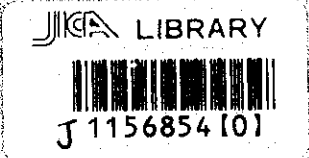


JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

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MINISTRY OF COMMUNICATIONS
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ROADS AND HIGHWAYS DEPARTMENT

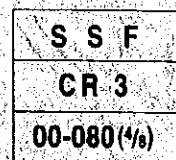
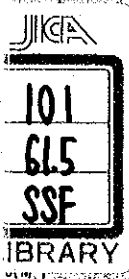
RUPSA BRIDGE CONSTRUCTION PROJECT
(PROPOSED TO BE FINANCED BY JAPAN BANK FOR
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Tender Documents : Volume C
(DRAFT VERSION)



MARCH 2000

PACIFIC CONSULTANTS INTERNATIONAL (PCI)
JAPAN OVERSEAS CONSULTANTS (JOC)



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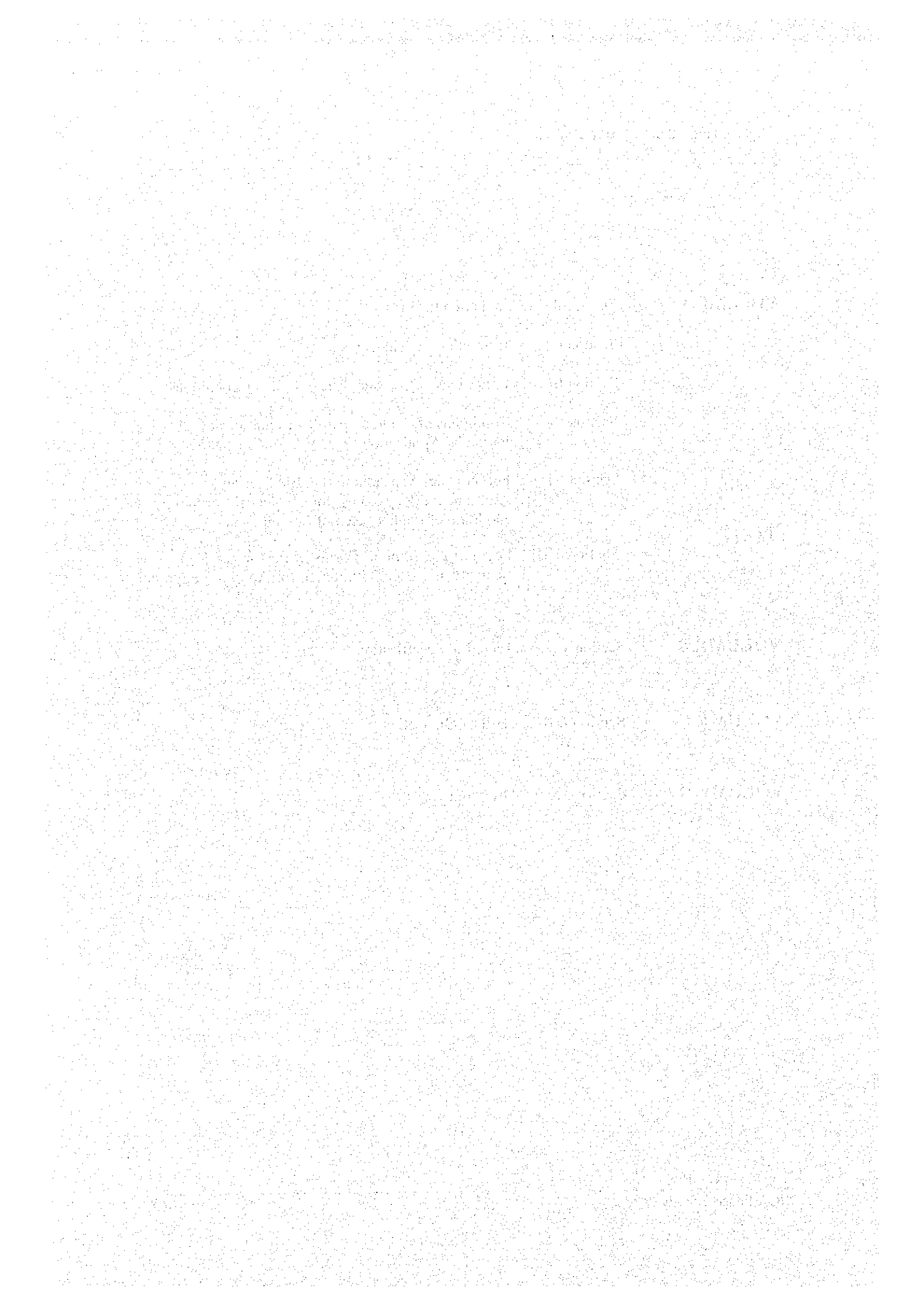
**PACIFIC CONSULTANTS INTERNATIONAL (PCI)
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TENDER DOCUMENTS

VOLUME A	Section I	Invitation for Bids
	Section II	Instructions to Bidders
	Section III	Conditions of Contract, Part I - General Conditions
	Section IV	Conditions of Contract, Part II - Conditions of Particular Application
	Section VI	Form of Bid, Appendix to Bid, Bid Security, Attachment I (Key criteria for "Technical Conformity") and Form of Bank's Letter of Commitment
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NOTE

The Draft Tender Documents for Rupsa Bridge Construction Project were prepared in the course of the Study on Construction of the Bridge over the River Rupsa in Khulna (Phase 2) by the Consultants led by Pacific Consultants International, Japan.

The documents were prepared as a draft version and are subject to a design review by a following consultant and approval by the Employer (Roads and highways Department, Ministry of Communications).

PREAMBLE TO BILL OF QUANTITIES

1. In this Bill of Quantities (BoQ), the sub-headings and item descriptions identify the work covered by the respective items, but the exact nature and extent for the work to be performed is to be ascertained by reference to the Drawings, Specification and Conditions of Contract.
2. The quantities set out against the various items are approximate only, and are not to be taken as a warranty of the amount of work to be carried out, or that they will not be exceeded. The actual quantity of work carried in accordance with the Contract will be measured by the Engineer as described in Clause 56 of the Conditions of Contract.
3. All quantities to be measured for payment shall be the net quantities of the finished work executed in accordance with the Contract notwithstanding trade customs to the contrary and without making allowances for e.g. waste, reinforcement laps/splices/couplers, post tensioning strand cut-offs, bulking, shrinkage, settlements and the like, except as shown on the Drawings or unless otherwise specified and separately scheduled in the BoQ.
4. The rates and prices entered in the Bill of Quantities shall be deemed to be the full inclusive value of the work covered by the several items, including but not limited to the following, unless expressly stated otherwise:
 - i) Labour and costs in connection therewith;
 - ii) The supply of materials and goods and the costs in connection therewith including wastage, delivery to and storage on site, and haul to any part of the site;
 - iii) Plant and costs in connection therewith;
 - iv) Fixing, erecting, installing, forming and placing of materials and goods in position;
 - v) Temporary Works, unless explicitly mentioned elsewhere;
 - vi) The effects of phasing the Works to the extent described or reasonably implied in the Contract Documents;
 - vii) Any additional cost incurred for working adjacent to, over, or in water whether or not specifically mentioned in the Contract Documents;
 - viii) General obligations, liabilities and risks involved in the execution of the Works set forth or reasonably implied in the Contract Documents;
 - ix) Complying with Quality Assurance requirements, including the provision of samples and testing;
 - x) Establishment charges, supervision, overheads and profit.
5. A rate or price shall be entered against each item whether quantities are stated or not. Items against which no rate or price has been entered shall be deemed to be covered by other rates and prices in the Bill of Quantities.

