

NAGPUR METRO RAIL PROJECT**BIDDING DOCUMENTS
FOR**

NAME OF WORK: : DESIGN AND CONSTRUCTION OF ELEVATED VIADUCT OF LENGTH 2.607 KM FROM CH: 3620.950 TO CH: 3962.558,4042.558 TO 4330.490, CH: 4411.490 TO 5174.498, CH: 5255.498 TO 5988.303 5988.303 AND 6131.017 TO 6612.560 BETWEEN GADDIGODAM TO SITABULDI (EXCLUDING ZERO MILE STATION)

AND

RAILWAY SPAN NEAR GADDIGODAM, VIADUCT AND ROAD CUM RAIL FLYOVER (DOUBLE DECKER) OF LENGTH 4.065KM INCLUDING APPROACH RAMPS FROM CH:-673.910 TO -219.050, CH:-213.550 TO 939.360, CH:1016.860 TO 2097.068, CH:2174.568 TO 3125.73 CH:,3202.870 TO 3620.950 AND CH:3962.558 TO 4042.558 ON BOQ BASIS (EXCLUDING STATIONS) IN REACH-2.

**TENDER NO.
N1C-12/2016(ICB)**

PART IV: BILL OF QUANTITIES



NAGPUR METRO RAIL CORPORATION LIMITED (NMRCL)

**“Metro House”, 28/2 CK Naidu Marg, Anand Nagar,
Civil Lines, NAGPUR, MAHARASHTRA-440001
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FINANCIAL BID
PREAMBLE

1. The Bill of quantities consists five Schedules as shown below:
 - i) Schedule 'A': Covers the main part of the contract covering construction of reach 2 metro Viaduct of length 2.76 kms from CH:+3620.95 to 3962.558m, CH:+4042.558 to 5988.303m and CH:+6131.017 to 6612.56m in N-S corridor on lumpsum basis.
 - ii) Schedule 'B': Covers construction of NHAI elevated flyover including Metro viaduct and Ramps from CH: -673.91 Automotive square to CH: 3620.950m Kadvi Chowk and CH:3962.558 to 4042.558m (railway span) approximate length of 4.295 kms. The Railway span of length 80 m near Gaddi Godam on BOQ basis is included.
 - iii)Schedule ' C': Covers Incidental and Unforeseen works associated with operation of above two schedules.
 - iv)Schedule 'D': Covers expenditure towards compliance of deliverables contained in SHE manual & ESHS component.
 - v) Schedule 'E': Covers application of anti-carbonation treatment to exposed concrete surface of Metro viaduct, NHAI elevated flyover and Railway span 80 m near Gaddi Godam on Lumpsum basis.
2. The Bill of Quantities shall be read in conjunction with Instructions to tenderers, General and Special Conditions of Contract, Notice Inviting Tender, Technical Specifications and Conceptual/ Layout Drawings.
3. Schedule 'A' of financial package comprises of scope of work under lumpsum basis. The bidder has to **quote a lump sum amount against** Schedule 'A'. Payment will be made as per Schedule for on account stage payment enclosed as **Annexure-1 of Schedule 'A'**.
4. Schedule 'B' consists of BOQ items as given in table below.
5. **Schedule 'B' consists of items to be executed. The bidder has to quote his unit rate against each of the item being executed and arrive at the final amount of Schedule-B.** The BOQ based Schedule-B has to be filled up by the bidder with the rates and amount item wise and has to be signed, scanned and duly uploaded in the financial section of e-tender portal of NMRCL. The final total amount of Schedule-B should be filled in the summary of financial bid section in the e-tender portal of NMRCL.
Note: - The rates and prices to be tendered in the Unit Priced Bill of Quantities of schedule 'B' are for completed and finished items of work and complete in all respects.
6. Schedule C consists of Lump sum provision to be operated for incidental and unforeseen items likely to require while execution of work. These items will be operated from USSOR (CR) -2011 i.e., Unified Standard Schedule of Rate or CPWD SOR. The cost under this Schedule (Schedule-C) will stand fixed as Rs 7,00,00,000/- and this amount of Rs Seven Crores already provided as fixed amount in the summary of financial bid.
7. The Schedule-D containing expenditure towards compliance of deliverables contained in SHE manual & ESHS component. The bidder is advised to add lump sum value for each of the ten items in the Schedule-D and the total value for the said ten items and fill up the same in the summary of financial bid. Also the bidder must fill up the lump sum rate of the ten items of the Schedule-D duly sign it and scan it and upload it in the financial bid section of NMRCL e-tender portal.

8. The Schedule-E containing expenditure towards Covers application of anti-carbonation treatment to exposed concrete surface of Metro viaduct, NHAI elevated flyover and Railway span 80 m near Gaddi Godam on Lumpsum basis. The bidder is expected to add lump sum value for this schedule based on his assessment.
9. The total of the five schedule as mentioned above i.e. from Schedule-A to Schedule-E filled up by the bidder in the summary of financial bid shall be treated as the total price bid quoted by the bidder for evaluation purpose.
10. Demolition of existing structures shall be carried out without making any damage to adjacent structures, utilities and with all safety measures. It will be deemed to include cost of all plants, labour, supervision, materials, transport, all temporary works, erection, maintenance, utility identification, contractor's profit and establishment/overheads, all general risks, insurance liabilities, compliance of labour laws and obligations set out or implied in the contract. For taxes and duties, refer sr. No. 17 of Special Conditions of Contract (GCC Sub clause11.1.1)
11. If the tenderer fails to quote rates against any item, the tender will be treated as incomplete and non-responsive and shall be rejected.
12. All the unit rates and amounts should be filled both in figures and in words. In case of any discrepancy between the two, the value provided in words shall be treated as sacrosanct. Para -E 31 of ITT may also be seen in this connection.
13. All columns in the Bill of Quantities shall be filled in indelible ink or type written and the total tender amount shown in the bottom. The person authorized to sign on behalf of the Tenderer shall sign in full with company seal and date at the bottom of all pages and the end of Schedules 'A', Schedule B, Schedule C , Schedule D and Schedule E .
14. This Schedule of Payment/Specified in Annexure-1 of Schedule A is purely for the purpose of releasing 'On Account payments' for the work executed under the 'Lump Sum' component of the work. The work executed against the BOQ items in Schedule B would be paid on measurement basis.
15. The work executed against the lump sum items in Schedule E would be paid on the following basis.
 - i) Out of total amount it is assumed that the Metro viaduct would contribute 55% and rest 45% by NHAI viaduct.
 - ii) Pier, pier cap, Spine girder, Cantilever arms, pedestal, etc. (All structural items below Deck slab) supporting NHAI viaduct are considered under NHAI portion for painting.
 - iii)The payment would be governed by the stage payment schedule as detailed below;

Overall percentage 100% i.e. quoted lump sum price has been divided in two Heads. The Percentage breakup of cost component for Head "M" (Metro) shall be not less than 55% of lump sum quoted price and Head "F" (NHAI Flyover) is not more than 45% of lump sum quoted price.			
S. No.	Description of Items	Payable unit	Percentage break up of "M"
Head "M" METRO (Equal to 55% of Quoted value for Schedule 'E')			
Sub Heads			

M-1.1	Anti carbonation Painting to Piers of all heights above pile cap / Flyover deck slab and upto Pier cap	LS	10.00%
M-1.2	Anti carbonation Painting to Pier caps at all heights	LS	5.00%
M-1.3	Anti carbonation Painting to girders with parapet, extended diaphragms, walls, etc.	L.S.	80.00%
	Anti carbonation Painting to all miscellaneous items like pedestals, seismic restrainers, etc.		
			100.00%
Head "F" NHA1 FLYOVER (Equal to 45% of Quoted value for Schedule 'E')			
Sub Heads			
F-1.1	Anti carbonation Painting to Piers of all heights above pile cap upto flyover Pier cap	LS	10.00%
F-1.2	Anti carbonation Painting to Pier caps at all heights	LS	7.00%
F-1.3	Anti carbonation Painting to spine girders at all heights.	L.S.	28.00%
F-1.4	Anti carbonation Painting to cantilever arms and soffit of the deck slab at all heights.	L.S.	50.00%
F-1.5	Anti carbonation Painting to all miscellaneous items like pedestals, seismic restrainers, etc.	LS	5.00%
			100.00%

16. The cost of work is for Construction of Viaduct, NHA1 flyover with viaduct and Railway span as per the details provided in the tender documents.
17. For the purpose of payment the proportion of the cost of viaduct would be considered as 97.50 % of the total cost against the 'Lump Sum' component while 2.5% would be considered towards general works. Thus if 'X' is the total cost of Lump Sum component and G and V are considered to be the cost component of General works and Viaduct respectively.
Total Cost of Head "G" (General) = 0.025 'X'
Total Cost of Head "V" (Viaduct) = 0.975 'X'
18. The payment under the Payment Schedule will cover all works specified in the tender drawing and / or provided in the scope of work. The Schedule of Payment will not get modified due to alterations of any type so far as the modifications/alterations are within the scope of work and/or provided for in the tender drawings.
19. The Contractor may raise their 'On Account' bills on monthly basis as per the status of work on the last day of the respective month.

Signature of the Authorized Signatory with Company Seal

Summary of Financial Bid

NAME OF WORK: DESIGN AND CONSTRUCTION OF ELEVATED VIADUCT OF LENGTH 2.769 KM FROM CH: 3620.950 TO CH: 3962.558,4042.558 TO 5988.303 AND 6131.017 TO 6612.560 BETWEEN GADDIGODAM TO SITABULDI (EXCLUDING ZERO MILE STATION) AND RAILWAY SPAN NEAR GADDIGODAM, VIADUCT AND ROAD CUM RAIL FLYOVER (DOUBLE DECKER) OF LENGTH 4.375KM INCLUDING APPROACH RAMPS FROM CH:-673.910 TO 3620.950 AND 3962.558 TO 4042.558 ON BOQ BASIS (REACH 2).

