



## **Attachment No. 3 of Addendum No. 9**

### **2.0. Bills of Quantities**

#### **2.1. Preamble**

- 2.1.1. The Bills of Quantities (BOQ) shall be read in conjunction with the Instructions to Bidders, the General Conditions of Contract, the Particular Conditions of Contract, the General Specification (GS), the Technical Specifications (TS), the Drawings, and the Addenda (if any).
- 2.1.2. The quantities given in the Bills of Quantities are estimated and provisional and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Engineer and valued at the rates and prices bid in the priced Bills of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix within the terms of the Contract.
- 2.1.3. The rates and prices bid in the priced Bill of Quantities are for complete and finished items of the work in all respects. The rates and prices shall, except insofar as it is otherwise provided under the Contract, shall include all necessary survey work, plants, tools, machinery, labour, compliance of labour laws, supervision, materials, transportation, handling, loading & unloading, storage, sampling, testing, fuel, oil, consumables, electric power, water, all leads and lifts, dewatering including water treatment facilities, all temporary works, staging, form works and false works, stacking, provision & maintenance of all temporary works area, construction of temporary store and buildings, fencing, barricading, lighting, ventilation, drainage arrangements, erection, maintenance, night working, inspection facilities, site clearance, tree cutting, removal of obstruction (above & below ground such as brick, concrete & steel etc.), reinstatement, remedy of any defect during the Defect Notification Period, safety measures for workmen and road users, preparation of design and drawings pertaining to the casting yard/temporary works/traffic diversion works & stacking yard, mobilisation and demobilisation, establishment and overhead charges, labour camps, insurance cost for labour and works, contractor's profit, all taxes, insurance, royalties, duties, cess, Octroi, GST and other levies and other charges together with all general risks, liabilities and obligations set out or implied in the Contract. The Contractor will be free to avail input tax credits under GST as per prevailing rules and input tax credit shall be deemed to have been considered in the Quoted Price.
- 2.1.4. The quoted rates and prices shall be deemed to have included the cost of survey of initial assessment of settlement of Existing Building & Structures (EBS), instrumentation & monitoring, protection/retrofitment/repair/replacement of EBS wherever required and payment of compensation for any consequences in EBS and any other structures due to the Works.



- 2.1.5. Even when T-1 and E-1 Contractors have right of access to and temporary possession of the site inside the tunnel, control of access to tunnel at Adit Portal, Main Tunnel Portal, Shaft-2 and Shaft-3 shall remain with C2 Contractor. C2 Contractor shall also be responsible for providing temporary lighting (with a minimum 20 lux intensity) inside the tunnel and Shafts and working of pump out system in Shaft-2 and Shaft-3 after handing over access to T1 Contractor or E1 Contractor or both till Taking Over of the Works. The quoted rates and prices shall be deemed to have included the cost of the items mentioned in this clause.
- 2.1.6. The cost of all the items as detailed in the General Specifications and the Technical Specifications shall be deemed to have been included in the rates and prices bid in the priced Bill of Quantities unless otherwise specified in the Contract.
- 2.1.7. General directions and descriptions of work and materials are not necessarily repeated nor summarized in the Bills of Quantities. References to the relevant sections of the Contract Documents shall be made before entering prices against each item in the priced Bills of Quantities.
- 2.1.8. Provisional Sums included and so designated in the Bill of Quantities shall be expended in whole or in part at the directions of the Engineer, except for the provisional sum for the cost of the DB, which requires no prior instruction of the Engineer, in accordance with Sub-Clause 13.5 and Clause 13.6 of the General Conditions.
- 2.1.9. A rate or price shall be entered against each item in the priced Bills of Quantities, whether quantities are stated or not. The cost of Items against which the Contractor has failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Bill of Quantities.
- 2.1.10. The whole cost of complying with the provisions of the Contract shall be included in the Items provided in the priced Bill of Quantities, and where no Items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related Items of Work.
- 2.1.11. The description of items in the BOQ are not exhaustive, and hence the Contractor shall be required to execute all necessary works required for completion of the concerned item of the BOQ in accordance with the Contract.
- 2.1.12. The rates and prices quoted in the Bill of Quantities shall be filled in with indelible ink or be type-written.

## **2.2. Daywork**

### **2.2.1. General**

Reference should be made to Sub-Clause 13.6 of the General Conditions. Work



shall not be executed on a Daywork basis except by written order of the Engineer. Bidders shall enter basic rates for daywork items in the Schedules, which rates shall apply to any quantity of daywork ordered by the Engineer. Nominal quantities have been indicated against each item of daywork, and the extended total for daywork shall be carried forward as a Provisional Sum to the Summary Total Bid Amount. Unless otherwise adjusted, payments for daywork shall be subject to price adjustment in accordance with the provisions in the Conditions of Contract. The basic rates applied to daywork items will be stated and payable in local currency only.

#### 2.2.2. Daywork Labour

In calculating payments due to the Contractor for the execution of Daywork, the hours for labour will be reckoned from the time of arrival of the labour at the job site to execute the particular item of Daywork to the time of departure from the job site but excluding meal breaks and rest periods. Only the time of classes of labour directly doing work ordered by the Engineer and competent to perform such work will be measured. The time of gangers (charge hands) actually doing work with the gangs will also be measured but not the time of foremen or other supervisory personnel. The Contractor shall be entitled to payment in respect of the total time that labour is employed on Daywork, calculated at the rates entered by him in Schedule of Daywork Rates: 1. Labour. The rates for labour shall be deemed to cover all the costs to the Contractor, including (but not limited to) the amount of wages paid to such labour, transportation time, overtime, subsistence allowances, and any sums paid to or on behalf of such labour for social benefits in accordance with the laws of India, as well as Contractor's profit, overheads, superintendence, liabilities, and insurances and allowances to labour, timekeeping, and clerical and office work, the use of consumable stores, water, lighting, and power; the use and repair of staging, scaffolding, workshops, and stores, portable power tools, manual plant, and tools; supervision by the Contractor's staff, foremen, and other supervisory personnel; and charges incidental to the foregoing.

#### 2.2.3. Daywork Materials

The Contractor shall be entitled to payment in respect of materials used for Daywork (except for materials for which the cost is included in the rate for the labour costs as detailed heretofore), at the rates entered by him in Schedule of Daywork Rates: 2. Materials and shall be deemed to include all overhead charges and profit. The rates for materials shall be deemed to cover all the costs to the Contractor, including (but not limited to) the invoiced price, freight, insurance, handling expenses, damage, losses, etc., and shall provide for delivery to store for stockpiling at the Site, and from there to the place where it is to be used in accordance with the terms for Labour and Construction Equipment in this



schedule.

#### 2.2.4. Daywork Contractor's Equipment

2.2.4.1. The Contractor shall be entitled to payments in respect of Contractor's Equipment already on Site and employed on daywork at the rental rates entered by them in Schedule of Daywork Rates: 3. Contractor's Equipment. The said rates shall be deemed to include cost of drivers, operators, and assistants; due and complete allowance for depreciation, interest, indemnity, and insurance, repairs, maintenance, supplies, fuel, lubricants, and other consumables, and all overhead, profit, and administrative costs related to the use of such equipment.

2.2.4.2. In calculating the payment due to the Contractor for Contractor's Equipment employed on Daywork, only the actual number of working hours on the Site will be eligible for payment.

### 2.3. Provisional Sums

Provisional Sums shall be used as per Sub-Clause 13.5 of the General Conditions.

### 2.4. Measurement and Payment

2.4.1. As already stated under Sub-Clause 2.1, the prices and rates quoted shall be comprehensive and must include for complying in all respects with the Bill of Quantities, Instruction to Bidders, the General Conditions, the Particular Conditions, the Specifications and the Drawings and for all matters and things necessary for the proper construction, completion, and making good of any defect in the whole of the Works.

2.4.2. No claims for additional payment will be allowed for any error or misunderstanding by the Contractor of the work involved.

2.4.3. The measurement shall be made as per the Bill of Quantities, the General Specifications, the Technical Specifications, the Drawings and other relevant provisions of the Contract. The least count of measurement for various quantities shall be taken as per as follows:

- (a) Each linear dimension shall be measured to the nearest 0.01 m
- (b) Areas shall be worked out to the nearest 0.01 m<sup>2</sup>
- (c) Cubical contents shall be worked out to the nearest 0.01 m<sup>3</sup>
- (d) Weight shall be measured to the nearest 0.001 metric ton
- (e) Month shall be measured to the nearest 0.01



## **2.5. Procedure for Payment**

- 2.5.1. The Employer shall make interim payments to the Contractor in accordance with the provisions of Sub-Clause 14.7 of the General Conditions, as certified by the Engineer on the basis of the progress achieved for the items of works/stages of the works.
- 2.5.2. The Contractor shall base his claim for interim payment in accordance with Sub-Clause 14.3 of the General Conditions for various items of work on the basis of actual progress of work executed till the end of the month for which the payment is claimed in relation to the Contractor's total executed quantity, supported with documents and updated programme in accordance with the Works Requirements.
- 2.5.3. The Employer may carry out necessary test checks either directly or through an independent agency, of the Works done by the Contractor for which a payment has been accepted and certified by the Engineer. The payment shall depend upon the outcome of such test checks.
- 2.5.4. A format of the Contractor's application for payment shall be agreed between the Engineer and the Contractor.
- 2.5.5. All necessary supplementary details to support progress claims, including all certified Request For Inspection in hard bound copy, shall be included with application for payment. Sketches, drawings, approvals, calculations, test reports etc. shall accompany an application for payment to be substantiated by the Contractor, certified by the Engineer and submitted to the Employer.
- 2.5.6. Even if no work is executed during the month or the Contractor does not choose to issue an application for payment, a 'NIL' application shall be submitted.
- 2.5.7. The Employer may deploy external agencies, other than the Engineer, to cross check the work done by the Contractor. If at a later stage it is discovered that excess payment has been released to the Contractor or the work is found to be defective, then suitable recoveries would be affected from the first available bill of the Contractor.
- 2.5.8. For the purposes of payment, the Contractor shall submit to the Engineer a detailed payment schedule indicating a further breakdown for each of the lump sum items contained in the priced Bill of Quantities within twenty-eight (28) days after the receipt of the Letter of Acceptance. Such cost breakdowns shall be subject to approval of the Engineer who shall review and evaluate with comments and/or issue approval within twenty-one (21) days of receipt of the same. The Contractor shall resubmit the cost breakdown structure corresponding to the Engineer's comments for review, if required.