6. Rates and prices entered in the Bill of Quantities shall be in Bangladesh Taka only. Payment required in foreign currency or currencies will be made in accordance with the Conditions of Contract, in the agreed proportions and at the agreed exchange rates entered in the appropriate Schedules of Supplementary Information, or as otherwise provided for in the Contract.
7. Attention is drawn to the requirement for the Contractor to design a number of components of the project, including but not necessarily limited to the highway lighting system, shock transmission units, pot bearings, expansion joints and the Bridge Toll System. Rates and prices shall include for such design and the warranty of the component where specified.
8. Method Related Charges
 - 8.1 For the purposes of this section the following words and expressions shall have the meanings hereby assigned to them:
 - a) "Method Related Charge" means the sum for an item included in the Bill of Quantities or inserted in the Bill of Quantities by a Tenderer at the time of tender;
 - b) "Time Related Charge" means a Method Related Charge for work the cost of which is to be considered as proportional to the length of time taken to execute the work;
 - c) "Fixed Charge" means a Method Related Charge which is not a Time Related Charge.
 - 8.2 The pricing of an item for a Method Related Charge in the Bill of Quantities shall not bind the Contractor to adopt the method stated in the item description in executing the Works. In the event of the satisfactory execution of any part of the Works which has been the subject of an item for a Method Related Charge using, whether in whole or in part, a method other than that described in the item, the Contractor shall nevertheless be entitled to payment of the Method Related Charge or the balance thereof, as the case may be, by such instalments at such times and upon such events as may from time to time be agreed between the Engineer and the Contractor.
 - 8.3 Method Related Charges shall not be subject to admeasurement but shall be deemed to be prices for the purpose of Clauses 52.1, 52.2 and 56 of the Conditions of Contract. Method Related Charges shall be certified and paid pursuant to Clause 60.
9. The quantities measured for the various items relate to designs of components which are capable of installation and erection by the methods of construction illustrated on the Drawings. Where a Contractor's approved method of construction entails additional material to accommodate temporary stresses or to ensure stability, etc. during installation or erection, such additional material shall be considered as Temporary Works and will not be subject to admeasurement.
10. Due to the fluctuations in the river level and the changing boundaries of the waterline, no distinction has been made in the Bill of Quantities between work carried out over, under or adjacent to water except where specifically stated. The rates and prices entered into the Bill of Quantities are deemed to allow for the ground conditions, hydrological and meteorological conditions of the Site, as described in Articles 0.1.4 and 0.2.13 of the Specification.
11. Rock is defined as any material met with in excavation which, in the opinion of the Engineer, cannot be removed without the use of blasting, breakers or splitters. Incidental boulders of 0.5

cu.m. or less shall not be classed as rock.

12. Provisional Sums included and so designated in the Bill of Quantities are defined and shall be expended in accordance with Clause 58 of the Conditions of Contract.
13. Items which cover measured work to be carried out, but for which a high expectation of quantity variation exists, have been identified by the use of the words (PROVISIONAL QUANTITY) following the item description in the Bill of Quantities. No increase or decrease in the rate shall be permitted whether or not the item is used or the quantity varied except that the item shall be taken into account for the purposes of Clause 52.3 of the Conditions of Contract.
14. The prices set out in the Bill of Quantities hereinafter insofar as they are marked as "sum" are unvariable prices and except as otherwise provided for in the Contract there shall be no addition to or deduction from the contract price by reason of the actual cost being higher or lower than estimated when fixing these prices. Payment shall be made by installments in proportion to the extent to which, in the opinion of the Engineer, the relevant work has been executed.
15. The prices set out against an item in the Bill of Quantities hereinafter insofar as such price has been derived by multiplying the quantity set out against such item by the rate inserted by the Contractor, is required solely for the purpose of assessment and shall not be deemed to be the actual sum which shall be paid to the Contractor for the execution of the respective work. The sums actually to be paid to the Contractor shall, subject to the provisions of the Contract, be determined by measuring the quantities of the works actually performed in accordance with the Contract and valuing them at the rates inserted by the Contractor.

The rates shall be deemed to be carefully proportioned in each case taking into consideration the special conditions of the relevant work. All work for which one rate is inserted shall be carried out and paid for at such rate, regardless of its difficulty or one part of it being more difficult than another.
16. **Dayworks**
 - 16.1 Reference should be made to sub-clause 52.4 of Part I of the Conditions of Contract. Work shall not be executed on a daywork basis except by written order of the Engineer. The basic rates entered for daywork items in the Schedule shall apply to any quantity of daywork ordered by the Engineer. Unless otherwise adjusted, payment for daywork shall be subject to price adjustment in accordance with the provisions in the Conditions of Contract.
 - 16.2 **Daywork Labour**
 - 16.2.1 In calculating payments due to the Contractor for the execution of dayworks, 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 return to the original place of departure, but excluding meal breaks and rest periods. Only the time of classes of labour directly doing work ordered by the Engineer and for which they are competent to perform 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.
 - 16.2.2 The Contractor shall be entitled to payment in respect of the total time that labour is employed on

daywork, calculated at the basic rates entered by him in the "SCHEDULE OF DAY WORK RATES: 8.1.1. LABOUR", together with the additional percentage payment on basic rates representing the Contractor's profit, overheads, etc. as described below:

- a) The basic rates for labour shall cover all direct 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 Bangladesh law. The basic rates will be payable in local currency or the currency of currencies entered in the Appendix to Bid as appropriate to the labour or activity involved.
- b) The additional percentage payment stated in the Bill of Quantities shall be applied to costs incurred under (a) above shall be deemed to cover the 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.
- c) Rates for complete crews shall consist of the total cost of all direct and attendant labour involved in the activity in question.

16.3 Daywork Materials

16.3.1 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 percentage addition to labour costs as detailed heretofore), at the basic rates entered by him in the "SCHEDULE OF DAY WORK RATES: 8.1.2. MATERIALS", together with the additional percentage payment on the basic rates to cover overhead charges and profit, as follows:

- a) The basic rates for materials shall be deemed to have been calculated on the basis of the invoiced price, freight, insurance, handling expenses, damage, losses, etc. and shall provide for delivery to store for stockpiling at the site. The basic rates shall be stated in local currency but payment will be made in the currency or currencies expended upon presentation of supporting documentation.
- b) The additional percentage payment stated in the Bill of Quantities shall be applied to the equivalent local currency payments made under (a) above, but payment will be made in the same currency or currencies as the basic rates for the materials.
- c) The cost of hauling materials for use on work ordered to be carried out as daywork from the store or stockpile on the site to the place where it is to be used will be paid in accordance with the terms for labour and Contractor's Equipment in this schedule.
- d) Where applicable basic material rates are not available in the Schedule of Daywork Rates - Materials, the basic rate shall be established using the principals defined in 16.3.1 a) above. In such cases the payment shall not be subject to price adjustment.