S.No.	Schedule	Description	Quoted Amount In Indian Rupees (In figures)
1	2	3	4
1	Schedule 'A'	Price of lump sum viaduct portion of the work.
2	Schedule 'B'	Construction of metro viaduct cum NHAI elevated flyover and railway span on BOQ basis
3	Schedule 'C'	Miscellaneous items for works which are not covered in Schedule B and not included in lump sum component.	7,00,00,000/-
3	Schedule 'D'	SOCIAL, HEALTH & ENVIRONMENT (SHE) (including ESMP) COST SCHEDULE (Lump sum)
4	Schedule 'E'	Application of anti-carbonation paint concrete surface of Metro viaduct, NHAI flyover and of ROR.
		A+B+C+D+E (In figures):
Grand Total		(In words):

Signature of the Authorized Signatory with Company Seal

NAME OF WORK: : DESIGN AND CONSTRUCTION OF ELEVATED VIADUCT OF LENGTH 2.607 KM FROM CH: 3620.950 TO CH: 3962.558,4042.558 TO 4330.490, CH: 4411.490 TO 5174.498, CH: 5255.498 TO 5988.303 5988.303 AND 6131.017 TO 6612.560 BETWEEN GADDIGODAM TO SITABULDI (EXCLUDING ZERO MILE STATION)AND RAILWAY SPAN NEAR GADDIGODAM, VIADUCT AND ROAD CUM RAIL FLYOVER (DOUBLE DECKER) OF LENGTH 4.065KM INCLUDING APPROACH RAMPS FROM CH:-673.910 TO -219.050, CH:-213.550 TO 939.360, CH:1016.860 TO 2097.068, CH:2174.568 TO 3125.73 CH:,3202.870 TO 3620.950 AND CH:3962.558 TO 4042.558 ON BOQ BASIS (EXCLUDING STATIONS) IN REACH-2.

SCHEDULE –A

Price of Lump sum viaduct portion of the work

The tenderer may quote his offer in Indian Rupees ONLY. The offer should be in the following proforma:

Indian Rupees	
IN FIGURES	
IN WORDS	

Signature of the Authorized Signatory with Company Seal

NAME OF WORK: : DESIGN AND CONSTRUCTION OF ELEVATED VIADUCT OF LENGTH 2.607 KM FROM CH: 3620.950 TO CH: 3962.558,4042.558 TO 4330.490, CH: 4411.490 TO 5174.498, CH: 5255.498 TO 5988.303 5988.303 AND 6131.017 TO 6612.560 BETWEEN GADDIGODAM TO SITABULDI (EXCLUDING ZERO MILE STATION)AND RAILWAY SPAN NEAR GADDIGODAM, VIADUCT AND ROAD CUM RAIL FLYOVER (DOUBLE DECKER) OF LENGTH 4.065KM INCLUDING APPROACH RAMPS FROM CH:-673.910 TO -219.050, CH:-213.550 TO 939.360, CH:1016.860 TO 2097.068, CH:2174.568 TO 3125.73 CH:,3202.870 TO 3620.950 AND CH:3962.558 TO 4042.558 ON BOQ BASIS (EXCLUDING STATIONS) IN REACH-2.

Schedule B

<u>CONSTRUCTION OF METRO VIADUCT CUM NHAI FLYOVER AND RAILWAY SPAN ON BOQ BASIS</u>		
Sr. No.	Item	Amount (in Rupees)
1.	Items of works on BOQ basis which are not covered in Lump sum Component	
Total amount of Schedule B		

Total Quoted Amount in figures:

Rupees

Total Quoted amount in words:

Rupees:.....

Signature of the Authorized Signatory with Company Seal

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SCHEDULE - B: METRO VIADUCT , NHAI FLYOVER AND Railway Span On BOQ BASIS

CONSTRUCTION OF NHAI FLYOVER AND ELEVATED METRO VIADUCT OF LENGTH 4.295 km from CH: -673.910 to 3620.950m and Railway Span of 80m SPAN NEAR GADDI GODAM from CH: 3962.558 TO 4042.558m.

Item	Description	Amount (Rs)
1	Sub-head V01: Foundation	
2	Sub-head V02: In-Situ Concrete Work for Sub-Structure	
3	Sub-head V03: In-Situ Concrete Work for Superstructure	
4	Sub-head V04: Precast Concrete Work for Superstructure	
5	Sub-head V05: Reinforcement, Pre-Stressing Steel and Structural Steel	
6	Sub-head V06: Bearings	
7	Sub-head V07: Viaduct Miscellaneous Items	
8	RE Wall & Road Works	
GRAND TOTAL OF SCHEDULE- B		

Note:- NMRCL reserves the right to execute this work partially or in full without any liability to either parties

SCHEDULE – B**METRO VIADUCT CUM NHAI FLYOVER FOR 4.065 KM STRETCH ALONG WITH RAILWAY SPAN OF 80m**

NAME OF WORK: : DESIGN AND CONSTRUCTION OF ELEVATED VIADUCT OF LENGTH 2.607 KM FROM CH: 3620.950 TO CH: 3962.558,4042.558 TO 4330.490, CH: 4411.490 TO 5174.498, CH: 5255.498 TO 5988.303 5988.303 AND 6131.017 TO 6612.560 BETWEEN GADDIGODAM TO SITABULDI (EXCLUDING ZERO MILE STATION)AND RAILWAY SPAN NEAR GADDIGODAM, VIADUCT AND ROAD CUM RAIL FLYOVER (DOUBLE DECKER) OF LENGTH 4.065KM INCLUDING APPROACH RAMP FROM CH:-673.910 TO -219.050, CH:-213.550 TO 939.360, CH:1016.860 TO 2097.068, CH:2174.568 TO 3125.73 CH:,3202.870 TO 3620.950 AND CH:3962.558 TO 4042.558 ON BOQ BASIS (EXCLUDING STATIONS) IN REACH-2.

Item	Description	As per BOQ			
		Unit	Est. Qty	Unit Rate (RS)	BOQ Amount (RS)
V01	FOUNDATION				
	<p>Providing and installing cast-in-situ vertical bored piles of approximate depth as per drawing and with M35/20 where "35" is the grade of concrete (using portland slag cement / Ordinary Portland cement) including all operations such as installation and shifting of piling rig etc, in all soil strata along elevated section and "20" is the "nominal maximum aggregate size"..The stated length include test piles for initial load tests. (Measurement shall be from cut-off level to founding level). The item includes disposal of earth, muck, slush released from piles, top cutted portion of pile at contractor's own disposal ground for all leads. Reinforcement shall be paid separately. Rate shall include cost of using required dosage of admixture in concrete for obtaining required workability as per approval of Engineer. Rate shall include provision of A class MS Steel pipes of 50mm outer Diameter as per technical specification , 2.9mm thick (light) as per IS: 1239 in all piles at the time of casting to be used for cross- hole sonic test. Pipes shall extend from ground level to bottom of pile where pipe shall be sealed at bottom. Rate shall include filling of tubes after sonic test using standard cement non-shrink mortar before casting of pile cap/transition block. The item shall also include the cost of polymer to be used for stabilisation of bore.</p>				
	Note: Contractor shall locate suitable place for dumping waste material at his own.				
1.1	For 1200mm dia Pile				
	(i) By hydraulic rigs using partial depth temporary casing and polymer	RM	12,571		

	(ii) Extra over (i) above for drilling and Socketing in weathered rock with total socketing length up to 3xD (3.6m) for 1200 mm dia pile	RM	3,404		
2	Providing and fixing permanent MS liner (of required 6mm thickness or as directed by engineer-in-charge) for 1200mm dia bored cast-in-situ piles wherever required as per the approved construction drawings and directions of engineer-in-charge all complete and applying a priming coat of approved steel primer.	MT	67		
	NOTES				
	The scope of work in the above item includes.				
	The liner shall be of MS steel plate, of 6mm thickness or as per drawings duly approved. The payment of liner shall be made in Kg as per the area of the MS sheet provided in liner multiplied by standard weight coefficient or actual weight, whichever is less. The quoted rates will be applicable for all lengths provided upto the bottom of pile cap. The measurement will be made for the actual length of liner provided correct to one centimeter.				
3	Carrying out initial vertical load tests as per relevant IS Codes including all arrangements for measuring deflections and submitting reports as per specifications. This includes making of pile head ready for testing at the desired level, supporting / reaction arrangement (including reaction piles/soil/rock anchors, if any) for the kentledge load. (Cost of pile to be tested is paid in item 1)				
3.1	1200 mm dia pile (2.5 times the theoretical design vertical load capacity of 700t, The test arrangements to be designed shall cater for additional 25% above test load)	Nos.	7		

