)**						
	Box Bridge	cum	1	3.560	43.844	0.800	124.868
	Shear Key	cum	2	3.560	1.750	0.850	10.591
	Return Wall-II (Main structure)	cum	4	3.400	3.500	0.800	38.080
						Total	**173.539**
2	**PCC-M15**						
	Box Bridge	cum	1	3.560	40.544	0.150	21.650
	Shear Key	cum	2	3.760	1.602	0.150	1.807
	Return Wall-II (Main structure)	cum	4	3.050	2.700	0.150	4.941
						Total	**28.399**
B. SUBSTRUCTURE							
3	**RCC-M30 (upto 5m)**						
	Bottom Slab	cum	1	3.560	42.844	0.350	53.384
	Box Side Wall (Main structure)	cum	2	42.844	0.280	2.000	47.985
	Return wall I (Main structure)	cum	4	0.500	0.300	2.580	1.548
	Base slab of return wall II (Main structure)	cum	4	2.900	2.500	0.250	7.250
	Return wall II (Main structure)	cum	4	2.900	0.225	2.680	6.995
	Shear key	cum	2	3.560	0.616		4.388
	Haunch	cum	2	42.844	0.011		0.964
						Total=	**122.513**
4	**Substructure Steel (HYSD Bars)**						
	70 kg/cum of Concrete	ton	1	8.576			8.576
						Total	**8.576**
5	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per side wall =42.2/2+1 =					23	
	No of weep holes in vertical direction per side wall =4.2/1+1 =					6	
	No of weep holes in horizontal direction per return wall (main str.)=3.4/2+1 =					3	
	No of weep holes in vertical direction per return wall (main str.)=2.6/1 +1=					4	
	Total no of Weep holes per side wall = 23 x 6					138	
	Total no of Weep holes per return wall (main str.) = 3 x 4					12	
	Total no of weep holes = 138 x 2 + 12 x 4 + 0 x 4						**324**
6	**Backfilling - Granular Material**						
	Box	cum	1	3.560		0.500	1.780
	Shear key	cum	2	1.780		1.000	3.560
	At Return wall II (Main structure)	cum	4	4.650		0.400	7.440
						Total	**12.780**
7	**Filter media**						
	Behind side wall	cum	2	42.244	0.600	2.580	130.787
	Behind Return Wall	cum	4	2.820	0.600	2.680	18.138
						Total	**148.926**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 2 m with Flexible Apron_EC SE**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
C. SUPERSTRUCTURE							
8	**RCC-M30(up to 5m)**						
	Box Bridge	cum	1	2.560	42.844	0.293	32.114
	Kerb over Top Slab	cum	2	2.560	0.250	0.300	0.384
	(+)Haunch	cum	2	42.844	0.011		0.964
						Total	**33.462**
9	**Superstructure Steel (HYSD Bars)**						
	75 kg/cum of concrete	ton	1		2.510		2.510
						Total	**2.510**
D. PROTECTION WORK							
10	**750 mm thick Flexible appron**						
	Upstream	cum	1	9.360	3.000	0.750	21.060
	Downstream	cum	1	9.360	6.000	0.750	42.120
	Deduction for Return wall 2	cum	4	3.400	0.650	0.750	6.630
						Total	**56.550**
11	**Curtain Wall- PCC (M-20)**						
	Downstream side	cum	1	21.360	1.910		40.798
	Upstream side	cum	1	15.360	1.480		22.733
	Deduction due to return wall II foundation (D/S)	cum	2	0.650	1.910		2.483
	Deduction due to return wall II foundation (U/S)	cum	2	0.650	1.480		1.924
						Total	**59.123**
12	**Excavation in Soil**						
	Curtain Wall (downstream)	cum	1	21.360	2.850	2.650	161.321
	Curtain Wall (upstream)	cum	1	15.360	2.500	2.150	82.560
	Flexible apron(downstream)	cum	1	8.360	2.000	0.750	12.540
	Flexible apron(upstream)	cum	1	8.360	5.000	0.750	31.350
	Deduction for Return wall 2	cum	4	3.400	0.650	0.900	7.956
						Total	**279.815**
13	**PCC (M-15)**						
	Below Curtain Wall						
	Downstream side	cum	1	21.360	1.850	0.150	5.927
	Upstream side	cum	1	15.360	1.500	0.150	3.456
	Deduction due to return wall II	cum	4	0.650	1.675	0.150	0.653
						Total	**8.730**
E. MISCELLANEOUS WORK							
14	**Painting**						
	Kerb	sqm	2	2.56	0.850		4.35
						Total	**4.352**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

TYPE - 15

ESTIMATE OF QUANTITY OF BOX CULVERT

Box Size:- **1 cell of 2 m x 3 m with Flexible Apron NC**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
A. FOUNDATION							
1	**Excavation(up to 3m)**						
	Box Bridge	cum	1	4.540	25.500	1.220	141.239
	Shear Key	cum	2	4.540	1.780	0.880	14.223
	Return Wall-II	cum	4	4.400	4.300	1.220	92.330
						Total	**247.792**
2	**PCC-M15**						
	Box Bridge	cum	1	3.540	22.140	0.150	11.756
	Shear Key	cum	2	3.740	1.645	0.150	1.845
	Return Wall-II	cum	4	4.500	3.500	0.150	9.450
						Total	**23.051**
B. SUBSTRUCTURE							
3	**RCC-M30 (upto 5m)**						
	Bottom Slab	cum	1	3.540	24.500	0.320	27.754
	Box Side Wall	cum	2	24.500	0.270	3.138	41.509
	Base slab of return wall II	cum	4	4.400	3.300	0.300	17.424
	Return wall I	cum	4	0.500	0.300	3.270	1.962
	Return wall II	cum	4	4.400	0.275	3.290	15.924
	Shear key	cum	2	3.540	0.651		4.610
	Haunch	cum	2	24.500	0.011		0.551
						Total=	**109.734**
4	**Substructure Steel (HYSD Bars)**						
	70 kg/cum of Concrete	ton	1	7.681			7.681
						Total	**7.681**
5	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per side wall =23.9/2+1 =					13	
	No of weep holes in vertical direction per side wall =3.1/1+1 =					5	
	No of weep holes in horizontal direction per return wall =4.9/2+1 =					4	
	No of weep holes in vertical direction per return wall =3.3/1 +1=					5	
	Total no of Weep holes per side wall= 13 x 5					65	
	Total no of Weep holes per return wall = 4 x 5					20	
	Total no of weep holes = 65 x 2 + 20 x 4						**210**
6	**Backfilling - Granular Material**						
	Box	cum	1	29.040		0.320	9.293
	Shear key	cum	2	1.770		0.880	3.115
	Return Wall-II	cum	4	4.400		0.300	5.280
						Total	**17.688**
7	**Backfilling - Sandy Material**						
	Behind the side wall and return wall	cum	2	23.900	4.900	1.489	348.695
	Deduct for the filter media	cum					115.692
						Total	**233.003**
8	**Filter media**						
	Behind Abutment	cum	2	23.900	0.600	2.958	84.821
	Behind Return Wall	cum	4	4.320	0.600	2.978	30.871
						Total	**115.692**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF BOX CULVERT

Box Size:- **1 cell of 2 m x 3 m with Flexible Apron NC**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
C. SUPERSTRUCTURE							
9	**RCC-M30(up to 5m)**						
	Box Bridge	cum	1	2.540	24.500	0.270	16.802
	(+)Haunch	cum	2	24.500	0.011		0.551
	Rectangular part of bracket	cum	2	24.500	0.300	0.300	4.410
	Triangular part of bracket	cum	2	24.500	0.045		2.205
						Total	**23.968**
10	**Superstructure Steel (HYSD Bars)**						
	75 kg/cum of concrete	ton	1		1.798		1.798
						Total	**1.798**
11	**Bituminous Concrete Wearing Coat(40mm)**						
		cum	1	9.540	22.000	0.040	8.395
						Total	**8.395**
12	**Mastic Asphalt**						
		sqm	1	9.540	22.000		209.880
						Total	**209.880**
13	**Tack Coat**						
		sqm	1	9.540	22.000		209.880
						Total	**209.880**
14	**Crash Barrier R.C.C. M40**	m	4	9.540			38.160
						Total	**38.160**
15	**Drainage Spout**	nos.	4				**4**
16	**PCC below Approach Slab**						
		cum	2	3.370	23.900	0.150	24.163
						Total	**24.163**
17	**Approach Slab**						
		cum	2	3.500	23.900	0.300	50.190
						Total	**50.190**
18	**Filler Joint**						
	(i) copper plate	m	2	24.500			**49.000**
	(ii) fibar board	m	2	24.500			**49.000**
	(iii) 20mm thick premoulded joint filler	m	2	24.500			**49.000**
	(iv) joint sealing compound	m	2	24.500			**49.000**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF BOX CULVERT

Box Size:- **1 cell of 2 m x 3 m with Flexible Apron NC**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
19	**750 mm thick Flexible appron**						
	Upstream	cum	1	12.340	3.000	0.750	27.765
	Downstream	cum	1	12.340	6.000	0.750	55.530
	Deduction due to return wall II foundation		4	4.400	1.250	0.750	16.500
						Total	**66.795**
20	**Curtain Wall- PCC (M-20)**						
	Downstream side	cum	1	25.340	1.910		48.399
	Upstream side	cum	1	19.340	1.480		28.623
	Deduction due to return wall II foundation (D/S)	cum	2	1.250	1.910		4.775
	Deduction due to return wall II foundation (U/S)	cum	2	1.250	1.480		3.700
						Total	**68.548**
21	**Excavation in Soil**						
	Curtain Wall (downstream)	cum	1	25.340	2.850	2.650	191.380
	Curtain Wall (upstream)	cum	1	19.340	2.500	2.150	103.953
	Flexible appron(downstream)	cum	1	11.340	2.000	0.750	17.010
	Flexible appron(upstream)	cum	1	11.340	5.000	0.750	42.525
	Deduction due to return wall II foundation	cum	4	5.400	1.750	0.900	34.020
						Total	**320.848**
22	**PCC (M-15)**						
	Below Curtain Wall						
	Downstream side	cum	1	24.340	1.850	0.150	6.754
	Upstream side		1	18.340	1.500	0.150	4.127
	Deduction due to return wall II foundation	cum	4	1.250	1.675	0.150	1.256
						Total	**9.625**

E. MISCELLANEOUS WORK

23	**Painting**						
	Crash Barrier	sqm	4	9.54	2.610		99.60
						Total	**99.60**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

TYPE - 16

ESTIMATE OF QUANTITY OF BOX CULVERT

Box Size:- **1 cell of 2 m x 3 m with Flexible Apron NC**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
A. FOUNDATION							
1	**Excavation(up to 3m)**						
	Box Bridge	cum	1	3.540	28.000	1.070	106.058
	Shear Key	cum	2	3.540	1.780	0.880	11.090
	Return Wall-II	cum	4	4.900	4.300	1.070	90.180
						Total	**207.328**
2	**PCC-M15**						
	Box Bridge	cum	1	3.540	24.640	0.150	13.084
	Shear Key	cum	2	3.740	1.645	0.150	1.845
	Return Wall-II	cum	4	4.550	3.600	0.150	9.828
						Total	**24.757**
B. SUBSTRUCTURE							
3	**RCC-M30 (upto 5m)**						
	Bottom Slab	cum	1	3.540	27.000	0.320	30.586
	Box Side Wall	cum	2	27.000	0.270	3.138	45.745
	Base slab of return wall II	cum	4	4.400	3.300	0.300	17.424
	Return wall I	cum	4	0.500	0.300	3.270	1.962
	Return wall II	cum	4	4.400	0.275	3.290	15.924
	Shear key	cum	2	3.540	0.651		4.610
	Haunch	cum	2	27.000	0.011		0.608
						Total=	**116.858**
4	**Substructure Steel (HYSD Bars)**						
	70 kg/cum of Concrete	ton	1	8.180			8.180
						Total	**8.180**
5	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per side wall =26.4/2+1 =					15	
	No of weep holes in vertical direction per side wall =3.1/1+1 =					5	
	No of weep holes in horizontal direction per return wall =4.9/2+1 =					4	
	No of weep holes in vertical direction per return wall =2.8/1 +1=					4	
	Total no of Weep holes per side wall= 15 x 5					75	
	Total no of Weep holes per return wall = 4 x 4					16	
	Total no of weep holes = 75 x 2 + 16 x 4						**214**
6	**Backfilling - Granular Material**						
	Box	cum	1	3.540		0.470	1.664
	Shear key	cum	2	1.770		1.030	3.646
	Return Wall-II	cum	4	6.550		0.450	11.790
						Total	**17.100**
7	**Backfilling - Sandy Material**						
	Behind the side wall and return wall	cum	2	26.400	4.900	1.489	385.169
	Deduct for the filter media	cum					124.564
						Total	**260.605**
8	**Filter media**						
	Behind Abutment	cum	2	26.400	0.600	2.958	93.694
	Behind Return Wall	cum	4	4.320	0.600	2.978	30.871
						Total	**124.564**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF BOX CULVERT

Box Size:- **1 cell of 2 m x 3 m with Flexible Apron NC**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
C. SUPERSTRUCTURE							
9	**RCC-M30(up to 5m)**						
	Box Bridge	cum	1	2.540	27.000	0.270	18.517
	(+)Haunch	cum	2	27.000	0.011		0.608
	Rectangular part of bracket	cum	2	27.000	0.300	0.300	4.860
	Triangular part of bracket	cum	2	27.000	0.045		2.430
						Total	**26.414**
10	**Superstructure Steel (HYSD Bars)**						
	75 kg/cum of concrete	ton	1		1.981		1.981
						Total	**1.981**
11	**Bituminous Concrete Wearing Coat(40mm)**						
		cum	1	9.540	22.000	0.040	8.395
						Total	**8.395**
12	**Mastic Asphalt**						
		sqm	1	9.540	22.000		209.880
						Total	**209.880**
13	**Tack Coat**						
		sqm	1	9.540	22.000		209.880
						Total	**209.880**
14	**Crash Barrier R.C.C. M40**	m	4	9.540			38.160
						Total	**38.160**
15	**Drainage Spout**	nos.	4				**4**
16	**PCC below Approach Slab**						
		cum	2	3.370	26.360	0.150	26.650
						Total	**26.650**
17	**Approach Slab**						
		cum	2	3.500	26.360	0.300	55.356
						Total	**55.356**
18	**Filler Joint**						
	(i) copper plate	m	2	27.000			**54.000**
	(ii) fibar board	m	2	27.000			**54.000**
	(iii) 20mm thick premoulded joint filler	m	2	27.000			**54.000**
	(iv) joint sealing compound	m	2	27.000			**54.000**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF BOX CULVERT

Box Size:- **1 cell of 2 m x 3 m with Flexible Apron NC**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
19	**750 mm thick Flexible apron**						
	Upstream	cum	1	12.340	3.000	0.750	27.765
	Downstream	cum	1	12.340	6.000	0.750	55.530
	Deduction due to return wall II foundation		4	4.400	1.250	0.750	16.500
						Total	**66.795**
20	**Curtain Wall- PCC (M-20)**						
	Downstream side	cum	1	24.340	1.910		46.489
	Upstream side	cum	1	18.340	1.480		27.143
	Deduction due to return wall II foundation (D/S)	cum	2	1.250	1.910		4.775
	Deduction due to return wall II foundation (U/S)	cum	2	1.250	1.480		3.700
						Total	**65.158**
21	**Excavation in Soil**						
	Curtain Wall (downstream)	cum	1	24.340	2.850	2.650	183.828
	Curtain Wall (upstream)	cum	1	18.340	2.500	2.150	98.578
	Flexible appron(downstream)	cum	1	11.340	2.000	0.750	17.010
	Flexible appron(upstream)	cum	1	11.340	5.000	0.750	42.525
	Deduction due to return wall II foundation	cum	4	4.900	1.250	0.900	22.050
						Total	**319.890**
22	**PCC (M-15)**						
	Below Curtain Wall						
	Downstream side	cum	1	24.340	1.850	0.150	6.754
	Upstream side		1	18.340	1.500	0.150	4.127
	Deduction due to return wall II foundation	cum	4	1.250	1.675	0.150	1.256
						Total	**9.625**