16.4 Daywork Contractor's Equipment

16.4.1 The Contractor shall be entitled to payments in respect of Contractor's Equipment already on

- Site and employed on daywork at the basic rental rates entered by him in the "SCHEDULE OF DAY WORK RATES: 8.1.3.CONTRACTOR'S EQUIPMENT". The said rates shall be deemed to include 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. The cost of drivers, operators and assistants will be paid for separately as described under the section of Daywork Labour.
- 16.4.2 In calculating the payment due to the Contractor for Contractor's Equipment employed on daywork, only the actual number of working hours will be eligible for payment, except that where applicable and agreed with the Engineer, the traveling time from the part of the Site where the Contractor's Equipment was located when ordered by the Engineer to be employed on daywork and the time for return journey thereto shall be included for payment
- 16.4.3 The basic rental rates for Contractor's Equipment employed on daywork shall be stated in local currency, but payment will be made in the currency or currencies entered in the Appendix to Bid, appropriate to the plant or activity involved having particular regard to the source country of the plant in question.
- 16.4.4 Payments for working plant shall be for the actual hours worked only; no payment for standing time will be made except where standing is specifically ordered by the Engineer in which case, if no standing time rate is provided in the Schedule, it shall be charged as 2/3 times the working rate.
17. Sum Items
- 17.1 Measurement of Performance Guarantee shall be made following evidence of a guarantee, acceptable to the Employer, being in force or as otherwise agreed by the Engineer. Payment shall be made in one or more installments during the course of the Contract on an appropriate schedule basis determined by the Engineer.
- 17.2 Measurement of Insurances shall be made following evidence of acceptable insurance being in force or as otherwise agreed by the Engineer. Payment shall be made in one or more installments during the course of the Contract on an appropriate basis determined by the Engineer.
- 17.3 Measurement of other Sum items shall comply with paragraph 14 of the Preamble to the Bill of Quantities.
18. Site Investigation
- 18.1 The measurement of establishment borehole plant, equipment and personnel and of the sample store shall be measured once only unless additional boreholes are ordered in writing by the Engineer. Any additional establishment to suit the Contractor's method of working shall not be measured.
- 18.2 The measurements for reporting of results and for transporting of samples shall be measured once only unless separately instructed otherwise by the Engineer. Up to three separate journeys

- to Dhaka shall be allowed. Any additional reporting or transportation to suit the Contractor's method of working shall not be measured.
- 18.3 The measurement of SPT and permeability tests and undisturbed and disturbed samples shall be the number successfully carried out or provided as required by the Contract.
- 18.4 The measurement of piezometers shall be the number of operational installations constructed as required by the Contract.
- 18.5 The measurement for additional cost of investigation working over water shall be measured once only. Any additional over water investigation costs incurred to suit the Contractor's method of working shall not be measured.
- 18.6 The measurement for laboratory testing off site shall be the number and type of tests instructed by the Engineer in accordance with the Contract.
19. Earthworks
- 19.1 General
- 19.1.1 For measurement purposes it shall be deemed that one cubic metre of cut equals one cubic metre of fill.
- 19.1.2 "Existing Ground Level at the time the excavation is commenced" shall be the ground level following excavation of topsoil.
- 19.2 Bridge Piers and Abutments
- 19.2.1 The measurement of excavation shall be the volume of the void to accommodate the structural foundation calculated on the basis of the horizontal area of the bottom of the foundation with the depth being measured from the bottom of the foundation (including in blinding concrete) to the Existing Ground Level at the time the excavation is commenced.
- 19.2.2 The measurement of compaction of fill shall be the volume of the void measured in accordance with excavation, above, less the volume of the structural foundation and structure within that void. Fill shall be either deposition of fill or deposition of fill and imported fill.
- 19.2.3 The volume of suitable excavated material available for deposition of fill shall be the volume of excavation, less the volume of material unsuitable for fill.
- 19.2.4 Where the volume of suitable excavated material exceeds the compacted fill requirement, all as measured as above, the difference shall be measured either, as material for fill above Existing Ground Level, or as material for fill above Existing Ground Level with the surplus being disposed off site. No separate Bill Item shall be provided for the disposal of the surplus excavated material.
- 19.2.5 Where the volume of suitable excavated material is less than the compacted fill requirement, all as measured as above, the difference shall be measured as imported fill.

19.2.6 The measurement of compaction of structural fill above Existing Ground Level at the time of the excavation, shall be the volume of the void between Existing Ground Level and the finished ground level indicated on the Drawings within the plan area of the structure.

19.3 Bridge Approach Roads

19.3.1 The measurement of imported fill shall be the volume of the void between Existing Ground Level and the levels indicated on the Drawings.

19.4 Compaction of Formation

19.4.1 The measurement of compaction of foundation shall be the area of the surface of the horizontal area of the bottom of the foundation less the horizontal area of the structure at the level of the surface immediately below the sub-base.

19.5 River Revetment Works

The measurement of the River Revetment Works earthworks shall be considered in two components; dry earthworks and wet earthworks. In the following, the term "bank profile" refers to the profile at the underside of the slope protection.

19.5.1 Dry Earthworks

19.5.1.1 The measurement of dry excavation shall be the volume between Existing Ground Level and the bank profile or +2.5m PWD, whichever is the higher level. The measurement of dry excavation shall allow for a temporary slope of 1:1.5, but the Contractor shall have sole responsibility for the slope of the Temporary Works.

19.5.1.2 The measurement of dry fill shall be the volume between Existing Ground Level or +2.5m PWD, whichever is the higher level, and the bank profile. Where dry excavation material is available for incorporation into the Permanent Works fill operation, no separate fill item shall be measured.

19.5.2 Wet Earthworks

19.5.2.1 The measurement of wet excavation shall be the volume between Existing Ground Level or +2.5m PWD, whichever is the lower level, and the bank profile. The measurement of wet excavation shall allow for a temporary slope of 1:3, but the Contractor shall have sole responsibility for the slope of the Temporary Works. If the Contractor opts to adopt a flatter gradient, the measurement of wet excavation in the temporary slope shall remain on the basis of a 1:3 slope.

19.5.2.2 The measurement of wet fill shall be the volume between Existing Ground Level and the bank profile or +2.5m PWD, whichever is the lower level.