4	Carrying out initial lateral load tests as per relevant IS Codes including all arrangements for measuring deflections and submitting reports as per specification and tender drawing. This includes making of pile head ready for testing at the desired level, supporting / reaction arrangement (include reaction piles/ soil/ rock anchors, if any) for the kentledge load. (Cost of pile is paid in item 1)				
4.1	1200 mm dia pile (2.5 times the theoretical design lateral load capacity of 25t)	Nos.	7		
5	Carrying out static routine vertical load tests as per relevant IS Codes including all arrangements for measuring deflections and submitting reports. This includes making of pile head ready for testing at the desired level, supporting / reaction arrangement (incl. reaction piles/soil/rock anchors, if any) for the kentledge load.				
5.1	1200 mm dia pile (1.5 times the theoretical design vertical load capacity of 700t.)	Nos.	18		
6	Carrying out dynamic routine vertical load tests as directed by the Engineer and as per NMRC's standards, including all arrangements for measuring deflections and submitting reports. This includes making of pile head ready for testing at the desired level, supporting / reaction arrangement (incl. reaction piles/soil/rock anchors, if any) for the kentledge load.				
6.1	1200 mm dia pile (1.5 times the theoretical design vertical load capacity of 700t.)	Nos.	7		
7	Carrying out static routine lateral load tests as per relevant IS Codes including all arrangements for measuring deflections and submitting reports. This includes making of pile head ready for testing at the desired level, supporting / reaction arrangement (incl. reaction piles/ soil/ rock anchors, if any) for the kentledge load.				
7.1	1200 mm dia pile (1.5 times the theoretical design lateral load capacity of 25t)	Nos.	12		
8	Non destructive integrity testing (low strain) of cast in situ piles as per specifications, and submitting reports. (Payment shall be made for number of pile tested)				
8.1	1200 mm diameter piles	Nos.	1,050		

	Non destructive integrity testing (high strain) of cast in situ piles as per specifications, and submitting reports. (Payment shall be made for number of pile tested)				
8.3	1200 mm diameter piles	Nos.	11		
9	Integrity pile test using cross hole sonic logging for 1200mm diameter pile as per the provision of ASTM standard D6760, as per drawings & technical specifications (Payment shall be made for number of pile tested)				
9.1	for 1200 mm dia	Nos.	225		
10	Boring 100mm dia borehole, 5m deep at pile locations to find out underground utilities as directed by Engineer.	RM	800		
11	Carrying out GPR survey to locate underground utilities upto 6m depth with a corridor width of 5m x 5m grid as directed by Engineer. Cost should include preparation of report and drawings both in soft and hard copy.	m ²	27,500		
12	Earthwork in excavation for floors of the flyovers , retaining walls etc. including setting out, dressing of sides, ramming of bottom, getting out the excavated material, back filling in layers with approved material and consolidation of the layers by ramming and watering etc. including all lift, disposal of surplus soil upto a lead of 300m, all types of shoring and strutting with all labour and material complete as per drawing and technical specifications as directed by Engineer				
12.1	All kinds of soils	m ³	1,000		
12.2	Ordinary Rock	m ³	200		
	TOTAL OF V01				
V02	IN-SITU CONCRETE WORK FOR SUB-STRUCTURE				
1	Providing M 15/20 concrete for Minimum 100mm thick PCC below pile cap, open foundation slabs extending 100mm all around beyond pile cap, open foundation slabs. Rate shall include cost of using required dosage of admixture in concrete for obtaining required workability as per approval of Engineer.	m ³	1,282		

<p>2</p>	<p>Providing M 45/20 concrete (using Portland slag cement / Ordinary Portland Cement as per technical specifications) for following concrete works: Pile cap including excavation through existing concrete and water bound macadam road /bituminous road / cement road of all thicknesses including dismantling other structures, dead utilities etc. and soil including dewatering, pumping and bailing out water, strutting and shoring etc. This item also includes formwork and backfilling in foundation including watering, compacting with a vibratory plate compactor and loading, leading and disposal of surplus excavated material using lockable and covered trucks so as to ensure that during transportation the carried material does not spill out. The item includes disposal of earth, muck, slush released from piles, top cutted portion of pile at contractor's own disposal ground for all leads. Reinforcement shall be paid separately. Rate shall include cost of using required dosage of admixture in concrete for obtaining required workability as per approval of Engineer. Measurement shall be considered only the total volume of pile cap concrete (excluding PCC below pile cap). This item includes cost of back filling with earth of approved quality in layers, compacting etc.</p>	<p>m³</p>	<p>22,440</p>		
<p>3</p>	<p>Providing concrete (cement as per technical specification) for Viaduct piers of all heights (standard pier, portal pier, cantilever piers, piers for extended pier caps, piers for cross-over structures) incl. shuttering, scaffolding and all related operations as required for completing the work. Reinforcement shall be paid separately. Rate shall include cost of using required dosage of admixture in concrete for obtaining required workability as per approval of Engineer.</p>				
<p>3.1</p>	<p>For pier in M50/20 Grade Concrete</p>	<p>m³</p>	<p>11,353</p>		
<p>3.2</p>	<p>For pier in M60/20 Grade Concrete</p>	<p>m³</p>	<p>100</p>		

<p>4</p>	<p>Providing and laying in position reinforced cement concrete grade M20/20 in ground level elements for medians etc including centering, shuttering, propping, staging, scaffolding, necessary tools, plants, machinery and all related operations etc. for all heights using steel material for shuttering & steel props. Rate shall include all lead and lift & cost of providing cutout etc. in formwork & using required dosage of admixture in concrete for obtaining required workability as per approval of Engineer. The work will include vibration of concrete, curing, protecting from damage, making site good , etc. complete as per drawings, specifications and as directed by the Engineer. The rate shall also include preparation of construction joints as per specification and providing approved wire mesh/weld mesh at such location, as required and as approved by Engineer or as shown in drawings. Reinforcement shall measured and paid under relevant BOQ item separately.</p>	<p>m³</p>	<p>1,200</p>		
<p>5</p>	<p>Providing and laying in position machine mixed, machine vibrated and machine batched Design Mix Cement Concrete M45 grade (Cast-in-situ) using 20mm graded crushed stone aggregate and coarse sand of approved quality for the following reinforced cement concrete structural elements for foundation like footing raft, retaining wall etc. including finishing, using admixtures in recommended proportions (as per IS 9103), if approved in mix design to accelerate or retard setting of concrete and/ or improve workability without impariring strength and durability complete as per sprcifications and direction of the Engineer incharge. The rate includes cost toward cement other materials, curing , labour etc. This item includes the cost of back filling with earth of approved quality,in layers, compaction etc.</p>	<p>m³</p>	<p>1,200</p>		

<p>6</p>	<p>Providing and laying M40/20 grade cement concrete (cement as per technical specification) for reinforced cement concrete crash barrier/Pier Protection all round the pier leaving a gap of 25mm min between and following the pier shape exactly on at grade road as specified in drawings, including centering, shuttering, scaffolding, curing and all related operations as required to complete the work. The gap shall be filled with either with coarse sand or compressible filler board of high density as directed by Engineer/as per GFC drawings. Rate shall also include the cost of required dosage of admixture in concrete for obtaining required workability and cost of compressible fibre board or coarse sand as per specification and approval of Engineer.</p>	<p>m³</p>	<p>5,770</p>		
	<p>TOTAL OF V02</p>				
<p>V03</p>	<p>IN-SITU CONCRETE WORK FOR SUPERSTRUCTURE</p>				
<p>1</p>	<p>Providing M 45/20 concrete (cement as per technical specification) for Portal Beams , Pier cap, Pier head, Cantilever arms, etc. etc for situations where precast girders are not practicable ,including centering, steel shuttering, scaffolding and all related operations as required to complete the work as specified in drawings. Reinforcement shall be paid separately. Rate shall include cost of using required dosage of admixture in concrete for obtaining required workability as per approval of Engineer.</p>	<p>m³</p>	<p>6,282</p>		
<p>2</p>	<p>Providing M45/20 concrete (cement as per technical specification) deck slab over Precast I-Beams/Steel beams & cross girder including centering, steel shuttering, scaffolding and all related operations as required to complete the work as specified in drawings. Rate includes provision of sacrificial formwork for casting of slab. Reinforcement shall be paid separately. Rate shall include cost of using required dosage of admixture in concrete for obtaining required workability as per approval of Engineer.</p>	<p>m³</p>	<p>240</p>		
<p>3</p>	<p>Providing, supplying, transporting and placing stitch concrete of grade M60 self compacting concrete with suitable admixtures, curing etc. for joining precast cantilever arms with segmental spine girder cost to include formwork, centering etc</p>	<p>m³</p>	<p>3,150</p>		
	<p>TOTAL OF V03</p>				

V04	PRECAST CONCRETE FOR SUPERSTRUCTURE				
1	<p>Providing and laying cement concrete of Grade M50/20 for concreting and curing precast segments of all spans (straight or curved) weighing up to 53 T in the casting yard including provision of shear connector for secondary pour concrete for rail plinths, (reinforcement steel shall be measured separately, as per respective item), bolt holes for fixation of Blisters for temporary Pre-Stressing, provision for future external Pre-Stressing arrangement, lifting the segments from the mould and shifting the same to the stacking yard. (Note: the cost shall be inclusive of the cost proportionate treatment for each cubicmeter of concrete for having provided all infrastructure in the casting yard, gantry cranes, moulds, casting beds mobile cranes, stores, concrete batching plant establishing labs, cut-outs, shear keys, bulkheads, end block in situ concrete after stressing etc. where specified, all curing arrangements as required all handling etc. complete). Rate also includes all inserts, bolts in parapet, GI OHE bolts as per drawings and specifications. Reinforcement steel shall be paid separately under relevant BOQ item. Payment for Prestressing system (includes strands, anchorages, sheathing, vent pipe..etc) will be measured under item 2 of Section E. Rate shall include the cost of required dosage of admixture in concrete for obtaining required workability as per specification and approval of Engineer. The Rate shall also include UPV testing (by approved NABL) for all end segments.</p> <p>Note:</p> <p>(i) The removal of inside shutters must be carried out using semi automatic hydraulic equipment.</p> <p>(ii) At the end of the work all the infrastructure facilities provided in casting yard may be taken back by the Contractor.</p> <p>(iii) Some inserts fabricated by other agencies which have to be incorporated in the precast segments/ cast-in-situ spans /piers/ pile cap/pile would have to be handed over to the contractor for placement and fixing in the reinforcement cage/ shuttering before concreting. No extra payment will be made for such inserts</p>	m ³	22,505		

