

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH

MINISTRY OF COMMUNICATIONS

ROADS AND RAILWAYS DIVISION

ROADS AND HIGHWAYS DEPARTMENT

**RUPSA BRIDGE CONSTRUCTION PROJECT**

(PROPOSED TO BE FINANCED BY JAPAN BANK FOR  
INTERNATIONAL COOPERATION)

**Tender Documents : Volume B**

**(DRAFT VERSION)**

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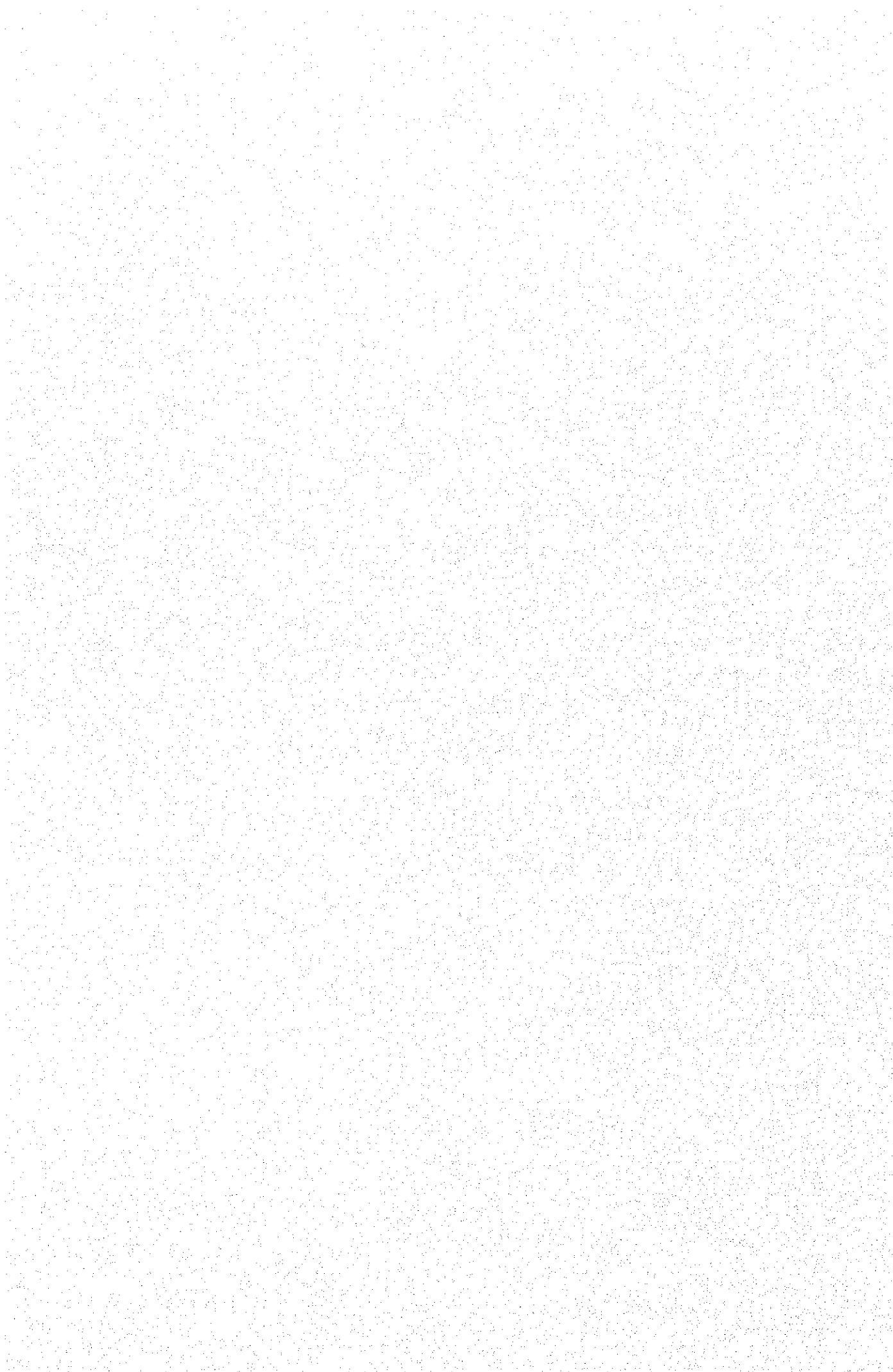
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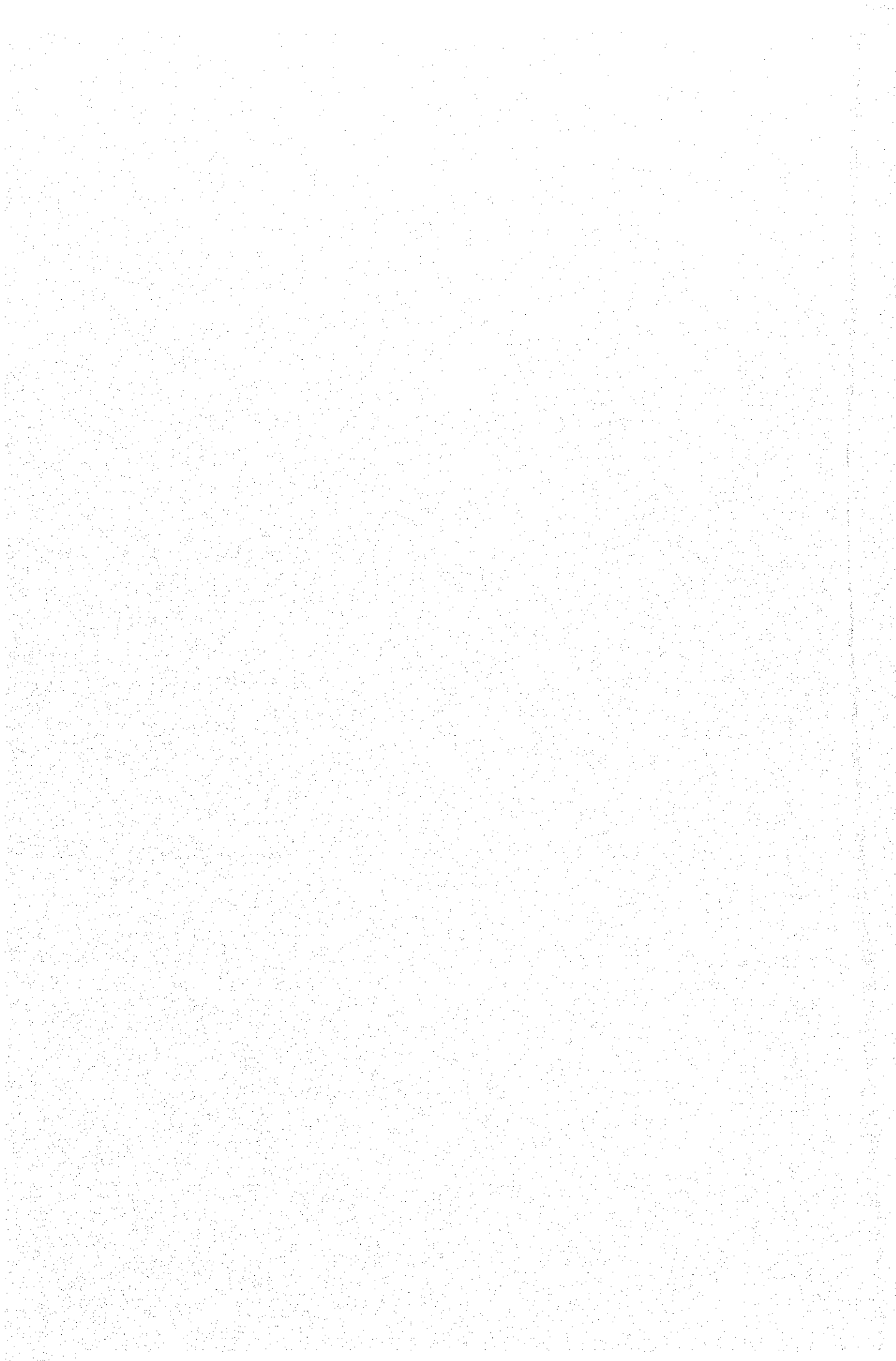
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1156853 [2]