19.5.2.3 The wet excavation and the wet fill operations shall be measured separately.

20.2 Measurement of Bored Piles

- 20.2.1 The measurement of establishment of piling plant and equipment shall be measured once only for each piling location, i.e. the trial pile site, each abutment and each pier. Any additional establishment of piling plant to suit the Contractor's method of working shall not be measured.
- 20.2.2 The measurement for full-size piles complete shall be the number of metres of pile required by the Contract installed complete by boring with temporary support, cleaning, and all other specified work up to and including base grouting. The length shall be measured along the pile from the top level of the pile shown on the Drawings, which is not existing ground level. The lengths measured shall be divided into length ranges as indicated in the Bill of Quantities. Provisional ranges are provided for measurement of total pile lengths up to 85m should longer piles up to that length be instructed by the Engineer.
- 20.2.3 The measurements for half-size trial piles complete and their load testing shall each be single sums for completion of the work on the two trial piles as specified and indicated on the Drawings: Any additional supply, installation and testing of reduced size piles to suit the Contractor's method of working shall not be measured.
- 20.2.4 In addition to the measurement of completed full-size and half-size piles by length the quantities of concrete, reinforcement and permanent casing used in piles required by the Contract shall be measured. Concrete and reinforcement shall be measured in accordance with the measurement of structural concrete. The measurement of permanent casing shall be the required length installed.
- 20.2.5 The measurement for removing trial piles shall be a single sum for the removal of all trial piles of any size as required by the Contract. Removal of any additional trial piles to suit the Contractor's method of working shall not be measured.
- 20.2.6 The measurement for additional cost of working over water for the construction of piles shall be measured once only. Any additional over water working costs incurred to suit the Contractor's method of construction of piles shall not be measured.
- 20.2.7 The measurement of directed changes to pile lengths shall be the overall total sum of the length changes ordered by the Engineer measured in linear metres along the piles. The overall change shall be considered an increase or reduction depending on whether the total after summing all the changes is positive or negative. In the event only either an overall increase or an overall reduction will apply but provisional quantities are included in the Bill of Quantities for both eventualities. This measurement shall be separate to the measurement of the lengths of completed piles. Changes ordered before and after the four week period for consideration of the approved final report on the Soils Investigation shall be measured separately.

Refer also to Para 9.2 of "Instructions to Bidders".

21. Precast Concrete

- 21.1 The word "precast" applies to a concrete unit manufactured in a location other than its final position.
- 21.2 The measurement of precast concrete shells for pile caps shall be the number of units.
- 21.3 The measurement of precast prestressed concrete girders shall be the number of girders.

- 21.4 Payment for precast concrete shells for pile caps and deck segments shall be made on the following basis:
- a) In the case of units precast and stored ready for installation:
 - 70% of the rate assigned to the relevant Bill of Quantities item, following casting, transportation and installation in storage and acceptance by the Engineer.
 - 30% following installation in the works.
 - b) In the case of units precast and immediately installed in the works:
 - 100% following installation in the works.
- 21.5 Measurement of the precast concrete railing walls has been separately identified on account of the magnitude and complexity of the work involved. All other trial pieces, panels, samples, and the like shall be provided for in accordance with the relevant measurement rules.
22. In Situ Concrete
- No deduction shall be made for:
- a) Holes, ducts, pockets, sockets, mortices and the like not exceeding 0.15 cubic metres each in volume;
 - b) Reinforcement;
 - c) Individual chamfers, splays, rebates, recesses, drips, grooves and the like of 100mm total girth or less when measured overall the faces of the individual feature formed in the concrete;
 - d) In the case of concrete with a patterned profile face, any indentations of 100mm total girth or less when measured overall the faces of the indentations formed in the concrete.
23. Steel Reinforcement for Structures
- 23.1 The mass of plain bar reinforcement shall be calculated on the basis that the nominal density of steel is 0.00785 kilograms per square millimetre of cross sectional area per linear metre, the mass of deformed bar reinforcement shall be calculated as the nominal rolling cross sectional area of the reinforcement. Steel bar supports to reinforcement where described in the Contract shall be measured as reinforcement.
- 23.2 Fabric reinforcement shall be measured as the area of work covered in the British Standard or other recognized reference being stated.
24. In Situ Post-Tensioned Prestressing for Structures
- 24.1 For the purpose of this section a tendon is defined as the steel cable, wire or strand into which a load is introduced to enable a compressive load to be imported to a concrete member.
- 24.2 Measurement shall be the weight of tendon measured between the external ends of the anchorages prior to stressing calculated on the basis that the nominal density of the steel is 0.00785 kilograms per square millimetre of cross sectional area per linear metre.

- 24.3 The measurement of stressing anchorages (live and dead) shall be the number installed and stressed.
25. Structural Steelwork
- 25.1 The measurement shall be the computed weight of the finished steelwork comprising plates, rolled section, stiffeners, cleats, packs, splice plates and all fittings, without allowance for tolerances for rolling margin and other permissible deviations from standard weights or nominal dimensions, and excluding the weights of welds, bolts, nuts, washers, rivets and protective coatings. No deductions shall be made for notches, cope holes, bolt and rivet holes, and the like; which are each less than 0.03 m^2 measured in plan.
- The computed weight of rolled and cast steel and cast iron shall be determined from the dimensions shown on the drawing, with the addition of 5% to the weight of castings for fillets and overrun, on the following basis:
- a) Rolled or cast steel, 7850 kg/m^3 ;
 - b) Cast iron, 7210 kg/m^3 .
- 25.2 Payment for supply, fabrication and delivery to Site shall be made on the computed weight of steel work supplied and fabricated into sub-assemblies (generally stiffened plates) and delivered to Site whether fabrication is carried out on Site or elsewhere. If the fabrication and/or assembly is carried out elsewhere than at the Site an amount calculated on the basis of 10 per cent of the rate entered by the Contractor against these items shall be retained to be paid upon delivery of the fabricated and/or assembled materials to the Site. Payment for assembly of steelwork into units for erection shall be made on the computed weight of fabricated steelwork so assembled whether assembly is carried out on Site or elsewhere.
26. Protection of Steelwork Against Corrosion
- The measurement shall be the surface area to be treated.
27. Waterproofing for Structures
- The measurement shall be the area of surface covered by the waterproofing. No deduction shall be made for openings of one square metre or less.
28. Bearings and Restraints
- The measurement shall be the number of complete units installed.
29. Metal Parapets
- The measurement of metal parapets shall be the developed length along the centre line of the parapet rail, and shall include for both rails, the posts and all fittings.
30. Expansion Joints

The measurement of bridge deck expansion joints shall be the complete installation. The stated length shall be measured along the centre line of the joint.

31. Pavement

31.1 The measurement of improved sub grade, sub base, lower base and upper base volume shall be calculated as per the typical cross section of pavement and embankment detail shown on the Drawing.

31.2 The measurement of prime coat, asphaltic concrete binder course, tack coat, asphaltic concrete wearing course and double bituminous surface treatment shall be the area calculated as per the typical cross section of pavement and embankment detail shown on the Drawing.

32. Road Markings

Intermittent lines shall be measured as the length of the marks only but the length of the mark and gap shall be stated.

33. Employer's Purchase of Engineer's and Employer's Requirements

The Contractor shall enter rates for these operations which shall include for the overhaul and refurbishment of the facility. Where the facility has electrical or mechanical components they shall be put into full working order. The rates shall be deemed to include for all costs, overheads and margins and be totally independent of each other and of any other item, such that the Employer may accept any, all or none of the facilities as described in the appropriate items without further compensation or adjustment.