<p>2</p>	<p>Providing and laying cement concrete of Grade M50/20 for concreting and curing precast spine girder segments of all spans (straight or curved weighing up to 72 MT) in the casting yard including provision of shear connector for secondary pour concrete for rail plinths, (reinforcement steel shall be measured separately, as per respective item), bolt holes for fixation of Blisters for temporary Pre-Stressing, provision for future external Pre-Stressing arrangement, lifting the segments from the mould and shifting the same to the stacking yard. (Note: the cost shall be inclusive of the cost proportionate treatment for each cubicmeter of concrete for having provided all infrastructure in the casting yard, gantry cranes, moulds, casting beds mobile cranes, stores, concrete batching plant establishing labs, cut-outs, shear keys, bulkheads, end block in situ concrete after stressing etc. where specified, all curing arrangements as required all handling etc. complete). Reinforcement steel shall be paid separately under relevant BOQ item. Payment for Prestressing system (includes strands, anchorages, sheathing, vent pipe..etc) will be measured under item 2 of Section E. Rate shall include the cost of required dosage of admixture in concrete for obtaining required workability as per specification and approval of Engineer. The Rate shall also include UPV testing (by approved NABL) for all end segments.</p>	<p>m3</p>	<p>27,375</p>		
<p>3</p>	<p>Providing, casting and curing precast PSC I-Girder Grade M50/20 (Post-Tensioned girders for transition spans) simply supported standard/special spans of all types (straight or curved as per approved GAD) in the casting yard including provision of lifting the girders from the mould and shifting the same to the stacking yard (Note: Quoted rate shall be inclusive of all infrastructure in the casting yard, gantry cranes, moulds, casting beds, mobile cranes,stores,concrete batching plant,testing labs,bulk heads, approved curing arrangements as required, all handling etc complete), teflon sheet at the end for placing on portal / arrangement for placing bearing as required and shown in drawing etc. complete). Pre-stressing strand/system and Reqinforcement shall be paid seperately in respective items. Rate shall include cost of lifting hooks, using required dosage of admixture in concrete for obtaining required workability as per approval of Engineer.</p>	<p>m³</p>	<p>50</p>		

	Note : Type, Size and number of shutter moulds shall be as per the GFC drawings and nothing extra is payable.				
4	Providing, casting and curing precast RCC cantilever arms of varying lengths between 5.8m to 7m (approx weighing up to 19 MT) in the casting yard including provision of shear connector for secondary pour concrete, bolt holes, lifting hooks for lifting the arms from the mould and shifting the same to the stacking yard (Note: the cost shall be inclusive of the cost of casting yard, gantry, moulds, providing cutouts where specified curing arrangements as required all handling etc. complete). Reinforcement anchorages and sheating shall be paid separately. Rate shall include cost of using required dosage of admixture in concrete for obtaining required workability & setting time as per approval of Engineer. It may be noted that inner shutter for the special span shall be different from that for standard spans.	m3	18,080		
5	Transporting precast segments from casting yard to work site, launching and erection in position				
5.1	<p>Loading, transporting precast segments from casting yard to work site, launching and erection in position with launching girder, including the erection and shifting of launching girder (minimum two nos of Launching girders to be mobilized), cost of all temporary supports, launching girder, erection equipment, transporting etc, applying epoxy-based bonding agent on end surfaces of segments after dry matching including temporary prestressing required during its curing period and positioning on bearings etc. (Unit weight of 2.5MT/Cum shall be used to derive the weight of every segment). This same item shall be operated for any type of launching scheme adopted.</p> <p>Note : 2% of the amount will be with held till the structure is handed over to the designated contractor.</p>	MT	1,24,700		
6	Transporting precast post tensioned I girders from casting yard to work site, launching and erection in position				

<p>6.1</p>	<p>Loading, transporting precast post tensioned I girders casting yard to work site, launching and erection in position with cranes/ launching girder, including the erection ,cost of all temporary supports, launching truss , erection equipment, transporting etc,and positioning on bearings etc. (Unit weight of 2.5MT/Cum shall be used to derive the weight of the precast element). This same item shall be operated for any type of launching scheme adopted.</p> <p>Note : 2% of the amount will be with held till the structure is handed over to the designated contractor.</p>	<p>MT</p>	<p>125</p>		
<p>7</p>	<p>Transporting precast cantilever arms (special as well as standard) from the casting yard to work site, launching or erection in positin on launching girder supports including the cost of all temporary supports, launching girder, erection equipment, transporting etc., applying epoxy-based bonding agent on end surfaces of segments including temporary bar prestressing required during its curing period, and positioning on bearings etc.</p>	<p>MT</p>	<p>45,200</p>		
<p>8</p>	<p>Load testing of PSC Box Girder / Spine girder</p>				
<p>8.1</p>	<p>Conducting Load Testing of 22m/25m/28m/31m or more span PSC box girder / spine girder including making all arrangement and conducting satisfactory Load testing on simply supported span constructed by pre-cast segments , erected in position on the piers at site, including arrangement for application of actual design serviceable vertical load of approx 400 MT / 500 MT or as directed by Engineer, arrangement for measurement of deflection at various salient points of the girder and submitting a report. The details of placement, position, increment of load on the simply supported span and installation of measurement devices etc. shall be as directed by the Engineer..Rate shall include submission of method statement and third party certification of the test.</p> <p>Note:Load testing may have to be carried out on more than one span.</p>	<p>MT</p>	<p>800</p>		
<p>TOTAL OF V04</p>					
<p>V05</p>	<p>REINFORCEMENT, PRESTRESSING STEEL AND STRUCTURAL STEEL</p>				

<p>1</p>	<p>Providing TMT reinforcement steel of Fe-500D grade, from approved supplier, handling, straightening, cutting, bending, tying, lap welding, placing in position including binding wire in diamond form at each reinforcement junction in all structural concrete at all heights and depths with all leads complete as per specifications and as directed including welding involved towards stray current protection effects as per the system approved by Engineer.</p>	<p>MT</p>	<p>28,545</p>		
	<p>Note:</p> <p>(i) No extra payment will be made for lap joint welding in pile reinforcement.</p> <p>(ii) For other structural members, lap joints are permitted for bar diameter <= 25 mm as directed by Engineer. However no extra payment shall be made for the lap the cost of which is deemed to be included in the rates.</p> <p>(iii) The cost quoted should cover all welding and providing mechanical couplers, etc., complete.</p> <p>(iv) The cost quoted should cover coating on reinforcement bar as per technical specification.</p>				
<p>2</p>	<p>Supplying and post threading uncoated stress-relieved low relaxation steel strands conforming to IS :14268 , class-2 , for various precast concrete elements such as segmental box girders Precast I girders ,Cantilever/Extended/Portal pier caps extended diaphragms for 19K15,12K15, 7K15 with , corrugated HDPE duct -3.3mm /2.8 mm thick, including couplers vent pipes ,spacers, anchorages, stressing using Multi strand stressing jacks ,curing , epoxy protection of anchorages, sealing of anchorage recess with concrete (same grade as structure) and all related operations to complete the work. (Note: the details shown on the drawing all likely to change and nothing extra will be paid to the contractor on this account).</p>				
<p>2.1</p>	<p>Longitudinal prestressing steel for Girders, Cantilever/ Extended/ Portal pier caps</p>	<p>MT</p>	<p>1,894</p>		
<p>2.2</p>	<p>Transverse prestressing steel for precst cantilever/ Extended/ Portal Pier caps</p>	<p>MT</p>	<p>570</p>		

<p>3</p>	<p>Providing , fabricating and erecting structural steel for hand railing and other structural members for viaduct including transition span consisting of tubular and rolled sections profiled to require shape, inserts, plates with welded hold fasts for walk-way, earth terminal plates, insert plates with welded hold-fasts, internal threaded sleeves including MS bolts tightened by Torque wrench and primer coat (zinc eplux or equivalent) & three coats of aluminium paint as per specification and drawing, with all lead and lifts and as per the directions of engineer. The rate shall also include required surface preparation (sand blasting), Stage Payment at 60% of the accepted rate or 80% of the invoice value whichever is minimum shall be paid on receipt of material at site and its certification by the Engineer against submission of original invoice and manufacturer Test reports and the indemnity bond. The total stage payment made at any given time shall not exceed 20% of the accepted value of this item.</p>	<p>MT</p>	<p>271</p>		
<p>4</p>	<p>Supply, fabrication and erection of Welded type Composite truss of 80 m span for Metro loading with the following steel grade at site as per approved drawings, Indian Railway Unified Standard Specifications (W&M) - 2010 (amended up to date) and Indian Railways standard specification for fabrication and erection of steel girder bridges and locomotive turntables (Fabrication Specifications) Serial No B1-2001 (amended up to date) including all incidental works etc., supplying and fixing in position of shop welding / shop bolting with nuts and washers, field bolts, primer coat (zinc eplux or equivalent) & three coats of aluminium paint as per specification and drawing, etc. required for complete fabrication of the girders and transportation of the fabricated materials at site and stacking of the same at places as directed by Engineer including metalizing as per clause No 39.2.1 of B1-2001 over the structural members with all contractor's labour, fuel, consumables, machinery, loading, unloading, tools & plants, material, lead and lift complete in all respect, as a complete job as per specifications and as directed by Engineer. Notes: - 1) Steel (Plates and Rolled sections) should conform to IS: 2062-2011. It shall have Sub quality 'BR' & Grade E250 (Fe 410 W).12 mm thick & above plates shall be fully skilled and fully normalized / controlled cooled. 2) The steel shall be procured only from those firms, which are Established, Reliable, Indigenous & Primary Producers of Steel, having Integrated Steel Plants (ISP), using iron ore as the basic raw material and having in</p>				