E. MISCELLANEOUS WORK

23	**Painting**						
	Crash Barrier	sqm	4	9.54	2.610		99.60
						Total	**99.60**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

TYPE - 17

ESTIMATE OF QUANTITY OF BOX CULVERT

Box Size:- **1 cell of 2 m x 3 m with Flexible Apron NC**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
A. FOUNDATION							
1	**Excavation(up to 3m)**						
	Box Bridge	cum	1	4.540	42.000	1.220	232.630
	Shear Key	cum	2	4.540	1.780	0.880	14.223
	Return Wall-II	cum	4	4.400	4.300	1.220	92.330
						Total	**339.182**
2	**PCC-M15**						
	Box Bridge	cum	1	3.540	38.640	0.150	20.518
	Shear Key	cum	2	3.740	1.645	0.150	1.845
	Return Wall-II	cum	4	4.500	3.500	0.150	9.450
						Total	**31.813**
B. SUBSTRUCTURE							
3	**RCC-M30 (upto 5m)**						
	Bottom Slab	cum	1	3.540	41.000	0.320	46.445
	Box Side Wall	cum	2	41.000	0.270	3.231	71.540
	Base slab of return wall II	cum	4	4.400	3.300	0.300	17.424
	Return wall I	cum	4	0.500	0.300	3.270	1.962
	Return wall II	cum	4	4.400	0.275	3.290	15.924
	Shear key	cum	2	3.540	0.651		4.610
	Haunch	cum	2	41.000	0.011		0.923
						Total=	**158.827**
4	**Substructure Steel (HYSD Bars)**						
	70 kg/cum of Concrete	ton	1	11.118			11.118
						Total	**11.118**
5	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per side wall =40.4/2+1 =					22	
	No of weep holes in vertical direction per side wall =3.2/1+1 =					5	
	No of weep holes in horizontal direction per return wall =4.9/2+1 =					4	
	No of weep holes in vertical direction per return wall =3.3/1 +1=					5	
	Total no of Weep holes per side wall= 22 x 5					110	
	Total no of Weep holes per return wall = 4 x 5					20	
	Total no of weep holes = 110 x 2 + 20 x 4						**300**
6	**Backfilling - Granular Material**						
	Box	cum	1	45.540		0.320	14.573
	Shear key	cum	2	1.770		0.880	3.115
	Return Wall-II	cum	4	4.400		0.300	5.280
						Total	**22.968**
7	**Backfilling - Sandy Material**						
	Behind the side wall and return wall	cum	2	40.400	4.900	1.536	607.985
	Deduct for the filter media	cum					179.767
						Total	**428.217**
8	**Filter media**						
	Behind Abutment	cum	2	40.400	0.600	3.051	147.925
	Behind Return Wall	cum	4	4.320	0.600	3.071	31.843
						Total	**179.767**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF BOX CULVERT

Box Size:- **1 cell of 2 m x 3 m with Flexible Apron NC**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
C. SUPERSTRUCTURE							
9	**RCC-M30(up to 5m)**						
	Box Bridge	cum	1	2.540	41.000	0.270	28.118
	(+)Haunch	cum	2	41.000	0.011		0.923
	Rectangular part of bracket	cum	2	41.000	0.300	0.300	7.380
	Triangular part of bracket	cum	2	41.000	0.045		3.690
						Total	**40.110**
10	**Superstructure Steel (HYSD Bars)**						
	75 kg/cum of concrete	ton	1		3.008		3.008
						Total	**3.008**
11	**Bituminous Concrete Wearing Coat(40mm)**						
		cum	1	9.540	37.000	0.040	14.119
						Total	**14.119**
12	**Mastic Asphalt**						
		sqm	1	9.540	37.000		352.980
						Total	**352.980**
13	**Tack Coat**						
		sqm	1	9.540	37.000		352.980
						Total	**352.980**
14	**Crash Barrier R.C.C. M40**	m	4	9.540			38.160
						Total	**38.160**
15	**Drainage Spout**	nos.	4				**4**
16	**PCC below Approach Slab**						
		cum	2	3.370	40.400	0.150	40.844
						Total	**40.844**
17	**Approach Slab**						
		cum	2	3.500	40.400	0.300	84.840
						Total	**84.840**
18	**Filler Joint**						
	(i) copper plate	m	2	41.000			**82.000**
	(ii) fibar board	m	2	41.000			**82.000**
	(iii) 20mm thick premoulded joint filler	m	2	41.000			**82.000**
	(iv) joint sealing compound	m	2	41.000			**82.000**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF BOX CULVERT

Box Size:- **1 cell of 2 m x 3 m with Flexible Apron NC**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
19	**750 mm thick Flexible appron**						
	Upstream	cum	1	12.340	3.000	0.750	27.765
	Downstream	cum	1	12.340	6.000	0.750	55.530
	Deduction due to return wall ll foundation		4	4.400	1.250	0.750	16.500
						Total	**66.795**
20	**Curtain Wall- PCC (M-20)**						
	Downstream side	cum	1	25.340	1.910		48.399
	Upstream side	cum	1	19.340	1.480		28.623
	Deduction due to return wall ll foundation (D/S)	cum	2	1.250	1.910		4.775
	Deduction due to return wall ll foundation (U/S)	cum	2	1.250	1.480		3.700
						Total	**68.548**
21	**Excavation in Soil**						
	Curtain Wall (downstream)	cum	1	25.340	2.850	2.650	191.380
	Curtain Wall (upstream)	cum	1	19.340	2.500	2.150	103.953
	Flexible appron(downstream)	cum	1	11.340	2.000	0.750	17.010
	Flexible appron(upstream)	cum	1	11.340	5.000	0.750	42.525
	Deduction due to return wall ll foundation	cum	4	5.400	1.750	0.900	34.020
						Total	**320.848**
22	**PCC (M-15)**						
	Below Curtain Wall						
	Downstream side	cum	1	24.340	1.850	0.150	6.754
	Upstream side		1	18.340	1.500	0.150	4.127
	Deduction due to return wall ll foundation	cum	4	1.250	1.675	0.150	1.256
						Total	**9.625**

E. MISCELLANEOUS WORK

23	**Painting**						
	Crash Barrier	sqm	4	9.54	2.610		99.60
						Total	**99.60**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

TYPE - 18

ESTIMATE OF QUANTITY OF BOX CULVERT

Box Size:- **1 cell of 2 m x 3 m with Flexible Apron with 2.7%(L),2.2%(R) SE**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
A. FOUNDATION							
1	**Excavation(up to 3m)**						
	Box Bridge	cum	1	4.540	25.500	1.949	225.636
	Shear Key	cum	2	4.540	1.780	0.880	14.223
	Return Wall-II	cum	4	4.900	5.150	1.949	196.732
						Total	**436.591**
2	**PCC-M15**						
	Box Bridge	cum	1	3.540	22.140	0.150	11.756
	Shear Key	cum	2	3.740	1.645	0.150	1.845
	Return Wall-II	cum	4	4.550	4.450	0.150	12.149
						Total	**25.750**
B. SUBSTRUCTURE							
3	**RCC-M30 (upto 5m)**						
	Bottom Slab	cum	1	3.540	24.500	0.320	27.754
	Box Side Wall	cum	2	24.500	0.270	3.279	43.377
	Base slab of return wall II	cum	4	4.450	4.150	0.400	29.548
	Return wall I	cum	4	0.500	0.300	3.540	2.124
	Return wall II	cum	4	4.400	0.325	3.460	19.788
	Shear key	cum	2	3.540	0.651		4.610
	Haunch	cum	2	24.500	0.011		0.551
						Total=	**127.752**
4	**Substructure Steel (HYSD Bars)**						
	70 kg/cum of Concrete	ton	1	8.943			8.943
						Total	**8.943**
5	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per side wall =23.9/2+1 =					13	
	No of weep holes in vertical direction per side wall=3.5/1+1 =					5	
	No of weep holes in horizontal direction per return wall =4.5/2+1 =					4	
	No of weep holes in vertical direction per return wall =3.5/1 +1=					5	
	Total no of Weep holes per side wall = 13 x 5					65	
	Total no of Weep holes per return wall = 4 x 5					20	
	Total no of weep holes = 65 x 2 + 20 x 4						**210**
6	**Backfilling - Granular Material**						
	Box	cum	1	29.040		0.470	13.649
	Shear key	cum	2	1.770		1.030	3.646
	Return Wall-II	cum	4	6.768		0.550	14.889
						Total	**32.184**
7	**Backfilling - Sandy Material**						
	Behind the side wall and return wall	cum	2	23.90	4.900	1.509	353.516
	Deduct for the filter media	cum					120.167
						Total	**233.349**
8	**Filter media**						
	Behind Abutment	cum	2	23.900	0.600	3.099	88.870
	Behind Return Wall	cum	4	4.320	0.600	3.019	31.298
						Total	**120.167**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF BOX CULVERT

Box Size:- **1 cell of 2 m x 3 m with Flexible Apron with 2.7%(L),2.2%(R) SE**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
C. SUPERSTRUCTURE							
9	**RCC-M30(up to 5m)**						
	Box Bridge	cum	1	2.540	24.500	0.270	16.802
	(+)Haunch	cum	2	24.500	0.011		0.551
	Rectangular part of bracket	cum	2	24.500	0.300	0.300	4.410
	Triangular part of bracket	cum	2	24.500	0.045		2.205
						Total	**23.968**
10	**Superstructure Steel (HYSD Bars)**						
	75 kg/cum of concrete	ton	1		1.798		1.798
						Total	**1.798**
11	**Bituminous conceret wearing course**						
		cum	1	9.540	22.000	0.040	8.395
						Total	**8.395**
12	**Mastic Asphalt**						
		sqm	1	9.540	22.000		209.880
						Total	**209.880**
13	**Tack Coat**						
		sqm	1	9.540	22.000		209.880
						Total	**209.880**
14	**Crash Barrier R.C.C. M40**	m	4	9.540			38.160
						Total	**38.160**
15	**Drainage Spout**	nos.	4				**4**
16	**PCC below Approach Slab**						
		cum	2	3.370	23.360	0.150	23.617
						Total	**23.617**
17	**Approach Slab**						
		cum	2	3.500	23.360	0.300	49.056
						Total	**49.056**
18	**Filler Joint**						
	(i) copper plate	m	2	23.360			**46.720**
	(ii) fibar board	m	2	23.360			**46.720**
	(iii) 20mm thick premoulded joint filler	m	2	23.360			**46.720**
	(iv) joint sealing compound	m	2	23.360			**46.720**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

ESTIMATE OF QUANTITY OF BOX CULVERT

Box Size:- **1 cell of 2 m x 3 m with Flexible Apron with 2.7%(L),2.2%(R) SE**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
D. PROTECTION WORK							
19	**750 mm thick Flexible apron**						
	Upstream	cum	1	12.340	3.000	0.750	27.765
	Downstream	cum	1	12.340	6.000	0.750	55.530
	Deduction for Return wall	cum	4	4.400	1.750	0.750	-23.100
						Total	**60.195**
20	**Curtain Wall- PCC (M-20)**						
	Downstream side	cum	1	24.340	1.910		46.489
	Upstream side	cum	1	18.340	1.480		27.143
	Deduction due to return wall ll foundation (D/S)	cum	2	1.750	1.910		6.685
	Deduction due to return wall ll foundation (U/S)	cum	2	1.750	1.480		5.180
						Total	**61.768**
21	**Excavation in Soil**						
	Curtain Wall (downstream)	cum	1	24.340	2.850	2.650	183.828
	Curtain Wall (upstream)	cum	1	18.340	2.500	2.150	98.578
	Flexible apron(downstream)	cum	1	11.340	2.000	0.750	17.010
	Flexible apron(upstream)	cum	1	11.340	5.000	0.750	42.525
	Deduction for Return wall	cum	4	4.900	1.750	0.900	-30.870
						Total	**311.070**
22	**PCC (M-15)**						
	Below Curtain Wall						
	Downstream side	cum	1	24.340	1.850	0.150	6.754
	Upstream side	cum	1	18.340	1.500	0.150	4.127
	Deduction due to return wall ll	cum	4	1.750	1.675	0.150	1.759
						Total	**9.122**
E. MISCELLANEOUS WORK							
23	**Painting**						
	Crash Barrier	sqm	4	9.54	2.610		99.60
						Total	**99.60**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

TYPE - 19

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 3 m with Flexible Apron_ECSE**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
A. FOUNDATION							
1.(a)	**Excavation(up to 3m)**						
	Box Bridge	cum	1	4.800	43.812	0.820	172.444
	Shear Key	cum	2	4.800	1.730	0.830	13.785
	Return Wall-II (Main structure)	cum	4	4.500	4.300	0.820	63.468
						Total	**249.697**
2	**PCC-M15**						
	Box Bridge	cum	1	4.800	40.552	0.150	29.197
	Shear Key	cum	2	5.000	1.574	0.150	2.361
	Return Wall-II (Main structure)	cum	4	4.150	3.500	0.150	8.715
						Total	**40.273**
B. SUBSTRUCTURE							
3	**RCC-M30 (upto 5m)**						
	Bottom Slab	cum	1	4.800	42.812	0.370	76.034
	Box Side Wall (Main structure)	cum	2	42.812	0.400	3.000	102.749
	Return wall I (Main structure)	cum	4	1.000	0.300	3.620	4.344
	Base slab of return wall II (Main structure)	cum	4	4.000	3.300	0.300	15.840
	Return wall II (Main structure)	cum	4	4.000	0.275	3.690	16.236
	Shear key	cum	2	4.800	0.593		5.697
	Haunch	cum	2	42.812	0.011		0.963
						Total=	**221.863**
4	**Substructure Steel (HYSD Bars)**						
	70 kg/cum of Concrete	ton	1	15.530			15.530
						Total	**15.530**
5	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per side wall =42.2/2+1 =					23	
	No of weep holes in vertical direction per side wall =4.2/1+1 =					6	
	No of weep holes in horizontal direction per return wall (main str.)=5/2+1 =					4	
	No of weep holes in vertical direction per return wall (main str.)=3.7/1 +1=					5	
	Total no of Weep holes per side wall = 23 x 6					138	
	Total no of Weep holes per return wall (main str.) = 4 x 5					20	
	Total no of weep holes = 138 x 2 + 20 x 4 + 0 x 4						**356**
6	**Backfilling - Granular Material**						
	Box	cum	1	4.800		0.520	2.496
	Shear key	cum	2	2.400		0.980	4.704
	At Return wall II (Main structure)	cum	4	6.150		0.450	11.070
						Total	**18.270**
7	**Filter media**						
	Behind side wall	cum	2	42.212	0.600	3.620	183.369
	Behind Return Wall	cum	4	4.420	0.600	3.690	39.144
						Total	**222.512**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 3 m with Flexible Apron_EC SE**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
C. SUPERSTRUCTURE							
8	**RCC-M30(up to 5m)**						
	Box Bridge	cum	1	2.800	42.812	0.334	40.038
	Kerb over Top Slab	cum	2	2.800	0.250	0.300	0.420
	(+)Haunch	cum	2	42.812	0.011		0.963
						Total	**41.421**
9	**Superstructure Steel (HYSD Bars)**						
	75 kg/cum of concrete	ton	1		3.107		3.107
						Total	**3.107**
D. PROTECTION WORK							
10	**750 mm thick Flexible appron**						
	Upstream	cum	1	12.800	3.000	0.750	28.800
	Downstream	cum	1	12.800	6.000	0.750	57.600
	Deduction for Return wall 2	cum	4	4.500	1.250	0.750	16.875
						Total	**69.525**
11	**Curtain Wall- PCC (M-20)**						
	Downstream side	cum	1	24.800	1.910		47.368
	Upstream side	cum	1	18.800	1.480		27.824
	Deduction due to return wall II foundation (D/S)	cum	2	1.250	1.910		4.775
	Deduction due to return wall II foundation (U/S)	cum	2	1.250	1.480		3.700
						Total	**66.717**
12	**Excavation in Soil**						
	Curtain Wall (downstream)	cum	1	24.800	2.850	2.650	187.302
	Curtain Wall (upstream)	cum	1	18.800	2.500	2.150	101.050
	Flexible apron(downstream)	cum	1	11.800	2.000	0.750	17.700
	Flexible apron(upstream)	cum	1	11.800	5.000	0.750	44.250
	Deduction for Return wall 2	cum	4	4.500	1.250	0.900	20.250
						Total	**330.052**
13	**PCC (M-15)**						
	Below Curtain Wall						
	Downstream side	cum	1	24.800	1.850	0.150	6.882
	Upstream side	cum	1	18.800	1.500	0.150	4.230
	Deduction due to return wall II	cum	4	1.250	1.675	0.150	1.256
						Total	**9.856**
E. MISCELLANEOUS WORK							
14	**Painting**						
	Kerb	sqm	2	2.80	0.850		4.76
						Total	**4.760**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