34. Bridge Toll System Design by Contractor:

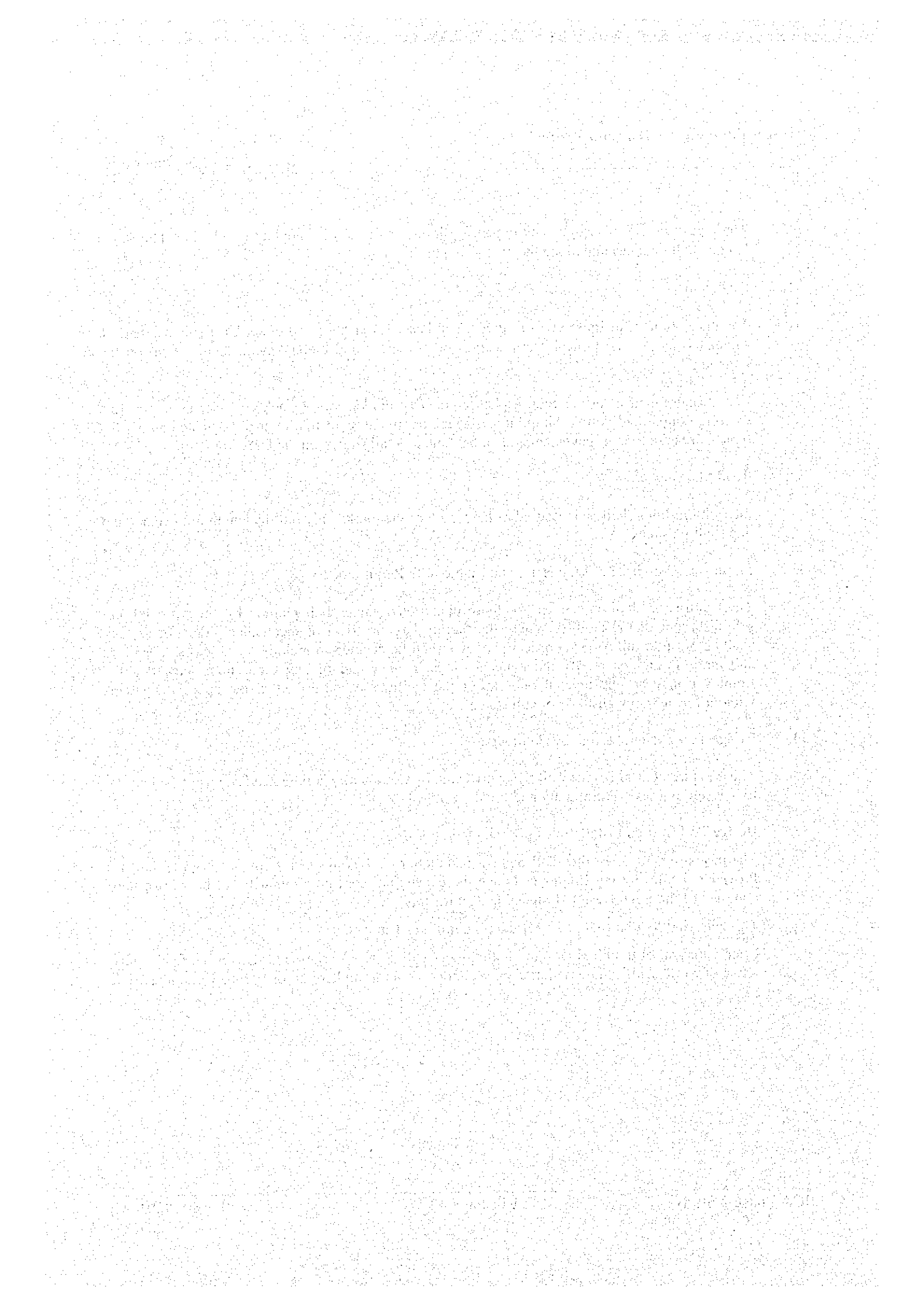
The measurement of Bridge Toll System Design by Contractor shall be single sums of each of the two design phases – Preliminary and Final.

35. Bridge Toll System Installation and Trial Operations:

The measurement of Bridge Toll System Installation and Trial Operations has been assigned a Provisional Sum by the Employer (since the exact final configuration will not be known until approval of the Final Design designed by Contractor).

This sum shall not be changed by Bidders submitting Tenders.

Upon approval of the Final Design, the Engineer will issue a Variation Order for the final agreed scope of work, with compensation to be set under the terms and conditions of the Contract Article 52.



Rupsa Bridge Construction Project

Bill of Quantities

Item No.	Description	Unit	Quantity	Unit Price (Taka)	Amount (Taka)
Bill No. 1 - General and Preliminary					
Items					
1.1	Contractual Requirements				
A	Performance Security (Clause 10)	sum			
B	Insurance of Works (Clause 21.1(a) and (b))	sum			
C	Insurance of Contractor's Equipment (Clause 21.1(c))	sum			
D	Third Party Insurance (Clause 23)	sum			
E	Insurance against Accident to Workmen (Clause 24.2)	sum			
F	Attendance during Defects Liability Period (Clause 49)	sum			
G	Compliance with the Conditions of Contract (Part 1 & II) not included elsewhere	sum			
1.2	Specified Requirements				
A	Surveys and setting out (Article 0.3.1)	sum			
B	Sign boards (article 0.3.2)	sum			
C	Progress photographs and videotapes (Article 0.3.3.)	sum			
D	Water level gauges (Article 0.3.4)	nr.	6		
E	Quality assurance, standards and materials testing (Article 0.6)	sum			
F	Construction of approach roads and initial dredging (Article 0.4.2)	sum			
G	Diversion of Irrigation Canal (Article 0.4.3)	sum			
H	Training of employer's personnel (Article 0.4.5)	sum			
I	Operation and Maintenance Manuals (Article 0.4.6)	sum			
J	Compliance with the Specification not included elsewhere	sum			
1.3	Method Related Charges				
The following sum descriptions are set out for the guidance of Tenderers as examples of the activities for which the Method Related Charges section has been incorporated and which may be Priced at the Tenderer's discretion.					
1.3.1	Fixed charges associated with mobilisation of:				
A	Concrete batching, prefabrication yards and working areas	sum			
B	Pile installation equipment and attendant plant	sum			
C	Pier construction equipment and attendant plant	sum			
D	Deck erection equipment and attendant plant	sum			
E	Dredging equipment and attendant plant	sum			
F	All other Contractor's Equipment	sum			
Page Total Carried to Bill No. 1 Collection					

Rupsa Bridge Construction Project

Bill of Quantities

Item No.	Description	Unit	Quantity	Unit Price (Taka)	Amount (Taka)
1.3.2	<u>Fixed charges associated with demobilisation of :</u>				
A	Concrete batching, prefabrication yards and working areas.	sum			
B	Piles installation equipment and attendant plant	sum			
C	Pier construction equipment and attendant plant	sum			
D	Deck erection equipment and attendant plant	sum			
E	Dredging equipment and attendant plant	sum			
F	All other Contractor's Equipment.	sum			
1.3.3	<u>Fixed charges associated with establishment</u>				
A	Access to and at Site, including dredging navigation channels from Mongla to Khulna	sum			
B	Contractor's Offices, stores, accommodation, services, etc.	sum			
C	Clearance and restoration fo working areas, etc.	sum			
1.3.4	<u>Time related charges associated with maintenance and operation of :</u>				
A	Access to and at, Site including navigation channels	sum			
B	Dredging equipment	sum			
C	Contractor's office, stores accommodation, services, etc.	sum			
D	Concrete batching plant, prefabrication yards and working areas	sum			
E	Deck erection equipment and attendant plant.	sum			
Page Total Carried to Bill No. 1 Collection					