## **Rupsa Bridge Construction Project**

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	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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<b>VOLUME B</b>	Section V	Technical Specification
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## Rupsa Bridge Construction Project

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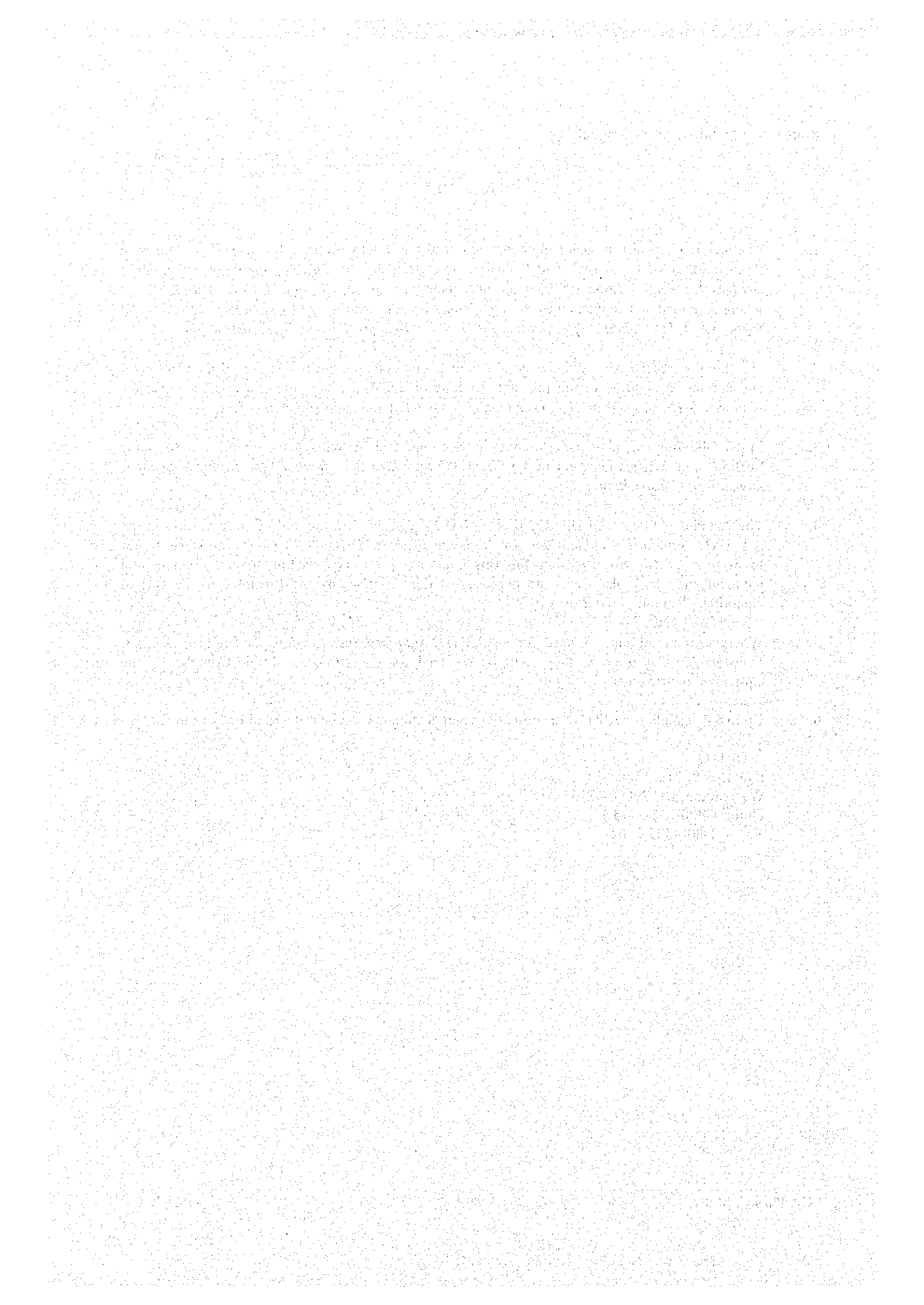
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**PREAMBLE**

1. The technical specification for the construction of the Works shall be the AASHTO (American Association of State Highway and Transportation Officials) *Standard Specifications for Highway Bridges*, Sixteenth Edition 1997 and as subsequently amended, *Division II, Construction*, except where amended and supplemented by the clauses herein. Sections 29 to 37 herein are additional to the AASHTO *Standard Specification for Highway Bridges, Division II, Construction*.
2. 'Section 0 - GENERAL' covers general technical and construction obligations of the Contractor and applies in addition to the relevant Sections of the AASHTO *Standard Specifications for Highway Bridges, Division II, Construction*, as amended and supplemented herein.
3. In the following amendments, references to 'Sections' and 'Articles' generally relate to the same Sections and Articles numbers in the AASHTO *Standard Specifications for Highway Bridges, Division II, Construction*.
4. The Articles entitled 'MEASUREMENT AND PAYMENT' at the end of each Section in the AASHTO *Standard Specifications for Highway Bridges, Division II, Construction* shall **not form part of the Specification for this Contract**. Articles relating to measurement and payment shall be replaced for the purposes of this Contract by the Preamble to the Bill of Quantities, Volume C (Section VII)
5. Wherever imperial units are used in the AASHTO *Standard Specifications for Highway Bridges, Division II, Construction*, they shall be replaced for the purposes of this Contract by the equivalent metric units.
6. Up to date standard AASHTO specifications and documents can be ordered directly from:

AASHTO  
P.O. Box 96716  
Washington, DC 20090-6716  
Phone 1-800-231-3475  
Fax 1-800-525-5562



## SECTION 0 GENERAL

In this Section 0 words and expression shall have the same meanings as are respectively assigned to them in the Conditions of Contract.