## **2.6. Methodology of Claiming Payment:**

- 2.6.1. The Contractor shall prepare his monthly application for payment in the agreed format in six hard copies and one soft copy. This shall be accompanied by supplementary details in accordance with Sub-Clause 14.3 of the General Conditions. All hard copies shall bear the original signatures of the Contractor's Representative and be submitted to the Engineer.
- 2.6.2. If these are found in order, in accordance with Sub-Clause 14.6 of the General Conditions, then the Engineer shall forward two certified copies of the application along with certified supplementary details to the Employer, with his recommendation for payment; otherwise, all documents shall be returned to the Contractor for rectification and resubmission.

## **2.7. Work Items**

The Bills of Quantities contain the following Bills, which have been grouped according to the nature of the work:

Bill No. 1 – General Items;

Bill No. 2 – Permanent Reinstatement and Associated Works at Portals;

Bill No. 2.1: At Main Tunnel Portal

Bill No. 2.2: At Adit Portal

Bill No. 3 – Shaft Work;

Bill No. 3.1.: Shaft No. 2

Bill No. 3.1.1: Main Works & Ventilation Building

Bill No.: 3.1.2: Permanent Reinstatement and Associated Works

Bill No. 3.2: Shaft No.3

Bill No. 3.2.1: Main Works & Ventilation Building

Bill No. 3.2.2: Permanent Reinstatement and Associated Works

Bill No. 4 – TBM Tunnel;

Bill No. 5 – NATM and Cut & Cover Tunnel;

Bill No. 5.1: Main Tunnel

Bill No. 5.2: Adit Tunnel

*Bill No. 6 – Daywork Schedule (Provisional Sum);*

*Bill No. 7 – Specified Provisional Sums; and*

*Bill No. 8 – Grand Summary*

Bidders shall price the Bills of Quantities in the currency or currencies specified in the Instructions to Bidders.



**Bill No. 1.0: General Items**

Item no.	Description	Unit	Quantity	Rate				Amount				
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	
101	Providing Site Offices for the Engineer/the Employer with all furniture, equipment and facilities complete and demolition of the above upon completion in accordance with the Specifications – the General Specifications (Sub-Division 04060)	lump sum	1									
102	Housekeeping and Maintenance of Site Offices including maintenance staff, stationeries and facilities as required to maintain the office for the Engineer/the Employer in accordance with the Specifications – the General Specifications (Sub-Division 04060)	month	59									
Total for Bill No. 1 (Carried forward to Grand Summary, p. )												



**Bill No. 2.0: Permanent Reinstatement and Associated Works at Portals**

**Bill No. 2.1: At Main Tunnel Portal**

Note: For details, the Contractor shall refer to the respective Drawings.

Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
201	Excavation in all kinds of strata as directed by the Engineer including site clearance and muck disposal in accordance with the Specification and the drawings.	cu m	200								
202	Supplying & filling suitable fill material in layers not exceeding 300mm in thickness, compacting each layer by roller & dressing complete in all respects in accordance with the Specification as directed by the Engineer.	cu m	200								
203	Construction of precast or cast in-situ RCC drains and catch pits of concrete grade M-35 with precast concrete perforated covers including excavation, muck disposal, backfilling, form work, concreting, compacting, curing and all temporary works required to construct the same in accordance with the Specification and the Drawings. Reinforcement steel shall be paid separately under item no. 205.										





Item no.	Description	Unit	Quantity	Rate				Amount				
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	
a)	RCC Drains											
i)	Type D1: Size 300 mm x 300mm (inner dimensions)	m	366									
ii)	Type D2: Size 500 mm x 500 mm (inner dimension)	m	81									
b)	RCC Catch pits											
i)	Type A: Size 1000 mm x 1000mm x 750mm (inner dimensions)	Nos	8									
ii)	Type C: Size 1500 mm x 1500mm x 1250mm (inner dimensions)	Nos	2									
204	Construction of boundary wall with precast concrete panels & columns with cast in-situ base structures (footing, pedestal and tie beams), concertina wire/coil fencing on top with support/fixing arrangements including excavation, muck disposal, backfilling, form work, concreting, compacting, curing, and protective coating on structural steel complete in all respects in accordance with the Specification and the Drawings. Reinforcement steel shall be paid separately under item no. 205.	m	316									



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local – INR	Foreign - JPY	Foreign – USD	Foreign – EUR	Local – INR	Foreign - JPY	Foreign – USD	Foreign – EUR
205	Supplying, cutting, bending, binding & placement of reinforcement steel of all diameters of grade Fe500D in accordance with the Specification and the Drawings.	MT	33								
206	Supplying & laying 300mm thick top soil (suitable for growth of plants & vegetation) in accordance with the Specification and the Drawings as directed by the Engineer.	sq m	5721								
207	Turfing including supplying and spreading manure on slopes and other areas and maintaining it for one year in accordance with the Specification and the Drawings as directed by the Engineer.	sq m	5721								
Total for Bill No. 2.1 (Carried forward to Grand Summary, p. )											



**Bill No. 2.2: At Adit Portal**

Note: For details, the Contractor shall refer to the respective Drawings.

Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
208	Excavation in all kinds of strata including site clearance and muck disposal in accordance with the Specification and the Drawings.	cu m	15185								
209	Slope protection works in accordance with the Specification and the Drawings.										
a)	Supplying and spraying shotcrete of 100mm thickness including supplying and fixing of wire mesh of size 100 mm x 100mm x 3.4 mm including all incidental works.	Sq m	1342								
b)	Supplying, drilling & installation of 25mm diameter, 8.5 metre long soil nails including grouting and all other accessories complete in all respects.	Nos	600								
c)	Supplying, drilling & installation of 25 mm diameter rock bolts of grade Fe500D including bearing plate, nut, grouting and all other accessories complete in all respects.										
i)	Length -3.0m	Nos.	600								



ii)	Length -4.0m	Nos.	600								
iii)	Length -5.0m	Nos.	600								
d)	Supplying, transporting, placing, compacting & curing plain cement concrete of grade M-25 in berms in slope.	cu m	424								
e)	Supplying and laying wire crates/boulder crates with stone boulders over levelled surface including removal of loose material and filling with stone boulders as per the Drawings.	cu m	3127								
210	Supplying & filling suitable fill material in layers not exceeding 300mm in thickness, in accordance with the Specification and the Drawings as directed by the Engineer.										
a)	compacting each layer so as to achieve 95% degree of compaction & dressing for SP in area to be handed over to E-1 Contractor.	cu m	2659								
b)	Compacting each layer by roller in other areas not covered in a) above as directed by the Engineer.	cu m	493								
211	Construction of precast or cast in-situ RCC drains, catch pits of concrete grade M-35 with precast concrete perforated covers including excavation, muck disposal, backfilling, form work, concreting, compacting, curing and all temporary works required to construct the										



	same in accordance with the Specification and the Drawings. Reinforcement steel shall be paid separately under item no. 216.										
a)	<b>RCC Drains</b>										
i)	Type D1: Size 300 mm x 300mm (inner dimensions)	m	341								
ii)	Type D2: Size 500 mm x 500 mm (inner dimension)	m	356								
iii)	Type D4: Size 1000 mm x 1000 mm (inner dimension)	m	318								
iv)	Type D5: Size 2000 mm x 2000 mm (inner dimension)	m	502								
b)	<b>RCC catch pits</b>										
i)	Type A: Size 1000 mm x 1000mm x 750mm (inner dimensions)	Nos	9								
ii)	Type C: Size 1500 mm x 1500mm x 1250mm (inner dimensions)	Nos	2								
212	<b>Cable Duct</b> Construction of RCC cable duct including cable duct entry and exit, manhole with covers and sump pits with drain pipe arrangements in accordance with the Specification and the Drawings.										
a)	Excavation in all kinds of strata including site clearance, muck disposal and backfilling.	cu m	5310								



b)	Supplying & laying plain cement concrete of grade M-20 for levelling the surface below structures including form work, concreting, compacting and curing.	cu m	111								
c)	Supplying & laying RCC of grade M-35 including form work, monkey ladders, concreting, compacting, curing, protective coating of bituminous paint on outer surface and all temporary works required to construct the same in accordance with the Specification and the Drawings. Reinforcement steel shall be paid separately under item no. 216.	cu m	902								
213	Construction of RCC Box culvert of concrete grade M-35 for existing drains/stream including excavation, muck disposal, backfilling with granular material, wing walls, approach slabs, parapet walls, curtain walls, drop walls, stone pitching with toe walls, stone apron, wearing course, flooring inside RCC box, formwork, concreting, compacting, curing, complete in all respects and all temporary works required to construct the same in accordance with the Specification and the Drawings. Reinforcement steel shall be paid separately under item no. 216.	m	32								
214	Boundary wall & MS gate										



a)	Construction of boundary wall with precast concrete panels & columns, concertina wire/coil fencing on top with support/fixing arrangements including excavation, muck disposal, backfilling, form work, concreting, compacting, curing, and protective coating on structural steel complete in all respects in accordance with the Specification and the Drawings. Reinforcement steel shall be paid separately under item no. 216.										
i)	With cast in-situ base structures (footing, pedestal and tie beams)	m	586								
ii)	With fixing arrangements over retaining walls	m	590								
b)	Supplying, fabricating & fixing of MS gate (G3 type) including providing RCC pedestals and footing of specified size with bolts, nuts, stoppers, handles, locking arrangements, including protective coating of structural steel in accordance with the Specification and the Drawings. Note: The reinforcement steel shall be paid separately under item no. 216.	Nos.	2								
215	Retaining Wall Construction of RCC retaining wall of grade M-35 including excavation, muck disposal, form work, supplying, transporting, placing, compacting &										



	curing in accordance with the Specification and the Drawings. Reinforcement steel shall be paid separately under item no. 216.										
a)	Type-A	m	260								
b)	Type-B	m	148								
c)	Type-C	m	72								
d)	Type-D	m	93								
e)	Type-G	m	21								
216	Supplying, cutting, bending, binding & placement of reinforcement steel of all diameters of grade Fe500D in accordance with the Specification and the Drawings.	MT	830								
217	Supplying & laying 300mm thick top soil (suitable for growth of plants & vegetation) in accordance with the Specification and the Drawings as directed by the Engineer.	sq m	18101								
218	Turfing including supplying & spreading manure on slopes and other areas in accordance with the Specification and the Drawings as directed by the Engineer	sq m	18101								