Rupsa Bridge Construction Project

Bill of Quantities

Item No.	Description	Unit	Quantity	Unit Price (Taka)	Amount (Taka)
1.4	<u>The Employer's and Engineers Requirements</u>				
1.4.1	Engineer's Office				
A	Provide Temporary office Accommodation including all services as specified (Article 0.8.3)	month	3		
B	Provide and erect office including all services as specified in Article 0.8 of the Specification and the Appendix 4 thereto	sum			
C	Provide services to office as specified in Article 0.8 of the Specification	month	39		
D	Provide, install and maintain office furnishing and equipment all as specification and Appendix 1 thereto.	sum			
E	Provide, install and maintain survey instruments for the Engineer all as specified in Article 0.3.1 and Appendix 2 and take back after the completion of the Project.	sum			
F	Provide, install and maintain telephones and site radios as specified in Article 0.11 of the Specification.	sum			
Page Total Carried to Bill No. 1 Collection					

Rupsa Bridge Construction Project

Bill of Quantities

Item No.	Description	Unit	Quantity	Unit Price (Taka)	Amount (Taka)
1.4.2	<u>Engineer's Site Laboratory</u>				
A	Provide and erect Engineer's Site Laboratory including all utilities and services as specified in Article 0.9 of the Specification and Appendix 5 thereto	sq.m.	400		
B	Maintain Engineer's Site Laboratory	month	42		
C	Provide install and maintain Laboratory furnishings, equipment and built-in fittings as specified in Article 0.9 of the specification and Appendix 3 thereto	sum			
D	Dismantle Engineer's Site Laboratory including disposal of materials, handing over of all equipment to the Employer and reinstatement of the site.	sum			
1.4.3	Engineer's and Employer's Accommodation Provide, erect and furnish accommodation for the Engineer and Employer including all services as specified in Article 0.10 of the Specification and Appendix 6 thereto :				
A	Engineer's Quarters	nr.	18		
B	Engineer's Mess/Employers Mess (16 bed & bathroom units)	nr.	3		
C	Dormitory Quarters (25 units)	nr.	1		
D	Maintain Engineers Quarters as specified in Article 0.10 of the specification :	house-month	756		
E	Maintain Engineers Mess/Employers Mess as specified in Article 0.10 of the specification :	mess-month	126		
F	Maintain Dormitory quarters as specified in Article 0.10 of the specification	dorm.-month	42		
G	Provide and maintain Temporary Engineer and Employer's accommodation (Article 0.10.3)	month	5		
H	Provision of meals for residents in Engineer's Accommodation as per Article 0.10.5				
	(i) "Engineer's Quarters" (1 No. Restaurant / dining facility)	facility-month	42		
	(ii) "Engineer's Mess" (3 No. kitchen / dining facilities)	facility-month	126		
Page Total Carried to Bill No. 1 Collection					

Item No.	Description	Unit	Quantity	Unit Price (Taka)	Amount (Taka)
1.4.4	<u>Power Generation and Distribution</u>				
A	Provide and install, including outdoor cables and street and security lighting, power generating units with a suitable continuous output of 600 KVA for the Engineer's and Employer's site facilities and accommodation as specified in Article 0.7.6 of the Specification.	sum			
B	Operate and maintain the power generation units	month	42		
1.4.5	<u>Water Supply system</u>				
A	Provide and install water supply system to provide a nominal output of 100 cu.m. per day of potable water as specified in Article 0.7.7 of the Specification.	sum			
B	Maintain and operate water supply system	month	42		
1.4.6	<u>Engineer's Transport</u>				
	Provide Engineer's transport as specified in Article 0.12 of the Specification :				
A	5 seater saloon car	nr.	5		
B	(a) 9 seater LWB 4 wheel drive Jeep (b) 9 seater LWB 4 wheel drive station wagon	nr.	3		
C	Twin cab 4 wheel drive pickup	nr.	14		
D	Minibus	nr.	2		
E	5 m workboat	nr.	4		
F	14m survey launch	nr.	1		
G	Maintain and operate vehicles (Per Article 0.12)	100 km	12,250		
H	Maintain and operate boats (Per Article 0.12)	boat-month	210		
I	<u>Berthing Facilities for Boats</u> Construct and maintain suitable facilities as per Article 0.12.4.	sum			
Page Total Carried to Bill No. 1 Collection					