### 0.1 Scope and General Information

#### 0.1.1 Location and Description of the Project

The Works to be constructed under the Contract is the Southern Section of Khulna Bypass including Rupsa Bridge (hereinafter referred as to "Rupsa Bridge") which aim to bypass congested Rupsa Ferry and other traffic bottlenecks on National Highway No. 7 in the downtown of Khulna.

The proposed river crossing and its approaches are situated within the Khulna District, approximately 2.6 km downstream of the existing Rupsa Ferry and some 150 km inland from the fairway buoy in the Bay of Bengal.

The location of the Rupsa Bridge is selected to pass mostly undeveloped area where it is beyond the southern boundary of urbanized area in Khulna City. The starting point is designated and clearly marked up on Khulna-Sathkira Road (R760) by KDA at 150 m (500ft) toward Sathkira from the western corner of Weather Office under Meteorological Department. The route is planned to connect to Khulna-Mongla Road (NH-7) at existing at-grade intersection in Telok area where 5m wide Kudir Bat Tala Sarak road exists to lead to Abdul Wadud Memorial Hospital. The total length of the route is 10.039 km.

#### 0.1.2 Extent of the Works

The scope of Works covered under the Contract includes :

- The construction of i) 1,360m Rupsa Bridge, ii) two (2) canal bridges of 90m long Hatia Canal Bridge and 30m long Molonghata Canal Bridge and iii) nine (9) box culverts shown on the Drawings;
- The construction of iv) 8,559m long stretch of roadwork section including six (6) at-grade intersections and v) one (1) toll plaza, conforming to the arrangement shown on the Drawings;
- The construction of vi) river revetment on the east bank and pier protection against scouring shown on the Drawings;
- Provision of Employer's and Engineer's requirements;
- All protective and temporary works and other consequential work required for carrying out the foregoing;
- Such further work as the Engineer may direct to execute and complete the Works and

remedy any defects therein.

### 0.1.3 Drawings

The Drawings (Volume D of the Tender Documents) contain details of the Works to be carried out under the Contract.

### 0.1.4 Information Provided

The following information is provided for the guidance of the Contractor and is given in good faith. No warranty is given by the Employer or the Engineer as to accuracy or relevance of the information.

#### 0.1.4.1 Soils Investigations

The information provided on soil investigations is given in the following report;

“The Soil Investigation Report for the Study on Construction of the Bridge over the River Rupsa in Khulna (Phase 2)”, December 1999, Bangladesh Consultants Ltd.

#### 0.1.4.2 Rupsa River

Water level in Rupsa is greatly influenced by tide in Bay of Bengal. The water level fluctuates periodically not only in dry season but also in flood season. The Rupsa River was free from the flood of upstream rivers, the Ganges river and the Garai/Madhumati river, even during the recorded flood in 1998.

Fig. 1 shows the mean monthly H.W.L and L.W.L at Khulna station from 1970 to 1998.

Fig. 2 shows the fluctuation of water level and flow velocity surveyed on July 29 1999.

Estimated water levels by frequency analysis are tabulated in Table 1.

Table 1 High Water and Low Water Level Versus Return Period

Unit : m (P.W.D)

Return Period Year	Khulna		Chalna		Rupsa Bridge	
	HWL	LWL	HWL	LWL	HWL	LWL
100	3.68	-1.06	4.24	-2.25	3.77	-1.26
50	3.58	-0.99	4.10	-2.04	3.67	-1.17
20	3.42	-0.90	3.92	-1.76	3.50	-1.04
10	3.32	-0.83	3.77	-1.56	3.40	-0.95
5	3.20	-0.74	3.61	-1.36	3.27	-0.84

Fig. 1 and 2

**0.1.4.3 Meteorological Data**

The Contractor is referred to the Bangladesh Meteorological Department for meteorological data.

**0.1.4.4 Survey Datum**

Survey shall be referred to the local grid system set up specifically for this Project and all coordinates on the Drawings are based on this local system. All levels shall be referred to the Bangladesh Public Works Datum (PWD). The Drawings include the coordinates of the survey reference points set up on both east and west dike roads of the Rupsa River.

**0.1.4.5 Navigability of the Rupsa River**

Information on navigable channels of the Rupsa and other rivers and their depth is available from the IWTA of the Government of Bangladesh. The results of an independent survey carried out in August 1999 are contained in the report "Hydrological Survey for the Study on Construction of the Bridge over the River Rupsa in Khulna (Phase 2)", August 1999, Surface Water Modeling Center. A copy of this report is available for viewing at the office of the Project Director. This report would appear to indicate that, with localized dredging, access should be available for vessels with draft of 13 feet and mast height of 53 feet. It is also understood that the maximum size of vessels calling Khulna Port is 1,500 to 1,700 DWT. However it is the responsibility of the Contractor to confirm this information if relevant to his planning or methodology.

**0.2 Site Areas, Access and Use****0.2.1 Boundaries of the Site**

The Site comprises the areas of land allocated to the Contract as shown on the Drawings. This land has been acquired by the Employer and shall be made available to the Contractor for the execution of the Works free of charge. The Contractor shall make his own arrangements, obtain any necessary permission and be solely responsible for paying any costs, charges or compensation for the use of any additional areas outside the boundaries of the Site which he may need in connection with the execution of the Works.

**0.2.2 (Not Used)****0.2.3 Contractors' Working Areas**

Part of the Site will be available to the Contractor for his temporary use to provide space for storage, offices, workshops, prefabrication facilities and the like. For any land, beyond that shown as the Site on the Drawing, required by the Contractor for working areas, disposal of surplus spoil or the like, the Contractor shall make his own arrangements, obtain any necessary



permission and be solely responsible for paying any costs, charges or compensation in connection therewith.

The Contractor shall provide, erect, construct, and equip and remove on completion all offices accommodation, workshops, stores, berthing loading and unloading facilities, weigh bridges, prefabrication and other areas for his staff, personnel and construction equipment required by him directly or indirectly for the execution and completion of the Works and the remedying of any defects therein. The Contractor shall submit for the prior approval of the Engineer his proposals for the layout of his working area and facilities. It is intended that such approvals will be given promptly provided there are no significant aspects which are not acceptable to the Engineer.

Upon completion of the Works the Contractor shall clear away all surplus materials, construction equipment or any debris and temporary works of every kind from the Site and shall reinstate the areas to the satisfaction of the Engineer.