219	<p>Construction of metaled access road in accordance with the Specification and the Drawings.</p> <p>This item includes:</p> <ul style="list-style-type: none"> <li>i) Earthwork in cutting/filling including muck disposal</li> <li>ii) All layers of road construction like i.e., bituminous concrete/semi-dense bituminous concrete (BC/SDBC), dense bituminous macadam (DBM), granular base, granular sub-base and good quality moorum as shown in the Drawing.</li> <li>iii) Lighting arrangement including light pole, cable, lamp etc. to ensure minimum intensity of 20 lux.</li> <li>iv) Any other works required to execute this item.</li> </ul>	sq m	953								
<p>Total for Bill No. 2.2 (Carried forward to Grand Summary, p. )</p>											



**Bill No. 3.0: Shaft Work**

**Bill No. 3.1: Shaft No. 2**

**Bill No. 3.1.1: Main Works & Ventilation Building**

Note: For details, the Contractor shall refer to the respective Drawings.

Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
301	Excavation of Shaft in all kinds of strata including site clearance and muck disposal in accordance with the Specification and the Drawings. This item includes: i. All the necessary survey & investigation work such as topographical survey, geological/geotechnical investigations. ii. Design of temporary shaft (considering TBM loading & unloading on the surface and crane loading operation for muck removal and supporting structure/work/services for TBM operations) including other temporary works. iii. Construction of temporary wall by continuous wall method such as secant pile or diaphragm wall (D-wall) as required.	cu m	92,474								



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
	iv. All necessary incidental works such as ground treatment, dewatering including water treatment facilities, ventilation. v. Complete excavation up to bottom of base slab, in all kinds of strata where blasting may or may not be permitted including precautionary measures against heaving of bottom of shaft. vi. Any other works required for execution of this item.										



Item no.	Description	Unit	Quantity	Rate				Amount				
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	
302	<p><b>Concrete work</b></p> <p>Supplying and laying in position cement concrete as per approved design mix with admixtures and manufactured in fully automatic batching plant and transported to site of work in transit mixer for all lifts &amp; leads, having continuous agitated mixer, pumping concrete from transit mixer to site of laying including form work (centring &amp; shuttering), compacting, finishing &amp; curing and <i>water stops</i> in accordance with the Specification and the Drawings.</p> <p>Reinforcement steel shall be paid separately under item no. 306.</p>											
a)	Plain cement concrete of grade M-20 below base slab for levelling the surface.	cu m	530									
b)	Plain cement concrete of grade M-25 for filling between track floor slab & base slab.	cu m	4,032									
c)	Plain cement concrete of grade M-25 for level adjustment between track floor slab & cable trough top	cu m	456									
d)	Reinforced cement concrete of grade M-35 in all permanent works including drainage											



Item no.	Description	Unit	Quantity	Rate				Amount				
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	
	system, ground earth system, all ducts, sleeves, opening areas in slab & partition walls.											
A	Shaft											
i)	Base slab	cu m	5,295									
ii)	Track floor slab	cu m	1,140									
iii)	Floor slabs & beams	cu m	6,167									
iv)	Side walls	cu m	12,312									
v)	Partition walls including sump walls	cu m	7,397									
B	Ventilation Building											
	RCC work in walls, columns, beams, slabs, ramps and other structural members including waterproofing of roof slabs.	cu m	757									
303	Supplying and providing waterproofing in accordance with the Specification and the Drawings.											
a)	On all inner surfaces of sump	sq m	1,314									
b)	Between levelling course and base slab	sq m	1,765									
c)	On Rock Surface	sq m	8,309									
304	Miscellaneous Works (Shaft & ventilation Building)											



Item no.	Description	Unit	Quantity	Rate				Amount				
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	
a)	Supplying, installing & commissioning of pump out system including all pumps, motors, pipes with accessories up to the nearest catch pit (including hydraulic testing), sluice valves, check valves, flow meter, automatic water level gauge, LT panel, monitoring panel and electrical cables with cable rack in accordance with the Specification and the Drawings.	Set	1									
b)	Staircase, steps, walk way and railing in accordance with the Specification and the Drawings.											
A	Shaft											
i)	Supplying, fabricating & fixing of structural steel with all accessories such as bolts, nuts, rivets, insert anchor bolts, washers including protective coating complete in all respects.	MT	117									
ii)	Supplying & laying cement mortar (1 cement: 3 fine aggregate) including supplying and fixing of wire mesh in steps and landings.	cu m	32.3									
B	Ventilation Building											
i)	Supplying, fabricating & fixing of structural steel for spiral staircase including chequered	set	1									



Item no.	Description	Unit	Quantity	Rate				Amount				
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	
	plate with all accessories such as bolts, nuts, rivets, insert anchor bolts, washers including protective coating complete in all respects.											
c)	Supplying, fabricating & fixing of MS doors, windows, rolling shutters, RCC louvers with supports and fixing arrangements in openings of specified size with all accessories such as bolts, nuts, stoppers, handles, locking arrangements, protective coating & finishing in accordance with the Specification and the Drawings.											
A	Shaft											
I	Door size- 1500mm x 2500mm											
i)	3 kPa pressure resistant & smoke-proof door	Nos.	10									
ii)	3 kPa pressure resistant door	Nos.	9									
iii)	Smoke-proof door	Nos.	10									
iv)	Ordinary door	Nos.	5									
II	Door size- 3000mm x 3000mm											
i)	3 kPa pressure resistant door	Nos.	1									
B	Ventilation Building											
I	Door size- 1500mm x 2400mm											
i)	Standard	Nos.	3									



Item no.	Description	Unit	Quantity	Rate				Amount				
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	
ii)	3 kPa pressure resistant door	Nos.	2									
II	Rolling Shutter (RS) Size- 4500mm x 5100mm	Nos.	3									
III	Window size- 2500mm x 4600mm	Nos.	12									
IV	RCC Louvers for openings of size 1150 mm x 4500mm	Nos.	36									
d)	Supplying & fixing 200mm thick precast RCC removable covers of grade M-35 with lifting hooks (2 nos. each) on openings for maintenance in accordance with the Specification and the Drawings. Reinforcement steel shall be paid separately under item no. 306.	Set	1									
e)	Supplying & fixing 1.0m high protection fence around the openings in accordance with the Specification and the Drawings.											
i)	Openings for maintenance	Set	1									
ii)	Openings for ventilation	Set	1									
f)	Providing air-conditioning of Panel room at B4 slab in accordance with the Specification and the Drawings.	lump sum	1									
g)	Evacuation guidance indication lighting board	Nos	2									





Item no.	Description	Unit	Quantity	Rate				Amount				
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	
	in accordance with the Specification and the Drawings.											
305	Erection of RC segment rings within shafts including protection concrete of grade M-35 including waterproofing, transportation of segments from casting yard, loading, unloading, supplying & fixing hydrophilic sealing and PE protection tape around the segments in accordance with the Specification and the Drawings.  Reinforcement steel <i>for protection concrete</i> shall be paid separately under item no. 306.  Payment of RC segments shall be made separately under item no. 402.	Nos.	6									
306	Supplying, cutting, bending, binding & placement of reinforcement steel of all diameters of grade Fe500D in accordance with the Specification and the Drawings.	MT	4,574									
Total for Bill No. 3.1.1 (Carried forward to Grand Summary, p. )												



**Bill No. 3.1.2: Permanent Reinstatement and Associated Works**

Note: For details, the Contractor shall refer to the respective Drawings.

Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
307	Excavation/Removal of unsuitable material below existing ground in all kinds of strata including site clearance and muck disposal in accordance with the Specification as directed by the Engineer.	cu m	50,000								
308	Supplying & filling suitable fill material in layers not exceeding 300mm in thickness, in accordance with the Specification and the Drawings as directed by the Engineer.										
a)	compacting each layer so as to achieve 95% degree of compaction & dressing for Sectioning Post in area to be handed over to E-1 Contractor.	cu m	85,000								
b)	Compacting each layer by roller in other areas not covered in a) above as directed by the Engineer.	cu m	45,000								
309	Construction of precast or cast in-situ RCC drains including catch pits and sump of concrete grade M-35 with precast concrete perforated covers										



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
	including excavation, muck disposal, backfilling, form work, concreting, compacting, curing and all temporary works required to construct the same in accordance with the Specification and the Drawings. Note: The reinforcement steel shall be paid separately under item no. 314.										
a)	RCC Drains										
i)	Type D1: Size 300 mm x 300mm (inner dimensions)	m	379								
ii)	Type D2: Size 500 mm x 500 mm (inner dimension)	m	432								
iii)	Type D3: Size 750 mm x 750 mm (inner dimension)	m	326								
iv)	Type D4: Size 1000 mm x 1000 mm (inner dimension)	m	261								
b)	RCC Catch pits										
i)	Type A: Size 1000 mm x 1000mm x 750mm (inner dimensions)	Nos	17								



Item no.	Description	Unit	Quantity	Rate				Amount				
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	
ii)	Type B: Size 1000 mm x 1000mm x 1000mm (inner dimensions)	Nos	8									
iii)	Type C: Size 1500 mm x 1500mm x 1250mm (inner dimensions)	Nos	6									
c)	Sump of size 3000 mm x 3000mm x 1000mm (inner dimensions)	Nos	1									
310	Cable Duct Construction of RCC cable duct including cable duct entry, manhole with covers and sump pits with drain pipe arrangements in accordance with the Specification and the Drawings.											
a)	Excavation in all kinds of strata including site clearance, muck disposal and backfilling.	cu m	4,887									
b)	Supplying & laying plain cement concrete of grade M-20 for levelling the surface below structures including form work, concreting, compacting and curing.	cu m	148									
c)	Supplying & laying RCC of grade M-35 including form work, monkey ladders, concreting, compacting, curing,	cu m	1,209									



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
	protective coating of bituminous paint on outer surface and all temporary works required to construct the same in accordance with the Specification and the Drawings. Reinforcement steel shall be paid separately under item no. 314.										
311	Construction of RCC retaining wall of grade M-35 including excavation, muck disposal, form work, supplying, transporting, placing, compacting & curing of concrete in accordance with the Specification and the Drawings. Reinforcement steel shall be paid separately under item no. 314.										
i)	Type-1	m	108								
ii)	Type-2	m	576								
iii)	Type-3	m	161								
iv)	Type-4	m	253								
v)	Type-5	m	1.5								
312	Boundary wall & MS Gates										
a)	Construction of boundary wall with precast concrete panels & columns,										



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
	concertina wire/coil fencing on top with support/fixing arrangements including excavation, muck disposal, backfilling, form work, concreting, compacting, curing, and protective coating on structural steel complete in all respects in accordance with the Specification and the Drawings. Reinforcement steel shall be paid separately under item no. 314.										
i)	With cast in-situ base structures (footing, pedestal and tie beams)	m	332								
ii)	With fixing arrangements over retaining walls	m	1331								
b)	Supplying, fabricating & fixing of MS gate including providing RCC pedestals and footing of specified size with bolts, nuts, stoppers, handles, locking arrangements, including protective coating on structural steel in accordance with the Specification and the Drawings. Reinforcement steel shall be paid separately under item no. 314.										
i)	G1: 6000 mm x 1800 mm	Nos	1								



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
ii)	G2: 6000 mm x 1800 mm	Nos	1								
iii)	G3: 6000 mm x 1800 mm	Nos	1								
iv)	G4: 1500 mm x 1800 mm	Nos	1								
313	Supplying & fixing of chain link wire mesh fencing with barbed wires in layers (on top) including excavation, muck disposal, backfilling, form work, concreting, compacting, curing, protective coating on structural steel complete in all respects in accordance with the Specification and the Drawings. Reinforcement steel shall be paid separately under item no. 314.	m	13								
314	Supplying, cutting, bending, binding & placement of reinforcement steel of all diameters of grade Fe500D in accordance with the Specification and the Drawings.	MT	660								
315	Supplying & laying 300mm thick top soil (suitable for growth of plants & vegetation) in accordance with the Specification and the Drawings as directed by the Engineer.	sq m	3,660								



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
316	Turfing including supplying & spreading manure on slopes and other areas in accordance with the Specification and the Drawings as directed by the Engineer.	sq m	3,660								
317	Construction of access road in accordance with the Specification and the Drawings. This item includes: i) Earthwork in cutting/filling including muck disposal ii) All layers of road construction i.e., bituminous concrete/semi-dense bituminous concrete (BC/SDBC), dense bituminous macadam (DBM), granular base, granular sub-base and moorum as shown in the Drawing. iii) Lighting arrangement including light pole, cable, lamp etc. to ensure minimum intensity of 20 lux. Any other works required to execute this item.	sq m	3,780								
Total for Bill No. 3.1.2 (Carried forward to Grand Summary, p. )											





**Bill No. 3.2: Shaft No. 3**

**Bill No. 3.2.1: Main Works & Ventilation Building**

Note: For details, the Contractor shall refer to the respective Drawings.

Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
318	<p>Excavation of shaft in all kinds of strata including site clearance and muck disposal in accordance with the Specification and the Drawings.</p> <p>This item includes:</p> <ul style="list-style-type: none"> <li>i. All the necessary survey &amp; investigation work such as topographical survey, geological/geotechnical investigations.</li> <li>ii. Design of temporary shaft (considering TBM loading &amp; unloading on the surface and crane loading operation for muck removal and supporting structure/work/services for TBM operations) including other temporary works.</li> <li>iii. Construction of temporary wall by</li> </ul>	cu m	43,091								



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
	continuous wall method such as secant pile or diaphragm wall (D-wall) as required. iv. All necessary incidental works such as ground treatment, dewatering including water treatment facilities. v. Complete excavation up to bottom of base slab, in all kinds of strata where blasting may or may not be permitted including precautionary measures against heaving of bottom of shaft. vi. Any other works required for execution of this item.										
319	<b>Concrete work</b> Supplying and laying in position cement concrete as per approved design mix with admixtures and manufactured in fully automatic batching plant and transported to site of work in transit mixer for all lifts & leads, having continuous agitated mixer, pumping concrete from transit mixer to site of laying including form work (centring & shuttering), compacting, finishing & curing and water stops in accordance with the Specification and the Drawings.										



Item no.	Description	Unit	Quantity	Rate				Amount				
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	
	Reinforcement steel shall be paid separately under item no. 323.											
a)	Plain cement concrete of grade M-20 below base slab for levelling the surface.	cu m	377									
b)	Plain cement concrete of grade M-25 for backfilling between track floor slab & base slab.	cu m	2,368									
c)	Plain cement concrete of grade M-25 for level adjustment between track floor slab & cable trough top.	cu m	373									
d)	Reinforced cement concrete of grade M-35 in all permanent works including drainage system, ground earth system, all ducts, sleeves, opening areas in slab & partition walls											
A	Shaft											
i)	Base slab	cu m	2,515									
ii)	Track floor slab	cu m	838									
iii)	Floor slabs & beams	cu m	2,633									
iv)	Side walls	cu m	5,670									



Item no.	Description	Unit	Quantity	Rate				Amount				
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	
v)	Partition walls including sump walls	cu m	3,248									
<b>B</b>	<b>VENTILATION BUILDING</b>											
	RCC work in walls, columns, beams, slabs, ramps, and other structural members including waterproofing of roof slabs.	cu m	525									
320	Supplying and providing waterproofing in accordance with the Specification and the Drawings.											
a)	<i>On all inner surfaces of sump</i>	<i>sq m</i>	<i>630</i>									
b)	<i>Between levelling course and base slab</i>	<i>sq m</i>	<i>1,257</i>									
c)	<i>On Rock Surface</i>	<i>sq m</i>	<i>4,483</i>									
321	Miscellaneous Works (Shaft & ventilation Building)											
a)	Supplying, installing & commissioning of pump out system including all pumps, motors, pipes with accessories up to the nearest catch pit (including hydraulic testing), sluice valves, check valves, flow meter, automatic water level gauge, LT panel, monitoring panel and	Set	1									



Item no.	Description	Unit	Quantity	Rate				Amount				
				Local – INR	Foreign - JPY	Foreign – USD	Foreign – EUR	Local – INR	Foreign - JPY	Foreign – USD	Foreign – EUR	
	electrical cables with cable rack in accordance with the Specification and the Drawings.											
b)	Supplying & fixing of staircase, steps, walk way and fencing in accordance with the Specification and the Drawings.											
A	Shaft											
i)	Supplying, fabricating & fixing of structural steel with all accessories such as bolts, nuts, rivets, insert anchor bolts, washers including protective coating complete in all respects.	MT	70									
ii)	Supplying & laying cement mortar (1 cement: 3 fine aggregate) including supplying and fixing of wire mesh in steps and landings.	cu m	20									
B	Ventilation Building											
i)	Supplying, fabricating & fixing of <i>spiral steel staircase</i> including chequered plate with all accessories such as bolts, nuts, rivets, insert anchor bolts, washers including protective	set	1									



Item no.	Description	Unit	Quantity	Rate				Amount				
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	
	coating complete in all respects.											
c)	Supplying, fabricating & fixing of MS doors, windows, rolling shutters, RCC louvers with supports and fixing arrangements in openings of specified size with all accessories such as bolts, nuts, stoppers, handles, locking arrangements, protective coating & finishing in accordance with the Specification and the Drawings.											
A	Shaft											
I	Door size - 1500mm x 2500mm											
i)	3 kPa pressure resistant & smoke-proof door	Nos.	6									
ii)	3 kPa pressure resistant door	Nos.	10									
iii)	Smoke-proof door	Nos.	10									
II	Door size- 3000mm x 3000mm											
i)	3 kPa pressure resistant door	Nos.	1									
III	Door size- 2500mm x 2500mm											



Item no.	Description	Unit	Quantity	Rate				Amount				
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	
i)	Smoke-proof door	Nos.	2									
B	Ventilation Building											
I	Door size- 1500mm x 2400mm											
i)	Standard	Nos.	5									
ii)	3 kPa pressure resistant door	Nos.	4									
II	Rolling Shutter (RS) Size- 3500mm x 5100mm	Nos.	1									
III	Window size- 5000mm x 4600mm	Nos.	11									
IV	RCC Louvers of size 1150 mm x 6000mm	Nos.	28									
d)	Supplying & fixing 200mm thick precast RCC removable covers of grade M-35 with lifting hooks (2 nos. each) on openings for maintenance in accordance with the Specification and the Drawings.  Reinforcement steel shall be paid separately under item no. 323.	Set	1									
e)	Supplying & fixing 1.0m high galvanized steel protection fence around the openings in accordance with the Specification and the											



Item no.	Description	Unit	Quantity	Rate				Amount				
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	
	Drawings.											
i)	Openings for maintenance	Set	1									
ii)	Openings for ventilation	Set	1									
f)	Providing air-conditioning of Panel room at B2 slab in accordance with the Specification and the Drawings.	Lump sum	1									
g)	Evacuation guidance indication lighting board in accordance with the Specification and the Drawings.	Nos	2									
322	Erection of RC segments within shafts including protection concrete of grade M-35 including waterproofing, transportation of segments from casting yard, loading, unloading, supplying & fixing hydrophilic sealing and PE protection tape around the segments in accordance with the Specification and the Drawings.  Reinforcement steel for protection concrete shall be paid separately under item no.323.	Nos.	4									





Item no.	Description	Unit	Quantity	Rate				Amount				
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	
	<i>Payment of RC segments shall be made separately under item no. 402.</i>											
323	Supplying, cutting, bending, binding & placement of reinforcement steel of all diameters of grade Fe500D in accordance with the Specification and the Drawings.	MT	2,138									
Total for Bill No. 3.2.1 (Carried forward to Grand Summary, p. )												



**Bill No. 3.2.2: Permanent Reinstatement and Associated Works**

Note: For details, the Contractor shall refer to the respective Drawings.

Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
324	Excavation/Removal of unsuitable material below existing ground in all kinds of strata including site clearance and muck disposal in accordance with the Specification as directed by the Engineer.	cu m	2909								
325	Supplying & filling suitable fill material in layers not exceeding 300mm in thickness, in accordance with the Specification and the Drawings as directed by the Engineer.										
a)	compacting each layer so as to achieve 95% degree of compaction & dressing for SP in area to be handed over to E-1 Contractor.	cu m	4500								
b)	Compacting each layer by roller in other areas not covered in a) above as directed by the Engineer.	cu m	22000								
326	Construction of precast or cast in-situ RCC drains including catch pits and sump of concrete grade M-35 with precast concrete perforated covers										



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local – INR	Foreign - JPY	Foreign – USD	Foreign – EUR	Local – INR	Foreign - JPY	Foreign – USD	Foreign – EUR
	including excavation, muck disposal, backfilling, form work, concreting, compacting, curing and all temporary works required to construct the same in accordance with the Specification and the Drawings. Reinforcement steel shall be paid separately under item no. 331.										
a)	RCC Drains										
i)	Type D1: Size 300 mm x 300mm (inner dimensions)	m	129								
ii)	Type D2: Size 500 mm x 500 mm (inner dimension)	m	118								
iii)	Type D3: Size 750 mm x 750 mm (inner dimension)	m	120								
iv)	Type D4: Size 1000 mm x 1000 mm (inner dimension)	m	142								
b)	RCC catch pits										



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
i)	Type A: Size 1000 mm x 1000mm x 750 mm (inner dimensions)	Nos	8								
ii)	Type B: Size 1000 mm x 1000mm x 1000mm (inner dimensions)	Nos	6								
iii)	Type C: Size 1500 mm x 1500mm x 1250mm (inner dimensions)	Nos	6								
iv)	Sump: Size 2000 mm x 2000mm x 1500mm (inner dimensions)	Nos	1								
327	<b>Cable Duct</b> Construction of RCC cable duct of size 3500 mm x 3500mm (inner dimension) including cable duct entry and manhole with covers, sump pits with drain pipe arrangements in accordance with the Specification and the Drawings.										
a)	Excavation in all kinds of strata including site clearance, muck disposal and backfilling.	cu m	1764								
b)	Supplying & laying plain cement concrete of grade M-20 for levelling the surface below structures including form	cu m	54								



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
	work, concreting, compacting and curing.										
c)	Supplying & laying RCC of grade M-35 including form work, monkey ladders, concreting, compacting, curing, protective coating of bituminous paint on outer surface and all temporary works required to construct the same in accordance with the Specification and the Drawings. Reinforcement steel shall be paid separately under item no. 331.	cu m	438								
328	Construction of RCC retaining wall of grade M-35 including excavation, muck disposal, form work, supplying, transporting, placing, compacting & curing in accordance with the Specification and the Drawings. Reinforcement steel shall be paid separately under item no. 331.										
i)	Type-1	m	17								
ii)	Type-2	m	38								
iii)	Type-3	m	32								



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local – INR	Foreign - JPY	Foreign – USD	Foreign – EUR	Local – INR	Foreign - JPY	Foreign – USD	Foreign – EUR
iv)	Type-4	m	119								
v)	Type-5	m	268								
329	<b>Boundary wall &amp; MS gates</b>										
a)	Construction of boundary wall over retaining wall with precast concrete panels & columns, concertina wire/coil fencing on top with support/fixing arrangements including excavation, muck disposal, backfilling, form work, concreting, compacting, curing and protective coating on structural steel in accordance with the Specification and the Drawings. Reinforcement steel shall be paid separately under item no. 331.										
i)	With cast in-situ base structures (footing, pedestal and tie beams)	m	78								
ii)	With fixing arrangements over retaining walls	m	475								
b)	Supplying, fabricating & fixing of MS gate including providing RCC pedestals of specified size with bolts, nuts, stoppers, handles, locking arrangements, protective coating on										



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
	structural steel in accordance with the Specification and the Drawings. Reinforcement steel shall be paid separately under item no. 331.										
i)	G3: 6000 mm x 1800 mm	Nos.	2								
330	<i>Deleted</i>										
331	Supplying, cutting, bending, binding & placement of reinforcement steel of all diameters of grade Fe500D in accordance with the Specification and the Drawings.	MT	271								
332	Supplying & laying 300mm thick top soil (suitable for growth of plants & vegetation) in accordance with the Specification and the Drawings as directed by the Engineer.	sq m	7734								
333	Turfing including supplying & spreading manure on slopes and other	sq m	7734								



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
	areas in accordance with the Specification and the Drawings as directed by the Engineer.										
334	<p>Construction of road in accordance with the Specification and the Drawings. This item includes:</p> <p>i) Earthwork in cutting/filling including muck disposal</p> <p>ii) All layers of road construction i.e., that is bituminous concrete/semi-dense bituminous concrete (BC/SDBC), dense bituminous macadam (DBM), granular base, granular sub-base and moorum. as shown in the Drawing.</p> <p>iii) Lighting arrangement including light pole, cable, lamp etc. to ensure minimum intensity of 20 lux.</p> <p>iv) Any other works required to execute this item.</p>	sq m	905								
Total for Bill No. 3.2.2 (Carried forward to Grand Summary, p. )											





**Bill No. 4: TBM Tunnel**

Note: For details, the Contractor shall refer to the respective Drawings.

Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
	TBM Tunnel										
401	<p>Erection of permanent lining rings including excavation of tunnel with closed mode TBMs (dual mode included) in accordance with the Specification and the Drawings.</p> <p>This item includes:</p> <ul style="list-style-type: none"> <li>i. Procurement &amp; mobilization of minimum 3 nos. 100% Brand new closed mode TBMs (dual mode included) including testing, inspection, transport, lowering of TBM into the shaft, TBM assembly &amp; commissioning including all temporary works required to execute the work</li> <li>ii. All necessary temporary works/services required like back support, packing, initial drive, breakthrough, making tunnel eye, power &amp; water supply, drainage &amp; ventilation system etc.</li> </ul>										



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
	iii. All necessary precautionary measures such as dewatering including water treatment facilities, probing, ground treatment, fissure grout, consolidation grout, compressed air working, vibration control against surface and Existing Building & Structures (EBS), protection of EBS. iv. Excavation of tunnel by TBM in all kinds of strata and muck disposal. v. Supplying & fixing hydrophilic sealing on gaskets. vi. Erection of permanent lining rings including temporary works/services such as handling, loading, unloading, delivery from casting yard to work site of the segments, fixing of dowels, primary grouting, secondary grouting (including sealing of grout sockets) ground earth system and infill concrete of grade M-45 or shotcrete in hollow portion of steel segments in accordance with the <i>Specification and the Drawings</i> . vii. Face mapping at location of each										



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
	equipment room viii. Consumable cutters and other items required for TBM working. ix. Demobilization and removal of TBMs & backup equipment etc from site upon completion of tunnelling work. x. Provision of Evacuation guidance indication boards. xi. Any other works required for execution of this item.										
a)	RC segments rings (standard and tapered segments)	Nos.	7450								
b)	RC adjustment segment rings	Nos.	59								
c)	Composite segment rings (RC segments + steel segments)	Nos.	171								
d)	Steel segments rings	Nos.	14								
402	Casting of Standard & Tapered RC segments & fabrication of Steel segments in accordance with the Specification and the Drawings. These items include: i. Establishment and maintenance of casting & fabrication yards, storage areas, setting up laboratory,										



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
	supplying & fabrication of moulds, concrete manufacturing, pouring & curing arrangement etc. ii. Casting of standard, tapered and adjustment RC segments of grade M-70 concrete. iii. Supply & fabrication of steel segments <i>along with painting</i> . iv. Supplying & installing One Pass Joint ( <i>or alternative design as per the Specification</i> ) and sockets for dowel joints. v. Supplying and fixing of EPDM gaskets. vi. Supplying & installing bolt sockets for drop arms & side brackets. vii. Providing grout pipes and shear cone viii. All necessary temporary works/services such as handling, storage, witness tests, mock-up of segmental lining and testing at casting yard. ix. Any other works required for execution of these items. The reinforcement steel and glass fibre										