TYPE - 20

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 3 m with Flexible Apron_ECSE**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
A. FOUNDATION							
1.(a)	**Excavation(up to 3m)**						
	Box Bridge	cum	1	4.960	44.912	0.800	178.211
	Shear Key	cum	2	4.960	1.750	0.850	14.756
	Return Wall-II (Main structure)	cum	4	4.400	4.300	0.800	60.544
						Total	**253.511**
2	**PCC-M15**						
	Box Bridge	cum	1	4.960	41.612	0.150	30.959
	Shear Key	cum	2	5.160	1.602	0.150	2.480
	Return Wall-II (Main structure)	cum	4	4.050	3.500	0.150	8.505
						Total	**41.944**
B. SUBSTRUCTURE							
3	**RCC-M30 (upto 5m)**						
	Bottom Slab	cum	1	4.960	43.912	0.350	76.231
	Box Side Wall (Main structure)	cum	2	43.912	0.380	3.000	100.119
	Return wall I (Main structure)	cum	4	1.100	0.300	3.620	4.778
	Base slab of return wall II (Main structure)	cum	4	3.900	3.300	0.300	15.444
	Return wall II (Main structure)	cum	4	3.900	0.275	3.670	15.744
	Shear key	cum	2	4.960	0.616		6.113
	Haunch	cum	2	43.912	0.011		0.988
						Total=	**219.419**
4	**Substructure Steel (HYSD Bars)**						
	70 kg/cum of Concrete	ton	1	15.359			15.359
						Total	**15.359**
5	**Weep holes**						
	Spacing for weep holes = 2 m in horizontal and 1 m in vertical direction						
	No of weep holes in horizontal direction per side wall =43.3/2+1 =					23	
	No of weep holes in vertical direction per side wall =4.2/1+1 =					6	
	No of weep holes in horizontal direction per return wall (main str.)=5/2+1 =					4	
	No of weep holes in vertical direction per return wall (main str.)=3.6/1 +1=					5	
	Total no of Weep holes per side wall = 23 x 6					138	
	Total no of Weep holes per return wall (main str.) = 4 x 5					20	
	Total no of weep holes = 138 x 2 + 20 x 4 + 0 x 4						**356**
6	**Backfilling - Granular Material**						
	Box	cum	1	4.960		0.500	2.480
	Shear key	cum	2	2.480		1.000	4.960
	At Return wall II (Main structure)	cum	4	6.050		0.450	10.890
						Total	**18.330**
7	**Filter media**						
	Behind side wall	cum	2	43.312	0.600	3.620	188.147
	Behind Return Wall	cum	4	4.420	0.600	3.670	38.931
						Total	**227.079**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE OF BOX CULVERT

Box Size:- **1 cell of 2 m x 3 m with Flexible Apron_EC SE**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
C. SUPERSTRUCTURE							
8	**RCC-M30(up to 5m)**						
	Box Bridge	cum	1	2.760	43.912	0.334	40.456
	Kerb over Top Slab	cum	2	2.760	0.250	0.300	0.414
	(+)Haunch	cum	2	43.912	0.011		0.988
						Total	**41.858**
9	**Superstructure Steel (HYSD Bars)**						
	75 kg/cum of concrete	ton	1		3.139		3.139
						Total	**3.139**
D. PROTECTION WORK							
10	**750 mm thick Flexible appron**						
	Upstream	cum	1	12.760	3.000	0.750	28.710
	Downstream	cum	1	12.760	6.000	0.750	57.420
	Deduction for Return wall 2	cum	4	4.400	1.250	0.750	16.500
						Total	**69.630**
11	**Curtain Wall- PCC (M-20)**						
	Downstream side	cum	1	24.760	1.910		47.292
	Upstream side	cum	1	18.760	1.480		27.765
	Deduction due to return wall II foundation (D/S)	cum	2	1.250	1.910		4.775
	Deduction due to return wall II foundation (U/S)	cum	2	1.250	1.480		3.700
						Total	**66.581**
12	**Excavation in Soil**						
	Curtain Wall (downstream)	cum	1	24.760	2.850	2.650	187.000
	Curtain Wall (upstream)	cum	1	18.760	2.500	2.150	100.835
	Flexible apron(downstream)	cum	1	11.760	2.000	0.750	17.640
	Flexible apron(upstream)	cum	1	11.760	5.000	0.750	44.100
	Deduction for Return wall 2	cum	4	4.400	1.250	0.900	19.800
						Total	**329.775**
13	**PCC (M-15)**						
	Below Curtain Wall						
	Downstream side	cum	1	24.760	1.850	0.150	6.871
	Upstream side	cum	1	18.760	1.500	0.150	4.221
	Deduction due to return wall II	cum	4	1.250	1.675	0.150	1.256
						Total	**9.836**
E. MISCELLANEOUS WORK							
14	**Painting**						
	Kerb	sqm	2	2.76	0.850		4.69
						Total	**4.692**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

REPAIR & REHABILITATION OF BRIDGE

JOB NO : 4146 (PACKAGE-5)
QTY. REPAIR & REHABILITATION

ITEM NO.	Description	Unit				TOTAL
			CH._51.819 KM 3 X 8.6 m_RCC T Girder Bridge	CH._54.332 KM 3 X 12.1 m_RCC T Girder Bridge	CH._56.461 KM 2 X 10 m_RCC T Girder Bridge	
	MISCELLANEOUS					
1	**Painting on concrete surface**	sqm		279.618	164.880	**444.498**
2	**Patching of damaged concrete surface**	sqm	17.304			**17.304**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

QUANTITY ESTIMATE
OF
REPAIRING OF BRIDGE

CHAINAGE_51.819KM

ESTIMATE OF QUANTITY FOR REPAIRING , REHABILITATION AND PROTECTION WORK OF BRIDGE

Chainage= 51.819 Km **SPAN ARRANGEMENT - 3 X 8.6 M**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
1	**Patching of damaged concrete surface**						
	Substructure(30 % of surface area)	sqm	2	8.240		3.500	17.304
						Total	**17.304**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

CHAINAGE_54.332KM

ESTIMATE OF QUANTITY FOR REPAIRING , REHABILITATION AND PROTECTION WORK OF BRIDGE

Chainage= 54.332 Km **SPAN ARRANGEMENT - 3 X 12.1 M**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
1	**Painting on concrete surface**						
	Kerb below railing	sqm	2	43.300	1.350		116.910
	Railing post	sqm	60	0.800		0.900	43.200
	Railing beam	sqm	4	0.690		43.300	119.508
						Total=	**279.618**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

CHAINAGE_56.461KM

ESTIMATE OF QUANTITY FOR REPAIRING , REHABILITATION AND PROTECTION WORK OF BRIDGE

Chainage= 56.461 Km **SPAN ARRANGEMENT - 2 X 10 M**

Item No.	Description	Unit	nos	Length (m)	Breadth (m)	Height (m)	Quantity
1	**Painting on concrete surface**						
	Kerb below railing	sqm	2	28.000	1.050		58.800
	Railing post	sqm	40	0.800		0.900	28.800
	Railing beam	sqm	4	0.690		28.000	77.280
						Total=	**164.880**

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

Volume-VIII: Bill of Quantites

BILL OF QUANTITIES & COST ESTIMATE
BILL NO. 1. SITE CLEARANCE

SL. NO.	SOR Item No.	Ref.of MoRT &H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
1.1	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 with all lifts and up to a lead of 1000 m and earth filling in the depression/pit.)				
	(i)		**Girth from 300 mm to 600 mm**	Each	698		
	(ii)		**Girth from 600 mm to 900 mm**	Each	542		
	(iii)		**Girth from 900 mm to 1800 mm**	Each	287		
	(iv)		**Girth above 1800 mm**	Each	137		
1.2	2.3	201	**Clearing and Grubbing Road Land** (Clearing and grubbing road land including uprooting rank vegetation, grass, bushes, shrubs, saplings and trees girth up to 300 mm, removal of stumps of trees cut earlier and disposal of unserviceable materials and stacking of serviceable material to be used or auctioned up to a lead of 1000 metres including removal and disposal of top organic soil not exceeding 150 mm in thickness.)				
	(ii)		**By Mechanical Means**				
	A		*In area of light jungle*	hectare	68.40		
	2.4		**Dismantling of Structures** (Dismantling of existing structures like culverts, bridges, retaining walls and other structure comprising of masonry, cement concrete, wood work, steel work, including T&P and scaffolding wherever necessary, sorting the dismantled material, disposal of unserviceable material and stacking the serviceable material with all lifts and lead of 1000 metres)				
	c.		*Prestressed / Reinforced cement concrete grade M-20 & above*				
	2.4 (I) .ii b		**By Mechanical Means for items No. 202(b) & (c)**				
			Prestressed / Reinforced cement concrete grade M-20 & above	cum	456.03		
1.3	2.5	202	**Dismantling of Flexible Pavements** (Dismantling of flexible pavements and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable materials separately)				
	II.		**By Mechanical Means**				
	a.		*Bituminous courses*	cum	7349.00		
	2.5 I. b.		*Granular courses (manual means)*	cum	14698.00		
			Total of Bill No.-1				

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

BILL OF QUANTITIES & COST ESTIMATE
BILL NO. 2. EARTHWORK, EROSION CONTROLL AND DRAINAGES

SL. NO.	SOR Item No.	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
2.1	**3.6**	**301**	**Excavation in Soil using Hydraulic Excavator CK 90 and Tippers with disposal upto 1000 metres.** (Excavation for roadwork in soil with hydraulic excavator of 0.9 cum bucket capacity including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, loading and disposal of cut road within all lifts and lead upto 1000m)	cum	91962.00		
2.2	**3.16.A**	**305**	**Embankment Construction with Material Obtained from Borrow Pits** (Construction of embankment with approved material 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 oe materials at site and laboratory as directed by the deptt.)				
			from private land	cum	972904.60		
2.3	**3.17**	**305**	**Construction of Embankment with Material Deposited from Roadway Cutting** (Construction of embankment with approved materials deposited at site from roadway cutting and excavation from drain and foundation of other structures graded and compacted to meet requirement of table 300-2)	cum	64373.40		

SL. NO.	SOR Item No.	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
2.4	**3.18a**	**305**	**Construction of Subgrade and Earthen Shoulders** (Construction of subgrade and earthen shoulders with approved material obtained from borrow pits with all lifts & leads, transporting to site, spreading, grading to required slope and compacted to meet requirement of table No. 300-2) (including compensation of earth.)(a),(Including cost of testing of naterials at site and laboratory as directed by the deptt.)				
			from private land	cum	189795.92		
2.5	**3.22**	**307**	**Seeding and Mulching** (Preparation of seed bed on previously laid top soil, furnishing and placing of seeds, fertilizer, mulching material, applying bituminous emulsion at the rate of 0.23 litres per sqm and laying and fixing jute netting, including watering for 3 months all as per clause 308)	sqm	124672.90		
2.6	**4.14**	**407**	**Construction of Median and Island with Soil Taken from Borrow Areas** (Construction of median and Island above road level with approved material brought from borrow pits, spread, sloped and compacted as per clause 407)	cum	25676.86		
2.7	**3.24 A**		**Surface Drains in Soil (Mechanical means)** Construction of unlined surface drains of average cross sectional area 0.40 sqm in soil to specified lines, grades, levels and dimensions to the requirement of clause 301 and 309. Excavated material to be used in embankment within a lead of 50 metres (average lead 25 metres)	Rm	31338.700		
			Total of Bill No.-2				

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

BILL OF QUANTITIES & COST ESTIMATE
BILL NO. 3. SUB-BASES, BASES (NON- BITUMINOUS) AND SHOULDERS

SL. NO.	SOR Item No.	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
	4.1	**401**	**Granular Sub-Base with Close Graded Material (Table:- 400-1)**				
3.1			**Plant Mix Method** (Construction of granular sub-base by providing close graded Material, mixing in a mechanical mix plant at OMC, carriage of mixed Material to work site, spreading in uniform layers with motor grader on prepared surface and compacting with vibratory power roller to achieve the desired density, complete as per clause 401(with an initial lead of 5 km) (Including cost of testing of materials at sitf and laboratory as directed by the dept.)				
	(i)		*for grading- I Material*	cum	15954.21		
			for grading-III Material	cum	6720.77		
3.2	***4.12***	**406**	**Wet Mix Macadam** (Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the Material with water at OMC in mechanical mix plant carriage of mixed Material by tipper to site, laying in uniform layers with paver in sub- base / base course on well prepared surface and compacting with vibratory roller to achieve the desired density. (including carriage up to initial lead of 5.0 km from quarry and carriage of mixed naterials up to 10.0 km initial lead from mixing plant)	cum	26386.84		
3.3	***4.3***	***403***	**Cement Treated Crushed Rock or combination as per clause 403.2 and table 400.4in Sub base/ Base (** Providing, laying and spreading Material on a prepared sub grade, adding the designed quantity of cement to the spread Material, mixing in place with rotavator, grading with the motor grader and compacting with the road roller at OMC to achieve the desired unconfined compressive strength and to form a layer of sub-base/base.				
		(i)	For Sub-Base course	cum	67496.85		
		(ii)	For Base course	cum	25437.21		
3.4	Non-Sch		GSB Reuse	cum	8819.00		
3.5	Non-Sch		RAP	cum	7209.97		
3.6	Non-Sch		Geocell	sqm	80078.43		
3.7			Recycling of Existing Pavement(Including Plant & Machinery, Labour) Lumsum				
			Total of Bill No.-3				

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

BILL OF QUANTITIES & COST ESTIMATE
BILL NO. 4. BITUMINOUS SURFACE COURSE

SL.NO	SOR Item No.	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
4.1	5.1 A (i)	502	**Prime coat** (Providing and applying primer coat with bitumen emulsion on prepared surface of granular Base including clearing of road surface and spraying primer at the rate of 1.0 kg/sqm using mechanical means.)(Including cost of testing of materials at sitfe and laboratory as directed by the depttt.)				
			with bitumen emulsion-CSS-1 h	sqm	326795.93		
4.2	5.2	503	**Tack coat** Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20 kg per sqm on the prepared bituminous/granular surface cleaned with mechanical broom.(Including cost of testing of materials at sitfe and laboratory as directed by the depttt.)				
	(I)		**with bitumen emulsion-CSS-1 h**				
	(a)		Normal bituminious surface	sqm	21543.00		
	(c)		Granular surface treated with primer	sqm	326795.93		
4.3	5.6	507	**Dense Graded Bituminous Macadam** (Providing and laying dense bituminous macadam with 100-120 TPH batch type HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.0 to 4.5% by weight of total mix of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 507 complete in all respects.)(including carriage up to initial lead of 5.0 km from quarry and carriage of mixed naterials up to 10.0 km initial lead from mixing plant)(Including cost of testing of materials at sitfe and laboratory as directed by the depttt.)				
	A.		**With hydrated lime/cement as filler(refer table 500-9 of MoRT&H specification)**				
	(I)		***With 40/60 or VG -40 grade bitumen***				
	(i)		*for Grading II (19 mm nominal size)*	cum	21953.61		

SL.NO	SOR Item No.	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
4.4	5.6	507	**Bituminous Concrete** (Providing and laying bituminous concrete with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 % of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 509 complete in all respects)(including carriage up to initial lead of 5.0 km from quarry and carriage of mixed naterials up to 10.0 km initial lead from mixing plant)(Including cost of testing of materials at sitfe and laboratory as directed by the depttt.)				
	A.		**With hydrated lime/cement as filler(refer table 500-9 of MoRT&H specification)**				
	(I)		***With 40/60 or VG -40 grade bitumen***				
	(i)		*for Grading II (13 mm nominal size)*	cum	13933.55		
			Total of Bill No.-4				