#### 0.2.4 Possession

The Contractor will be given possession of the Site allocated for his temporary use and the execution of the Works in accordance with the provisions of Clause 42 of the Conditions of Contract.

#### 0.2.5 Access

The Contractor shall be entirely responsible for providing all access to the Site for his personnel, materials, vehicles, plant and equipment and for all other requirements of the Works, whether such access be via the Rupsa River or via the existing road or rail network.

The Contractor shall abide by all limitations, laws and regulations relating to the use of public transportation routes and waterways, and shall be responsible for any damage or disruption caused by his misuse of them. The Contractor may improve and/or widen existing roads, repair or strengthen existing bridges or culverts, and widen and/or deepen existing waterway routes to meet his haulage requirements, provided that such works will be so scheduled and conducted as to minimize disturbance to other users, and subject to the approval of the Engineer and any Statutory Authorities having jurisdiction.

Should the Contractor require any other form or route of access not provided for by the Contract, he shall make his own arrangements, obtain any necessary permission, and be solely responsible for payment of any costs, charges or compensation in connection therewith.

#### 0.2.6 Security

The Contractor's responsibility for the security and safe working environment of the Site commences from the time possession is given to him by the Employer. As soon as possible after possession has been given, the boundary of the Site shall be marked out, and the Contractor shall submit to the Engineer for approval, his proposals for maintaining the boundary and the security within.

The Contractor's proposals shall include a security control system which shall consist of sufficient equipment and personnel to prevent unauthorized access 24 hours per day, 7 days per week and which can meet the prevailing circumstances to ensure the safety and security of persons and property of the Site. The security control system shall include, inter alia, outside lighting of all buildings and other facilities to be provided for the Engineer and the Employer as well as street lighting and lighting of fencing and gates erected as part of the Contractor's security control system.

The Contractor shall erect and maintain at his own expense suitable and approved temporary fencing and gates to enclose areas of the Works to be carried out and other areas of land as may be necessary to implement his obligations under the Contract to the satisfaction of the Engineer.

All authorized persons, as defined in Article 0.2.9 of this Specification, shall be registered by the Engineer, and this register shall be provided to and maintained by the Contractor.

#### 0.2.7 Cleanliness and Reinstatement

The Contractor's attention is drawn to his obligations under the provisions of Clause 32 of the Conditions of Contract, and shall throughout the period of construction of the Works maintain the whole of the area of his operations in a clean, tidy and safe condition by arranging his materials and construction equipment in an orderly manner. All rubbish, waste material, debris and the like shall be systematically cleared off the working areas and removed directly off the Site for disposal in authorized tips or other proper disposal facilities.

The Contractor shall immediately upon completion of any work and following the approval of the Engineer in accordance with the provisions of Clause 38.1 of the Conditions of Contract, fill up all holes and trenches which may have been made or dug, level any mounds made and clear away all rubbish which may have been occasioned or made in the course of the execution of the Works. These requirements are in addition to the Contractor's obligations under Clause 33 of the Conditions of Contract.

#### 0.2.8 Disposal and Pollution

The Contractor shall not dispose of any waste, rubbish or offensive matter in any place not approved by the Engineer or Statutory Authorities having jurisdiction.

The Contractor shall not discharge into any watercourse oil, solids, noxious, floating materials or untreated waterborne effluent, and take reasonable precautions to prevent their accidental spillage, contact with soil or discharge into water course.

The Contractor shall take all reasonable precautions to keep public or private roads clear of any spillage or droppings from his vehicles. Any spillage or droppings which occur shall be cleared without delay to the satisfaction of the Engineer.

#### 0.2.9 Health and Safety

The Contractor shall be responsible for the provision of adequate sanitary facilities for all of his

employees at all construction and camp sites, and shall provide details of sanitary arrangements for the Engineer's approval.

The Contractor shall observe and maintain standards of Health and Safety towards all of his employees not less than those laid down in his own national standards or statutory regulations in addition to complying with the national standards of the Government of Bangladesh. He should take all reasonable steps including training and safety drill to ensure the safety of all persons on the Site, whether in his employ or not. Safety is paramount.

The Contractor shall provide and maintain all appropriate protective clothing and equipment for the work to be done and ensure its proper use. Where required safety nets, belts harness and lines shall be provided and, where work is in, over or near water, life preserving and rescue boats shall be provided. All men working over water shall be required to wear life preservers.

The Contractor shall provide and maintain in prominent and well-marked positions all necessary first-aid equipment, medical supplies and other facilities. A sufficient number of trained personnel will be required to be available at all times to render first aid.

A suitably equipped room shall be made available with beds and stretchers for emergency medical treatment, and a planned system for removal to hospital for authorized persons requiring further treatment shall be provided by the Contractor to the satisfaction of the Engineer. Authorized persons are those approved by the Engineer as the registered personnel involved in the Works of this Contract.

The Contractor shall report to the Engineer promptly and in writing particulars of any accident or unusual or unforeseen occurrences on the Site, whether likely to affect progress of the work or not.

#### 0.2.10 Temporary Works

The Contractor shall be responsible for the design, specification, execution and subsequent removal of all Temporary Works necessary for the completion of the Works. Temporary Works shall be designed by the Contractor in accordance with the standards described elsewhere in this Specification or as agreed with the Engineer. It is emphasized that the Contractor is also responsible for the design of Temporary Works required to create a sheltered and sufficiently safe working environment for the construction in the river.

Before the Contractor starts construction on any part of the Temporary Works, he shall furnish to the Engineer complete drawings and, if so required, calculations relating to stability, strength and deflections of that part of the Temporary Works. Where the Temporary Works have direct contact with any part of the Permanent Works, the drawings and calculations shall clearly indicate the relationship, illustrate erection sequences and show any loadings or stresses applied to or from the Permanent Works.

Calculations shall be submitted on size A4 paper and shall be clearly and neatly set out in the English language. All calculations shall be in SI units. All pages shall be uniquely numbered, dated and titled Pages may be in manuscript provided this is clear and legible. Script shall be such that clear photocopies can be reproduced.

The required submission of drawings and/or calculations shall be made to the Engineer at a reasonable period before the Contractor intends to commence any fabrication or installation of Temporary Works. The Contractor shall make due allowance in his programme for submission of Temporary Works proposals, review by the Engineer and amendment, re-submission and further review by the Engineer as may be necessary until the consent of the Engineer to the proposals is obtained.

The furnishing of any drawings and calculations of the Temporary Works to the Engineer shall not relieve the Contractor of any liability or obligation under the Contract in respect of such Temporary Works. Refer also to Section 3, Technical Specifications for more detailed requirements.

