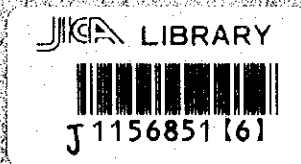


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ROADS AND HIGHWAYS DEPARTMENT

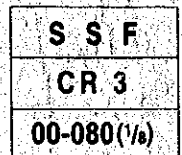
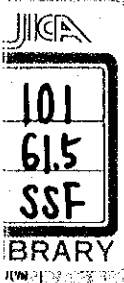
RUPSA BRIDGE CONSTRUCTION PROJECT
(PROPOSED TO BE FINANCED BY JAPAN BANK FOR
INTERNATIONAL COOPERATION)

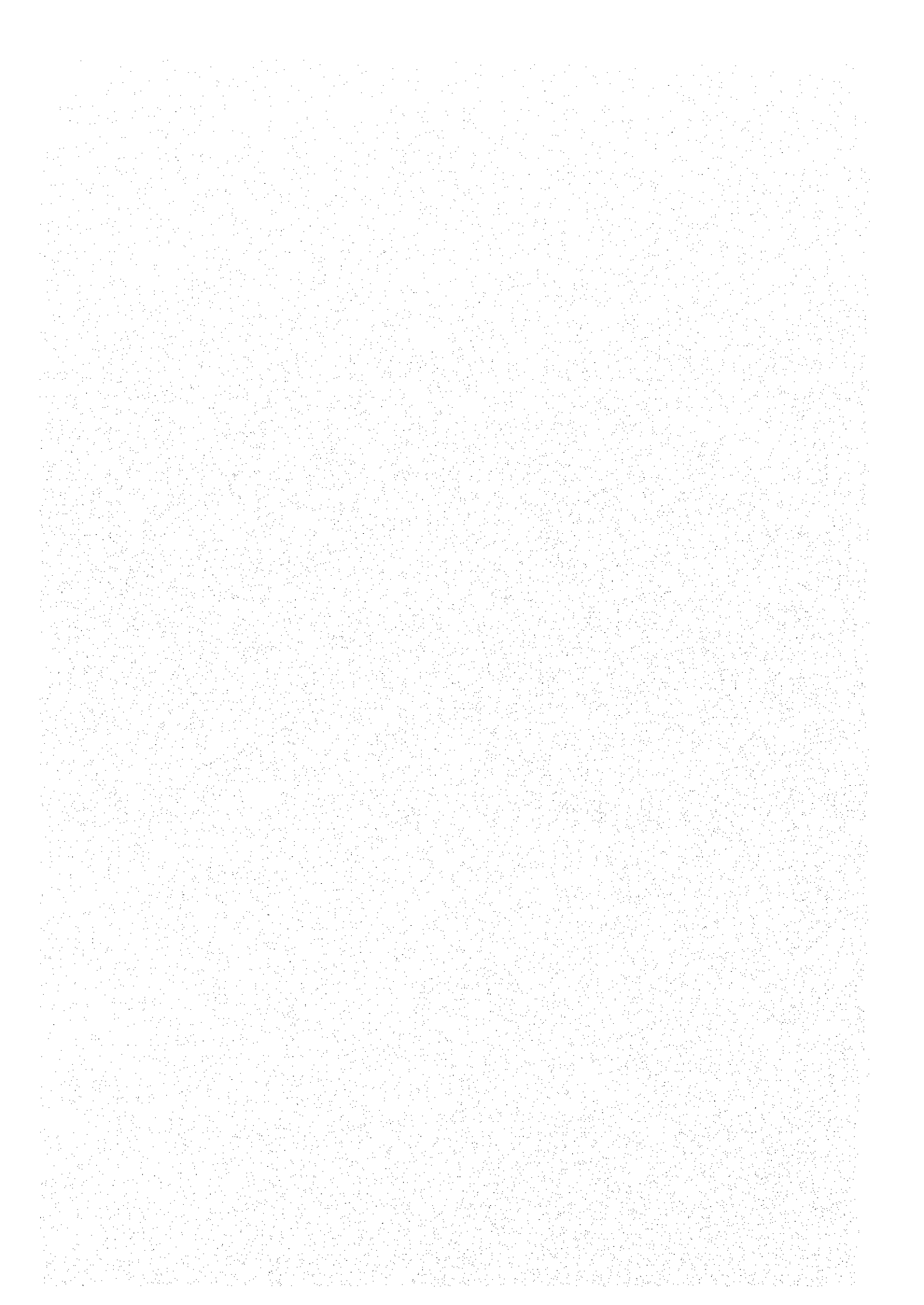
PREQUALIFICATION DOCUMENTS
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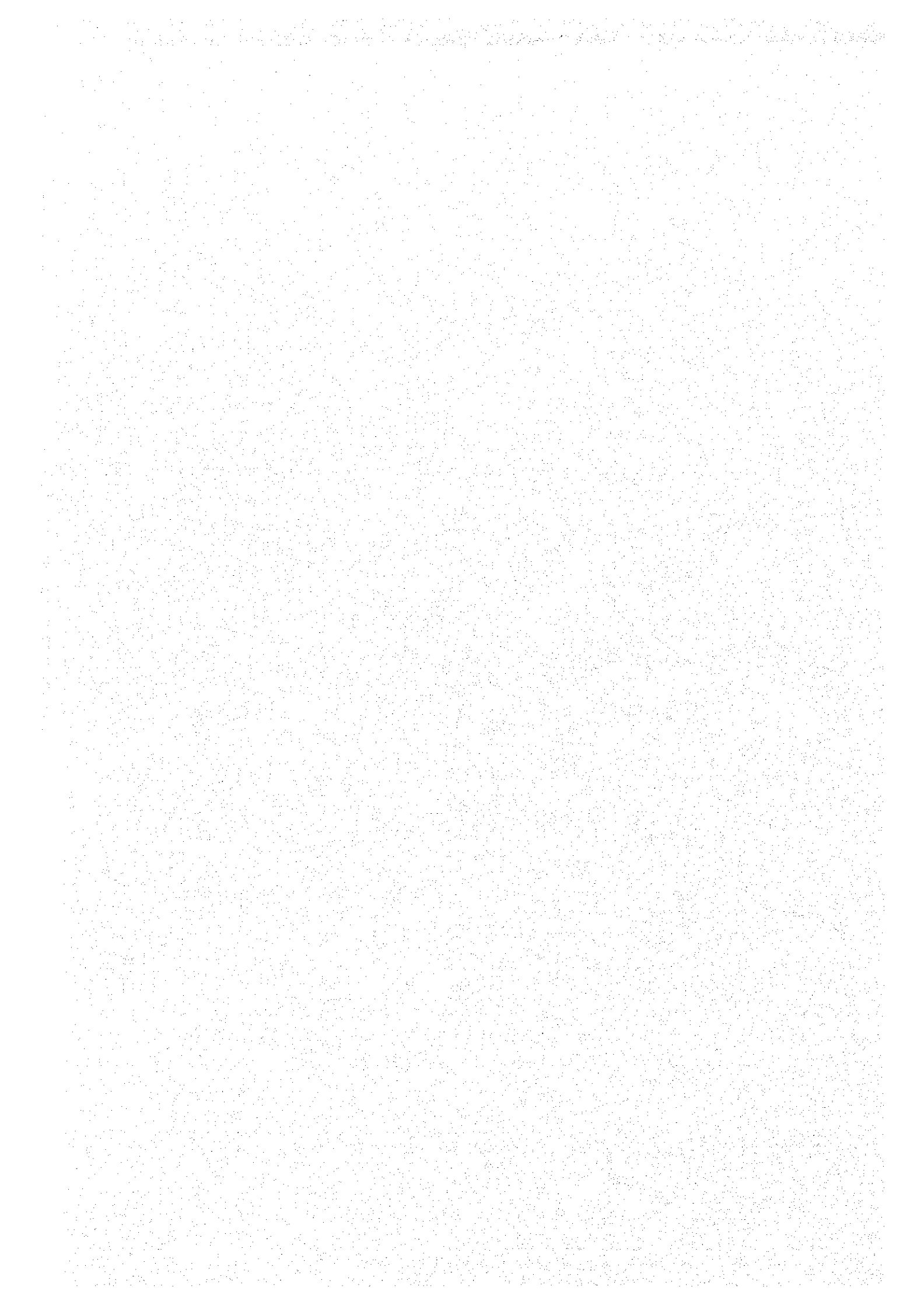
MARCH 2000