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

BILL OF QUANTITIES & COST ESTIMATE
BILL NO.5 TRAFFIC SIGNS, ROAD MARKING AND OTHER ROAD APPURTENANCES

SL. NO.	SOR Item No.	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
5.1	*8.1*	408	**Cast in Situ Cement Concrete M20 kerb** (Construction of cement concrete kerb with top and bottom width 115 and 165 mm respectively, 250 mm high in M 20 grade PCC on M-10 grade foundation 150 mm thick, foundation having 50 mm projection beyond kerb stone, kerb stone laid with kerb laying machine, foundation concrete laid manually, all complete as per clause 408)				
	B		***Using Concrete Batching and Mixing Plant***	metre	33138		
5.2	*8.4*		**Retro- reflectorised Traffic signs** (Providing and fixing of retro- reflectorised cautionary, mandatory and informatory sign as per IRC :67 made of encapsulated lens type reflective sheeting vide clause 801.3, fixed over aluminium sheeting, 2.0 mm thick fixed on an angle iron of 25x25x4mm supported on a mild steel angle iron post 75 mm x 75 mm x 6 mm firmly fixed to the ground by means of properly designed foundation with M15 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing and signs(All steel work must be Tata/Sail/or any other approved brand)				
	(i)		**90 cm equilateral triangle**	each	89		
	(iii)		**60 cm circular**	each	10		
	(iv)		**80 mm x 60 mm rectangular**	each	8		
	(vii)		**90 cm high octagon**	each	25		
5.3	*8.5*	801	**Direction and Place Identification signs upto 0.9 sqm size board**.(Providing and erecting direction and place identification retro-reflectorised sign asper IRC:67 made of encapsulated lens type reflective sheeting vide clause 801.3, fixed over aluminium sheeting, 2 mm thick with area not exceeding 0.9 sqm fixed on an angle iron of 25x25x4mm supported on a mild steel angle iron post 75 mm x 75 mm x 6 mm firmly fixed to the ground by means of properly designed foundation with M15 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing and signs(All steel work must be Tata/Sail/or any other approved brand)	sqm	15		

SL. NO.	SOR Item No.	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
5.5	*8.14*	804	**Kilo Metre Stone** (Reinforced cement concrete M15grade kilometre stone of standard design as per IRC:8-1980, fixing in position including painting and printing etc)				
	(i)		5th kilometre stone (precast)	each	8		
	(ii)		Ordinary Kilometer stone (Precast)	each	22		
	(iii)		Hectometer stone (Precast)	each	58		
5.6	*8.54*		**Road Delineator** Providing metal tubular delineator (50mm dia & 1.25mm thick)with 15 cm reflector made of heigh intensity grade retro reflectorised sheeting around the pipe at top covered with wire mesh of 20cm length with 2 nos of similar reflective bends and bottom fastner M.S.angle including firmly fixing the delineator to the ground by means of CC (M-15) foundation of size (25x25x25cm),25cm below ground to the true line and level as directed by the deptt. With six months replacement warranty and free maintenance. b) 750 mm ht.	each	613		
5.7	*8.16*	806	**Boundary pillar** (Reinforced cement concrete M15 grade boundary pillars of standard design as per IRC:25-1967, fixed in position including finishing and lettering but excluding painting)	each	178		

SL. NO.	SOR Item No.	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
5.8	***iv)***		**pole Height 6m:**The materials of the pole as follows:Conforming to grade S355JO,Base plate Fe 410 conforming to IS 226/IS 2062, Foundation Bolts:-6.8 Gr. As per IS 1367, Plole sections:- The octagonal poles shall be in single piece with single longitudinal welding join.Galvanization:-The pole shall be hot dip galvanized as per IS 2629/IS 2633/IS 4759 standards with average coating thickness of 65 micron.The galvanizing shal be done in single dipping. Door opening:-The octagonal poles shall have door of approxinate 500 mm length at the elevation of 500 mm from the base plate.The door shall be vandal resistance and shall be weather proof to ensure saefty of of inside connections.The door shall be flush with the exterior surface and shall have suitable locking arrangement.The pole shall be adequately strengthened at the location of the door compensate for the loss in the section.There shall also be suitable arrangement for the purpose of earthing,smart pack junction box with 6 MCB & Terminals for mounting inside base compartment of pole.Top dia(A/F) 70 Bottom Dia. (A/F) 130, Sheet thickness 3 mm, Base Plate Dimensions(LXBXT) 220x220x12, Foundation Bolt, Bolt size:-(noxdia) 4x20 dia, pitch circle dia.(PCD) 205,Bolt length 600,Projected Bolt Length 100, Anchor plate thickness:- 4 mm,Pole Foundation :- The octagonal poles shall be bolted on a pre - cast foundation with a set of four foundation bolts for greater rigidity. Foundation :- The foundation shall be done with (i) Earth work:- 2.04 cubic Meters.(ii)RCC:- 1:1.5:3 proportion 0.65 cubic meters. (iii0 Steel:-22.43 kg .(iv0 Shuttering:-4.32 square meters.=22.43 kg.	each	177		
5.9	**8.13**	**803**	**Road Marking with Hot Applied Thermoplastic Compound** (Providing and laying of hot applied thermoplastic compound 2.5 mm thick including reflectorising glass beads @ 250 gms per sqm area, thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC:35 .The finished surface to be level, uniform and free from streaks and holes.	sqm	13800.000		

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SL. NO.	SOR Item No.	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
5.10	8.35		**Road Markers/Road Stud with Lense Reflector** Providing and fixing of road stud 100x 100 mm, die-cast in aluminium, resistant to corrosive effect of salt and grit, fitted with lense reflectors, installed in concrete or asphaltic surface by drilling hole 30 mm upto a depth of 60 mm and bedded in a suitable bituminous grout or epoxy mortar, all as per BS 873 part 4:1973	nos	1236		
5.11	8.23 A		**W-Metal beam crash barrier** Providing and erecting a "W" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 70 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 1.8 m high, 1.1 m below ground/road level, all steel parts and fitments to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a spacer of channel section 150 x 75 x 5 mm, 330 mm long complete as per clause 810	metre	11081.000		
			Total of Bill No.-5				

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

BILL OF QUANTITIES & COST ESTIMATE
BILL NO. 6. DRAINAGE & PROTECTION WORK

SL. NO.	SOR Item No.	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
RCC Cover Drain							
6.1	**3.13 (I) . A**	**304**	**Excavation for Structures** (Earth work in excavation of 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, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.) i) Ordinary soil A. a)Mechanical Means, with dewatering upto 3 m depth	cum	5727.59		
6.2	***12.8***	**1500,1700 & 2100**	**Plain/Reinforced cement concrete** in open foundation complete as per drawing and technical specifications including steel shuttering forrmwork				
	A.		**Without plasticiser**				
	(a)		**PCC Grade M15**	cum	488.860		
6.3	***13.5***	**1500,1700 & 2200**	*Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications*				
	N(A).f.		**Without plasticiser**				
			RCC Grade M25				
	Case II		*With Batching Plant, Transit Mixer and Concrete Pump*	cum	2253.560		
6.4	**13.6 (a) (i)**	**1600 & 2300**	Reinforcement in Substructure :Supplying, fitting and placing un-coatedTMT bar reinforcement in foundation complete as per drawing and technical specifications a) From primary sources: TATA/SAIL/Esser Steel/Jindal steel/Shyam steel i) TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	157.75		
6.5	***13.8***	**2200 & 2706**	**Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment**, wing wall/return wall with 100 mm dia AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing foce. Complete as per drawing and Technical specifications	each	6370.000		
					Total=		

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

SL. NO.	SOR Item No.	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
RR Masonry Chute Drain							
6.6	**3.13 (I) B. (a)**	**304**	**Excavation for Structures** (Earth work in excavation of 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, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.) i) Ordinary soil A. a)Manual Means, with dewatering upto 3 m depth	cum	471.980		
6.7	**1500, 1700 & 2100**		Plain/Reinforced Cement Concrete in Open Foundation complete as per Drawing and Technical Specifications.				
	B		**Without plasticiser**				
			PCC Grade M20	cum	292.540		
6.8	**15.4**	**2504**	Stone Pitching	cum	134.850		
					Total=		

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SL. NO.	SOR Item No.	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
For RE Wall							
6.9	***3.18a***	**305**	**Embankment Filling by Subgrade Material**	cum	139207.04		
6.10			**Embankment Filling by Sand**	cum	139207.05		
6.11	**7.5**	**3100**	Reinforced Earth Stuctures (Reference to MORT&H's specifications 3100). With reinfocing element of synthetic geogrids				
	(i)		Facing Element of RCC	sqm	39040.70		
	(ii)		With reinforcing element of synthetic geogrids	sqm	39040.70		
6.12	***12.8***	**1500,1700 & 2100**	**Plain/Reinforced cement concrete** in open foundation complete as per drawing and technical specifications including steel shuttering forrmwork				
	A.		**Without plasticiser**				
	(a)		**PCC Grade M15**	cum	996.000		
	(E)		**RCC Grade M25**				
	Case II		*With Batching Plant, Transit Mixer and Concrete Pump*	cum	4182.024		
6.13	**12.4 0 (a). (i)**	**1600 & 2300**	**Supplying, fitting and placing HYSD bar reinforcement in foundation**	tonne	292.74		
	13.10		**Filter Media**	cum	23421		
6.14	***8.22 (ii)***	**809**	**Reinforced Cement Concrete Crash Barrier** (Provision of an Reinforced cement concrete crash barrier at the edges of the road, approaches to bridge structures and medians, constructed with M-20 grade concrete with HYSD reinforcement conforming to IRC:21 and dowel bars 25 mm dia, 450 mm long at expansion joints filled with pre-moulded asphalt filler board, keyed to the structure on which it is built and installed as per design given in the enclosure to MORT&H circular No. RW/NH - 33022/1/94-DO III dated June 1994 as per dimensions in the approved drawing and at locations directed by the Engineer, all as specified	metre	4979		
					Total=		

SL. NO.	SOR Item No.	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
For Retaining Wall							
6.15	**3.13 (I) . A**	**304**	**Excavation for Structures** (Earth work in excavation of 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, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.) i) Ordinary soil A. a)Mechanical Means, with dewatering upto 3 m depth	cum	4716.95		
6.16	**12.7**	**1400**	**Stone masonry work in cement mortar 1:3 for foundation**				
	B		**RR Masonry**	cum	1249.50		
6.17	***12.8***	**1500,1700 & 2100**	**Plain/Reinforced cement concrete** in open foundation complete as per drawing and technical specifications including steel shuttering forrmwork				
	A.		**Without plasticiser**				
	(a)		**PCC Grade M15**	cum	1002.110		
	(e)		**RCC Grade M25**				
	Case II		*With Batching Plant, Transit Mixer and Concrete Pump*	cum	807.680		
6.18	**12.4**		**Supplying, Fitting and Placing un-coated HYSD bar Reinforcement in Foundation complete as per Drawing and Technical Specifications.**	tonne	95.210		
6.19	***13.5***	**1500,1700 & 2200**	*Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications*				
	N(A).f.		**Without plasticiser**				
			PCC Grade M20				
			With Batching Plant, Transit Mixer and Concrete Pump	cum	43.520		
			RCC Grade M25				
	Case II		*With Batching Plant, Transit Mixer and Concrete Pump*	cum	568.390		

SL. NO.	SOR Item No.	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
6.20	**13.6 (a) (i)**	**1600 & 2300**	Reinforcement in Substructure :Supplying, fitting and placing un-coatedTMT bar reinforcement in foundation complete as per drawing and technical specifications a) From primary sources: TATA/SAIL/Esser Steel/Jindal steel/Shyam steel i) TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	65.68		
6.21	**12.7**	**1400 & 2200**	**Stone masonry work in cement mortar 1:3 for substructure**				
	B		**RR Masonry**	cum	1749.30		
			CR Masonry	cum	305.64		
6.22	***13.8***	**2200 & 2706**	**Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment**, wing wall/return wall with 100 mm dia AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing foce. Complete as per drawing and Technical specifications	each	1760.85		
6.23	**13.10**	**710.1.4 of IRC:78 & 2200**	Providing and laying of Filter media with granular materials/stone crushed aggregates satisfying the requirements laid down in clause 2504.2.2. of MoRTH specifications to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition complete as per drawing and technical specification.	Cum	3409.62		
					Total=		

SL. NO.	SOR Item No.	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
Toe Wall							
6. 24	**3.13 (I) . A**	**304**	**Excavation for Structures** (Earth work in excavation of 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, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.) i) Ordinary soil A. a)Mechanical Means, with dewatering upto 3 m depth	cum	1846.56		
6.25	***12.8***	**1500,1700 & 2100**	**Plain/Reinforced cement concrete** in open foundation complete as per drawing and technical specifications including steel shuttering forrmwork				
	A.		**Without plasticiser**				
	(a)		**PCC Grade M15**	cum	205.17		
6.26	**13.5 F (p) Case II**		**RCC Substructure M25 Height 5M**	cum	1858.63		
6.27	**12.4**		**Supplying, Fitting and Placing un-coated HYSD bar Reinforcement in Foundation complete as per Drawing and Technical Specifications.**	tonne	130.10		
					Total=		
Ground Improvement Works (Sand Pile)							
6.28	**Non Sche**		**Driven cast-in-place vertical Sand Pile complete as per Drawing and & Technical Specification**	m	53220.00		
					Total=		

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SL. NO.	SOR Item No.	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
River Protection Work (Stone Pitching)							
6.29	15.4		Providing and laying Pitching on slopes laid over prepared filter media including				
	A		Stone/Boulder	cum	6117.05		
6.30	***15.5***	**2504**	Providing and laying Filter material underneath pitching in slopes complete as per drawing and Technical specification	cum	3058.53		
6.32	***12.8***	**1500,1700 & 2100**	**Plain/Reinforced cement concrete** in open foundation complete as per drawing and technical specifications including steel shuttering forrmwork				
	A.		**Without plasticiser**				
	(a)		**PCC Grade M15**	cum	5.73		
	(b)		**PCC Grade M20**	cum	14.06		
			Total of Bill No.-6				

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

BILL OF QUANTITIES & COST ESTIMATE
BILL NO. 7. BUS- BAY WITH PASSENGER SHELTER & TRUCK LAY BYE

SL. NO.	SOR Item No.	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
A. Bus Bay							
7.1	***4.3***	***403***	**Cement Treated Crushed Rock or combination as per clause 403.2 and table 400.4in Sub base/ Base (** Providing, laying and spreading Material on a prepared sub grade, adding the designed quantity of cement to the spread Material, mixing in place with rotavator, grading with the motor grader and compacting with the road roller at OMC to achieve the desired unconfined compressive strength and to form a layer of sub-base/base.				
		(i)	For Sub-Base course	cum	1004.000		
		(ii)	For Base course	cum	502.000		
7.2	**4.12**	**406**	**Wet Mix Macadam** (Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the Material with water at OMC in mechanical mix plant carriage of mixed Material by tipper to site, laying in uniform layers with paver in sub- base / base course on well prepared surface and compacting with vibratory roller to achieve the desired density. (including carriage up to initial lead of 5.0 km from quarry and carriage of mixed naterials up to 10.0 km initial lead from mixing plant)	cum	502.000		
7.3	**5.1 A (i)**	**502**	Providing and applying **Primer coat** over WMM layer using bitumen emulsion (Grade SS-1) @ 0.85Kg / sqm as per drawings and Technical specifications clause 502 and as directed by the Engineer.	sqm	5020.000		
7.4	**5.2**	**503**	**Tack coat** Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20 kg per sqm on the prepared bituminous/granular surface cleaned with mechanical broom.(Including cost of testing of materials at sitfe and laboratory as directed by the depttt.)				
	(I)		**with bitumen emulsion-CSS-1 h**				
	(c)		Granular surface treated with primer	sqm	5020.00		

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SL. NO.	SOR Item No.	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
7.5	**3.18a**	**305**	**Construction of Subgrade and Earthen Shoulders** (Construction of subgrade and earthen shoulders with approved material obtained from borrow pits with all lifts & leads, transporting to site, spreading, grading to required slope and compacted to meet requirement of table No. 300-2) (including compensation of earth.)(a),(Including cost of testing of naterials at site and laboratory as directed by the deptt.)				
			from private land	cum	2510.00		
7.6	**5.6 A (I)**	**505**	**Dense Graded Bituminous Macadam** (Providing and laying dense bituminous macadam with 100-120 TPH batch type HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.0 to 4.5% by weight of total mix of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 507 complete in all respects.)(including carriage up to initial lead of 5.0 km from quarry and carriage of mixed naterials up to 10.0 km initial lead from mixing plant)(Including cost of testing of materials at sitfe and laboratory as directed by the depttt.)				
	(ii)		**for Grading II (With 40/60 or VG -40 grade bitumen) (for Grading II (40 mm nominal size)**	cum	301.200		