	<p>house iron rolling facilities, followed by production of liquid steel & crude steel.</p>				
	<p>3) (a) 40 % of rate payment shall be made after steel material required for fabrication (as per drawing) is received at site. (b) 15 % of rate payment shall be made on acceptance of fabricated components at site. (c) 20 % of rate payment shall be made after erection & launching. (d) 25 % of rate payment shall be made after final approval of NMRCL and successful completion of all works included in this item including metallising and finishing complete. 4) No deduction for holes and no addition for rivets / bolts / welds / HSFG Bolts etc. shall be made. 5) The contractor shall submit the detailed erection drawing and Launching scheme along with necessary design calculations for approval from RITES Ltd before erection and launching of girder. 6) Temporary supports if any required for the erection / launching shall be erected after the approval of Engineer. Nothing extra shall be payable on this account. 7) The contractor shall take all safety precautions that will be necessary in consultation with Engineer as per extant rules / guidelines. Nothing extra shall be payable on this account.</p>				

	<p>8) Notwithstanding above, the contractor shall be fully responsible for any mishap that may occur as a result of negligent working.</p> <p>9) Contractor has to take every precautionary measure for safety of running train during and after launching of girder.</p> <p>10) The rate includes launching under traffic blocks wherever required. However, the rate does not include the cost of possession of traffic / OHE block.</p> <p>11) The Block required shall be arranged by NMRCL. The duration of the block shall be as approved by Engineer. If the Block granted is not made available due to unavoidable reasons, nothing extra / no compensation shall be paid.</p> <p>12) However penalties, if any, levied by NMRCL caused due to any careless working or otherwise of violation of the Terms and Conditions of the track /OHE block, shall be payable by the contractor. Meant for 83 m span ROR at CH: 7100 TO CH: 7183</p>				
4.1	Grade E250	MT	230		
4.2	Grade E350	MT	650		
	TOTAL OF V05				
V06	BEARINGS				
1	Elastomeric bearings				
1.1	(i) For horizontal bearings below Concrete box girders/Steel Beams - Providing, fitting and fixing in position true in line and level elastomeric bearings, complete in all respect with all components, materials, equipments etc. as per technical specification except cost of steel wedges, which will be paid as per item V06-2(v).	Cucm	2,32,50,958		
1.2	For Vertical bearings @ Sismic restrainer including stainless steel plate 12mm thick including all inserts, bolts, etc for shear keys	Cucm	36,13,315		
2	Supplying, fitting and fixing in position true to line and level POT-PTFE bearing consisting of a metal piston supported by a disc or un reinforced elastomer confined within a metal cylinder, sealing rings, dust seals, PTFE surface sliding against stainless steel mating surface, complete assembly to be of cast steel / fabricated structural steel, metal and elastomer elements complete as per IS 2062, IS: 1030, AISI:304, AISI:316, IS:6911, BS:3784, IS:3400, IS:226, BS				

	5400.,Bridge code and as per drawing and approved Technical Specifications The design of the bearings shall be submitted by the manufacturers/ contractor and got approved from NMRC before fixing. Test report of the bearings should be got approved before the materials are lifted from the manufacturer premises.				
	Note: Quoted price shall hold good for forces and movements varying by +/- 25% for those indicated.				
2.1	Fixed POT Bearing (FXB) V=675MT, H ₂ =25MT, HT=10MT V=590MT, H ₂ =65MT, HT=35MT	Nos	220		
2.2	Fixed POT Bearing (FXB) V=590MT, H ₂ =15MT, HT=5MT - Normal Longitudinal Translation +50mm / -25mm V=500MT, H ₂ =30MT, H ₂ =56MT - Seismic Trans Translation +45mm / -10mm	Nos	40		
2.3	Longitudinal Guide POT Bearing V=675MT, H ₂ =10MT - Normal V=590MT, HT=35MT - Seismic Longitudinal Translation +45mm / -10mm	Nos	220		
2.4	Longitudinal Guide POT Bearing V=590 MT, HT=5MT - Normal V=500 MT, HT=30MT - Seismic Trans Translation +45mm / -10mm	Nos	40		
3	Design, supplying, fitting and fixing in position true to line and level Spherical bearing for 80 m Span complete as per approved Technical Specifications. The design of the bearings shall be submitted by the manufacturers/ contractor and got approved from NMRCL before fixing. Test report of the bearings should be got approved before the materials are lifted from the manufacturer premises. (set comprises of one spherical fixed bearing, one spherical slide guide bearing(T), one spherical slide guide bearing(L) and a free float bearing)	Set	1		
	TOTAL OF V06				
V07	VIADUCT MISCELLANEOUS ITEMS				
1	Drainage Work				

	Providing & fixing of rigid HDPE rain water pipes in superstructure diaphragm (end segment) and down take pipes , bends , couplers , upper receiving cap etc upto bottom of pier through shear key / upto road incl. all accessories such as pipe clamps,GI grating , collection chamber anchor straps and its connections etc. as specified in drawings incl all accessories				
	(a) 180mm Dia	RM	6,650		
	(a) 250mm Dia	RM	1,700		
1.1	Providing and fixing MS drainage spout with grill in deck slab with hot dipped galvanising @ 650 g/sqm after welding as per specification and drawings	nos	803		
1.2	Providing and fixing MS Lower drainage box at shear key level with hot dipped galvanising @ 650 g/sqm after welding as per specification and drawings	nos	130		
2	INSERTS AND THREADED SLEEVES IN SEGMENT				
2.1	Providing, fabricating and erecting structural steel inserts for cable tray, inserts for OHE/ signalling mast, steel brackets over parapet for fixing signalling post, earthing arrangement consisting of flats/plates with welded hold fast, welded headed nuts, internal threaded sleeve, studs in the form of U bars (grade 8.8), bolts (class 4.6) etc.	MT	47		
3	Rain Water Harvesting				
	Providing and constructing the Rain water harvesting system in the median of the road including Boring /drilling of bore well of 300mm dia for casing /strainer pipes prescribed in the drawing, Excavation in all type of soils / rock, constructing BW chamber, foundation, RCC top slab, plastering, CI manhole cover, filling/packing gravels in the chamber and the annular space in the bore, filling granules in the vertical pipe, laying HDPE pipes from piers to chamber, etc. complete as per the GFC drawings.	NOS	74		
4	Expansion Joints				

<p>4.1</p>	<p>Design, manufacture, supply & installation of the approved expansion joint (W Seal)at the site at track level under the supervision of manufacturer's representative as per specification and expected movement (25 to 50 mm) as mentioned in relevant GFC drgs.</p>	<p>RM</p>	<p>1112</p>		
<p>4.2</p>	<p>Supplying providing and laying single strip seal type expansionas per deailed design and drawings to be providede by the Contractor and approved by the Engineer for movement of +20 mm -35 mm complying to MOST specifications</p>	<p>RM</p>	<p>2167</p>		
<p>5</p>	<p>Boring in all types of soil at selected Pier locations (Locations to be decided by the Engineer) up to 3m in hard rock (refer criteria for hard rock in preamble) or 30m boring whichever is earlier and collecting core samples in rock for determination core Recovery, RQD and carrying out compressive strength test of rock samples. The rate inclusive of boring in soil, conducting SPT and collecting samples at 3m depth intervals and submitting borelog reports with soil classifications / SPT, Drilling 3m in hard rock with double barrel core for obtaining samples for testing, of core recovery RQD and compressive strength as per standard practice, Preparation and submission of report containing core recovery, RQD, Compressive strength at Hard Rock Locations with all lead and lifts and as per the directives of Engineer</p>	<p>RM</p>	<p>1,550</p>		
<p>6</p>	<p>Traffic Signals, signages & other Traffic aids (as per IRC specification)</p>				
<p>6.1</p>	<p>Providing and fixing road informatory items viz. retro reflective traffic signs of high intensity as per IRC specification/ drawings and as recommended by MORTH supported on MS angle of size 35 x 35 x 4 mm depending upon the requirements. In concrete base of approved size at locations as directed by local traffic police/engineer and maintain them in in position till completion of work through out the entire length of viduct including loop line. The cost also include M15 Concrete for base of size 300 x300x300mm</p>	<p>Sq.m</p>	<p>350</p>		