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





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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)

PREQUALIFICATION DOCUMENTS
(DRAFT VERSION)

March 2000

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

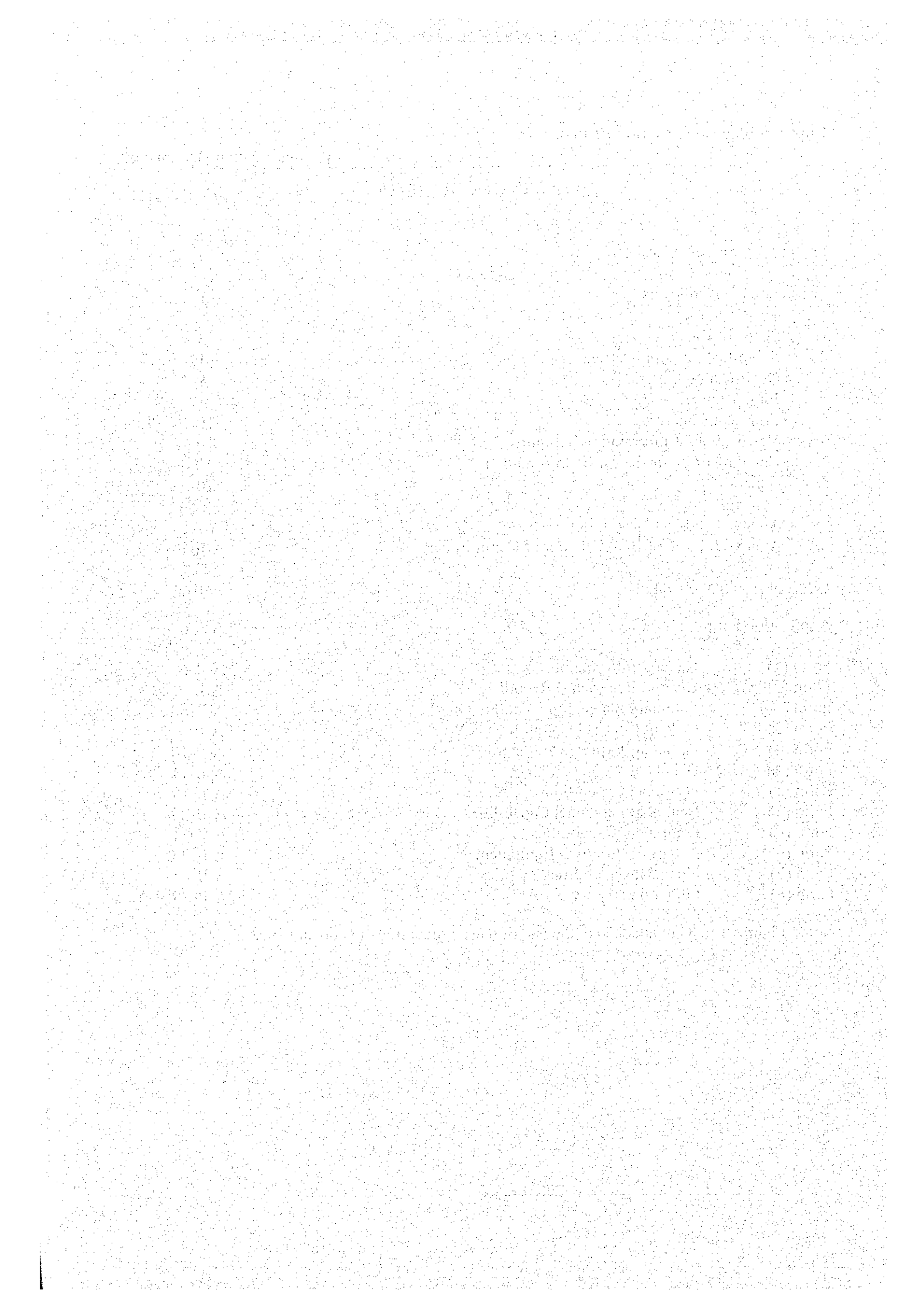


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Note : Figures 1 to 8 are attached at the end of these prequalification documents.



GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH
MINISTRY OF COMMUNICATIONS
ROADS AND RAILWAYS DIVISION
ROADS AND HIGHWAYS DEPARTMENT

RUPSA BRIDGE CONSTRUCTION PROJECT
INVITATION FOR PREQUALIFICATION

Date:.....2000

1. The Government of Bangladesh (GOB) has approached the Government of Japan (GOJ) for a loan from the Japan Bank for International Cooperation (hereinafter referred to as "JBIC") in various currencies towards the cost of implementation of Rupsa Bridge Construction Project. No commitment has yet been made by the GOJ on such loan financing. It is intended that a part of the proceeds of this loan, if available, will be used for eligible payments under the contract for which this Invitation for Prequalification is issued.
2. The Roads and Highways Department under the Ministry of Communications, the Government of Bangladesh (hereinafter referred to as "Employer") intends to prequalify contractors for the civil works. The works to be carried out under the contract are (i) construction of 10km long Southern Section of Khulna Bypass including three bridges, namely Rupsa Bridge (1,360m), Hatia Canal Bridge (90m) and Molonghata Canal Bridge (30m), (ii) construction of 50m x 150m wide river revetment on the East Bank and pier protection against scouring at piers of Rupsa Bridge in the water.
3. It is expected that Invitations to Bid will be issued in.....2000.
4. Prequalification is open to firms and voluntarily formed joint ventures from all countries and areas and the contract shall be bid on an international competitive bidding (ICB) basis in accordance with the "Guidelines for Procurement under JBIC ODA Loans, October 1999".
5. Eligible applicants may obtain the prequalification documents by calling at, or by writing, faxing to : The office of the Executive Engineer, RHD, Planning, Sarak Bhaban, Block-B, Room 210A, Ramna, Dhaka-1000, Telephone No.955-1702, Fax No.+880-2-956-0496 (Attention : EE, RHD, Planning).
6. The request must clearly state "Request for Prequalification Documents for the Rupsa Bridge Construction Project". The documents are available during office hours up to2000 for a non-refundable fee of Tk..... The Employer will promptly dispatch the documents by registered airmail, but under no circumstances will it be held responsible for late delivery or loss of the documents so mailed.