**0.2.11 Works Off Site**

The Contractor shall give adequate written notice to the Engineer of the preparation or manufacture at a place not on the Site of the Permanent Works of any preconstructed units or parts of units to be used in the Works, all in accordance with the provisions of Article 0.6 of this Specification.

**0.2.12 Notice to Mariners**

The Contractor shall arrange for the publication of all "Notices to Mariners" which may be required in respect of the Works.

**0.2.13 Contractor's Programme and Methods of Construction**

The Contractor's programme and methods of construction must take account of the continually changing configuration of the channels and chars in the river and the seasonal flooding of the river.

The soils investigation required in terms of Section 33 is to be programmed to enable the information to be available in sufficient time that the final decision on pile length can be made by the Engineer and advised to the Contractor before mobilization of piling plant has taken place.

The survey of the Site required in terms of Article 0.3.1 shall be programmed to enable the information to be available in sufficient time for the Engineer to undertake any necessary revisions to the design, in particular in respect of the river revetment works on the east bank.

**0.3 General and Sundry Obligations**

**0.3.1 Surveys and Setting Out**

Before commencing any part of the Works the Contractor shall, together with the Engineer, prepare a survey and take levels of the site of the Works both above and below water level, and shall agree all records of the survey and particulars upon which any measurements of the Works will be based. Failing such survey or agreement of records being prepared and signed

jointly, the records of a survey by the Engineer shall be final and binding on the Contractor.

The survey shall include, inter alia, cross sections of both river banks at least 50m intervals, over the full length of revetment and 100m upstream and downstream, and should indicate where rock (from the existing banks) is present on the river bed and banks.

Survey reference points have been established on the Site and the positions, co-ordinates and levels are shown on the Drawings, as described in Article 0.1.4.4. In addition to the Contractor's obligations under Clause 17 of the Conditions of Contract, and within 4 weeks of the Commencement Date of Works, the Contractor shall verify with the Engineer the co-ordinates and levels of survey reference points and shall repair or reinstate in positions approved by the Engineer any survey reference points which have been damaged or misplaced.

The Contractor shall provide, for the Engineer's sole use, the instruments scheduled in the Contract (Appendix 2 to this Specification) within 45 days of the Commencement Date. He shall maintain them in good condition at all times until completion of the Works, when he shall remove them from the Site. The survey equipment shall remain the property of the Contractor at the end of the Contract. The Contractor shall also make available poles, pegs, stagings, moulds, templates or profiles required by the Engineer for checking or measurement of the Works including leaving in position without obstruction to sighting any poles, pegs, templates or profiles used in the setting out of the Works.

The Contractor shall give the Engineer not less than 24 hours notice in writing of his intention to set out or give levels for any part of the Works so that arrangements can be made for checking the work. Work shall be suspended for such time as is necessary for checking lines and levels on any part of the Works. The Contractor shall at his own expense provide all assistance which the Engineer may require for checking the setting out.

The Contractor shall also cooperate and coordinate with any other contractors appointed by the Employer on the joint use of the survey reference points.

### 0.3.2 Sign Boards

The Contractor shall supply, erect, (within 45 days of the Commencement Date), maintain and remove on completion notice boards at each public entrance to the Site, giving brief details of the Project in English and Bengali, including but not limited to, the names of the Contractor, Employer, Engineer, and Supervision Consultant. The wording, colors and style of the signs and size of lettering and the like shall be submitted to the Engineer for approval.

### 0.3.3 Progress Photographs and Videotapes

The Contractor shall supply to the Engineer 35mm color slides, approximately twenty in number for each occasion, taken by an approved photographer, before the start of the Works and monthly thereafter showing the progress of the Works and also such particular sections of the Works, Site, Plant or Materials as the Engineer may direct. In addition the Contractor shall supply 3 color prints of each slide.

The prints shall be well executed, unmounted and approximately 18cm by 24cm in size. Each

print shall be marked on the reverse side with the date of exposure, identification or reference number, and a brief description of the view, and delivered to the Engineer within 2 weeks of exposure.

The Contractor shall also supply 2 No. copies of videotapes on an approved VHS system of approximately 30 minutes duration with suitable recorded commentary/subtitles taken by an approved experienced photographer before the start of the Works and at monthly intervals thereafter, all to the direction of the Engineer. Refer also to Clause 0.5.4.

The copyright of such photographs and videotapes and all rights of reproduction shall be reserved exclusively to the Employer. No other photographs and videotapes will be allowed to be taken without prior permission obtained from the Employer in writing.

#### 0.3.4 Water Level Gauges

The Contractor shall supply, install and maintain for the duration of the Contract up to 6 No. water level gauges at locations to be determined by the Engineer, including all necessary support structures, having non-erodible gauge plates and standard centimeter marks, and capable of measuring water levels between Standard Low and Standard High Water Levels.

#### 0.3.5 Working Drawings

The Contractor shall submit working drawings for the prior approval of the Engineer. Such working drawings shall include bar bending schedules and such detail drawings as are required for all permanent and temporary works as deemed necessary by the Engineer. No part of the Works shall be constructed until the relevant working drawings are approved by the Engineer.

Drawings shall be prepared in metric units, with English text and to ISO A1 size unless otherwise approved by the Engineer, and shall be accurate to scale and fully dimensioned. The style and presentation shall be standardized.

Each working drawing shall have assigned to it a unique number and title. All issues of revisions of any working drawing shall be identified by a sequential revision letter or number, the date of revision and brief descriptions of the revisions. All copies of drawings issued shall be clearly marked with the status of the drawings, showing whether it has been issued for information, comment, approval, construction or other purpose.

The Contractor shall maintain a comprehensive register of working drawings listing all relevant information including numbers, titles, date of issue, to whom issued, number of copies, status of issue, date of approval, rejection, receipt of comments, date when superseded, remarks etc. Copies of the register shall be issued to the Engineer as directed.

Where errors or omissions are found on any approved working drawing, approval of that drawing shall be withdrawn. The drawing shall without delay be withdrawn from circulation, amended and re-submitted for the approval of the Engineer. Construction shall proceed only in accordance with the revised working drawings when approved by the Engineer.

The Contractor shall on each submission of drawings to the Engineer and Supervision

Consultant provide four paper copies plus one polyester film copy of minimum thickness 75 microns, plus one CAD file copy (on computer diskette) where appropriate. Two paper copies are to be submitted directly to the Engineer with the balance (2 No. paper copies, 1 No. polyester film copy, 1 No. CAD file copy on diskette/CD) to be submitted directly to the Supervision Consultant.

#### 0.3.6 Environmental Obligations

The Contractor's attention is drawn to his obligations under the provisions of Clause 19.1(c) of the Conditions of Contract, and shall comply with all legislation relating to environmental protection that is relevant to his operations.

The Contractor shall take adequate preventive measures for surface water pollution, and in case the pollution occurs due to his negligence the Contractor shall be responsible to make the water to its original quality especially where the surface water has potential use.