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
	reinforced polymer rods shall be paid separately under item no. 406										
a)	RC segments rings (standard and tapered segments)	Nos.	7,460								
b)	RC adjustment segment rings	Nos.	59								
c)	Composite segment rings (RC segments + steel segments)	Nos.	171								
d)	Steel segments rings	Nos.	14								
403	Supplying, transporting, placing, compacting & curing cast-in-situ/precast concrete (reinforced/plain cement concrete) of specified grade including supplying, laying & fixing of drainage system & ground earth system in accordance with the Specification and the Drawings. Reinforcement steel shall be paid separately under item no. 406.										
a)	Backfill concrete of grade M-25 between bottom segments & track bed concrete including providing and laying PE central drain pipe of DN800, RCC inspection boxes/ drainage pits with MS	m	15,430								



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
	grating, hand holes of all sizes, cable crossing FEP pipes, placing & embedding dowel anchors for track bed concrete.  The payment of dowel anchors shall be made separately under item no. 406.										
b)	Track bed concrete of both tracks of grade M-35 including providing cable crossing FEP pipes and concrete anchors for track slabs with groove for reference pin and expansion joints at every 10m length.	m	15,494								
c)	Supplying & fixing of precast RCC cable trough (both sides) of all sizes of grade M-75 (with lid and locking mechanism) including backfill concrete of grade M-25 around the trough and walkway for maintenance with U2 finish (lid & locking material shall be handed over to E1 Contractor).	m	15,494								
404	<b>Construction of tunnel in docking zone</b> This item includes:  i. Design of temporary support at docking zone.	m	22								



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
	ii. Probing and dewatering. iii. Fissure grout and consolidation grout. iv. Excavation by suitable method in all kinds of strata including muck disposal with temporary support. v. Enlargement in front of cutter head if any. vi. All temporary work including anchoring arrangement for removal of TBM. vii. Supplying, fabrication & fixing steel plate in accordance with the Drawings. viii. Cavity grout behind steel plate. ix. Cast-in-situ RCC of grade M-35 in tunnel lining including formwork and curing in accordance with the Specification and the Drawing. x. Water proofing of construction joints with RC segments. xi. Supplying & installing anchor bolts for drop arms, general purpose bolts in accordance with the Specification and the Drawings. xii. <i>Vibration control against surface</i>										



Item no.	Description	Unit	Quantity	Rate				Amount				
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	
	<p><i>and Existing Building &amp; Structures (EBS), protection of EBS.</i></p> <p>Note:</p> <p>a) Backfill concrete, Track bed concrete &amp; precast cable trough shall be paid separately under item no. 403(a, b &amp; c) respectively.</p> <p>b) Reinforcement steel shall be paid separately under item no. 406.</p>											
405	<b>Equipment Room (TBM)</b>											
a)	<p>Excavation of Equipment Rooms in all kinds of strata including muck disposal in accordance with the Specification and the Drawings.</p> <p>This item includes:</p> <p>i. Removal &amp; strengthening of steel segments of TBM tunnel. Removed steel segments shall be Contractor's property.</p> <p>ii. All necessary incidental works such as dewatering including water treatment facilities, drainage &amp; ventilation system, probing, ground treatment, fissure grout, consolidation grout, vibration</p>											





Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
	control against surface and Existing Building & Structures (EBS), protection of EBS. iii. Design of temporary support system including auxiliary supports. iv. Supplying & fixing of temporary support system such as shotcrete, rock bolts and steel ribs and auxiliary supports.										
i)	Type A- Size 4.5m x 3.5m x 8.5m	Nos.	18								
ii)	Type B - Size 3.0m x 3.0m x 4.0m	Nos.	12								
b)	Supply & fabrication of all the steel segments for an equipment room including supplying and fixing of EPDM gaskets, protective coating handling, storage and testing at casting yard in accordance with the Specification and the Drawings.										
i)	Type A1	Nos.	6								
ii)	Type A2	Nos.	12								
iii)	Type B1	Nos.	6								



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
iv)	Type B2	Nos.	6								
c)	<p>Erection of all the steel segments in an Equipment Room in accordance with the Specification and the Drawings. This item includes:</p> <p>i. All necessary temporary works/services required like power &amp; water supply, transportation, etc. including all necessary incidental works etc.</p> <p>ii. Erection of permanent lining with steel segments including temporary works/services such as handling, loading, unloading, transportation, cable pits with cover, supplying and fixing of hydrophilic sealing ground earth system complete in all respect.</p> <p>iii. Infill concrete of grade M-45 or shotcrete in hollow portion of steel segments of equipment rooms in accordance with the Specification and the Drawings.</p> <p>iv. Backfilling of space between excavated profile &amp; steel segments with cement grout. Ensuring water tightness of junction</p>										



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
	of main tunnel with equipment rooms. v. Plain cement concrete of grade M-25 in material storage floor area <i>with cable pits.</i> vi. <i>Supplying and fixing precast RCC cable pit cover of all sizes of grade M75.</i> vii. Any other works required for execution of these items. <i>Reinforcement steel for cable pit cover shall be paid separately under item no. 406.</i>										
i)	Type A1	Nos.	6								
ii)	Type A2	Nos.	12								
iii)	Type B1	Nos.	6								
iv)	Type B2	Nos.	6								
406	Supplying, cutting, bending, binding & placement of reinforcement steel/glass fibre reinforced polymer rods in accordance with the Specification and the Drawings.										
a)	Reinforcement steels of grade Fe500D of all diameters	MT	32985								
b)	Glass fibre reinforced polymer rods	MT	399								



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
407	Supplying and installing reinforcement steel bar corrosion monitoring system (Anode ladder type) in RC segments of TBM and providing 3 Nos. (Total) hand measuring instruments in accordance with the Specification and the Drawings.	Nos.	15								
Total for Bill No. 4 (Carried forward to Grand Summary, p. )											



**Bill No. 5.0: NATM and Cut & Cover Tunnel**

**Bill No. 5.1: Main Tunnel**

Note: For details, the Contractor shall refer to the respective Drawings.

Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
	<b>NATM Tunnel</b>										
501	<p>Excavation of tunnel following NATM in different kinds of strata including muck disposal in accordance with the Specification and the Drawings. This item includes: All necessary incidental works such as dewatering including water treatment facilities, probing, ground treatment, fissure grout, consolidation grout, face stabilisation, ventilation, cavity treatment, auxiliary supports, controlled blasting/mechanical means, face mapping, vibration control against surface and Existing Buildings &amp; Structures (EBS), protection of EBS and instrumentation &amp; 3D monitoring of deformation of tunnel.</p> <p>i. Excavation for 455mm diameter centre drain pipe (below invert). ii. Any other works required for execution of this item.</p>										



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
a)	Class IV <sub>N</sub> Strata	m	2452								
b)	Class III <sub>N</sub> Strata	m	2,001								
c)	Class II <sub>N</sub> Strata	m	34								
d)	Class I <sub>N</sub> , I <sub>L</sub> & I <sub>S</sub> Strata	m	333								
502	Tunnel support system including all incidental works in accordance with the Specification and the Drawings.										
a)	Supplying & spraying shotcrete of specified grade										
i)	Thickness -100mm	sq m	64266								
ii)	Thickness -150mm	sq m	53510								
iii)	Thickness -200mm	sq m	8888								
b)	Supplying, cutting, bending & fixing of MS welded wire mesh of size 100mm x 100mm x 3.4mm dia.	sq m	3,585								
c)	Supplying, drilling & installation of 25 mm diameter rock bolts of grade Fe500D including bearing plate, nut, waterproof protection pads, grouting and all other accessories complete in all respects.										
i)	Length - 3.0m	Nos.	8008								
ii)	Length - 4.0m	Nos.	294								
iii)	Length - 5.0m	Nos.	5756								
d)	Supplying, fabricating, transporting &	MT	291								



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
	erecting steel support including all necessary accessories such as bracing, lagging & backfilling sheaths, splice plates, bolts, nuts & other services required to execute the work.										
503	<p>Supplying, transporting, placing, compacting &amp; curing cast-in-situ concrete (reinforced/plain cement concrete) of specified grade including formwork, drainage system, providing waterproofing system, evacuation guidance indication boards, evacuation guidance indication lighting board at the junction of main tunnel and Adit, indication of lining thickness, &amp; ground earth system in accordance with the Specification and the Drawings.</p> <p>Note –</p> <p>i. The chainages given are tentative and may change during execution of works.</p> <p>ii. The reinforcement steel shall be paid separately under item no. 508.</p> <p>iii. Electric cable and lamps in indicator lighting board shall be provided by the E-1 Contractor.</p>										



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
a)	<b>Lining Concrete</b>										
i)	Reinforced cement concrete of grade M-35 including filling of overbreak, supplying & installing anchor bolts for drop arms & side brackets including providing waterproofing membrane (EVA) with isolation mat and rear drain catchment (perforated) with filter material.	m	37								
ii)	<i>Plain</i> cement concrete of grade M-25 including filling of overbreak, supplying & installing anchor bolts for drop arms & side brackets, providing waterproofing membrane (EVA) with isolation mat and rear drain catchment (perforated) with filter material, evacuation guiding indicator boards, evacuation guidance lighting indication boards.	m	4,783								
b)	<b>Invert Concrete</b>										
i)	<i>Reinforced cement concrete</i> of grade M-35 including providing and laying d <sub>n</sub> 455mm perforated UPVC pipe in the longitudinal direction in a trench with filter media covered with EVA sheet, d <sub>n</sub> 80 UPVC pipe in a trench with filter median covered with EVA sheet and DN 75 PE pipes in transverse direction.	m	37								





Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
ii)	Plain cement concrete of grade M-25 including providing and laying d <sub>n</sub> 455mm perforated UPVC pipe in the longitudinal direction in a trench with filter media covered with EVA sheet, d <sub>n</sub> 80 UPVC pipe in a trench with filter median covered with EVA sheet and DN 75 PE pipes in transverse direction.	m	4,783								
c)	Backfill concrete of grade M-25 between invert & track bed concrete including providing inspection boxes/ drainage pits with MS grating, hand holes of all sizes, cable crossing FEP pipes placing & embedding dowel anchors for track bed concrete. The payment of dowel anchors shall be made under item no. 508.	m	4,820								
d)	Track bed concrete of both tracks of grade M-35 including providing cable crossing FEP pipes and concrete anchors for track slabs with groove for reference pin.	m	4,820								
e)	Supplying & fixing of precast RCC cable trough (both sides) of all sizes of grade M-75 (with lid and locking mechanism) including backfill concrete of grade M-25 around the trough and walkway for maintenance with U2 finish (lid & locking	m	4,820								