7. Submissions of Applications for Prequalification must be in sealed envelopes, which must be either delivered by hand or by registered mail, to:

The Project Director, RHD, Rupsa Bridge Construction Project,
Sarak Bhaban, Ramna, Dhaka — 1000

not later than:

12:30 P.M (Bangladesh time) on2000.

and be clearly marked “Application to Prequalify for the Rupsa Bridge Construction Project”.

8. The Employer reserves the right to accept or reject late applications.
9. Applicants will be advised, in due course, of the result of their application. Only firms and joint ventures prequalified under this procedure will be invited to bid.

Project Director, RHD
Rupsa Bridge Construction Project
Sarak Bhaban, Ramna, Dhaka-1000

GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH
MINISTRY OF COMMUNICATIONS
ROADS AND RAILWAYS DIVISION
ROADS AND HIGHWAYS DEPARTMENT

RUPSA BRIDGE CONSTRUCTION PROJECT

INSTRUCTIONS TO APPLICANTS

Date :2000

1. Scope of Bid

- 1.1 The Government of Bangladesh (GOB) has approached the Government of Japan (GOJ) for a loan from the Japan Bank for International Cooperation (hereinafter referred to as "JBIC") in various currencies towards the cost of implementation of Rupsa Bridge Construction Project. No commitment has yet been made by the GOJ on such loan financing. It is intended that a part of the proceeds of this loan, if available, will be used for eligible payments under the contract for which this Invitation for Prequalification is issued.
- Payments by the JBIC will be made only at the request of the Government of Bangladesh and upon approval by the JBIC and will be subject in all respects to the terms and conditions of the Loan Agreement. No party other than the Government of Bangladesh shall derive any rights from the Loan Agreement or have any right to the loan proceeds.
- 1.2 The Employer intends to prequalify contractors for the Rupsa Bridge Construction Project (hereinafter "the Contract"), which will comprise (i) construction of 10km long Southern Section of Khulna Bypass including three bridges, namely Rupsa Bridge (1,360m), Hatia Canal Bridge (90m) and Molonghata Canal Bridge (30m), (ii) construction of 50m x 150m wide river revetment on the East Bank and pier protection against scouring at piers of Rupsa Bridge in the water.
- 1.3 The prequalified contractors shall bid on the basis of the Consultant's design and no alternative offers will be considered by the Employer. General information on the climate, topography, hydrology, etc. is attached as Annex-I to these Instructions to Applicants.
- 1.4 Prequalification is open to firms and voluntarily formed joint ventures from all countries and areas and the contract shall be bid on an international competitive bidding (ICB) basis in accordance with the "Guidelines for Procurement under JBIC ODA Loans, October 1999".
- 1.5 A "two envelope bidding procedure" shall be followed for this contract. Under this

procedure bidders will be required to submit technical and price proposals simultaneously in two separate envelopes. The technical proposals will be opened first then evaluated to determine whether they conform to the specified technical requirements. The price offers of the bidders whose technical proposals have been determined to conform to the specified requirements are then opened publicly. Evaluation of price proposals will then be undertaken and the contract will be awarded to the technically conforming bidder whose price offer has been determined to be "the lowest evaluated bid price".

1.6 The Contract will be a unit price re-measurement contract.

2. Submission of Applications

2.1 Applications for prequalification must be submitted in one original and three copies in sealed envelopes, which must be either delivered by hand or by registered mail, at

The Project Director, RHD, Rupsa Bridge Construction Project,
Sarak Bhaban, Ramna, Dhaka-1000

not later than

12:30 P.M (Bangladesh time) on2000.

and be clearly marked "Application to Prequalify for the Rupsa Bridge Construction Project". The Employer reserves the right to accept or reject late applications.