6.2	Providing and fixing (including maintenance) Road infrastructure items required for traffic diversion as per MORTH specification/ drawings and as approved by local police, and as directed by the engineer-in-charge.				
6.2.1	Road delienator	Each	215		
6.2.2	Traffic Cones with following Details:	Each	410		
	i) Square Base Cone with heavy base				
	ii) Height : 705 mm				
	iii) Base : sqaure 390 mm x 390 mm				
	iv) Cone Colour : Red colour (UV stabilised)				
	v) Body Material : Low Density Poly Ethylene				
	vi) Reflective Part : 1 No. White colour Engineering Grade Reflective band of 125 mm width all round.				
7	Deployment of adequate manpower for day and night management of traffic at intersection, junctions, traffic diversions etc at various levels to the complete satisfaction of local traffic police and as directed by engineer for 8 hrs shift. Note : The traffic marshals should be familiar with traffic rules and regulations.				
7.1	Incharge	Shift	2,500		
7.2	Supervisor	Shift	7,500		
7.3	Traffic guards	Shift	62,500		
8	Providing and laying at or near ground level factory made kerb stone (top and bottom width 114 and 165mm respectively., 400mm high and 450mm length) of M-25 grade cement concrete in position to the required line, level and curvature, jointed with cement mortar 1:3 (1 cement: 3 coarse sand) including making joints with or without grooves (thickness of joints except at sharp curve shall not be more than 5mm), including making drainage opening wherever required complete etc. as per direction of Engineer-in-charge (length of finished kerb edging shall be measured for payment). (Precast C.C. kerb stone shall be approved by Engineer-in-charge).	RM	14,000		
9	Providing supplying and fixing in position, boundary pillars of standard design stones with NMRCL logo on it with reinforced cement concrete of M15 grade using 20mm and size granite metal as per standard design including cost of materials, steel, labour, curing complete as per specification.	Each	65		

<p>10</p>	<p>Diagonal Cross trenching works for identifying underground utility at every Pier locations to the required length, width and depth upto 3.0m from existing ground level , as per drawing, which includes excavation in all types of soil, hard soil, rock, footpath, bitumen road, concrete road, medians.. etc cutting of all types road surfaces and backfilling the same with available excavated earth. The rate includes surveying and taking coordinates of the existing utility and submitting the reports (hard & soft copy) of the same as per the directions of the Engineer</p>	<p>Cum</p>	<p>1,000</p>		
<p>11</p>	<p>Providing & fixing hard drawn steel wire fabric reinforcement from approved list of manufacturer, straightening, cutting, cleaning, bending, tying, lap/butt welding placing including binding with mild steel annealed binding wire of 18 SWG in all structural concrete at all heights and depths, with all lead and lift.etc complete as per drawing, specifications and directions of Engineer.</p>	<p>Kg</p>	<p>150</p>		
<p>12</p>	<p>Painting pier identification number on piers & parapet inner face at different locations as directed by Engineer-In -Charge duly following the colour scheme including all material and labour, with all lead & lift. Final coating to be done at the time of handing over.</p>	<p>Each</p>	<p>128</p>		
<p>13</p>	<p>During the contract period including the extended contract period till the final completion of the work, the contractor shall provide Surveying by establishing DGPS control points and TBM's, Marking of alignment and pier locations, vertical & horizontal clearances for the elevated section including modifications, if any, as per drawings. No extra amount will be paid to re- do or to re-establish any of the survey points. The control points are to be fixed using DGPS double frequency and the accuracy of 1 in 50,000 or better is to be assured.</p>	<p>Km</p>	<p>4.700</p>		
	<p>Note: The payment schedule for the item shall be as follows:</p> <p>i) Payment at 25% of total cost of the item on checking and verification of all control points and submission of drawings.</p> <p>ii) Payment at 70% of total cost of the item equally distributed over the duration of the contract period and will be paid on prorata basis.</p>				

	iii) Payment at 5% of total cost of the item on satisfactory completion of work along with the final bill.				
14	Providing temporary barricade of plain MS sheet 16 Gauge fixed with steel frame as per drawing, painting (including primer of approved quality) with synthetic enamel paint of approved color, quality and brand, writing lettering and logo of Metro including maintenance of the same duly cleaning the same on fortnightly basis and painting if required, arrangement for blinker lights on barricades during night as per requirement and as per the instruction of the engineer. Barricading should be rugged. During the construction, barricading has to be kept continuously. Nothing extra will be paid for dismantling and re-erecting the barricades at the same place. There should not be any opening at the end of barricade except at locations approved by Engineer.				
	Note:				
	(i) Barricades on either side shall be measured individually.				
	(ii) Once barricade has been provided and work started, removal of barricade is not permitted till completion of pile, pile cap, pier and pier caps, portal beams, segment erection, I girder erection, till completion of entire superstructure.				
	(iii) While erecting barricade, the bottom gap between barricade and road should be plugged with cement concrete from inside.				
	(iv) There should be minimum openings at the end of barricade to allow access of trucks / lorries and machine to site work area. Even these spacing should have proper opening & closing arrangements.				
	(v) For 2.0m barricades adequate blinking lights on barricade during night time must be ensured. The cost of this item should include provision for power pack / Genset etc. so as to ensure the blinking of lights in night time as long as barricades are in position at the work spot.				

	(vi) After completion of the entire work, the barricades shall be the property of the contractor. (vii) If the cleaning is not done including removal of posters regularly, a recovery shall be made at the rate of 0.1% of the accepted rate of item per fortnight on prorata basis of length not cleaned.				
	Barricading of height 2.0m height as per GFCD. Payment shall be made at 70% on erection of barricade and 30% on removal of barricade as per the instructions of Engineer.	RM	3,460		
15	Submitting colour photographs of the works as directed by the engineer at intervals as instructed by the engineer. One set shall comprise of 25 photographs in 3 copies each of size not less than 225mm x 175mm each in album form, apart from 3 soft copy of all photographs on DVD. The photographs chosen should cover important activities of the work.	Set	12		
16	Supply of video DVDs of 180 minutes duration comprising one master copy and two extra copy duly edited titled showing the progress of works and methodology and at interval as directed by the engineer. One set consists of one master copy and two extra copies.	Set	8		
17	Cutting / Felling trees of the girth (measured at a height of 1 m above ground level), including cutting of trunks and branches, removal and uprooting the stumps & roots and stacking of serviceable material, transporting it to the stores of employer/forest dept and disposal of unserviceable material at contractors dumping yard with all leads & lifts, loading & unloading..etc as directed by the engineer.				
17.1	Beyond 30 cm girth upto and including 60 cm girth	Each	25		
17.2	Beyond 60cm girth upto and including 90 cm girth	Each	25		
17.3	Beyond 90and above	Each	25		
18	Removal and uprooting of stumps and roots of all girth including disposal to the contractors dumping yard with all lead and lift including transportation loading, unloading etc, as directed by the engineer.				
18.1	Beyond 120 cm girth upto and including 240 cm girth	Each	25		
18.2	Above 240 cm girth	Each	25		

19	Supplying and fixing stainless steel chemical chemical Fasteners of approved make, including testing for fixing into already constructed RCC structure for OHE mast, etc.				
	a) 12mm dia	Nos.	100		
	b) 16mm dia	Nos.	100		
	c) 20mm dia	Nos.	100		
	f) 25mm dia	Nos.	100		
	g) 32mm dia	Nos.	100		
20	Supplying and fixing stainless steel Expansion Fasteners of approved make, including testing for fixing into already constructed RCC structure.				
	a) 8mm dia	Nos.	100		
	b) 10mm dia	Nos.	100		
	c) 12mm dia	Nos.	100		
	d) 16mm dia	Nos.	100		
TOTAL OF V07					
VO8	RE WALL AND ROAD WORKS				
1	Providing M35/20 reinforced cement concrete in open foundation for RE Wall, friction slab, approach slab, etc including providing 100mm thick M15/20 grade plain cement concrete, excavation through existing concrete and water bound macadam road/bituminous road/cement road soil, morrum and soft/wheathered rock including dismantling other structures, dead utilities etc. including dewatering, pumping and bailing out water, strutting and shoring etc. on all sides of excavated ground or road & cost involved in curing etc. This item also includes formwork and backfilling in foundation with local sand including watering, compacting with a vibratory plate compactor and loading, leading and disposal of surplus excavated material including of all lead & all lift using lockable and covered trucks so as to ensure that during transportation the carried material does not spill out. Reinforcement shall be paid separately. Rate shall include cost of using required dosage of admixture in concrete for obtaining required workability & setting time as per approval of Engineer as per drawing.	m3	930		

2	<p>Designing, providing, casting and erecting in position precast reinforced M-35 grade, fascia (panels only) with all components for reinforced soil embankment for approach retaining wall with corrosion protected reinforcing the strips / mesh / geogrid as specified in design including all materials, labour, connection, joint fillers, inserts, drainage outlets, erection of panel, perforated PVC pipe of 150mm dia for drain, wrapped with geotextile, applying coal tar epoxy paint on earth retaining face of panel, 300mm filter media behind RE Wall as per design including providing cast insitu foundation beam & coping beam on top of fascia panel etc. and improvement/strengthening of ground, if required complete as per approved drawing and as per MORTH 3100 Sp. and as directed by Engineer (including reinforcement with anticorrosive treatment with galvanization) for all heights as per drawing.</p>	SQM	1,550		
3	<p>Earth work in embankment for subgrade and hard shoulders manually or by using mechanical means with approved material obtained from borrow areas outside ROW having 4 days soaked CBR equal to or more than 8% laying in layers not exceeding 250mm loose, breaking clods and dressing to the required lines, curve grades and watering to OMC and compacting to 98% modified proctor density with vibratory roller having minimum 80-100KN static weight and or mini vibratory roller including all leads and lifts etc. complete as per drawing.</p>	Cum	13,560		
4	<p>Providing Granular Sub Base, Wet Mix Macadam, Primer coat, Tack coat with BM, DBM and BC, Bituminous Macadam & Bituminous concrete as detailed below (width of top BC layer shall be taken for payment purpose):</p>				
4.1	<p>Providing and laying 200 mm thick Granular Sub Base (drainage layer) conforming to Grading II of Table 400-2 each layer not exceeding the compacted thickness of 100mm with specified graded stone metal and sand mixed in place and laid with mechanical means spreading with motor grader and compacting with vibratory roller having minimum 80-100 KN static weight and or mini vibratory roller to achieve desired density of 98% of MDD including all material, labour, machinery with all leads and lifts etc. complete as per drawing.</p>	m3	2,600		