Item no.	Description	Unit	Quantity	Rate				Amount				
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	
	material shall be handed over to E1 Contractor).											
<b>504</b>	<b>Enlargement Part of NATM Tunnel at IOSs and junction of Adit Tunnel</b>											
a	Extra over item no. 501 for excavation											
i)	Class IV <sub>N</sub> Strata	m	24									
ii)	Class III <sub>N</sub> Strata	m	0									
iii)	Class II <sub>N</sub> Strata	m	0									
iv)	Class I <sub>N</sub> , I <sub>L</sub> & I <sub>S</sub> Strata	m	16									
	The payment for temporary support under this item shall be made in item no. 502.											
b	Extra over item no. 503 a) (ii) for lining concrete.	m	40									
<b>505</b>	<b>Equipment Rooms</b>											



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
a)	Excavation of Equipment Rooms in all kinds of strata including muck disposal in accordance with the Specification and the Drawings. This item includes: All necessary incidental works such as dewatering including water treatment facilities, probing, ground treatment, fissure grout, consolidation grout, vibration control against surface and Existing Building & Structures (EBS), protection of EBS. Design of temporary support system including auxiliary supports based on ground conditions. Supplying & fixing of temporary support system such as shotcrete, rock bolts and steel ribs and auxiliary supports. Any other works required for execution of this item.										
i)	Type A	Nos.	5								
ii)	Type B	Nos.	3								



Item no.	Description	Unit	Quantity	Rate				Amount				
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	
b)	<p>Supplying, transporting <i>and placing</i> of concrete including formwork, compacting &amp; curing in accordance with the Specification and the Drawings.</p> <p>i. Plain cement concrete of <i>grade M-25</i> in lining, invert, backfill, material storage floor area, <i>cable pits</i>;</p> <p>ii. Providing water proofing membrane with isolation mat, rear drain catchment (perforated), drainage system ensuring water tightness of junction of main tunnel with Equipment Rooms;</p> <p>iii. Providing ground earth system,</p> <p>iv. <i>Supplying and fixing precast RCC cable pit covers of all sizes of grade M75.</i></p> <p>v. Any other works required for execution of these items.</p> <p><i>Reinforcement steel for cable pit cover shall be paid separately under item no. 508.</i></p>											
i)	Type A	Nos.	5									
ii)	Type B	Nos.	3									
	<b>Cut and Cover Tunnel</b>											



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
506	Tunnel Excavation										
a)	Excavation in all kinds of strata including site clearance, muck disposal, backfilling with suitable material in layers not exceeding 300mm in thickness, compacting each layer so as to achieve 90% degree of compaction in a profile in accordance with the Specification and the Drawings as directed by the Engineer.	cu m	10,785								
b)	Excavation/removal of unsuitable material (below subgrade) and filling by M-20 grade concrete in accordance with the Specification subject to the approval of the Engineer.	cu m	200								
507	Supplying, transporting, placing, compacting & curing cast-in-situ plain/reinforced cement concrete of specified grade including water stop & joint filler at the construction joints, formwork, drainage system and water proofing system in accordance with the Specification and the Drawings. Reinforcement steel shall be paid separately under item no. 508.										



Item no.	Description	Unit	Quantity	Rate				Amount				
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	
a)	<b>Levelling concrete</b> Plain cement concrete of grade M-20 below base concrete for levelling the surface.	m	65									
b)	<b>Lining Concrete</b> Reinforced cement concrete of grade M-40 including supplying & installing anchor bolts for drop arms, indication of lining thickness.	m	65									
c)	<b>Base Concrete</b> Reinforced cement concrete of grade M-40 including providing and laying d <sub>n</sub> 455mm perforated UPVC drainage pipe in trench embedded in filter media.	m	65									
d)	Supplying and installing reinforcement steel bar corrosion monitoring system (Anode ladder type) in cut & cover portion of NATM tunnel in accordance with the Specification and the Drawings.	Nos.	1									
e)	Track bed concrete of both tracks of grade M-35 including providing cable crossing FEP pipes and concrete anchors for track slabs with groove for reference pin.	m	65									
f)	Supplying & fixing of precast RCC cable trough (both sides) of all sizes of grade M-	m	65									



Item no.	Description	Unit	Quantity	Rate				Amount				
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	
	75 (with lid and locking mechanism) including backfill concrete of grade M-25 around the trough and walkway for maintenance with U2 finish (locking material shall be handed over to E1 Contractor).											
g)	<p><b>Portal Structure</b></p> <p>Supplying, transporting, placing, compacting &amp; curing cast-in-situ RC concrete of grade M-40 including tunnel post in accordance with the Drawings.</p> <p>Note:</p> <p>i) The quantity of concrete under this item shall exclude thickness of lining of tunnel which is included in item 507 b) &amp; c).</p> <p>ii) The reinforcement steel shall be paid separately under item no. 508.</p>	cu m	7									
508	Supplying, cutting, bending, binding & placement of reinforcement steel of all diameters of grade Fe500D in accordance with the Specification and the Drawings.	MT	520									
Total for Bill No. 5.1 (Carried forward to Grand Summary, p. )												



**Bill No. 5.2: Adit Tunnel**

Note: For details, the Contractor shall refer to the respective Drawings.

Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
	<b>Adit Tunnel</b>										
509	<p>Excavation of tunnel following NATM in different kinds of strata including muck disposal in accordance with the Specification and the Drawings.</p> <p>This item includes:</p> <p>i. All necessary incidental works such as dewatering including water treatment facilities, probing, ground treatment, fissure grout, consolidation grout, face stabilisation, ventilation, cavity treatment, auxiliary supports, controlled blasting/mechanical means, face mapping, vibration control against surface and Existing Buildings &amp; Structures (EBS), protection of EBS and instrumentation &amp; 3D monitoring of deformation of tunnel.</p> <p>ii. Excavation for 455mm diameter centre drain pipe (below invert).</p>										





Item no.	Description	Unit	Quantity	Rate				Amount				
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	
	iii. Any other works required for execution of this item.											
a)	Class IV <sub>N</sub> Strata	m	86									
b)	Class III <sub>N</sub> Strata	m	87									
c)	Class II <sub>N</sub> Strata	m	87									
d)	Class I <sub>N</sub> , I <sub>L</sub> & I <sub>S</sub> Strata	m	111									
510	Temporary supports including all incidental works in accordance with the Specification and the Drawings.											
a)	Supplying & spraying shotcrete of specified grade as shown in the Drawings.											
i)	Thickness-100mm	sq m	1,821									
ii)	Thickness-150mm	sq m	3,681									
iii)	Thickness-200mm	sq m	2,371									
b)	Supplying cutting, bending & fixing of MS welded wire mesh of size 100mm x 100mm x 3.4mm dia. as reinforcement for shotcrete.	sq m	1,047									
c)	Supplying, drilling & installation of 25 mm diameter rock bolts of grade Fe500D including bearing plate, nut, waterproof											



Item no.	Description	Unit	Quantity	Rate				Amount				
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	
	protection pads, grouting and all other accessories complete in all respects.											
i)	Length - 3.0m	Nos.	352									
ii)	Length - 4.0m	Nos.	696									
iii)	Length - 5.0m	Nos.	1,554									
d)	Supplying, fabricating, transporting & erecting steel support including all necessary accessories such as bracing, lagging & backfilling sheaths, splice plates, bolts, nuts & other services required to execute the work.	MT	71									
511	Supplying, transporting, placing, compacting & curing cast-in-situ concrete (reinforced/plain cement concrete) of specified grade including formwork, drainage system, providing waterproofing system, evacuation guidance indication boards and indication of lining thickness in accordance with the Specification and the Drawings. Note – i. The chainages given are tentative and may change during execution of											



Item no.	Description	Unit	Quantity	Rate				Amount				
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	
	works. The reinforcement steel shall be paid separately under item no. 516.											
a)	<b>Lining Concrete</b>											
i)	Reinforced cement concrete of grade M-35 including filling of overbreak, providing waterproofing membrane (EVA) with isolation mat and rear drain catchment (perforated) with filter material.	m	20									
ii)	<i>Plain</i> cement concrete of grade M-25 including filling of overbreak, providing waterproofing membrane (EVA) with isolation mat and rear drain catchment (perforated) with filter material, evacuation guiding indicator boards.	m	351									
b)	<b>Invert Concrete</b>											
i)	<i>Reinforced cement concrete</i> of grade M-35 including providing and laying d <sub>n</sub> 455mm perforated UPVC pipe in the longitudinal direction in a trench with filter media covered with EVA sheet, d <sub>n</sub> 80 UPVC pipe in a trench with filter median covered with EVA sheet and DN 75 PE pipes in	m	20									



Item no.	Description	Unit	Quantity	Rate				Amount				
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	
	transverse direction.											
ii)	Plain cement concrete of grade M-25 including providing and laying d <sub>n</sub> 455mm perforated UPVC pipe in the longitudinal direction in a trench with filter media covered with EVA sheet, d <sub>n</sub> 80 UPVC pipe in a trench with filter median covered with EVA sheet and DN 75 PE pipes in transverse direction.	m	351									
c)	Backfill concrete of grade M-25 between invert & pavement concrete including providing inspection boxes/ drainage pits with MS grating	m	371									
d)	Pavement concrete of grade M-25 including supplying & fixing of concrete kerbs.	m	371									
512	<b>Niche in Adit</b>											
a)	Excavation in all kinds of strata including muck disposal in accordance with the Specification and the Drawings. This item includes: All necessary incidental works such as dewatering including water treatment	Nos.	1									