2.2 The name and mailing address of the applicant shall be clearly marked on the envelope.

2.3 All information requested for prequalification shall be provided in the English language. Information in another language shall be accompanied by a translation of its pertinent parts into English. The English translation will govern and be used for interpreting the information.

2.4 Failure to provide information which is essential to evaluate the Applicant's qualifications or to provide timely clarification or substantiation of the information supplied may result in disqualification of the Applicant.

2.5 Each sheet shall be duly signed by the applicant or a person or persons duly authorized to sign on behalf of the applicant. Such authorization shall be indicated by a written power-of-attorney accompanying the application.

2.6 All documents submitted by the applicants shall be treated as confidential and will not be returned.

2.7 The Applicant should provide accurate information on any litigation or arbitration

resulting from contracts completed or under execution by him over the last five years. A consistent history of awards against the Applicant or any partner of a joint venture may result in failure of the application.

- 2.8 The Project Director, RHD, Rupsa Bridge Construction Project, Sarak Bhaban, Ramna, Dhaka will inform all applicants of the result of their application. The Project Director reserves the right to reject or accept any application and to annul the prequalification process and reject all applications, without thereby incurring any liability to the affected applicants or any obligation to inform the applicants of the grounds for his action.

3. Qualification Criteria

- 3.1 Prequalification will be based on meeting all the following minimum pass/fail criteria regarding the Applicant's general and particular experience, personnel and equipment capabilities, and financial position, as demonstrated by the Applicant's responses in the forms attached to the Letter of Application (specific requirements for joint ventures are given under paras. 4.1 and 4.2 below). The Employer reserves the right to waive minor deviations, if they do not materially affect the capability of an applicant to perform the Contract. Subcontractors' experience and resources shall not be taken into account in determining the Applicant's compliance with the qualifying criteria.

3.2 General Experience

The Applicant must have an average annual turnover (defined as billing for works in progress and completed) of US \$ 170 million equivalent since _____ 19 ____.
[Refer to Application Form (2) and Application Form (2a).]

3.3 Particular Experience

The Applicant must have successful construction experience as prime contractor and have successfully completed the following threshold activities at least once in the last five years, or be currently engaged in such activities (for compliance, more than 50% of the relevant contract must have been successfully completed at the time of application).

- (a) Construction of a major civil engineering infrastructure project outside the contractor's home country with a contract value of US\$ 60 million or more.
[Refer to Application Form (4a-i)]
- (b) Construction of a major multi-span prestressed concrete bridge involving at least 5 No. spans, all of which are at least 80 m long with a contract value of US\$60 million or more.
[Refer to Application Form (4a-ii)]
- (c) Construction of major marine or riverine hydraulic engineering works involving

dredging, reclamation and slope protection works with a total contract value of US\$ 5 million or more.

[Refer to Application Form (4a-iii)]

- (d) Construction of bored cast-insitu concrete piles in water (10m or deeper) on a scale of large diameter (2.0m or larger) and pile length (60m or longer).
[Refer to Application Form (4a-iv)]
- (e) Construction of segmental continuous prestressed concrete box girder of span length over 80m.
[Refer to Application Form (4a-v)]
- (f) Fabrication of precast prestressed concrete girders with a span length of 24m or longer (160 numbers or more at one construction yard), and erection of girders and construction of cast-insitu concrete slab.
[Refer to Application Form (4a-vi)]
- (g) Dredging with cutter suction dredgers in depths of 10m or more, with sustained weekly production rate of at least 10,000m³, including forming underwater slopes to accurate profiles.
[Refer to Application Form (4a-vii)]
- (h) Construction of underwater slope protection works involving placing rock/concrete block accurately onto a geo-textile underlayer, or similar works, in depths of water of 10m or more, with a contract value of US\$1 million or more.
[Refer to Application Form (4a-viii)]

3.4 Personnel Capabilities

The Applicant must have suitably qualified personnel, to fill the following positions. The Applicant shall supply information on a prime candidate and an alternate for each position, both of whom should meet the minimum experience requirements specified in **Table A** below.