4.2	Providing and laying 300mm Wet Mix Macadam with paver finisher in specified thickness, each layer not exceeding 150mm compacted thickness including premixing in pugmill/plant well graded crushed stone aggregate with watering and spreading by to required profile and compacting with vibratory roller having minimum 80-100KN static weight and or mini vibratory roller to achieve desired density of 98% of MDD including all material, labour, machinery with all leads and lifts etc. complete as per drawing.	m3	3,900		
4.3	Providing and applying primer coat using bituminous emulsion complying to IS:8887 over prepared surface of granular base with emulsion at a temperature between 20-60 deg. C and applying a uniform coat with the aid of self propelled bitumen pressure spraying bar with nozzles of constant volume of pressure system @ 10kg/10Sqm including all material, labour, machinery with all leads and lifts etc. complete	Sqm	13,000		
4.4	Providing and applying tack coat with BM, DBM and BC by using 60/70 grade bitumen over prepared surface preheated to the specified temperature and applying a uniform coat with the aid of self propelled bitumen pressure sprayer with self heating arrangement and spraying bar with nozzles of constant volume or pressure system at the rate of 3Kg/10Sqm on primed/blacktop surface and curing etc. including all material, labour, machinery, with all leads and lifts etc. complete as per drawing.	Sqm	13,000		
4.5	Providing and laying Bituminous Macadam of maximum 100mm compacted thickness on prepared surface using 30/40 grade bitumen (min 3.5% by total weight) providing necessary aggregates with specified gradation mixing with mechanical means in hot mix plant of suitable capacity of batch mix type and electronically controlled mixing to the specified temperature, transporting and laying the mix with self propelled paver finisher with electronic sensor device and initial compaction with minimum 80-100KN static weight smooth wheeled roller followed by intermediate rolling with minimum 80-100KN static weight vibratory roller/pneumatic tyred roller having minimum 150-250KN weight having a tyre pressure of atleast 0.7Mpa and finished with minimum 60-80KN weight smooth wheeled tandem roller to achieve desired density including all material, labour, machinery with all leads and lifts (Excluding tack coat) etc. complete as per drawing.	m3	485		

4.6	Providing and laying Dense Bituminous macadam in a single layer of 75mm compacted thickness on prepared surface using 30/40 grade bitumen (min 4.5% by total weight) including providing necessary aggregates with specified gradation mixing with mechanical means in hot mix plant of suitable capacity of batch mix type and electronically controlled mixing of the specified temperature, transporting and laying the mix with self propelled paver finisher with electronic sensor device in full width and initial compaction with minimum 80-100KN static weight vibratory roller/pneumatic tyred roller having minimum 150-250KN weight having a tyre pressure of atleast 0.7Mpa and finished with minimum 60-80KN weight smooth wheeled tandem roller to achieve desired density including all material, labour, machinery with all leads and lifts (excluding tack coat) etc. complete as per drawing.	m3	1,300		
4.7	Providing and laying Bituminous Concrete in a single layer of 50mm compacted thickness on prepared surface using modified bitumen CRMB 55 grade bitumen (min 6.25% by total weight) approved by the engineer including providing necessary aggregates with specified gradation mixing with mechanical means in hot mix plant of suitable capacity of batch mix type and electronically controlled mixing to the specified temperature, transporting and laying the mix with self propelled paver finisher with electronic sensor device in full width and initial compaction with minimum 80-100KN static weight smooth wheeled roller followed by intermediate rolling with minimum 80-100Kn static weight vibratory roller/pneumatic tyred roller having minimum 150-250KN weight having a tyre pressure of atleast 0.7Mpa and finished with minimum 60-80KN weight smooth wheeled tandem roller to achieve desired density including all material, labour, machinery with all leads and lifts etc. complete (excluding tack coat) and including cement filler @ 2% by weight of mix.	Sqm	650		
4.8	Providing and laying road stripes using thermoplastic paint including supplying, laying for all leads.	Sqm	3,420		
5	Wearing course over the concrete deck slab				
	Bituminous wearing course comprising of 40 mm thick bituminous concrete overlaid with 25 mm thick bitumen mastic layer, including membrane water proffing, etc complete as per drawing and MoSRT&H Specification	Sqm	64,050		
TOTAL OF V08					
TOTAL AMOUNT OF SCHEDULE-B					
				TOTAL	

NAME OF WORK: : DESIGN AND CONSTRUCTION OF ELEVATED VIADUCT OF LENGTH 2.607 KM FROM CH: 3620.950 TO CH: 3962.558,4042.558 TO 4330.490, CH: 4411.490 TO 5174.498, CH: 5255.498 TO 5988.303 5988.303 AND 6131.017 TO 6612.560 BETWEEN GADDIGODAM TO SITABULDI (EXCLUDING ZERO MILE STATION)AND RAILWAY SPAN NEAR GADDIGODAM, VIADUCT AND ROAD CUM RAIL FLYOVER (DOUBLE DECKER) OF LENGTH 4.065KM INCLUDING APPROACH RAMPS FROM CH:-673.910 TO -219.050, CH:-213.550 TO 939.360, CH:1016.860 TO 2097.068, CH:2174.568 TO 3125.73 CH:,3202.870 TO 3620.950 AND CH:3962.558 TO 4042.558 ON BOQ BASIS (EXCLUDING STATIONS) IN REACH-2.

Summary of Schedule C (USSOR Items Lump sum provision as per USSOR-2011-CR or latest CPWD SOR with amendment)

Miscellaneous works which are not covered in Lump sum contract and BOQ Contract		
Sr. No.	Item	Amount (in Rupees)
1.	Total of miscellaneous works which are not covered in Lump sum Contract and BOQ contract (Any other Items which are not covered in the above Sections shall be operated as per USSOR 2011 with up to date correction slips.)	Rs. 7,00,00,000/-
Total amount of Schedule C		Rs. 7,00,00,000/-

Total Quoted Amount in figures

Rupees 7,00,00,000/-

Total Quoted Amount in Words

Rupees Seven Crores Only

Signature of the Authorized Signatory with Company Seal

NAME OF WORK: : DESIGN AND CONSTRUCTION OF ELEVATED VIADUCT OF LENGTH 2.607 KM FROM CH: 3620.950 TO CH: 3962.558,4042.558 TO 4330.490, CH: 4411.490 TO 5174.498, CH: 5255.498 TO 5988.303 5988.303 AND 6131.017 TO 6612.560 BETWEEN GADDIGODAM TO SITABULDI (EXCLUDING ZERO MILE STATION)AND RAILWAY SPAN NEAR GADDIGODAM, VIADUCT AND ROAD CUM RAIL FLYOVER (DOUBLE DECKER) OF LENGTH 4.065KM INCLUDING APPROACH RAMPS FROM CH:-673.910 TO -219.050, CH:-213.550 TO 939.360, CH:1016.860 TO 2097.068, CH:2174.568 TO 3125.73 CH:,3202.870 TO 3620.950 AND CH:3962.558 TO 4042.558 ON BOQ BASIS (EXCLUDING STATIONS) IN REACH-2.

Schedule D (ENVIRONMENT, SOCIAL, HEALTH & SAFETY (ESHS) COST SCHEDULE)

Item No	Description	SHE Specifications Clause N°	Unit	Amount [specify currency]
SHE 1	Resources allocated to ESHS management	Clause 4	Lump sum	
SHE 2	Drafting and updating the ESHS documentation, reporting, inspections	Clauses 1, 2, 3, 5, 6, 7, 9	Lump sum	<i>[Cost SHE 1 should exclude all or part of the costs of those tasks]</i>
SHE 3	Implementation of the Health and Safety Plan: Meetings, health care center, medical check-ups, emergencies and evacuations, safety protective equipment, hygiene	Clauses 1, 9, 20 to 24, 26 to 36, 40	Lump sum	<i>[Cost SHE 1 should exclude all or part of the costs of those tasks]</i>
SHE 4	Accommodation, drinking water, meals and transportation of staff(*)	Clauses 35, 38, 39		<i>[The cost for "site mobilization" should exclude all or part of the costs of those tasks]</i>
	(*) : The Bidder shall detail the financial conditions of the supply of accommodation, meals and transport to its staff:			
	- Accommodation		Lump sum	
	- Meals		Lump sum	
	- Transport		Lump sum	
SHE 5	Training and local recruitment management costs	Clauses 8, 37	Lump sum	<i>[Cost SHE 1 should exclude all or part of the costs associated to those tasks]</i>
SHE 6	Protection of adjacent areas, prevention of erosion and wastewater management	Clauses 10, 11, 12, 17	Lump sum	
SHE 7	Traffic, noise and atmospheric emissions management, land take	Clauses 13, 14, 41, 42	Lump sum	

SHE 8	Waste and hazardous products management	Clauses 15, 25, 39	Lump sum	
SHE 9	Vegetation clearing and site rehabilitation	Clauses 16, 18, 19	Lump sum	<i>[The cost for "site mobilization" should exclude all or part of the costs associated to those tasks]</i>
SHE 10	All other items except SHE 1 to 9, contained in SHE manual & ESMP	SHE manual	Lump sum	
Total for Bill SHE (Total amount of Schedule-D)				
SHE costs are deemed to cover operations on all Sites (as defined in Clause 1.3 of SHE Specifications)				
Interim payment certificates shall include the portion of each SHE cost amounting to the percentage of the actual progress achieved in executing the SHE measures in compliance with the SHE Specifications and approved by the Engineer. Payment towards Schedule-D will be in proportion to IPC payment on compliance of various items of Schedule 'D'.				