Item no.	Description	Unit	Quantity	Rate				Amount			
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR
	<p>facilities, probing, ground treatment, fissure grout, consolidation grout, vibration control against surface and Existing Buildings &amp; Structures (EBS), protection of EBS.</p> <p>Design of temporary support system including auxiliary supports based on ground conditions.</p> <p>Supplying &amp; fixing of temporary support system such as shotcrete, rock bolts, steel ribs and auxiliary supports.</p> <p>Any other works required for execution of this item.</p>										
b)	<p>Supplying, transporting, placing, compacting &amp; curing cast-in-situ concrete (plain cement concrete) in lining, invert &amp; backfill of grade M-25 including formwork, drainage system, water proofing membrane with isolation mat, rear drain catchment (perforated), ensuring water tightness of junction of adit tunnel with niche in accordance with the Specification and the Drawings.</p>	Nos.	1								



Item no.	Description	Unit	Quantity	Rate				Amount				
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	
	<b>Cut and Cover Adit Tunnel</b>											
513	Tunnel Excavation											
a)	Excavation in all kinds of strata including site clearance, muck disposal, backfilling with suitable material in layers not exceeding 300mm in thickness, compacting each layer so as to achieve 90% of degree of compaction in a profile in accordance with the Specification and the Drawings as directed by the Engineer.	cu m	1,137									
b)	Excavation/removal of unsuitable material (below subgrade) and filling by M-20 grade concrete in accordance with the Specification subject to the approval of the Engineer.	cu m	50									
514	Supplying, transporting, placing, compacting & curing cast-in-situ plain/reinforced cement concrete of specified grade including water stop & joint filler at the construction joints, formwork, drainage system and water proofing system in accordance with the Specification and the											



Item no.	Description	Unit	Quantity	Rate				Amount				
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	
	Drawings. Reinforcement steel shall be paid separately under item no. 516.											
a)	<b>Levelling Concrete</b> Supplying & laying plain cement concrete of grade M-20 below base concrete for levelling the surface.	m	23									
b)	<b>Lining Concrete</b> Reinforced cement concrete of grade M-40 including indication of lining thickness.	m	23									
c)	<b>Base Concrete</b> Reinforced cement concrete of grade M-40 including providing and laying d <sub>n</sub> 455mm perforated UPVC drainage pipe in trench embedded in filter media.	m	23									
d)	Pavement concrete of grade M-25 including supplying & fixing of concrete kerbs.	m	23									
515	<b>Miscellaneous works</b>											
a)	Providing & fixing fence including MS doors with hinges, bolts, nuts, stoppers, handles, locking arrangements, welding including between Adit tunnel & main	Nos.	1									



Item no.	Description	Unit	Quantity	Rate				Amount				
				Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	Local - INR	Foreign - JPY	Foreign - USD	Foreign - EUR	
	tunnel in accordance with the Specification and the Drawings.											
b)	Construction of reinforced concrete separator wall & MS doors at the start of Adit tunnel with hinges, bolts, nuts, stoppers, handles, locking arrangements including in accordance with the Specification and the Drawings. Reinforcement steel shall be paid separately under item no. 516.	Nos.	1									
516	Supplying, cutting, bending, binding & placement of reinforcement steel of all diameters of grade Fe500D in accordance with the Specification and the Drawings.	MT	116									
Total for Bill No. 5.2 (Carried forward to Grand Summary, p. )												





**Schedule of Daywork Rates: 1. Labour**

Item No.	Description	Unit	Nominal Quantity	Rate	Amount
				Local- INR	Local- INR
D100	Foreman	Day	360		
D101	Miner	Day	1080		
D102	Driller	Day	1080		
D103	Operator	Day	360		
D104	Driver	Day	360		
D105	Labourer	Day	1080		
D106	Bricklayer	Day	360		
D107	Mason	Day	360		
D108	Carpenter	Day	360		
D109	Steel fixer	Day	360		
D110	Welder	Day	360		
D111	Painter	Day	360		
D112	Asphalt Worker	Day	360		
D113	Electrician	Day	360		
D114	Blacksmith	Day	360		
D115	Plumber	Day	360		
D116	Any other technician	Day	360		
Subtotal					
Total Daywork for Labour (Carried forward to Daywork, p.__)					



**Schedule of Daywork Rates: 2. Materials**

Item No.	Description	Unit	Nominal Quantity	Rate	Amount
				Local- INR	Local- INR
D200	Cement (OPC 43 grade)	MT	100		
D201	Sand	m <sup>3</sup>	100		
D202	Coarse aggregate (nominal size 20mm)	m <sup>3</sup>	100		
D203	Concrete M35	m <sup>3</sup>	300		
D204	Concrete M10	m <sup>3</sup>	100		
D205	Concrete M25	m <sup>3</sup>	300		
D206	Shotcrete M20	m <sup>3</sup>	300		
D207	Structural Steel	MT	10		
D208	Reinforcement Steel Fe-500D	MT	10		
D209	RCC Pipe dia. 300mm	m	100		
D210	RCC Pipe dia 500mm	m	100		
Subtotal					
Total Daywork for Materials (Carried forward to Daywork, p. __)					



### Schedule of Daywork Rates: 3. Contractor's Equipment

Item No.	Description	Unit	Nominal Quantity	Rate	Amount
				Local- INR	Local- INR
D300	Backhoe 0.4m <sup>3</sup>	hr	400		
D301	Dozer 10ton	hr	400		
D302	Vibratory-Roller 8~10ton	hr	400		
D303	Dump Truck 10ton	hr	400		
D304	Hydra Crane 15ton	hr	400		
D305	Generator 25kVA	hr	800		
D306	Air Compressor 170 cfm	hr	800		
D307	Welding Machine 250A	hr	2400		
D308	Submersible Pump 5 HP	hr	2400		
D309	Submersible Pump 10 HP	hr	2400		
D310	Dump Truck 30 Ton	hr	400		
D311	Hydraulic Crane 50 Ton	hr	400		
D312	Wheel Dozer 6 cu m capacity	hr	400		
D313	Gantry Crane 50 Ton	hr	400		
D314	Diesel Locomotive 20 Ton	hr	400		
D315	Diesel Locomotive 30 Ton	hr	400		
D316	Truck 2 Ton	hr	400		
D317	Truck 4 Ton	hr	400		
D318	Drilling equipment (Single boomer)	hr	400		
Total Daywork for Contractor's Equipment (Carried forward to Daywork, p.__)					



**Bill No. 6: Daywork Schedule (Provisional Sum)**

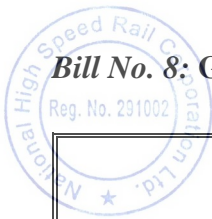
*Dayworks Summary*

<b>Description</b>	<b>Amount Local-INR</b>
(1) Total for Daywork: Labour	
(2) Total for Daywork: Materials	
(3) Total for Daywork: Contractor's Equipment	
Total for Daywork (Provisional Sum) [1+2+3] (Carried forward to Grand Summary, p. __)	



**Bill No. 7: Specified Provisional Sums**

Bill No.	Item No.	Description	Amount			
			Local – INR	Foreign- JPY	Foreign – USD	Foreign – EUR
	1	Utility support above and below MIDC road near Main Tunnel Portal a) Investigations b) Design and construction of: (i) Temporary road diversion (ii) Steel decking (iii) Utility support c) Precautionary measures for NATM excavation considering utility supports method d) Reinstatement Note: Refer to Sub-clause 2.3 and 2.9 of Sub-Division 06060, Division 06000 of the General Specifications. <i>Released materials of utility support shall be the property of the Contractor.</i>	600,000,000			
	2	Unchartered Utilities	100,000,000			
	3	Cost of DB*	57,000,000			
Total for Specified Provisional Sums (Carried forward to Grand Summary, p. __)			757,000,000			
Provisional Sums included and so designated in the Bill of Quantities shall be expended in whole or in part at the directions of the Engineer, except for the provisional sum for the cost of the DB, which requires no prior instruction of the Engineer, in accordance with Sub-Clause 13.5 and Clause 13.6 of the General Conditions.						



**Bill No. 8: Grand Summary**

General Summary	Page	Amount				Total Amount Equivalent in Local Currency
		Local – INR	Foreign- JPY	Foreign – USD	Foreign – EUR	
Bill No. 1: General Items						
Bill No. 2: Permanent Reinstatement and Associated Works at Portals		/	/	/	/	/
Bill No. 2.1: At Main Tunnel Portal						
Bill No. 2.2: At Adit Portal						
Bill No. 3: Shaft Work		/	/	/	/	/
Bill No. 3.1: Shaft No. 2		/	/	/	/	/
Bill No. 3.1.1: Main Works & Ventilation Building						
Bill No. 3.1.2: Permanent Reinstatement and Associated Works						
Bill No. 3.2: Shaft No. 3		/	/	/	/	/
Bill No. 3.2.1: Main Works & Ventilation Building						
Bill No. 3.2.2: Permanent Reinstatement and Associated Works						
Bill No. 4: TBM Tunnel						
Bill No. 5: NATM and Cut & Cover Tunnel		/	/	/	/	/
Bill No. 5.1: Main Tunnel						
Bill No. 5.2: Adit Tunnel						
Subtotal of Bills (1 to 5)						



General Summary	Page	Amount				Total Amount Equivalent in Local Currency
		Local – INR	Foreign- JPY	Foreign – USD	Foreign – EUR	
Subtotal of Bills (1 to 5)	(A)					
<i>Bill No. 6: Day Work Schedule</i> (Provisional Sum)	(B)					
<i>Bill No. 7: Specified Provisional Sums</i>	(C)	757,000,000				
Add Provisional Sum for Contingency Allowance	(D)	2,000,000,000				
Bid Price (A+B+C+D) (Carried forward to Form of Bid)	(E)					

(Total in words and in figures .....)