Rupsa Bridge Construction Project

Prequalification Documents

Position	Minimum Requirements						Proficiency in English Language (*See Note)
	Total Experience (years)	Experience in Similar Works (years)	Experience in Similar Position (years)	Experience in Developing Countries (years)	Experience outside Home Country (years)		
Project Manager	20	10 or 3 No. Major Bridge Projects	5 or 2 No. Major Bridge Projects	7 or 2 No. Major Civil Projects	7 or 2 No. Major Civil Projects	7 or 2 No. Major Civil Projects	Spoken - good Reading - good Writing - good
Planning Engineer	15	8 or 2 No. Major Bridge Projects	5 or 2 No. Major Civil Projects	5 or 2 No. Major Civil Projects	3 or 1 No. Major Civil Projects	3 or 1 No. Major Civil Projects	-
Foundation / Piling Engineer	15	8 or 3 No. Major Piling Projects	5 or 2 No. Major Piling Projects	5 or 2 No. Major Civil Projects	3 or 1 No. Major Civil Project	3 or 1 No. Major Civil Project	Spoken - good
Concrete / Prestressing Engineer	15	8 or 2 No. Major Bridge Projects	5 or 2 No. Major Civil Projects	5 or 2 No. Major Civil Projects	-	-	Spoken - good
Dredging / Earthworks Engineer	15	8 or 3 No. Major Dredging Projects	5 or 2 No. Major Dredging Projects	5 or 2 No. Major Civil Projects	-	-	-
Material Engineer	10	5 or 3 No. Major Bridge Projects	5 or 2 No. Major Bridge Projects	3 or 2 No. Major Civil Projects	3 or 2 No. Major Civil Projects	3 or 2 No. Major Civil Projects	Spoken - good Reading - good Writing - good
Pavement Engineer	8	5 or 3 No. Major Pavement Projects	5 or 2 No. Major Pavement Projects	3 or 2 No. Major Civil Projects	3 or 2 No. Major Civil Projects	3 or 2 No. Major Civil Projects	Spoken - good

* Note: Successful Bidder will also be required to provide an adequate number of interpreters fluent in English and Bengali Languages to facilitate communication with Engineer's staff, Supervision Consultant staff and their own local staff. The official language of the Contract Documents and all formal contract correspondence is English.

TABLE A Personnel Capabilities – Minimum Requirements to be satisfied for Bid to be Considered “Technically Conforming”.

3.5 Equipment Capabilities

The Applicant should list the key items of equipment which he would propose to complete the following major works included in the Contract within the periods specified. The Applicant should also demonstrate how he has assured access to such equipment for use in the Contract, e.g. owned or through hire, lease, purchase agreement, availability of manufacturing capacity, or other means.

[Refer to Application Form (6) and Application Form (6a)]

- (a) Construction on water of approximately 48 numbers of cast-insitu concrete piles of 2.5m diameter and 75m in length within a period of 16 months. (Equipment to suit option for which prequalification is sought.)
- (b) Construction of 16m wide prestressed concrete box girder bridge of a total length of approximately 640m by segmental method over water, within a period of 25 months.
- (c) Production of approximately 39,000m³ concrete within a period of 25 months.
- (d) Construction of a national or regional highway including box culverts and pavement with a contract value of US\$ 15 million or more.

3.6 Financial Position

The Applicant should demonstrate that he has access to, or has available, liquid assets, unencumbered real assets, lines of credit, and other financial means sufficient to meet the construction cash flow for a period of three months, estimated as US\$ 8,000,000 equivalent, net of the Applicant's commitments for other contracts. If the Applicant feels necessary to do so, he may include with his application a bank commitment from any scheduled bank of Bangladesh or of a foreign bank having a corresponding bank in Bangladesh to supplement his application. This letter of commitment should commit that in case the Contract is awarded to the Applicant, he will be provided with a revolving line of credit for an amount of not less than US\$ 8,000,000 or equivalent Bangladesh Taka until the Works are completed and taken over by the Employer. Annex-2 to these Instructions to Applicants shows a form of such letter of commitment acceptable to the Employer. The letter of commitment shall be submitted in original form with the bank seal and signature/s of the Bank's authorized representative affixed.

- 3.7 The audited balance sheets for the last five years should be submitted and must demonstrate the soundness of the Applicant's financial position, showing long-term profitability. Where necessary, the Employer will make enquiries with the Applicant's bankers.

[Refer to Application Form (7)]

3.8 Litigation History

The Applicant should provide accurate information on any litigation or arbitration resulting from contracts completed or under execution by him over the last five years. A consistent history of awards against the Applicant or any partner of a joint venture may result in failure of the application. Subsequent discovery of undisclosed litigation or arbitration shall lead to the disqualification of the Applicant.

[Refer to Application Form (8)]

4. Joint Ventures

4.1 Joint ventures must comply with the following requirements:

(a) Following are the minimum qualification requirements:

(i) the lead partner shall meet at least (a), (b) and (e) of the qualifying criteria given in para. 3.3 and the joint venture must satisfy collectively all the qualifying criteria. If other partners are of specialist nature (piling contractor, river revetment contractor, etc), they shall meet 100% of the relevant qualifying criteria in para. 3.3.