Rupsa Bridge Construction Project

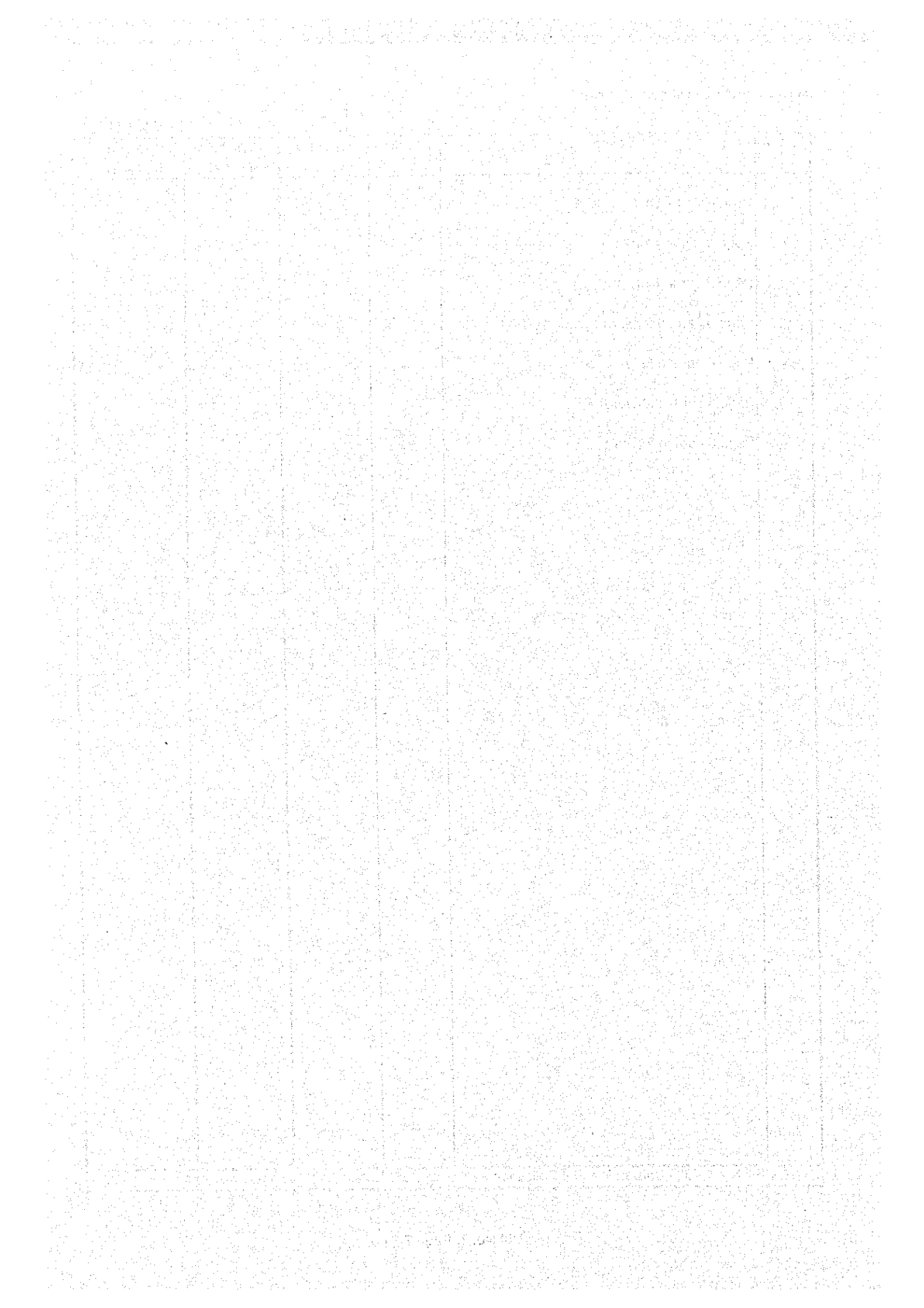
Bill of Quantities

Item No.	Description	Unit	Quantity	Unit Price (Taka)	Amount (Taka)
1.4.7	<u>Personnel</u> Provide the following labour to work under the sole direction of the Engineer / Employer for up to 12 hours per day and 7 days per week.				
A	Watchman for offices, laboratories and Employer's and Engineer's accommodation	man-month	420		
B	Labourers to work in the laboratory and in the field	man-month	84		
C	Drivers	man-month	1050		
D	Boatmen	man-month	210		
E	Experienced Laboratory Technicians	man-month	84		
1.4.8	<u>Domestic Personnel</u> Provide the following domestic employees to work in the accommodation and offices of the Engineer / Employer for upto 12 hour per day				
A	Cleaners	man-month	504		
B	Cooks	man-month	420		
C	Gardeners	man-month	210		
D	Office assistants (Peons)	man-month	420		
1.5	<u>Bridge Toll System Design By Contractor (See also BoQ Item 8.2.5)</u>				
A	Preliminary	sum			
B	Final	sum			
Page Total Carried to Bill No. 1 Collection					

Rupsa Bridge Construction Project

Bill of Quantities

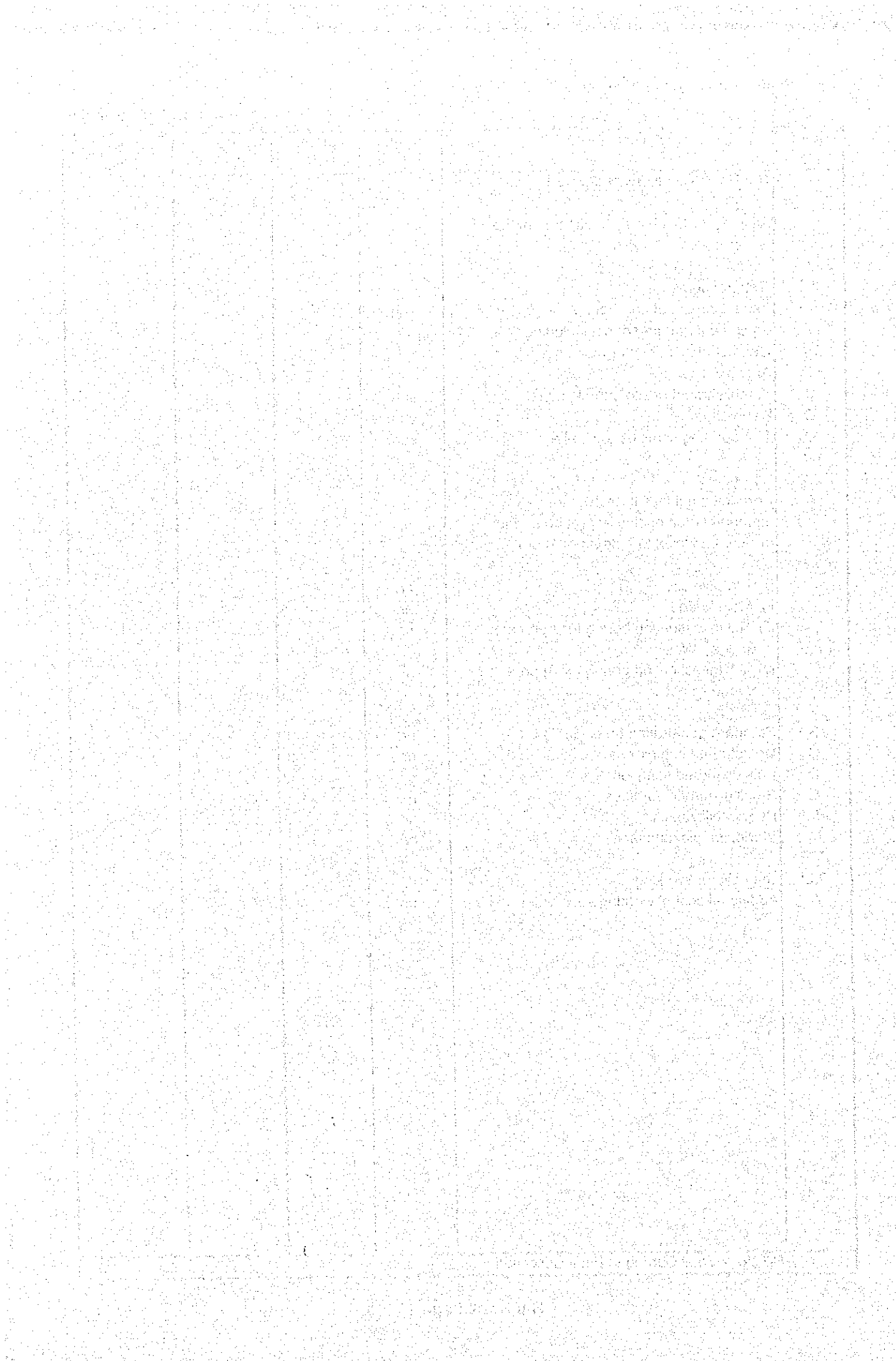
Item No.	Description	Unit	Quantity	Unit Price (Taka)	Amount (Taka)
	<u>BILL NO. 1 COLLECTION</u>				
	Page 1 carried forward				
	Page 2 carried forward				
	Page 3 carried forward				
	Page 4 carried forward				
	Page 5 carried forward				
	Page 6 carried forward				
	Bill No. 1 Total Carried to Final Collection				