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SL. NO.	SOR Item No.	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
7.7	**5.8 A (I)**	**507**	**Bituminous Concrete** (Providing and laying bituminous concrete with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 % of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 509 complete in all respects)(including carriage up to initial lead of 5.0 km from quarry and carriage of mixed naterials up to 10.0 km initial lead from mixing plant)(Including cost of testing of materials at sitfe and laboratory as directed by the depttt.)				
	(Ii)		**for Grading-I (19 mm nominal size)**	cum	200.800		
7.8	***8.1***	**408**	**Cast in Situ Cement Concrete M20 kerb** (Construction of cement concrete kerb with top and bottom width 115 and 165 mm respectively, 250 mm high in M 20 grade PCC on M-10 grade foundation 150 mm thick, foundation having 50 mm projection beyond kerb stone, kerb stone laid with kerb laying machine, foundation concrete laid manually, all complete as per				
	A		***Using Concrete Mixer***	metre	252		
7.9	***4.13***	**407**	**Construction of Median and Island with Soil Taken from Roadway Cutting** (Construction of Median and Island above road level with approved material deposited at site from roadway cutting and excavation for drain and foundation of other structures, spread, graded and compacted as per clause 407)	cum	51		

SL. NO.	SOR Item No.	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
Passenger Shelter							
7. 10	**3.13 (I) . (A)**	**304**	**Excavation for Structures** (Earth work in excavation of 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, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.) i) Ordinary soil A. a)Manual Means, with dewatering upto 3 m depth	cum	21.120		
7.11	**12.5**	**1300**	Brick masonry (Brick masonry work in cement mortar 1:3 in foundation complete excluding pointing and plastering, as per drawing and technical specifications	cum	6.080		
7.12	**12.5**	**1300**	Brick masonry (Brick masonry work in cement mortar 1:3 in Super Structure complete excluding pointing and plastering, as per drawing and technical specifications	cum	17.520		
7.13	**12.8 C**	**1500, 1700 & 2100**	Plain/Reinforced cement concrete in open foundation -RCC M25-Without plasticiser(With Batching Plant, Transit Mixer and Concrete Pump)	cum	2.280		
7.14	**12.4 0 (a). (i)**	**1600**	Reinforcement in foundation-TMT Bar (From primary sources: TATA/SAIL/Esser Steel/Jindal steel/Shyam steel)-TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	Tonne	0.160		

SL. NO.	SOR Item No.	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
7.15	**12.8 A (a)**	**1500,1700 & 2200**	Plain/Reinforced cement concrete in super-structure complete as per drawing and Technical Specifications section 1500,1700& 2200 and as directed by the Engineer. PCC M15	cum	4.040		
7.16	**14.1 A case -II(i) a).**	**1500 &1600,1700, 2300**	Furnishing and Placing Reinforced/ Prestressed cement concrete in super-structure as per drawing and Technical Specification section 1500,1700 & 2300 and as directed by the Engineer. RCC M25	cum	14.720		
7.17	**14.2 (a). (i**	**1600 & 2300**	Supplying, fitting and placing HYSD/TMT bar reinforcement in super-structure complete as per drawing and technical specifications section 1600 & 2300 and as directed by the Engineer.	Tonne	1.120		
7.18	***13.3***	**1300 & 2200**	Plastering with cement mortar (1:3) on brick work in super-structure as per Technical specifications	sqm	249.480		
			Total of Bus bay with passenger shelter=				
			Total of Bill No.-7				

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

BILL OF QUANTITIES & COST ESTIMATE
BILL NO. 8. JUNCTION

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
8.1	*4.3*	*403*	**Cement Treated Crushed Rock or combination as per clause 403.2 and table 400.4in Sub base/ Base (** Providing, laying and spreading Material on a prepared sub grade, adding the designed quantity of cement to the spread Material, mixing in place with rotavator, grading with the motor grader and compacting with the road roller at OMC to achieve the desired unconfined compressive strength and to form a layer of sub-base/base.				
		(i)	For Sub-Base course	cum	1100.00		
		(ii)	For Base course	cum	550.00		
8.2	**5.1 A**	**502**	**Prime coat**				
			Prime coat (Providing and applying primer coat with bitumen emulsion on prepared surface of granular Base including clearing of road surface and spraying primer at the rate of 0.60 kg/sqm using mechanical means.)(Including cost of testing of materials at sitfe and laboratory as directed by the depttt.)				
	(i)		**with bitumen emulsion-CSS-1 h**	sqm	5500.00		
8.3	**5.2 (I)**	**503**	**Tack coat** Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20 kg per sqm on the prepared bituminous/granular surface cleaned with mechanical broom.(Including cost of testing of materials at sitfe and laboratory as directed by the depttt.)				
			with bitumen emulsion-CSS-1 h				
	(b)		Granular surface treated with primer	sqm	5500.00		

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
8.4	***4.12***	**406**	**Wet Mix Macadam** (Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the Material with water at OMC in mechanical mix plant carriage of mixed Material by tipper to site, laying in uniform layers with paver in sub- base / base course on well prepared surface and compacting with vibratory roller to achieve the desired density. (including carriage up to initial lead of 5.0 km from quarry and carriage of mixed naterials up to 10.0 km initial lead from mixing plant)	cum	550.00		
8.5	***5.8***		**Bituminous Concrete** (Providing and laying bituminous concrete with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 % of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 509 complete in all respects)(including carriage up to initial lead of 5.0 km from quarry and carriage of mixed naterials up to 10.0 km initial lead from mixing plant)(Including cost of testing of materials at sitfe and laboratory as directed by the depttt.)				
	A.		**With hydrated lime/cement as filler(refer table 500-9 of MoRT&H specification)**				
	(I)		***With 40/60 or VG -40 grade bitumen***				
	(ii)		*for GradingII(13 mm nominal size)*	cum	220.000		

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SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
8.6	***5.6***		**Dense Graded Bituminous Macadam** (Providing and laying dense bituminous macadam with 100-120 TPH batch type HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.0 to 4.5% by weight of total mix of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 507 complete in all respects.)(including carriage up to initial lead of 5.0 km from quarry and carriage of mixed naterials up to 10.0 km initial lead from mixing plant)(Including cost of testing of materials at sitfe and laboratory as directed by the depttt.)				
	A.		**With hydrated lime/cement as filler(refer table 500-9 of MoRT&H specification)**				
	(I)		***With 40/60 or VG -40 grade bitumen***				
	(i)		*for Grading II (19 mm nominal size)*	cum	330.00		
8.7	***3.18a***	**305**	**Construction of Subgrade and Earthen Shoulders** (Construction of subgrade and earthen shoulders with approved material obtained from borrow pits with all lifts & leads, transporting to site, spreading, grading to required slope and compacted to meet requirement of table No. 300-2) (including compensation of earth.)(a),(Including cost of testing of naterials at site and laboratory as directed by the deptt.)				
			from private land	cum	2750.00		
			Total of Bill No.-8				

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

BILL OF QUANTITIES & COST ESTIMATE
BILL NO. 9.1.1 SERVICE ROAD

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
9.1.1	***4.3***	***403***	**Cement Treated Crushed Rock or combination as per clause 403.2 and table 400.4in Sub base/ Base (** Providing, laying and spreading Material on a prepared sub grade, adding the designed quantity of cement to the spread Material, mixing in place with rotavator, grading with the motor grader and compacting with the road roller at OMC to achieve the desired unconfined compressive strength and to form a layer of sub-base/base.				
		(i)	For Sub-Base course	cum	5020.68		
		(ii)	For Base course	cum	2510.34		
	4.1	**401**	***Granular Sub-base with Close Graded Material (Table:- 400-1)***				
9.1.2	*3.18a*	**305**	**Construction of Subgrade and Earthen Shoulders** (Construction of subgrade and earthen shoulders with approved material obtained from borrow pits with all lifts & leads, transporting to site, spreading, grading to required slope and compacted to meet requirement of table No. 300-2) (including compensation of earth.)(a),(Including cost of testing of naterials at site and laboratory as directed by the deptt.)				
			from private land	cum	12551.70		
9.1.3	**5.1 A**	**502**	**Prime coat**				
			Prime coat (Providing and applying primer coat with bitumen emulsion on prepared surface of granular Base including clearing of road surface and spraying primer at the rate of 0.60 kg/sqm using mechanical means.)(Including cost of testing of materials at sitfe and laboratory as directed by the depttt.)				
	(i)		**with bitumen emulsion-CSS-1 h**	sqm	25103.40		

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SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
9.1.4	5.2 (I)	503	**Tack coat** Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20 kg per sqm on the prepared bituminous/granular surface cleaned with mechanical broom.(Including cost of testing of materials at sitfe and laboratory as directed by the depttt.)				
			with bitumen emulsion-CSS-1 h				
	(b)		Granular surface treated with primer	sqm	25103.40		
9.1.5	*4.12*	406	**Wet Mix Macadam** (Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the Material with water at OMC in mechanical mix plant carriage of mixed Material by tipper to site, laying in uniform layers with paver in sub- base / base course on well prepared surface and compacting with vibratory roller to achieve the desired density. (including carriage up to initial lead of 5.0 km from quarry and carriage of mixed naterials up to 10.0 km initial lead from mixing plant)	cum	2510.34		

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
9.1.7	***5.8***		**Bituminous Concrete** (Providing and laying bituminous concrete with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 % of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 509 complete in all respects)(including carriage up to initial lead of 5.0 km from quarry and carriage of mixed naterials up to 10.0 km initial lead from mixing plant)(Including cost of testing of materials at sitfe and laboratory as directed by the depttt.)				
	(ii)		**for Grading-II (With 40/60 or VG -40 grade bitumen) (for Grading II (13 mm nominal size)**	cum	1004.14		
9.1.8	***8.22***		**Reinforced Cement Concrete Crash Barrier (M20)** Provision of an Reinforced cement concrete crash barrier at the edges of the road, approaches to bridge structures and medians, constructed with M-20 grade concrete with HYSD reinforcement conforming to IRC:21 and dowel bars 25 mm dia, 450 mm long at expansion joints filled with pre-moulded asphalt filler board, keyed to the structure on which it is built and installed as per design given in the enclosure to MOST circular No. RW/NH - 33022/1/94-DO III dated 24 June 1994 as per dimensions in the approved drawing and at locations directed by the Engineer, all as specified	metre	2117.12		
			Total of Bill No.-9.1				

BILL OF QUANTITIES & COST ESTIMATE
BILL NO. 9.2 APPROACH ROAD & DIVERSION ROAD

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
9.2.1	**2.5**		**Dismantling of Flexible Pavements** (Dismantling of flexible pavements and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable materials separately)				
	II.		**By Mechanical Means**				
	a.		*Bituminous courses*	cum	237.50		
	b.		*Granular courses (manual means)*	cum	831.25		
9.2.2	**3.6**	**301**	**Excavation in Soil using Hydraulic Excavator CK 90 and Tippers with disposal upto 1000 metres.** (Excavation for roadwork in soil with hydraulic excavator of 0.9 cum bucket capacity including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, loading and disposal of cut road within all lifts and lead upto 1000m)	cum	5300.00		
9.2.3	*A*		**Plant Mix Method** (Construction of granular sub-base by providing close graded Material, mixing in a mechanical mix plant at OMC, carriage of mixed Material to work site, spreading in uniform layers with motor grader on prepared surface and compacting with vibratory power roller to achieve the desired density, complete as per clause 401(with an initial lead of 5 km) (Including cost of testing of materials at sitf and laboratory as directed by the dept.)				
	(i)		*for grading- I Material*	cum	177.2		
9.2.4	**3.16.A**	**305**	**Embankment Construction with Material Obtained from Borrow Pits** (Construction of embankment with approved material 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 oe materials at site and laboratory as directed by the deptt.)				
			from private land	cum	625.00		
9.2.5	***SOR Ref No. M-007(Page No-251)***		**Moorum** for Diversion road	cum	93.75		

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
9.2.6	*3.18a*	**305**	**Construction of Subgrade and Earthen Shoulders** (Construction of subgrade and earthen shoulders with approved material obtained from borrow pits with all lifts & leads, transporting to site, spreading, grading to required slope and compacted to meet requirement of table No. 300-2) (including compensation of earth.)(a),(Including cost of testing of naterials at site and laboratory as directed by the deptt.)				
			from private land	cum	590.70		
9.2.7		**601**	**Dry Lean Cement Concrete Sub- base** (Construction of dry lean cement concrete Sub- base over a prepared sub-grade with coarse and fine aggregate conforming to IS: 383, the size of coarse aggregate not exceeding 25 mm, aggregate cement ratio not to exceed 15:1, aggregate gradation after blending to be as per table 600-1, cement content not to be less than 150 kg/ cum, optimum moisture content to be determined during trial length construction, concrete strength not to be less than 10 Mpa at 7 days, mixed in a batching plant, transported to site, laid with a paver with electronic sensor, compacting with 8-10 tonnes vibratory roller, finishing and curing.)(including carriage up to initial lead of 5.0 km from quarry and carriage of mixed naterials up to 10.0 km initial lead from mixing plant)	cum	177.21		
9.2.8		**602**	**Cement Concrete Pavement** Construction of un-reinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with 43 grade cement @ 400 kg per cum, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form or slip form paver, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound, finishing to lines and grades as per drawing .(including carriage up to initial lead of 5.0 km from quarry and carriage of mixed naterials up to 10.0 km initial lead from mixing plant)	cum	295.35		
9.2.9	**8.13**	**803**	**Road Marking with Hot Applied Thermoplastic Compound** (Providing and laying of hot applied thermoplastic compound 2.5 mm thick including reflectorising glass beads @ 250 gms per sqm area, thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC:35 .The finished surface to be level, uniform and free from streaks and holes.	sqm	100.000		

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SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
RCC Cover Drain							
9.2.10	**3.13 (I) . A**	**304**	**Excavation for Structures** (Earth work in excavation of 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, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.) i) Ordinary soil A. a)Mechanical Means, with dewatering upto 3 m depth	cum	493.02		
9.2.11	***12.8***	**1500,1700 & 2100**	**Plain/Reinforced cement concrete** in open foundation complete as per drawing and technical specifications including steel shuttering forrmwork				
	A.		**Without plasticiser**				
	(a)		**PCC Grade M15**	cum	39.840		
9.2.12	***13.5***	**1500,1700 & 2200**	*Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications*				
	N(A).f.		**Without plasticiser**				
			RCC Grade M25				
	Case II		*With Batching Plant, Transit Mixer and Concrete Pump*	cum	194.220		
9.2.13	**13.6 (a) (i)**	**1600 & 2300**	Reinforcement in Substructure :Supplying, fitting and placing un-coatedTMT bar reinforcement in foundation complete as per drawing and technical specifications a) From primary sources: TATA/SAIL/Esser Steel/Jindal steel/Shyam steel i) TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	13.60		
9.2.14	***13.8***	**2200 & 2706**	**Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment**, wing wall/return wall with 100 mm dia AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing foce. Complete as per drawing and Technical specifications	each	998.000		

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SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
Sump Pit							
9.2.15	**3.13 (I) . A**	**304**	**Excavation for Structures** (Earth work in excavation of 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, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.) i) Ordinary soil A. a)Mechanical Means, with dewatering upto 3 m depth	cum	23.87		
9.2.16	***12.8***	**1500,1700 & 2100**	**Plain/Reinforced cement concrete** in open foundation complete as per drawing and technical specifications including steel shuttering forrmwork				
	A.		**Without plasticiser**				
	(a)		**PCC Grade M15**	cum	0.600		
9.2.17	***13.5***	**1500,1700 & 2200**	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications				
	N(A).f.		**Without plasticiser**				
			RCC Grade M30				
	Case II		*With Batching Plant, Transit Mixer and Concrete Pump*	cum	8.140		
9.2.18	**13.6 (a) (i)**	**1600 & 2300**	Reinforcement in Substructure :Supplying, fitting and placing un-coatedTMT bar reinforcement in foundation complete as per drawing and technical specifications a) From primary sources: TATA/SAIL/Esser Steel/Jindal steel/Shyam steel i) TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	1.42		
Pump with all Accessories							
9.2.19	**Non Sche**	**Lump sum cost**	Supply, fittings and fixing of Dewatering submersible type pump set including electric motor of 4000 liter per minute capacity, 10 mwc head with 15 kw rated motor including supply and installation of automation star delta panel and water level sensor, complete with all electrics. **(Lumpsump Cost of Pump With all Accessories)**	Nos	2.00		
			Total of Bill No.-9.2				