(ii) the lead partner shall meet not less than 65% of the qualifying criteria and the other partners, individually, 35% of the qualifying criteria given in para. 3.6 above. Where the lead partner satisfies 100% of the qualifying criteria given in para. 3.6 above, there is no qualifying requirement for the other partners.

and

(iii) the joint venture must satisfy collectively the criteria of paragraphs. 3.4, 3.5 and 3.6, for which purpose the relevant figures for each of the partners shall be added together to arrive at the joint ventures total capacity. Individual members must each satisfy the requirements of paragraphs. 3.7 and 3.8 above.

(b) the formation of a joint venture after prequalification, and any change in a prequalified joint venture, will be subject to the written approval of the Employer prior to the deadline for submission of bids. Such approval may be denied if (i) partners withdraw from a joint venture and the remaining partners do not meet the qualifying requirements; (ii) the new partners to a joint venture are not qualified, individually or as another joint venture; and (iii) in the opinion of the Employer, a substantial reduction in competition may result; and

(c) any bid shall be signed so as to legally bind all partners, jointly and severally, and any bid shall be submitted with a copy of the joint venture agreement providing the

joint and several liability with respect to the contract.

- 4.2 The prequalification of a joint venture does not necessarily prequalify any of its partners individually, or as a partner in any other joint venture or association. In case of dissolution of a joint venture, each one of the constituent firms may prequalify if they meet all the prequalification requirements, subject to the written approval of the Employer.

5. Conflict of Interest

- 5.1 The Applicant (including all members of a joint venture) shall disclose any current association or association in the past five years, with the consultant or any other entity that has prepared the design, specifications, and other prequalification and bidding documents for the Project. Any such association will be assessed to determine whether there is a conflict of interest, in which case the Applicant will be disqualified.

6. Verification of Information Submitted

- 6.1 Applicants are advised that verification checks may be conducted on any of the technical and financial information submitted with their applications. Where the information provided is fraudulent or incorrect, the Applicant may be disqualified from the prequalification process.

Further verification checks may also be conducted during the bidding process prior to the award of contract. At that time any information provided during the prequalification process and bidding process which is found to be fraudulent shall result in disqualification of the bidder.

7. Updating of Prequalification Information

- 7.1 Bidders shall be required to update the financial information used for prequalification at the time of submitting their bids, to confirm their continued compliance with the qualification criteria and verification of the information provided. A bid shall be rejected if the Applicant's qualification thresholds are no longer met at the time of bidding.

8. General

- 8.1 Only firms and joint ventures that have been prequalified under this procedure will be invited to bid. A qualified firm or a member of a qualified joint venture may participate in only one bid for the Contract. If a firm submits more than one bid, singly or in joint venture, all bids including that party will be rejected. This rule will not apply in case of bids which include specialist subcontractors who are used by more than one bidder.
- 8.2 Bidders will be required to provide bid security in the form of a bond, banker's guarantee