Rupsa Bridge Construction Project

Bill of Quantities

Item No.	Description	Unit	Quantity	Unit Price (Taka)	Amount (Taka)
	<u>Bill No. 2 - Soils Investigation</u>				
	All in accordance with Section 33 of the Specification.				
2.1	<u>General sums</u>				
A	Establishment of borehole plant equipment and personnel including Geotechnical Engineer / Geologist Article 3.1.7.	sum			
B	Establishment of site sample store	sum			
C	Reporting	sum			
D	Transporting samples to Dhaka	sum			
2.2	<u>Boreholes</u>				
A	Boreholes not less than 100mm diameter commencing at ground surface or river bed level to a depth of 100m.				
	i) Trial Pile site	nr.	1		
	ii) Main bridge	nr.	8		
	iii) Soil Investigation boring for Approach Bridge - West	nr.	6		
	iv) Soil Investigation boring for Approach Bridge - East	nr.	2		
B	Standard penetration tests (SPT)	nr.	440		
C	Undisturbed samples	nr.	40		
D	Bulk disturbed samples	nr.	32		
E	Small disturbed samples	nr.	128		
F	Permeability tests	nr.	15		
G	Standpipe piezometers	nr.	5		
2.3	<u>Over Water Working</u>				
A	Additional cost of working voer water	sum			
Bill No. 2 Total Carried to Final Collection					



Rupsa Bridge Construction Project

Bill of Quantities

Item No.	Description	Unit	Quantity	Unit Price (Taka)	Amount (Taka)
Bill No. 3 - Main Bridge Substructure					
3.1	<u>Excavation and backfill</u>				
A	Excavation for piers	cu.m	2175.4		
B	Back fill with local borrow material	cu.m	1055.9		
3.2	Temporary Works Construction and dewatering for precast formwork of pile cap as per Drawing.	nr.	6		
3.3	Piling				
3.3.1	Piling Plant				
A	Establishment of piling and associated plant for preliminary trial and load test piling in advance of main piling	nr.	1		
B	Establishment of piling and associated plant for main piling	sum	1		
C	Additional cost for bored piling work in the river channel portion.	sum	6		
3.3.2	<u>Full - size pile complete (including boring, base grouting, temporary casing, concrete and reinforcement etc.) except for permanent casing:</u>				
A	55 m	m	440.0		
B	75 m	m	2700.0		
3.3.3	Trial Piles / Test Piles				
A	Trial Piles complete except for concrete, reinforcement and permanent casing.	nr.	1		
B	Load Test Piles (including Osterberg Load Cells) and load tests	sum	1		
3.3.4	<u>Permanent casing</u>				
A	Permanent steel casing	m	210.0		
3.3.5	Remove piles				
A	Trial Piles	sum	nil		
B	Load Test	sum	nil		
3.3.6	Integrity testing				
A	Sonic core testing	sum	2		
Page Total Carried to Bill No. 3 Collection					

Rupsa Bridge Construction Project

Bill of Quantities

Item No.	Description	Unit	Quantity	Unit Price (Taka)	Amount (Taka)
3.3.7	<u>Direct changes to pile length instructed up to 4 weeks from submission of the approved final Soils Investigation Report</u>				
A	Overall increase (PROVISIONAL QUANTITY)	m	660.0		
B	Overall reduction (PROVISIONAL QUANTITY)	m	220.0		
3.4	<u>Structural Concrete</u> Insitu concrete in accordance with the Drawings and Section 8 of the Specification :				
A	Blinding concrete Class U15/20	cu.m	669.7		
B	Pile Cap - Insitu concrete Class 30/20	cu.m	5172.0		
C	Pier stems - insitu concrete Class 30/20	cu.m	1378.8		
3.5	<u>Reinforcing steel (Substructure)</u> High yield steel bar reinforcement all diameters of 12 metres length or less including cutting, bending and placing.	tonne	1002.6		
3.6	<u>Bearing</u>				
A	Supply and install free sliding pot bearings on piers to Drawing and specification Section 18	nr.	4		
B	Supply and install free sliding pot bearings on abutments to Drawing and Specification Section 18	nr.	nil		
3.7	<u>Horizontal Restraints</u>				
A	Supply and install shock transmission units and transverse restraints	nr.	nil		
B	Supply and install shear key at Piers (transverse and longitudinal restraint)	nr.	nil		
C	Supply and install shear key at abutments (transverse restraint)	nr.	nil		
3.8	<u>Water proofing</u>				
A	Supply and apply two coats of bituminous emulsion to buried concrete surfaces.	sq.m	3448.0		
Page Total Carried to Bill No. 3 Collection					

Rupsa Bridge Construction Project

Bill of Quantities

Item No.	Description	Unit	Quantity	Unit Price (Taka)	Amount (Taka)
	<u>BILL NO. 3 COLLECTION</u> Page 1 carried forward Page 2 carried forward				
Bill No. 3 Total Carried to Final Collection					

Rupsa Bridge Construction Project

Bill of Quantities

Item No.	Description	Unit	Quantity	Unit Price (Taka)	Amount (Taka)
Bill No. 4 - Main Bridge Superstructure					
4.1	Structural Concrete				
4.1.1	Precast concrete				
A	Precast concrete class 30/20 footways segments including handling and erection at bridge site as per Drawings	nr.	1276		
B	Precast concrete class 30/20 parapet segments including handling and erection at bridge site as per Drawings	nr.	640		
C	Precast concrete class 30/20 sidewalk cover segments including handling and erection at bridge site as per Drawings	nr.	2552		
D	Precast concrete class 30/20 lightingbase attached to parapet including handling and erection at bridge site as per Drawings	nr.	48		
E	Precast concrete class 30/20 Barrier cover segments including handling and erection at bridge site as per Drawings	nr.	394		
4.1.2	Cast in-place concrete				
	Concrete class 40/20 for segmental bridge by balance cantilever method as per Drawings	cum	8006.1		
4.1.3	Internal Prestressing				
A	Longitudinal tendons comprising 15.2mm diameter strand or equivalent approved in ducts providing with ducts & anchors, post tensioning, anchoring, grouting, etc. complete as Drawings	tonne	426.4		
B	Transverse tendons of various sizes comprising 15.2mm strand or equivalent approved in ducts providing with ducts, anchors, post tensioning, anchoring, grouting, etc. complete as Drawings	tonne	100.4		
Page Total Carried to Bill No. 4 Collection					

Rupsa Bridge Construction Project

Bill of Quantities

Item No.	Description	Unit	Quantity	Unit Price (Taka)	Amount (Taka)
4.1.4	External Prestressing				
	Anchorage blocks with steel deviator tubes for future provisional external longitudinal tendons as per Drawings	nr.	768		
4.1.5	Steel Reinforcement for Structures				
	High yield steel bar reinforcement all sizes not exceeding 12m in length including cutting, bending and placing.	tonne	1442.1		
4.2	Expansion Joints				
	Bridge deck expansion joints including galvanized metal cover plates to parapet, median barrier and footways as per Drawings	m	33.0		
4.3	Metal Parapet				
	Galvanized metal parapet railings as per Drawings	m	4.6		
4.5	Access Provision				
A	Design, supply, and install access manholes, frames and covers in decks at piers as per Drawings	nr.	8.0		
Page Total Carried to Bill No. 4 Collection					

Rupsa Bridge Construction Project

Bill of Quantities

Item No.	Description	Unit	Quantity	Unit Price (Taka)	Amount (Taka)
	<u>BILL NO. 4 COLLECTION</u> Page 1 carried forward Page 2 carried forward				
	Bill No. 4 Total Carried to Final Collection				