Where abstraction from a borehole by the Contractor results in adverse effects on groundwater, which at the time of commencement of the Works was being used by the local people, the Contractor shall arrange supplies of equivalent quality to that previously.

All vehicles and construction equipment operated by the Contractor shall be maintained according to the original manufacturer's specifications and manuals, with particular regard to the control of noise emissions. The Engineer shall have the right to require the Contractor to replace or rectify any vehicle or construction equipment that he thinks emits excessive noise, within 48 hours of notice in writing.

The Contractor shall make every reasonable effort to reduce noise nuisance caused by construction activities, including siting of crusher and other production plant in locations where the distance between them and residential areas is such it results in attenuation of noise at existing residential areas. The Contractor shall take all reasonable measures to minimize dust-blow arising from any sites under his control by regular watering of any stockpiles, bare soil, haul roads, unsurfaced traffic areas and any sources of fatigue dust, when conditions require dust suppression. If, in the opinion of the Engineer, the suppression measures are ineffective, the Contractor shall take further measures to minimize nuisance as directed by the Engineer.

In case of any damage incurred in agriculture or surrounding homesteads outside of the acquired land due to the Contractor's negligence, the Contractor shall be responsible to pay the compensation for that upon the appropriate monetary evaluation applicable to the local situation at the time of the occurrence of such damage.

### 0.4 **Special Requirements**

#### 0.4.1 Access

The Contractor shall ensure that continuous access is provided to the public to and from the areas of land identified on the Drawing, which are surrounded by the Site but not included within the Site area.

**0.4.2 Existing Ferry Service**

The existing ferry service on the National Highway No. 7 shall be relocated somewhere upon completion of the Project. Until such time as the ferry is located, the Contractor shall plan and carry out his works with all necessary precautions and measures to ensure that the existing ferry services are not interrupted.

**0.4.3 Diversion of Canal**

The Contractor shall construct a new length of irrigation canal and connect with the existing canal in accordance with the Drawings. The Contractor shall plan and execute the necessary works to ensure that disruption to the supply of irrigation water is minimized. Details of the programming of the work and in particular the construction of the tie-ins of the new length of canal to the existing canal shall be agreed with the Engineer and subject to his approval. The Contractor's attention is drawn to the requirements of Article 0.2.4 in this regard.

**0.4.4 Safety of Navigation**

The Contractor shall comply with all orders and directions given to him from time to time by the Engineer in respect of the safety of navigation and with requirements for marking, watching and lighting any structure, craft or equipment which may be used in the construction of the Works.

The Contractor shall not lay down or provide permanent moorings for his floating plant. The Contractor's temporary moorings shall be positioned and installed to the approval of the Engineer and the Inland Waterway Transportation Authority (IWTA) of the Government of Bangladesh. Prior notification of their installation shall be given officially to IWTA.

The Contractor shall without delay raise and remove or recover any material, construction equipment (floating or otherwise) or vessel belonging to or hired by him which may be sunk stranded or gone adrift in the course of execution and completion of the Works or remedying of defects therein, or otherwise deal with the same as the Engineer may direct. Until there is no further threat to navigation the Contractor shall set up and maintain whatever markers, buoys and lights are deemed necessary by the Engineer or any Statutory Authority having jurisdiction.

Whether or not such materials, construction equipment or vessels which may be sunk stranded or gone adrift are insured or have been declared an actual or constructive total loss shall not absolve the Contractor from his obligations under this Article.

If the Contractor is unable or unwilling at once to fulfill his obligations under this Article the Employer shall be entitled to employ and pay other persons to carry out such work as the Engineer may consider urgently necessary. The costs so incurred shall be recoverable from the Contractor by the Employer in accordance with the relevant provisions of Clause 64 of the Conditions of Contract.

**0.4.5 Training**

The Contractor is required to assist and cooperate with the Supervision Consultant in the



training of selected Employer's personnel to enable them to operate and maintain the Works during and after the Defects Liability Period. This training will be to a programme approved by the Employer and include instruction during the contract period in matters associated with the construction, and imparting a thorough understanding of all elements of the Operation and Maintenance Manual.

#### 0.4.6 Operation and Maintenance Manual

In addition to his obligations under Clause 7.2 (b) of the Conditions of Contract and before completion of the Works, the Contractor shall forward to the Engineer ten (10 No.) copies of an Operation and Maintenance Manual in English and Bengali, plus 2 sets of electronic word processing files on computer diskettes/CD.

Drafts of the Manual shall be submitted to the Engineer for approval not less than 12 weeks before the date fixed for commissioning or handover of completed Works. Any modifications to the form or extent of the contents required by the Engineer shall be incorporated in the final issue of the Manual.

The Manual shall contain, but not be limited to the following :

- A folio of record drawings showing all details "as built" for the whole of the Works; (refer Note)
- Operating instructions applicable to any items of mechanical or electrical equipment or appliances handed over to the Employer in accordance with the Contract;
- A schedule for inspection and monitoring of all component parts susceptible to wear and tear, damage or weathering and deterioration with time;
- A schedule of routine and periodic maintenance activities appropriate for the climate, the anticipated level of use or exposure and the availability of skilled labor;
- Instructions and procedures for the correction of faults or foreseeable accidental damage;
- Specifications for materials and workmanship for all predictable routine and periodic maintenance or repair activities;
- Lists of tools, instruments and equipment necessary for all inspection, operation and maintenance activities.

**Note:** For "as built" drawings, 10 paper copies and one polyester film copy of 75 micron thickness shall be submitted to the Engineer, together with 2 sets of CAD files on computer diskettes/CD where appropriate. Refer also to Clause 6.12 of the Conditions of Contract.

### 0.5 Programme and Progress Reports and Returns

#### 0.5.1 General

The programme required by Clause 14 of the Conditions of Contract shall be in the form of both a bar chart and network diagram. They shall cover all the main items of work, showing their inter-relation with, and interdependence on, other items of work, and be laid out in a format which will permit progress of the various items to be marked up on them throughout the execution of the Works. They shall be produced as a result of a critical path analysis in a form (based on a standard project management computer software package approved by the Engineer) capable of being updated, showing all requisite operations, earliest and latest start and completion dates, durations, float and critical activities, and shall be submitted with the programme.

The programme shall include, inter alia

- The dates by which the Contractor requires any information from the Engineer.
- The dates by which the Contractor requires instructions from the Engineer to carry out work described in the Contract as Provisional Sums.
- The dates and periods for the preparation of working drawings and review of these by the Engineer.

The method statements required in accordance with Clause 14.1 of the Conditions of Contract shall include a list of major items of construction equipment to be used, their deployment in relation to the programme, methods of movement of materials, Temporary Works and other like matters.

On the last day of each week the Contractor shall issue to the Engineer details of his intended programme of work for the week ahead.