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BILL OF QUANTITIES & COST ESTIMATE
BILL NO. 10. UTILITY DUCT

SL. NO.	SOR Item No.	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
1	***Non-Sch***		Laying of utility duct of HDPE pipe (Group of 3 pipes 90mm dia.)	m	54960		
						Total Amount=	

DETAILED COST ESTIMATES
BILL NO. 11 FOR MAJOR BRIDGES

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.1 :: FOUNDATION							
11.1	***12.1***	**304**	**Excavation for Structures** (Earth work in excavation of 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.		***Ordinary soil***				
	B.		**Mechanical Means**				
	(b)		**with dewatering**				
	(i)		*Depth upto 3 m*	cum	1795.340		
	(ii)		*Depth 3 m to 6 m*	cum	224.000		
11.2	***12.8***	**1500,1700 &2100**	**Plain/Reinforced cement concrete** in open foundation complete as per drawing and technical specifications including steel shuttering forrmwork				
	A.		**Without plasticiser**				
	(a)		**PCC Grade M15**	cum	94.500		
	12.38		**RCC Pile Cap M30**				
	(A) III.(ii)		***Using Batching Plant, Transit Mixer and Concrete Pump***	cum	1061.740		
11.3	***12.22***	**1200 & 1900**	**Providing steel liner 10 mm thick f**or curbs and 6mm thick for steining of wells including fabricating and setting out as per detailed drawing	tonne	9.590		
11.4	***12.25A***	**1100 & 1700**	**Bored cast-in-situ M35 grade R.C.C. pile** excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (**Pile diameter-1200 mm**)	metre	1734.000		
11.5	***12.40***	**1600**	**Reinforcement in foundation :Supplying, fitting and placing un-coatedTMT bar reinforcement in foundation complete as per drawing and technical specifications**				
	(a)		From primary source**s:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
	(i)		TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	320.977		
TOTAL FOR B.1 :: FOUNDATION							

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SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.2 :: SUBSTRUCTURE							
11.6	***13.5 (N) .A .g.(i)-case II***	**1500,1700 &2200**	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications				
			RCC Grade M30				
			Height upto 5m				
			With Batching Plant, Transit Mixer and Concrete Pump	cum	456.81		
	13.5 (N) .A .g.(ii)-case II		***Height 5m to 10m***				
			With Batching Plant, Transit Mixer and Concrete Pump	cum	186.16		
	h.		***RCC Grade M35***				
	(i)		***Height 5m to 10m***				
	Case II		***With Batching Plant, Transit Mixer and Concrete Pump***	cum	42.060		
11.7	***13.6 (a) (i)***	**1600 &2200**	**Supplying, fitting and placing TMT bar** reinforcement in sub-structure complete as per drawing and technical specifications				
			From primary source**s:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	95.904		
11.8	***13.8***	**2200 &2706**	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing foce. Complete as per drawing and Technical specifications	each	378.000		
11.9	***13.9***	**710.1.4 of IRC:78 & 2200**	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification				
	A		*Granular material*	cum	245.700		
	B		*Sandy material*	cum	1019.540		

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
11.10	***13.10***	**710.1.4 of IRC:78 & 2200**	**Providing and laying of Filter media** with granular materials/stone crushed aggregates satisfying the requirements laid down in clause 2504.2.2. of MoRTH specifications to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition complete as per drawing and technical specification.	cum	285.880		
11.11	***13.13***	**2000 & 2200**	Supplying, fitting and fixing in position true to line and level sliding plate bearing with PTFE surface sliding on stainless steel complete including all accessories as per drawing and Technical Specifications and BS: 5400, section 9.1 & 9.2 (for PTFE) and clause 2004 of MoRTH Specifications.	tonne capacity	9600.000		
11.12	***13.14***	**2000 & 2200**	Supplying, fitting and fixing in position true to line and level elastomeric bearing conforming to IRC: 83 (Part-II) section IX and clause 2005 of MoRTH specifications complete including all accessories as per drawing and Technical Specifications.	cubic centimetre	639150.000		
TOTAL FOR B.2 :: SUBSTRUCTURE							

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.3 :: SUPERSTRUCTURE							
	14.1 A. III.case - II(i) a	**1500 ,1600 & 1700**	Furnishing and Placing Reinforced/Prestressed cement concrete in super-structure as per drawing and Technical Specification				
			RCC Grade M 30				
			Using Batching Plant, Transit Mixer and Concrete Pump.				
11.13			***For solid slab super-structure***				
			Height upto 5m	cum	15.250		
	14.1 A. VI .(i) a).		**PSC Grade M-45**				
			For solid slab/voided slab super-structure				
			Height upto 5m	cum	891.960		
11.14	***14.3***		**High tensile steel wires/strands including all accessories for stressing, stressing operations and grouting complete as per drawing and Technical Specifications**	tonne	44.000		
11.15	***14.2 (a). (i)***		Supplying, Fitting, Fixing TMT Bar-From primary sources: TATA/SAIL/Esser Steel/Jindal steel/Shyam steel (TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	136.082		
11.16	***14.5***	**515 & 2702**	**Mastic Asphalt**				
			Providing and laying 12 mm thick mastic asphalt wearing course on top of deck slab excluding prime coat with paving grade bitumen meeting the requirements given in table 500-29, prepared by using mastic cooker and laid to required level and slope after cleaning the surface, including providing antiskid surface with bitumen precoated fine grained hard stone chipping of 9.5 mm nominal size at the rate of 0.005cum per 10 sqm and at an approximate spacing of 10 cm center to center in both directions, pressed into surface when the temperature of surfaces not less than 100 deg. C, protruding 1 mm to 4 mm over mastic surface, all complete as per clause 515.	sqm	1287.440		

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
11.17	***5.8 (ii)***		Providing and laying Bituminious wearing course comprising of tack coat with bitumen emulsion CSS-1 h as per APWD SOR item no 5.2 & MoRT&H Specification Nos 503,6mm thick mastic asphalt as per APWD SOR item no 14.5& MoRT&H Specification no 515 &2702 and 2 layer of 25 mm thick asphalt concrete including of close Graded Premix Surfacing (CGPS) material with Type -a aggregate as per APWD SOR item no 5.11 & MoRT &H Specification Nos 512 including all lead and lift as directed.	cum	51.500		
11.18	**5.2**		**Tack coat** Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20 kg per sqm on the prepared bituminous/granular surface cleaned with mechanical broom.(Including cost of testing of materials at sitfe and laboratory as directed by the depttt.)	sqm	1,287.44		
11.19	**14. 4**	**515 & 2702**	Providing and laying Cement concrete wearing coat M-30 grade including reinforcement complete as per drawing and Technical Specifications-With batching plant	cum	15.250		
11.20	***14.6***	**1500,1600,1700 & 2703**	Construction of precast RCC railing of M30 Grade, aggregate size not exceeding 12 mm, true to line and grade, tolurence of vertical RCC post not to exceed 1 in 500, centre to centre spacing between vertical post not to exceed 2000 mm, leaving adequate space between vertical post for expansion, complete as per approved drawings and technical specifications.	metre	135.520		
11.21	***14.9***	**2705**	Drainage Spouts complete as per drawing and Technical specification	each	20.000		
11.22	***14.10***	**2700**	PCC M15 Grade leveling course below approach slab complete as per drawing and Technical specification	cum	24.670		
11.23	***8.22 (ii)***	**809**	**Reinforced Cement Concrete Crash Barrier** (Provision of an Reinforced cement concrete crash barrier at the edges of the road, approaches to bridge structures and medians, constructed with M-40 grade concrete with HYSD reinforcement conforming to IRC:21 and dowel bars 25 mm dia, 450 mm long at expansion joints filled with pre-moulded asphalt filler board, keyed to the structure on which it is built and installed as per design given in the enclosure to MORT&H circular No. RW/NH - 33022/1/94-DO III dated June 1994 as per dimensions in the approved drawing and at locations directed by the Engineer, all as specified)	metre	271.04		

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
11.24	***14.11(a)***	**1500,1600,1700 & 2704**	Reinforced cement concrete approach slab including reinforcement and formwork complete as per drawing and Technical specification				
			With TATA make TMT CRS(Fe-500) grade rebar	cum	50.610		
11.25	***14.18***	**2605**	**Filler joint**				
	(i)		*Providing & fixing 2 mm thick corrugated copper plate in expansion joint complete as per drawing & Technical Specification.*	metre	48.200		
	(ii)		*Providing & fixing 20 mm thick compressible fibre board in expansion joint complete as per drawing & Technical Specification.*	metre	48.200		
	(iii)		*Providing and fixing in position 20 mm thick premoulded joint filler in expansion joint for fixed ends of simply supported spans not exceeding 10 m to cater for a horizontal movement upto 20 mm, covered with sealant complete as per drawing and technical specifications.*	metre	48.200		
	(iv)		*Providing and filling joint sealing compound as per drawings and technical specifications with coarse sand and 6% bitumen by weight*	metre	48.200		
11.26	***14.22***	**2607**	**Strip Seal Expansion Joint** (Providing and laying of a strip seal expansion joint catering to maximum horizontal movement upto 70 mm, complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation.)	metre	50.000		
TOTAL FOR B.3 :: SUPERSTUCTURE							

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.4 :: PROTECTION WORKS							
11.27	***15.4***	**2403**	Providing and laying Pitching on slopes laid over prepared filter media including boulder apron laid dry in front of toe of embankment complete as per drawing and Technical specifications				
	A		***Stone/Boulder***	cum	820.670		
11.28	***15.5***	**2504**	Providing and laying Filter material underneath pitching in slopes complete as per drawing and Technical specification	cum	410.340		
11.29	***15.11***	**2505**	Flexible Apron :Construction of flexible apron 1 m thick comprising of loose stone boulders weighing not less than 40 kg beyond curtain wall.	cum	193.240		
TOTAL FOR B.4 :: PROTECTION WORKS							
B.5::MISCELLANIOUS							
11.30	**8.8**	**803**	Painting Two Coats on New Concrete Surfaces (Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces)	sqm	1068.820		
11.31	**8.4 (iv)**		Citizen information Board NH Project	nos	2.00		
11.32	**12.5**		Brick work at median	cum	8.76		
TOTAL FOR B.5 :: MISCELLANIOUS							
			Total of Bill No.11				

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DETAILED COST ESTIMATES
BILL NO. 12 FOR MINOR BRIDGES

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.1 :: FOUNDATION							
12.1	***12.1***	**304**	**Excavation for Structures** (Earth work in excavation of 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.		***Ordinary soil***				
	B.		**Mechanical Means**				
	(b)		**with dewatering**				
	(i)		*Depth upto 3 m*	cum	14226.484		
	(ii)		*Depth 3 m to 6 m*	cum	1141.843		
12.2	***12.8***	**1500,1700 &2100**	**Plain/Reinforced cement concrete** in open foundation complete as per drawing and technical specifications including steel shuttering forrmwork				
	A.		**Without plasticiser**				
			PCC Grade M15	cum	726.677		
	(g)		**RCC Grade M30 (Pile Cap)**				
	Case II		***Using Batching Plant, Transit Mixer and Concrete Pump***	cum	5235.400		
12.3	***12.22***	**1200 & 1900**	**Providing steel liner 10 mm thick f**or curbs and 6mm thick for steining of wells including fabricating and setting out as per detailed drawing	tonne	0.000		
12.4	***12.25A***	**1100 & 1700**	**Bored cast-in-situ M35 grade R.C.C. pile** excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (**Pile diameter-1200 mm**)	metre	7952.000		
12.5	***12.4 0 (a). (i)***	**1600**	**Reinforcement in foundation :Supplying, fitting and placing un-coatedTMT bar reinforcement in foundation complete as per drawing and technical specifications**				
			From primary source**s:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	1502.378		
TOTAL FOR B.1 :: FOUNDATION							

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.2 :: SUBSTRUCTURE							
12.6	***13.5 (N) .A .g.(i)-case II***	**1500,1700 &2200**	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications				
			RCC Grade M30				
			Height upto 5m				
			With Batching Plant, Transit Mixer and Concrete Pump	cum	3658.627		
	13.5 (N) .A .g.(ii)-case II		***Height 5m to 10m***				
			With Batching Plant, Transit Mixer and Concrete Pump	cum	797.690		
12.7	***13.5 (N) .A .h.(i)-case II***		**RCC Grade M35 (Pedestals & RB)**				
			Height 5m to 10m				
			With Batching Plant, Transit Mixer and Concrete Pump	cum	133.160		
12.8	***13.6 (a) (i***	**1600 &2200**	**Supplying, fitting and placing TMT bar** reinforcement in sub-structure complete as per drawing and technical specifications				
			From primary source**s:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	471.966		
12.9	***13.8***	**2200 &2706**	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing foce. Complete as per drawing and Technical specifications	each	2270.000		

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
12.10	***13.9***	**710.1.4 of IRC:78 & 2200**	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification				
	A		*Granular material*	cum	1520.531		
	B		*Sandy material*	cum	5017.102		
12.11	***13.10***	**710.1.4 of IRC:78 & 2200**	**Providing and laying of Filter media** with granular materials/stone crushed aggregates satisfying the requirements laid down in clause 2504.2.2. of MoRTH specifications to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition complete as per drawing and technical specification.	cum	1666.844		
12.12	***13.14***	**2000 & 2200**	Supplying, fitting and fixing in position true to line and level elastomeric bearing conforming to IRC: 83 (Part-II) section IX and clause 2005 of MoRTH specifications complete including all accessories as per drawing and Technical Specifications.	cubic centimetre	1039200.000		
12.13	***13.16***	**2000 & 2200**	Supplying, fitting and fixing in position true to line and level POT-PTFE bearing consisting of a metal piston supported by a disc or unreinforced elastomer confined within a metal cylinder, sealing rings, dust seals, PTFE surface sliding against stainless steel mating surface, completre assembly to be of cast steel/fabricated structural steel, metal and elastomer elements to be as per IRC: 83 part-I & II respectively and other parts conforming to BS: 5400, section 9.1 & 9.2 and clause 2006 of MoRTH Specifications complete asper drawing and approved technical specifications.	tonne capacity	40800.000		
TOTAL FOR B.2 :: SUBSTRUCTURE							

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SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.3 :: SUPERSTRUCTURE							
12.14	***14.1 A. III.case -II(i) a***	**1500 ,1600 & 1700**	Furnishing and Placing Reinforced/Prestressed cement concrete in super-structure as per drawing and Technical Specification				
			Without plasticiser				
			RCC Grade M 30				
			Using Batching Plant, Transit Mixer and Concrete Pump.				
			For T-Beam				
			Height upto 5m	cum	4237.704		
	14.1 A. VI .(i) a)		**PSC Grade M-45**				
			For solid slab/voided slab super-structure				
			Height upto 5m	cum	698.910		
12.15	***14.2 (a). (i)***	**1600**	**Reinforcement in Super Structure**: Supplying, fitting and placing TMT bar reinforcement in super-structure including splicing complete as per drawing and technical specifications				
			From primary source**s:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	761.783		
12.16	***14.3***	**1800**	High tensile steel wires/strands including all accessories for stressing, stressing operations and grouting complete as per drawing and Technical Specifications	tonne	29.000		