Signature of the Authorized Signatory with Company Seal

NAME OF WORK: : DESIGN AND CONSTRUCTION OF ELEVATED VIADUCT OF LENGTH 2.607 KM FROM CH: 3620.950 TO CH: 3962.558,4042.558 TO 4330.490, CH: 4411.490 TO 5174.498, CH: 5255.498 TO 5988.303 5988.303 AND 6131.017 TO 6612.560 BETWEEN GADDIGODAM TO SITABULDI (EXCLUDING ZERO MILE STATION)AND RAILWAY SPAN NEAR GADDIGODAM, VIADUCT AND ROAD CUM RAIL FLYOVER (DOUBLE DECKER) OF LENGTH 4.065KM INCLUDING APPROACH RAMPS FROM CH:-673.910 TO -219.050, CH:-213.550 TO 939.360, CH:1016.860 TO 2097.068, CH:2174.568 TO 3125.73 CH:,3202.870 TO 3620.950 AND CH:3962.558 TO 4042.558 ON BOQ BASIS (EXCLUDING STATIONS) IN REACH-2.

SCHEDULE –E

Price of lump sum for Application of anti-carbonation paint to Metro viaduct, ROR and NHAI flyover portion of the work

The tenderer may quote his offer in Indian Rupees ONLY. The offer should be in the following proforma:

Miscellaneous works which are not covered in Schedule A&B of BOQ Contract		
Item	Unit	Amount (in Rupees)
Providing and Applying of three coats of high build micro porous anti-carbonation coating to exposed concrete surface of Pier, Pier cap, pedestal, soffit & sides of segmental girders of metro viaduct, Railway span and Double Decker (NHAI flyover) spine segment , cantilever arm & crash barriers sides ,with excellent resistance to attack by carbon-dioxide, air borne chlorides, acid rain with exceptional weathering characteristics as per manufacturer specification and instruction of site Engineer for all lead and lift, etc. complete.	Lump Sum	
Total amount of Schedule E		

Signature of the Authorized Signatory with Company Seal

Annexure -1 of Schedule - A			
SCHEDULE FOR ON ACCOUNT PAYMENTS UNDER LUMP SUM PORTION			
<p>NAME OF WORK: : DESIGN AND CONSTRUCTION OF ELEVATED VIADUCT OF LENGTH 2.607 KM FROM CH: 3620.950 TO CH: 3962.558,4042.558 TO 4330.490, CH: 4411.490 TO 5174.498, CH: 5255.498 TO 5988.303 5988.303 AND 6131.017 TO 6612.560 BETWEEN GADDIGODAM TO SITABULDI (EXCLUDING ZERO MILE STATION)AND RAILWAY SPAN NEAR GADDIGODAM, VIADUCT AND ROAD CUM RAIL FLYOVER (DOUBLE DECKER) OF LENGTH 4.065KM INCLUDING APPROACH RAMPS FROM CH:-673.910 TO -219.050, CH:-213.550 TO 939.360, CH:1016.860 TO 2097.068, CH:2174.568 TO 3125.73 CH:,3202.870 TO 3620.950 AND CH:3962.558 TO 4042.558 ON BOQ BASIS (EXCLUDING STATIONS) IN REACH-2.</p>			
<p>The payment would be governed by the stage payment schedule as detailed below;</p>			
<p>Overall percentage 100% i.e. quoted lump sum price has been divided in two Heads. The Percentage breakup of cost component for Head "G" (General) shall be not less than 2.5% of lump sum quoted price and Head "V" (Viaduct) is not more than 97.5% of lump sum quoted price.</p>			
S. No.	Description of Items	Payable unit	Percentage break up of "G"
Head "G" GENERAL (Equal to 2.5% of Quoted value for Schedule 'A')			
Sub Heads			
G-1.1	Submission of Soil investigations, buildings condition survey report and construction of site office.	LS	5.00%
G-1.2	Commissioning of site laboratory, submission of quality, safety, environment and public health manuals, submission of Interface Management Plan and submission of instrumentation scheme and traffic diversion schemes if any.	LS	12.00%
G-1.3	Submission of utility identification report after actual trenching and making good road etc. complete and submission to utility owning agency	L.S.	8.00%
G-1.4	Submission of quarterly audit report of SHE and Action Taken on non-compliance of non-conformance report and its closure during last month Note: To be paid quarterly on pro-rata basis for submission of quarterly audit report.	LS	10.00%

<p>-1.5</p>	<p>Deployment of SHE personnel as per SHE Manual. The payment shall be made on monthly basis starting from 3 months after the Commencement Date.</p> <p>Notes:</p> <ol style="list-style-type: none"> 1. 80% of the apportioned payment as per this Milestone shall be equally spread over 25 months (after initial 3 months) for the purpose of payment. 2. Remaining 20% payment shall be released on completion of work, subject to continued deployment of SHE personnel in the period beyond 28 months. 3. Any shortfall of deployment of SHE personnel from the numbers indicated in the SHE Manual will attract penalty at the rate of 3 times the prorated shortfall. For example, if the SHE Manual requires 17 staff and the deployment is 16 staff for a particular month, then $[3 \times 1/17 =]$ 17.65% of the payment due for that month will be permanently deducted. Likewise, shortage of 2 staff will result in 35.3% lesser payment and so on. This penalty shall also apply to 20% final payment also on prorated manner. 	<p>LS</p>	<p>20%</p>
<p>G-1.6</p>	<p>IT requirements of NMRCL (online project management platform, documentation management system, enterprise work program platform, 5D BIM modeling etc.) – Refer Para XXX under Employer’s Requirements for details.</p> <p>Notes:</p> <ol style="list-style-type: none"> 1. 30% of the apportioned payment under this Milestone (i.e. 30% of 25%) shall be released after Contractor put in place the necessary hardware, IT center and software licenses. This should be accomplished not later than 3 months from commencement date. 2. 50% of the apportioned payment under this Milestone (i.e. 50% of 25%) shall be equally spread over 25 months after completion of SN -1 above and deployment of requisite IT staff in full as per requirement. Shortfall of staff shall attract penalty in similar manner as for SHE staff as per G-1.5 above. 3. Balance 20% will be released on completion of work, subject to continued deployment of IT staff in the period beyond above 25 months. 	<p>LS</p>	<p>25%</p>

G-1.7	Regular maintenance and repair of existing road, service road, foot path, construction and maintenance of temporary diversions as required for traffic management during construction period to keep them in traffic worthy condition. Restoration of road damaged for construction purpose is also included. Note: To be paid monthly on pro-rata basis. Payment of this item will start from 6 months from commencement of project.	L.S.	20.00%
			100.00%

S. No.	Description of Items	Payable unit	Percentage break up "V"
Head "V" VIADUCT (Equal to 97.5% of quoted value for Schedule 'A')			
Sub Heads			
V-1.1	Foundation		
V-1.1 (a)	Commissioning Casting Yard (Contractor and engineer shall make jointly program of commissioning of various activities of casting yard. Payment shall be released on monthly basis based on progress achieved as certified by engineer.)	Proportionately till Commissioning	2.00 %
V-1.1.1	Piling	Per Pile Group	18.00%
V-1.1.2	Pile Caps	Per Pile Cap	10.00%
OR			
	In case of open foundation like isolated / raft foundations	Per foundation	28.00%
V-1.2	Piers including Pier Caps , crash barrier & Shear Keys/ stoppers	per pier	12.00%
V-1.3	Casting of segments/Girders including parapet	Per span	25.00%
V-1.4	Erection of segments/Girders (including parapet) including stressing, grouting etc all complete.	per span	21.00%
V-1.5	Deleted		
V-1.6	Deleted		

V-1.7	Bearing - Supply and fixing for all spans. Note : 50 % on supply and 50% on fixing	per span	3.00%
V-1.8	Completion of the work in all respects including railing, G.I. Brackets for cable, earthing, manholes, ground water recharging etc.	per span	3.00%
V-1.9	Providing & Fixing Expansion Joints	per span	2.00%
V-1.10	Payments on clearing of the site in all respects so that area is in traffic worthy condition	per span	2.00%
V-1.11	All other balance works to complete the entire work as per the scope & specifications , handing over of viaduct to NMRCL and submission of as built drawings	LS	2.00%
	TOTAL		100.00%

	<u>Note (For Viaduct)</u>
(i)	Total Route km covered in this contract is shown in GAD attached with tender documents. Whole route length is viaduct carrying two tracks. Details are shown in GAD enclosed with the tender. In case of variation in route length on either side, i.e. increase or decrease, the total value of viaduct, i.e. "V", will get modified accordingly on prorata basis for payment purpose.
(ii)	The successful Contractor will submit a quantity schedule for the work as per the details finalized by them for the components listed in the table above, which will be subject to approval by the employer/engineer. Unit payment of the items shall be governed by the Quantity schedule within the total % payment specified against that item. For example if there are 'N' no of pile groups in the viaduct, the payment due on completion of individual pile group would be $0.18 \times V/N$.
(iii)	The quantity schedule after being approved by the Engineer will be used for making all stage payments. The Contractor should note that while stage payment will be governed by the quantity schedule, total cost of the 'Lump Sum' component would remain unchanged for the specified work subject to adjustment for the length of the viaduct brought out in (i) above.

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