#### 0.5.2 Progress meetings

Meetings will be held at intervals as required by the Engineer, but not exceeding one month, between the Engineer and the Contractor to discuss the progress of the Works and any problems which may have arisen. The Contractor shall give to the Engineer at these meetings details of his progress to date in relation to the programme.

#### 0.5.3 Weekly Returns

At weekly intervals the Contractor shall, in accordance with his obligations under Clause 35 of the Conditions of Contract, supply to the Engineer returns of labor, materials and Contractor's Equipment and, in addition, a schedule of the main work items in each section of the Works showing quantitative progress during the previous week and cumulative progress to date.

#### 0.5.4 Monthly Returns

At monthly intervals, and not later than the first week in every month, the Contractor shall submit to the Engineer progress report documentation for the previous month which shall

include, but not be limited to the following:

- a programme marked up with any agreed amendments and showing the actual percentage completion of each of the main items of work, in such a way that comparison can be made with the scheduled percentage completion of each item;
- weather and other conditions, including daily temperature range, humidity, rainfall, wind speed and direction, river levels etc.;
- summary of staff and labor employed on the Site;
- schedule of Contractor's Equipment on Site with dates of arrival and departure as appropriate;
- schedule of principal material items with dates of placing orders, progress of manufacture, dates of delivery to Site etc.;
- profiles of the dredged slopes and slope protection works of partially completed and completed work;
- record of Site safety;
- photographs and videotapes as described in Clause 0.3.3.

#### 0.5.5 Submission of Returns

All reports, statements, returns, diagrams or drawings etc. which the Contractor is required to submit to the Engineer and Supervision Consultant during the progress of the Works shall be furnished in quadruplicate (4 No. copies) unless otherwise directed. One copy shall be submitted to the Supervision Consultant and three copies to the Engineer.

### 0.6 **Quality Assurance, Standards and Materials Testing**

#### 0.6.1 Quality Assurance

The Contractor shall document and operate a Quality System generally complying with the AASHTO "Implementation Manual for Quality Assurance" 1996 or an equivalent guideline approved by the Engineer.

The Contractor shall prepare a Quality Plan for the Works. The plan shall be submitted for the approval of the Engineer within 4 weeks of receipt of the Letter of Acceptance.

The Quality Plan shall be reviewed, updated and re-submitted for approval as necessary throughout the contract period.

The Quality Plan shall specifically address the procedures for maintaining the project quality

requirements with respect to the use of subcontractors, vendors and suppliers. The requirements for quality surveillance shall reflect the criticality of the item or material concerned. The criteria for assessment of criticality shall be approved by the Engineer.

The Contractor shall cooperate with the Engineer and shall provide all necessary access to works and records to enable the Engineer to assess the Contractor's Quality System and to audit the implementation of the Quality Plan and associated procedures.

#### 0.6.2 Procedures

The Contractor shall not commence any item of Permanent Works until he has submitted to the Engineer a written statement of his proposed procedure for his own inspections of that item, recording such inspection and obtaining the Engineer's written approval thereof. Each detailed procedure shall be formulated following detailed discussions with the Supervision Consultant. Every such statement shall identify the individuals on the Contractor's or Sub-Contractor's staff or Supervision Consultant's staff who are responsible for inspecting the workmanship and/or testing the materials for the item in question, the place of inspection, the stages at which inspections and tests are to be made, the detailed aspects to be verified or measured in each inspection. Each inspection shall be recorded.

#### 0.6.3 Tests and Inspection Records

The record shall identify the Contractor and Supervision Consultant staff involved, the place, the date and time when the inspection was completed, the section of the Works and the materials tested or inspected, and its state of completion. Reference shall be made to the relevant working drawings and the specific aspects or properties which were checked or measured shall be recorded.

One copy of each record of inspection shall be submitted to the Engineer and one copy of each record of inspection shall be submitted to the Supervision Consultant. The records of inspections and tests shall be stored in an orderly fashion on the Site by the Contractor until the issue of the Defects Liability Certificate for the whole of the Works, or such earlier time as the Engineer may instruct, and the Engineer shall have the right to access to them at all times.

After the issue of the Defects Liability Certificate for the whole of the Works, or such earlier time as the Engineer may instruct, the Contractor shall, as instructed by the Engineer, either dispose of the records or deliver them as directed.

#### 0.6.4 Contractor's Testing and Inspection

The Contractor shall be responsible for ensuring that all specified testing (in the laboratory, in the field and off site) and inspections of materials and workmanship are carried out. No work shall be covered up without the written approval of the Engineer. All items of work concealed in the finished work shall be inspected by the Contractor and Supervision Consultant immediately before they are covered up. Inspection and testing shall be recorded according to the procedure specified in Article 0.6.3.

It is intended that the majority of the laboratory testing required will be undertaken in the

**Engineer's Laboratory** described in Clause 0.9. Some specialist testing is to be arranged by the Contractor and carried out in suitable laboratories off-site. Field sampling and testing will be carried out by suitably qualified and experienced Contractor's staff under the oversight of Supervision Consultant staff.

It is expected that the Contractor's Materials Engineer will be responsible for liaising and coordinating with the Engineer's Laboratory, Supervision Consultant, field sampling/testing staff and off-site laboratories to ensure all sampling, specified tests and inspections are carried out in a timely manner.

#### 0.6.5 Engineer's Testing and Inspection

In addition to the Contractor's testing and inspection described in Clause 0.6.4, the Contractor shall afford and facilitate access at all times for the Engineer's inspection and testing of materials and workmanship. The Contractor shall provide means of access and assistance as may reasonably be required by the Engineer. For all items of work the Contractor shall give adequate notice in writing to the Engineer that the item in question is complete and is ready for inspection, and shall not cover it by subsequent work until the Engineer has confirmed in writing that it has been inspected and is approved. No inspection or approval by the Engineer shall relieve the Contractor of any of his duties and obligations under the Contract.

#### 0.6.6 Notice of Works Off Site

The Contractor shall give adequate written notice to the Engineer of the preparation or manufacture at a place not on the Site of any preconstructed units or parts of units or materials to be used in the Works. Such notice shall state the place and time of the preparation or manufacture, quarrying or extraction, and be given sufficiently in advance as to enable the Engineer to make arrangements which he may deem necessary for inspection before the start and at any stage of the work, and not only when the units or parts are completed. Works off Site shall not commence without the prior approval of the Engineer.

Any units or parts which are prepared or manufactured without such prior notice having been given to the Engineer may be rejected if the Engineer considers that his inspection was necessary during the progress of the preparation or manufacture. No inspection by the Engineer shall relieve the Contractor of any of his duties and liabilities under the Contract.