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
12.17	***14.5 (A)***	**515 & 2702**	**Mastic Asphalt**				
			Providing and laying 12 mm thick mastic asphalt wearing course on top of deck slab excluding prime coat with paving grade bitumen meeting the requirements given in table 500-29, prepared by using mastic cooker and laid to required level and slope after cleaning the surface, including providing antiskid surface with bitumen precoated fine grained hard stone chipping of 9.5 mm nominal size at the rate of 0.005cum per 10 sqm and at an approximate spacing of 10 cm center to center in both directions, pressed into surface when the temperature of surfaces not less than 100 deg. C, protruding 1 mm to 4 mm over mastic surface, all complete as per clause 515.	sqm	7525.130		
12.18	***5.8 (ii)***		Providing and laying Bituminious wearing course comprising of tack coat with bitumen emulsion CSS-1 h as per APWD SOR item no 5.2 & MoRT&H Specification Nos 503,6mm thick mastic asphalt as per APWD SOR item no 14.5& MoRT&H Specification no 515 &2702 and 2 layer of 25 mm thick asphalt concrete including of close Graded Premix Surfacing (CGPS) material with Type -a aggregate as per APWD SOR item no 5.11 & MoRT &H Specification Nos 512 including all lead and lift as directed.	cum	301.020		
12.19	**5.2 (I) (a)**		**Tack coat** Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20 kg per sqm on the prepared bituminous/granular surface cleaned with mechanical broom.(Including cost of testing of materials at sitfe and laboratory as directed by the depttt.)	sqm	7525.130		
12.20	**14. 4**		Providing and laying Cement concrete wearing coat M-30 grade including reinforcement complete as per drawing and Technical Specifications-With batchimg plant	cum	82.879		
12.21	***14.9***	**2705**	Drainage Spouts complete as per drawing and Technical specification	each	112.000		
12.22	***14.10***	**2700**	PCC M15 Grade leveling course below approach slab complete as per drawing and Technical specification	cum	181.994		
12.23	***14.11 (a)***	**1500,1600, 1700 & 2704**	Reinforced cement concrete approach slab including reinforcement and formwork complete as per drawing and Technical specification				
			With TATA make TMT CRS(Fe-500) grade rebar	cum	373.656		

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
12.24	***14.18***	**2605**	**Filler joint**				
	(i)		*Providing & fixing 2 mm thick corrugated copper plate in expansion joint complete as per drawing & Technical Specification.*	metre	396.880		
	(ii)		*Providing & fixing 20 mm thick compressible fibre board in expansion joint complete as per drawing & Technical Specification.*	metre	396.880		
	(iii)		*Providing and fixing in position 20 mm thick premoulded joint filler in expansion joint for fixed ends of simply supported spans not exceeding 10 m to cater for a horizontal movement upto 20 mm, covered with sealant complete as per drawing and technical specifications.*	metre	396.880		
	(iv)		*Providing and filling joint sealing compound as per drawings and technical specifications with coarse sand and 6% bitumen by weight*	metre	396.880		
12.25	***8.22 (ii)***		*RCC Crash Barrier(M 40 grade concrete)*	metre	1605.080		
12.26	***14.6***		*Precast RCC Railing-With batching plant*	metre	736.540		
12.27	***14.22***	**2607**	**Strip Seal Expansion Joint** (Providing and laying of a strip seal expansion joint catering to maximum horizontal movement upto 70 mm, complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation.)	metre	197.600		
12.28			HDPE Pipe	metre	507.600		
TOTAL FOR B.3 :: SUPERSTRUCTURE							

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.4 :: PROTECTION WORKS							
12.29	***2505***	**2403**	Providing and laying Flooring complete as per drawing and Technical specifications laid over cement concert bedding.				
	A		Rubble stone laid in cement mortar 1:3	cum	179.699		
12.30	***15.2***	**2505**	**Boulder apron laid in wire crates** (Providing and laying of boulder apron laid in wire crates made with 4mm dia GI wire conforming to IS: 280 & IS:4826 in 100mm x 100mm mesh (weaved diagonally) including 10% extra for laps and joints laid with stone boulders weighing not less than 40 kg each.)	cum	1922.804		
12.31	***15.5***	**2507.2**	Providing and laying Filter material underneath pitching in slopes complete as per drawing and Technical specification	cum	961.400		
12.32	***15.11***	**304**	Flexible Apron :Construction of flexible apron 750 mm thick comprising of loose stone boulders weighing not less than 40 kg beyond curtain wall.	cum	245.993		
12.33	***13.5 (N) .A .b***	**1500,1700 &2200**	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications				
	12.8 A (a)		**PCC Grade M15**	cum	377.064		
12.34	***15.10 (B)***	**2507.2**	**Curtain Wall-Cement concrete Grade M20**	cum	249.202		
12.35	***12.1 I . B. (b).(i)***	**304**	**Excavation for Structures**	cum	1327.704		
12.36	***15.11***	**304**	Falling Apron on River Bed	cum	910.720		
TOTAL FOR B.4 :: PROTECTION WORKS							
B.5:: MISCALLAENEOUS WORKS							
12.37	**8.8**	**803**	**Painting Two Coats on New Concrete Surfaces** (Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces)	sqm	5995.030		
12.38	**8.4 (iv)**		Citizen information Board NH Project	nos	12.000		
12.39	**12.5**		Brick work at median	cum	29.380		
TOTAL FOR B.5:: MISCALLAENEOUS WORKS							
			Total of Bill No.12				

DETAILED COST ESTIMATES

BILL NO. 13 FOR ROB

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.1 :: FOUNDATION							
13.1	***12.1***	**304**	**Excavation for Structures** (Earth work in excavation of 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.		***Ordinary soil***				
	B.		**Mechanical Means**				
	(b)		**with dewatering**				
	(i)		*Depth upto 3 m*	cum	13173.040		
	(ii)		*Depth 3 m to 6 m*	cum	338.610		
13.2	***12.25A***	**1100 & 1700**	**Bored cast-in-situ M35 grade R.C.C. pile** excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (**Pile diameter-1200 mm**)	metre	10296.000		
13.3	***12.38 (A) III.(ii)***		***RCC Pile Cap M30 -Using Batching Plant, Transit Mixer and Concrete Pump***	cum	8475.050		
13.4	***12.39***	**1100 & 1700**	Levelling course for Pile cap	cum	1169.750		
13.5	***12.4 0 (a). (i)***	**1600**	**Reinforcement in foundation :Supplying, fitting and placing un-coatedTMT bar reinforcement in foundation complete as per drawing and technical specifications**				
			From primary source**s:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	2090.660		
13.6	***12.5***		Brick masonry work (1:3)	cum	141.070		
TOTAL FOR B.1 :: FOUNDATION							

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.2 :: SUBSTRUCTURE							
13.7	***13.5 (N) .A .g.(i)- case II***	**1500,1700 &2200**	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications				
			Without plasticiser				
			RCC Grade M35				
	(i)		***Height upto 5m***				
	case II		***With Batching Plant, Transit Mixer and Concrete Pump***	cum	1806.290		
	(ii)		***Height 5m to 10m***				
	Case II		***With Batching Plant, Transit Mixer and Concrete Pump***	cum	3413.540		
	(iii)		***Height above 10m***				
	Case II		***With Batching Plant, Transit Mixer and Concrete Pump***	cum	1768.100		
13.8	***13.6 (a) (i)***	**1600 &2200**	**Supplying, fitting and placing TMT bar** reinforcement in sub-structure complete as per drawing and technical specifications				
			From primary source**s:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	993.580		
13.9			Pin Bearing	tonne capacity	10760.000		
13.10	***13.13***	**2000 & 2200**	Supplying, fitting and fixing in position true to line and level sliding plate bearing with PTFE surface sliding on stainless steel complete including all accessories as per drawing and Technical Specifications and BS: 5400, section 9.1 & 9.2 (for PTFE) and clause 2004 of MoRTH Specifications.	tonne capacity	30240.000		
13.11			Metallic guide bearing	tonne capacity	10760.000		
13.12	***13.14***		Elastomeric bearing	CCUM	15246566.0		
13.13			Reinforced/Prestressed cement concrete M40	cum	109.000		
TOTAL FOR B.2 :: SUBSTRUCTURE							

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.3 :: SUPERSTRUCTURE							
13.14	***14.1 A. III.case -II(i) a),***	**1500 ,1600 & 1700**	Furnishing and Placing Reinforced/Prestressed cement concrete in super-structure as per drawing and Technical Specification				
			Without plasticiser				
			RCC/PSC Grade M35				
			Using Batching Plant, Transit Mixer and Concrete Pump				
			For solid slab super-structure				
			Height upto 5m	cum	7861.490		
	VI.		**PSC Grade M-45**				
	(i)		***For solid slab/voided slab super-structure***				
	a)		*Height upto 5m*	cum	1847.350		
13.15	***14.2 (a). (i)***	**1600**	**Reinforcement in Super Structure**: Supplying, fitting and placing TMT bar reinforcement in super-structure including splicing complete as per drawing and technical specifications				
			From primary sources**:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	1747.590		
13.16	***non sch***		Supply, fabrication, delivery at bridge site and erection of structural steel works as per IS 2062, including two coats of primer, one at shop and the other at site and two coats of aluminium paints including all labour, material, consumables etc.	tonne	2168.620		

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
13.17	***14.5 (A)***	**515 & 2702**	**Mastic Asphalt**				
			Providing and laying 12 mm thick mastic asphalt wearing course on top of deck slab excluding prime coat with paving grade bitumen meeting the requirements given in table 500-29, prepared by using mastic cooker and laid to required level and slope after cleaning the surface, including providing antiskid surface with bitumen precoated fine grained hard stone chipping of 9.5 mm nominal size at the rate of 0.005cum per 10 sqm and at an approximate spacing of 10 cm center to center in both directions, pressed into surface when the temperature of surfaces not less than 100 deg. C, protruding 1 mm to 4 mm over mastic surface, all complete as per clause 515.	sqm	17467.150		
13.18	***5.8 (ii)***		Providing and laying Bituminious wearing course comprising of tack coat with bitumen emulsion CSS-1 h as per APWD SOR item no 5.2 & MoRT&H Specification Nos 503,6mm thick mastic asphalt as per APWD SOR item no 14.5& MoRT&H Specification no 515 &2702 and 2 layer of 25 mm thick asphalt concrete including of close Graded Premix Surfacing (CGPS) material with Type -a aggregate as per APWD SOR item no 5.11 & MoRT &H Specification Nos 512 including all lead and lift as directed	cum	901.300		
13.19	**5.2**		**Tack coat** Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20 kg per sqm on the prepared bituminous/granular surface cleaned with mechanical broom.(Including cost of testing of materials at sitfe and laboratory as directed by the depttt.)	sqm	17467.150		
13.20	***14.8***		Providing, fitting and fixing mild steel railing complete as per drawing and Technical Specification	metre	1101.760		
13.21	***14.9***	**2705**	Drainage Spouts complete as per drawing and Technical specification	each	322.000		
13.22	***14.10***	**2700**	PCC M15 Grade leveling course below approach slab complete as per drawing and Technical specification	cum	11.700		
13.23	***8.22 (ii)***	**809**	**Reinforced Cement Concrete Crash Barrier** (Provision of an Reinforced cement concrete crash barrier at the edges of the road, approaches to bridge structures and medians, constructed with M-40 grade concrete with HYSD reinforcement conforming to IRC:21 and dowel bars 25 mm dia, 450 mm long at expansion joints filled with pre-moulded asphalt filler board, keyed to the structure on which it is built and installed as per design given in the enclosure to MORT&H circular No. RW/NH - 33022/1/94-DO III dated June 1994 as per dimensions in the approved drawing and at locations directed by the Engineer, all as specified)	metre	3604.640		

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
13.24	***14.18***	**2605**	**Filler joint**				
	(i)		*Providing & fixing 2 mm thick corrugated copper plate in expansion joint complete as per drawing & Technical Specification.*	metre	86.680		
	(ii)		*Providing & fixing 20 mm thick compressible fibre board in expansion joint complete as per drawing & Technical Specification.*	metre	86.680		
	(iii)		*Providing and fixing in position 20 mm thick premoulded joint filler in expansion joint for fixed ends of simply supported spans not exceeding 10 m to cater for a horizontal movement upto 20 mm, covered with sealant complete as per drawing and technical specifications.*	metre	86.680		
	(iv)		*Providing and filling joint sealing compound as per drawings and technical specifications with coarse sand and 6% bitumen by weight*	metre	86.680		
13.25	***14.22***	**2607**	**Strip Seal Expansion Joint** (Providing and laying of a strip seal expansion joint catering to maximum horizontal movement upto 70 mm, complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation.)	metre	768.980		
13.26	***8.1 (A)***		RCC M30 Kerb	M	25.140		
13.27	***Non-Sch***		Reciever pipe for Drainage Spout	metre	1580.000		
TOTAL FOR B.3 :: SUPERSTRUCTURE							
B.4 :: MISCELLANEOUS							
13.28	**8.8**	**803**	**Painting Two Coats on New Concrete Surfaces** (Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces)	sqm	11831.570		
13.29	**non sch**		Inspection ladder	tonne	10.889		
13.30	**non sch**		Stair	tonne	234.620		
TOTAL FOR B.4 :: MISCELLANEOUS							
			Total of Bill No.13		**Total=**		

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DETAILED COST ESTIMATES

BILL NO. 14 FOR VUP

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.1 :: FOUNDATION							
14.1	***12.1***	**304**	**Excavation for Structures** (Earth work in excavation of 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.		***Ordinary soil***				
	B.		**Mechanical Means**				
	(b)		**with dewatering**				
	(i)		*Depth upto 3 m*	cum	1089.350		
14.2	***12.8***	**1500,1700 &2100**	**Plain/Reinforced cement concrete** in open foundation complete as per drawing and technical specifications including steel shuttering forrmwork				
	A.		**Without plasticiser**				
			PCC Grade M15	cum	67.950		
	(g)		**RCC Grade M30**				
	Case II		***Using Batching Plant, Transit Mixer and Concrete Pump***	cum	591.940		
14.3	***12.25A***	**1100 & 1700**	**Bored cast-in-situ M35 grade R.C.C. pile** excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (**Pile diameter-1200 mm**)	metre	1146.000		
14.4	***12.40(a). (i)***	**1600**	**Reinforcement in foundation :Supplying, fitting and placing un-coatedTMT bar reinforcement in foundation complete as per drawing and technical specifications**				
			From primary source**s:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	190.795		
TOTAL FOR B.1 :: FOUNDATION							

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SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.2 :: SUBSTRUCTURE							
14.5	***13.5 (N) .A .g.(i)- case II***	**1500,1700 &2200**	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications				
			Without plasticiser				
			RCC Grade M30				
			Height upto 5m				
			With Batching Plant, Transit Mixer and Concrete Pump	cum	195.310		
			Height 5m to 10m				
			With Batching Plant, Transit Mixer and Concrete Pump	cum	225.820		
			Height above 10m				
			With Batching Plant, Transit Mixer and Concrete Pump	cum	132.230		
			RCC Grade M35 (Pedestals & RB)				
			Height 5m to 10m				
			With Batching Plant, Transit Mixer and Concrete Pump	cum	39.610		
14.6	***13.6(a) (i)***	**1600 &2200**	**Supplying, fitting and placing TMT bar** reinforcement in sub-structure complete as per drawing and technical specifications				
			From primary source**s:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	55.289		
14.7	***13.9***	**710.1.4 of IRC:78 & 2200**	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification				
	A		*Granular material*	cum	187.200		
14.8	***13.14***	**2000 & 2200**	Supplying, fitting and fixing in position true to line and level elastomeric bearing conforming to IRC: 83 (Part-II) section IX and clause 2005 of MoRTH specifications complete including all accessories as per drawing and Technical Specifications.	cubic centimetre	207840.000		
14.9	***13.13***	**2000 & 2200**	Supplying, fitting and fixing in position true to line and level sliding plate bearing with PTFE surface sliding on stainless steel complete including all accessories as per drawing and Technical Specifications and BS: 5400, section 9.1 & 9.2 (for PTFE) and clause 2004 of MoRTH Specifications.	tonne capacity	9600.000		
TOTAL FOR B.2 :: SUBSTRUCTURE							

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.3 :: SUPERSTRUCTURE							
14.10	***14.1 A. III.case - II(i) a***	**1500 ,1600 & 1700**	Furnishing and Placing Reinforced/Prestressed cement concrete in super-structure as per drawing and Technical Specification				
			Without plasticiser				
			RCC Grade M 30				
			Using Batching Plant, Transit Mixer and Concrete Pump.				
			For T-Beam				
			Height upto 5m	cum	58.800		
14.11	***V.***		**PSC Grade M-40**				
	Case II		***Using Batching Plant, Transit Mixer and Concrete Pump***				
	(ii)		***For T-beam & slab***				
	a)		*Height upto 5m*	cum	288.670		
14.12	***14.1 A. VI .(i) a).***		**PSC Grade M-45**				
			For solid slab/voided slab super-structure				
			Height upto 5m	cum	545.370		
14.13	***14.2 (a). (i)***	**1600**	**Reinforcement in Super Structure**: Supplying, fitting and placing TMT bar reinforcement in super-structure including splicing complete as per drawing and technical specifications				
			From primary source**s:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	133.926		
14.14	***14.3***	**1800**	High tensile steel wires/strands including all accessories for stressing, stressing operations and grouting complete as per drawing and Technical Specifications	tonne	28.000		

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
14.15	***14.5(A)***	**515 & 2702**	**Mastic Asphalt**				
			Providing and laying 12 mm thick mastic asphalt wearing course on top of deck slab excluding prime coat with paving grade bitumen meeting the requirements given in table 500-29, prepared by using mastic cooker and laid to required level and slope after cleaning the surface, including providing antiskid surface with bitumen precoated fine grained hard stone chipping of 9.5 mm nominal size at the rate of 0.005cum per 10 sqm and at an approximate spacing of 10 cm center to center in both directions, pressed into surface when the temperature of surfaces not less than 100 deg. C, protruding 1 mm to 4 mm over mastic surface, all complete as per clause 515.	sqm	1306.440		
14.16	***5.8 (ii)***		Providing and laying Bituminious wearing course comprising of tack coat with bitumen emulsion CSS-1 h as per APWD SOR item no 5.2 & MoRT&H Specification Nos 503,6mm thick mastic asphalt as per APWD SOR item no 14.5& MoRT&H Specification no 515 &2702 and 2 layer of 25 mm thick asphalt concrete including of close Graded Premix Surfacing (CGPS) material with Type -a aggregate as per APWD SOR item no 5.11 & MoRT &H Specification Nos 512 including all lead and lift as directed	cum	52.260		
14.17	**5.2 (I) (a)**		**Tack coat** Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20 kg per sqm on the prepared bituminous/granular surface cleaned with mechanical broom.(Including cost of testing of materials at sitfe and laboratory as directed by the depttt.)	sqm	1306.440		
14.18	***14.9***	**2705**	Drainage Spouts complete as per drawing and Technical specification	each	20.000		
14.19	***14.10***	**2700**	PCC M15 Grade leveling course below approach slab complete as per drawing and Technical specification	cum	7.880		

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
14.20	***14.18***	**2605**	**Filler joint**				
	(i)		*Providing & fixing 2 mm thick corrugated copper plate in expansion joint complete as per drawing & Technical Specification.*	metre	42.000		
	(ii)		*Providing & fixing 20 mm thick compressible fibre board in expansion joint complete as per drawing & Technical Specification.*	metre	42.000		
	(iii)		*Providing and fixing in position 20 mm thick premoulded joint filler in expansion joint for fixed ends of simply supported spans not exceeding 10 m to cater for a horizontal movement upto 20 mm, covered with sealant complete as per drawing and technical specifications.*	metre	42.000		
	(iv)		*Providing and filling joint sealing compound as per drawings and technical specifications with coarse sand and 6% bitumen by weight*	metre	42.000		
	8.22 (ii)		*RCC Crash Barrier(M 40 grade concrete)*	metre	275.040		
14.21	***14.22***	**2607**	**Strip Seal Expansion Joint** (Providing and laying of a strip seal expansion joint catering to maximum horizontal movement upto 70 mm, complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation)	metre	63.000		
14.22	***Non-Sch***		Reciever pipe for Drainage Spout	metre	180.000		
TOTAL FOR B.3 :: SUPERSTRUCTURE							
B.4 :: MISCALLAENEOUS WORKS							
14.23	**8.8**	**803**	**Painting Two Coats on New Concrete Surfaces** (Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces)	sqm	607.840		
14.24	**8.4 (iv)**		Citizen information Board NH Project	nos	2.000		
14.25	**12.5**		Brick masonry work (1:3)	cum	68.250		
TOTAL FOR B.4 :: MISCALLAENEOUS WORKS							
			Total of Bill No.14				

DETAILED COST ESTIMATES

BILL NO. 15 FOR LOW HEIGHT SUBWAY

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.1 :: FOUNDATION							
15.1	*12.1*	304	**Excavation for Structures** (Earth work in excavation of 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.		**Ordinary soil**				
	B.		**Mechanical Means**				
	(b)		**with dewatering**				
	(i)		*Depth upto 3 m*	cum	2841.365		
	(ii)		*Depth 3 m to 6 m*	cum	999.815		
15.2	*12.8*	1500,1700 &2100	**Plain/Reinforced cement concrete** in open foundation complete as per drawing and technical specifications including steel shuttering forrmwork				
	A.		**Without plasticiser**				
			PCC Grade M15	cum	210.339		
	(g)		**RCC Grade M30**				
	Case II		***Using Batching Plant, Transit Mixer and Concrete Pump***	cum	486.531		
15.3	*12.40(a). (i)*	1600	**Reinforcement in foundation :Supplying, fitting and placing un-coatedTMT bar reinforcement in foundation complete as per drawing and technical specifications**				
			From primary source**s:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	34.057		
TOTAL FOR B.1 :: FOUNDATION							

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SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.2 :: SUBSTRUCTURE							
15.4	***13.5 (N) .A .g.(i)- case II***	**1500,1700 &2200**	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications				
			Without plasticiser				
			RCC Grade M20	cum	61.600		
			Height upto 5m				
			RCC Grade M30				
			Height upto 5m	cum	447.454		
			RCC Grade M35				
			Height upto 5m	cum	255.200		
15.5	***13.6(a) (i)***	**1600 &2200**	**Supplying, fitting and placing TMT bar** reinforcement in sub-structure complete as per drawing and technical specifications				
			From primary source**s:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	75.674		
15.6	***13.9***	**710.1.4 of IRC:78 & 2200**	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification				
	A		*Granular material*	cum	302.953		
	B		*Sandy material*	cum	2561.785		
15.7	***13.10***	**710.1.4 of IRC:78 & 2200**	**Providing and laying of Filter media** with granular materials/stone crushed aggregates satisfying the requirements laid down in clause 2504.2.2. of MoRTH specifications to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition complete as per drawing and technical specification.	cum	941.874		
15.8	***14.4***	**2702**	Providing and laying Cement concrete wearing coat M-30 grade including reinforcement complete as per drawing and Technical Specifications	cum	24.552		
TOTAL FOR B.2 :: SUBSTRUCTURE							

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SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.3 :: SUPERSTRUCTURE							
15.9	***14.1 A. III.case - II(i) a***	**1500 ,1600 & 1700**	Furnishing and Placing Reinforced/Prestressed cement concrete in super-structure as per drawing and Technical Specification				
			Without plasticiser				
	IV.		**RCC/PSC Grade M35**				
	a)		*Height upto 5m*	cum	126.052		
15.10	***14.2 (a). (i)***	**1600**	**Reinforcement in Super Structure**: Supplying, fitting and placing TMT bar reinforcement in super-structure including splicing complete as per drawing and technical specifications				
			From primary source**s:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	17.647		
TOTAL FOR B.3 :: SUPERSTRUCTURE							

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SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.4 :: MISCALLAENEOUS WORKS							
15.11	**8.23 A**		**W-Metal beam crash barrier** Providing and erecting a "W" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 70 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 1.8 m high, 1.1 m below ground/road level, all steel parts and fitments to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a spacer of channel section 150 x 75 x 5 mm, 330 mm long complete as per clause 810	metre	379.600		
15.12	***non sch***		**Structural Steel** Supply, fabrication, delivery at bridge site and erection of structural steel works as per IS 2062, including two coats of primer, one at shop and the other at site and two coats of aluminium paints including all labour, material, consumables etc.	tonne	33.239		
15.13	**12.3**		Sand Cushion	cum	52.096		
15.14	***non sch***		**Polycarbonate Sheet**	Sqm	1558.000		
15.15			**Level Crossing Shfting cost**	Lumpsump cost			
15.16			**All arrangement of rail track support and other items during construction & placing of rail track after construction of LHS with cut & cover method/cut & cover using RH girder method/TSLV or other suitable method.**	Lumpsump cost			
TOTAL FOR B.4 :: MISCALLAENEOUS WORKS							
			Total of Bill No.15				

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DETAILED COST ESTIMATES

BILL NO. 16 FOR CULVERT

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.1 :: FOUNDATION							
16.1	***12.1***	**304**	**Excavation for Structures** (Earth work in excavation of 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.		***Ordinary soil***				
	B.		**Mechanical Means**				
	(b)		**with dewatering**				
	(i)		*Depth upto 3 m*	cum	13962.509		
16.2	***12.8***	**1500,1700 &2100**	**Plain/Reinforced cement concrete** in open foundation complete as per drawing and technical specifications including steel shuttering forrmwork				
	A.		**Without plasticiser**				
			PCC Grade M15	cum	1587.359		
TOTAL FOR B.1 :: FOUNDATION							

C.E. TESTING CO. PVT. LTD. KOLKATA 700 092 124A, N.S.C. BOSE ROAD

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.2 :: SUBSTRUCTURE							
16.3	***13.5 (N) .A .g.(i)-case II***	**1500,1700 &2200**	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications				
			Without plasticiser				
			RCC Grade M30				
			Height upto 5m				
			With Batching Plant, Transit Mixer and Concrete Pump	cum	6767.537		
16.4	***13.6 (a) (i)***	**1600 &2200**	**Supplying, fitting and placing TMT bar** reinforcement in sub-structure complete as per drawing and technical specifications				
			From primary source**s:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	473.728		
16.5	***13.8***	**2200 &2706**	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing foce. Complete as per drawing and Technical specifications	each	14604.000		
16.6	***13.9***	**710.1.4 of IRC:78 & 2200**	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification				
	A		*Granular material*	cum	1190.132		
	B		*Sandy material*	cum	6047.654		
16.7	***13.10***	**710.1.4 of IRC:78 & 2200**	**Providing and laying of Filter media** with granular materials/stone crushed aggregates satisfying the requirements laid down in clause 2504.2.2. of MoRTH specifications to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition complete as per drawing and technical specification.	cum	7528.601		
TOTAL FOR B.2 :: SUBSTRUCTURE							

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.3 :: SUPERSTRUCTURE							
16.8	***14.1 A. III.case - II(i) a***	**1500 ,1600 & 1700**	Furnishing and Placing Reinforced/Prestressed cement concrete in super-structure as per drawing and Technical Specification				
			Without plasticiser				
			RCC Grade M 30				
			Using Batching Plant, Transit Mixer and Concrete Pump.				
			For solid slab super-structure				
			Height upto 5m	cum	1718.111		
16.9	***14.2 (a). (i)***	**1600**	**Reinforcement in Super Structure**: Supplying, fitting and placing TMT bar reinforcement in super-structure including splicing complete as per drawing and technical specifications				
			From primary source**s:** TATA/SAIL/Esser Steel/Jindal steel/Shyam steel				
			TMT Corrosion Resistance Steel (CRS) reinforcement bar of Fe-500 N/mm2	tonne	128.858		
16.10	***14.5 (A)***	**515 & 2702**	**Mastic Asphalt**				
			Providing and laying 12 mm thick mastic asphalt wearing course on top of deck slab excluding prime coat with paving grade bitumen meeting the requirements given in table 500-29, prepared by using mastic cooker and laid to required level and slope after cleaning the surface, including providing antiskid surface with bitumen precoated fine grained hard stone chipping of 9.5 mm nominal size at the rate of 0.005cum per 10 sqm and at an approximate spacing of 10 cm center to center in both directions, pressed into surface when the temperature of surfaces not less than 100 deg. C, protruding 1 mm to 4 mm over mastic surface, all complete as per clause 515.	sqm	7995.520		
16.11	***5.8 (ii)***		Providing and laying Bituminious wearing course comprising of tack coat with bitumen emulsion CSS-1 h as per APWD SOR item no 5.2 & MoRT&H Specification Nos 503,6mm thick mastic asphalt as per APWD SOR item no 14.5& MoRT&H Specification no 515 &2702 and 2 layer of 25 mm thick asphalt concrete including of close Graded Premix Surfacing (CGPS) material with Type -a aggregate as per APWD SOR item no 5.11 & MoRT &H Specification Nos 512 including all lead and lift as directed	cum	319.821		
16.12	**5.2 (I) (a)**		**Tack coat** Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20 kg per sqm on the prepared bituminous/granular surface cleaned with mechanical broom.(Including cost of testing of materials at sitfe and laboratory as directed by the depttt.)	sqm	7995.520		

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SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
16.13	***14.9***	**2705**	Drainage Spouts complete as per drawing and Technical specification	each	154.000		
16.14	***14.10***	**2700**	PCC M15 Grade leveling course below approach slab complete as per drawing and Technical specification	cum	925.752		
16.15	***8.22 (ii)***	**809**	**Reinforced Cement Concrete Crash Barrier** (Provision of an Reinforced cement concrete crash barrier at the edges of the road, approaches to bridge structures and medians, constructed with M-40 grade concrete with HYSD reinforcement conforming to IRC:21 and dowel bars 25 mm dia, 450 mm long at expansion joints filled with pre-moulded asphalt filler board, keyed to the structure on which it is built and installed as per design given in the enclosure to MORT&H circular No. RW/NH - 33022/1/94-DO III dated June 1994 as per dimensions in the approved drawing and at locations directed by the Engineer, all as specified)	metre	1465.800		
16.16	***14.11***	**1500,1600, 1700 & 2704**	Reinforced cement concrete approach slab including reinforcement and formwork complete as per drawing and Technical specification				
	(a)		With TATA make TMT CRS(Fe-500) grade rebar	cum	1922.928		
16.17	***14.18***	**2605**	**Filler joint**				
	(i)		*Providing & fixing 2 mm thick corrugated copper plate in expansion joint complete as per drawing & Technical Specification.*	metre	1852.400		
	(ii)		*Providing & fixing 20 mm thick compressible fibre board in expansion joint complete as per drawing & Technical Specification.*	metre	1852.400		
	(iii)		*Providing and fixing in position 20 mm thick premoulded joint filler in expansion joint for fixed ends of simply supported spans not exceeding 10 m to cater for a horizontal movement upto 20 mm, covered with sealant complete as per drawing and technical specifications*	metre	1852.400		
	(iv)		*Providing and filling joint sealing compound as per drawings and technical specifications with coarse sand and 6% bitumen by weight*	metre	1852.400		
TOTAL FOR B.3 :: SUPERSTRUCTURE							

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SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
B.4 :: PROTECTION WORKS							
16.18	***15.11***	**2507.2**	Flexible Apron :Construction of flexible apron 1 m thick comprising of loose stone boulders weighing not less than 40 kg beyond curtain wall.	cum	3939.690		
16.19	***13.5 (N) .A .b***	**1500,1700 &2200**	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications				
			PCC Grade M 15(Height upto 5m)	cum	590.617		
16.20	***15.10 (B)***	**2507.2**	**Curtain Wall-Cement concrete Grade M20**	cum	4033.651		
16.21	**8.8**	**803**	**Painting Two Coats on New Concrete Surfaces** (Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces)	sqm	3946.982		
16.21	**12.1 I . B. (b).(i)**	**304**	**Excavation for Structures**	cum	19233.273		
16.22			**Guard Stone**	Nos	900.000		
TOTAL FOR B.4 :: PROTECTION WORKS							
			Total of Bill No.16				

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DETAILED COST ESTIMATES
BILL NO. 17 : REPAIRING OF BRIDGE

SL. NO.	SOR Ref. No	Ref.of MoRT&H	DESCRIPTION	UNIT	QUANTITY	RATE (INR)	AMOUNT (INR)
17.1	**16.6**	**2800**	Patching of damaged concrete surface with polymer concrete and curing compounds, initiator and promoter, available in present formulations, to be applied as per instructions of manufacturer and as approved by the Engineer.	sqm	17.304		
17.2	**8.8**	**803**	Painting Two Coats on New Concrete Surfaces (Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces)	sqm	444.498		
			Total of Bill No.17