#### 0.6.7 Standards

Except where otherwise specified or authorized by the Engineer all materials and workmanship shall conform to the latest edition of the relevant Standard Specifications of the American Association of State Highway and Transportation Officials, Inc. (hereinafter abbreviated to AASHTO) or of the American Society for Testing Materials (hereinafter abbreviated to ASTM) current at the date of Invitation to Tender.

Where reference is made to any of the above Standard Specifications in imperial units, the nearest unit of imperial dimension to the metric dimension quoted in the Drawings or Specification shall apply.

Materials meeting other internationally accepted equal or better standards may be accepted subject to review by the Engineer. Any such alternative standard proposed by the Contractor shall be submitted in the English language for approval by the Engineer.

The Contractor shall supply to the Engineer three (3 No.) sets of each of the standards, codes and references to be used in the Contract within 45 days of the Commencement Date of the Works, and in addition he shall supply three (3 No.) copies of any other standard or code subsequently specified or alternatively proposed. One set of these documents is for the Engineer, one set for the Supervision Consultant and one set for the Engineer's Laboratory. All standards shall be in English. On completion of the Contract all standards, codes and references so provided shall become the property of the Employer.

#### 0.6.8 Proprietary Products

Where a proprietary or brand name or the name of a supplier or manufacturer is indicated on the Drawings or in the Specification this is in respect of items which are not otherwise adequately described by AASHTO, ASTM or equivalent recognized standards. Alternative items based on recognized national standards of the country of origin may be accepted provided that documented proof in the English language is submitted to the Engineer for his approval sufficiently in advance and showing that the alternative proposed is of equal or higher quality and performance than the specified item.

#### 0.6.9 Materials to be New

All materials used in the Permanent Works shall be new unless otherwise specified or agreed by the Engineer in writing. No materials to be incorporated in the Permanent Works shall have previously been used in the Temporary Works unless otherwise specified or agreed by the Engineer in writing.

#### 0.6.10 Orders for Materials

Before orders are placed for any material of any description to be used in the Permanent Works the Contractor shall submit to the Engineer the names and addresses of the manufacturers or suppliers proposed. Following approval by the Engineer, the Contractor shall submit to him copies of all orders placed for such materials.

#### 0.6.11 Samples

In accordance with the provisions of Clause 36 of the Conditions of Contract, the Contractor shall as directed by the Engineer supply samples of materials to be incorporated in the Works. The samples required for approval shall be submitted by the Contractor in labeled boxes suitable for storage, and in sufficient time for testing, due allowance being made for the fact that if samples are rejected, further samples and testing will be required. Approved samples will be kept by the Engineer who will reject any materials not corresponding in character and quality with the approved samples.

#### 0.6.12 Certificates

All manufacturer's certificates of test, proof sheets, mill sheets etc., showing that the materials have been tested in accordance with the requirements of the relevant ASTM or other approved standard or this Specification, shall be supplied in the English language by the Contractor to the Engineer free of charge.

## 0.7 Engineer's and Employer's Requirements

### 0.7.1 General

The Contractor shall provide, install and maintain until the issuance of the Taking-Over Certificate, as specified below, the office, laboratory and accommodation including access roads and hardstandings thereto, services, vehicles, vessels, berthing and other facilities and equipment for the sole use of the Engineer and Employer and their respective staff as detailed and specified in this Section of the Specification.

All the requirements of the Engineer and Employer shall be provided by the Contractor in a timely manner to a programme agreed and approved by the Engineer. In this respect the Contractor shall submit detailed proposals for the provision of all requirements as an annex to the Programme to be submitted under Clause 14 of the Conditions of Contract.

### 0.7.2 Attendance

The Contractor shall provide qualified laboratory technicians, drivers, laborers, chainmen, boatmen and crew, clerical staff, watchmen and office cleaning labor and other attendants, for the sole direction of the Engineer and Employer and their respective staff as scheduled in this Section of the Specification. The Contractor shall supply capable personnel equal to the tasks required, maintain continuity of staff, and provide such overtime as may be required by the Engineer or Supervision Consultant on the Site until the issuance of the Taking-Over Certificate. Some of these staff must have an acceptable proficiency in the English language.

### 0.7.3 Consumables

All buildings provided by the Contractor are to be properly maintained and regularly cleaned. All consumables required for this purpose are to be provided by the Contractor until issuance of the Taking-Over Certificate.

All vehicles and vessels shall be properly licensed, insured and maintained in good running order at all times. Replacement transport shall be provided at any time the original transport is unavailable for 12 consecutive hours or more. All fuel, oils, tires, spare parts and other consumables will be supplied by the Contractor until the issuance of the Taking-Over Certificate unless otherwise instructed by the Engineer.

### 0.7.4 Removal of Buildings on Completion

The Contractor shall obtain permission from the Engineer before the removal or demolition of any buildings, installations, furnishings, fittings or anything provided, installed or constructed under the provisions of this Section of the Specification.

Upon completion of the Works the Contractor shall remove and clear away from the Site all buildings, installations, furnishings, fittings, everything provided, installed or constructed under the provisions of this Section of the Specification, unless otherwise stated in the Contract or directed by the Engineer.

#### 0.7.5 Telecommunications

The Contractor shall provide and maintain until the issuance of the Taking-Over Certificate telecommunications facilities for the sole use of the Engineer and Employer and their respective staff as specified in this Section of the Specification, (Clause 0.11) unless otherwise directed by the Engineer.

#### 0.7.6 Electricity Supply

The Contractor shall be responsible for electricity supply for all works, accommodation, offices, laboratories and services provided under this Contract. The Contractor may either generate the electricity supply by his own means or buy electricity from the Power Board. Standby generating capacity sufficient to enable normal operation of the Engineer's Office, Engineer's Laboratory, and Engineer's Accommodation (excluding air conditioning loads) is to be provided if normal electricity is to be supplied by the Power Board.

In designing and installing the electricity distribution system for the accommodation and offices for the Employer and Engineer, the Contractor shall take into account the permanent nature of part of these buildings.

When so directed the Contractor shall hand over the aforementioned distribution system into the charge of the Employer after the issuance of the Taking-Over Certificate.

Except where separate provision for payment for electrical works is made in the Bill of Quantities, the cost of all other electricity requirements shall be deemed to be included in the other rates and prices in the Contract.

The electricity supply and distribution system for accommodation, recreational and information facilities, offices and laboratories for the use of Engineer and Employer shall be uninterrupted (with standby generating capacity provided, if necessary) and shall include street-lighting and security lighting as specified in Article 0.2.6 of this Specification.

#### 0.7.7 Water Supply

The Contractor shall be responsible for water supply to all places of work, accommodation, offices, laboratories and services provided under this Contract.

Drinking water supply to the office, laboratory and accommodation as detailed in this Section shall be by means of water obtained from deep tube wells and of a quality (obtained through chemical or other treatment, if required, without cost to the Employer) to the World Health Organization Standards.