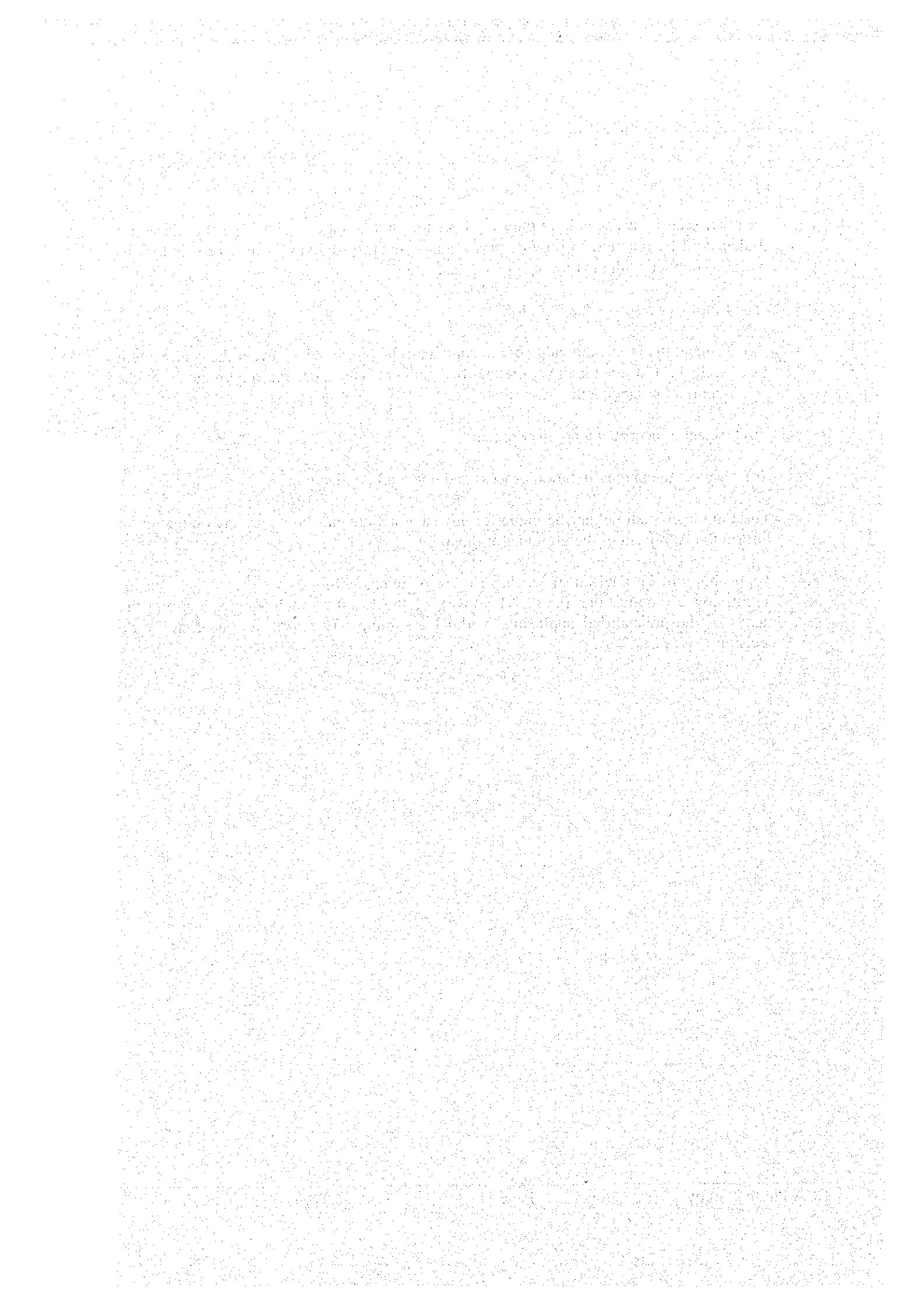
or other security acceptable to the Employer for an amount of %, and the successful bidder will be required to provide performance security. Examples of acceptable forms will be supplied with the bidding documents.

8.3 The Employer reserves the right to:

- (a) amend the scope and value of the contract to be bid, in which event the contract will only be bid among those prequalified bidders who meet the requirements of the contract as amended;
- (b) reject or accept any application; and
- (c) cancel the prequalification process and reject all applications.

The Employer shall neither be liable for any such actions nor be under any obligation to inform the Applicant of the grounds for them.

8.4 Applicants will be advised in writing by fax or telex, within 180 days of the date for submission of applications (para. 2.1 above), of the result of their application, and the names of the prequalified applicants, without assigning any reason for the Employer's decision.



Annex-1

PROJECT DESCRIPTION**1. Project Site**

The Southern Section of Khulna Bypass including Rupsa Bridge (hereinafter referred as to "Rupsa Bridge") aim to bypass congested Rupsa Ferry and other traffic bottlenecks on National Highway No. 7 in the downtown of Khulna so as to strengthen the road network of Khulna City and its surroundings as well as to stimulate Mongla Port to induce freight demand as shown in Fig. 1.1.

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 river crossing point of the Rupsa Bridge is located 2.6 km south from Rupsa Ferry, and 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.

2. Scope of the Project

The project comprises the following major works:

- 1) 1,360m Rupsa Bridge;
- 2) Two (2) canal bridges of 90m long Hatia Canal Bridge and 30m long Molonghata Canal Bridge;
- 3) Nine (9) box culverts;
- 4) 8,559m long stretch of roadwork section including six (6) at-grade intersections;
- 5) One (1) toll plaza; and
- 6) River revetment on the east bank and pier protection against scouring.

3. Summary of Natural, Socio-economic and Social & Environmental Conditions**3.1 Natural conditions****3.1.1 Geomorphology**

Bangladesh is situated in the Bengal Basin of which the geophysical feature is the tectonically active Hinge Zone which is extending from Calcutta in India to Mymensingh in Bangladesh. The movement of the Plate has been considered as the major cause of the modification of the Basin Structure. The Bengal Basin is tectonically very active and it is characterized by a number of faults. It is revealed that a part of the Basin has been uplifted and subsided due to the result of neo-tectonic actives by geo-physical observation. Particularly in the northeastern part of the country, such presence of faults, neo-tectonic activities and modifications of the Basin are more remarkable than that in the southwestern part. Khulna City is located in the southwest region of the country, and therefore Khulna City is tectonically more stable than the rest of the country.

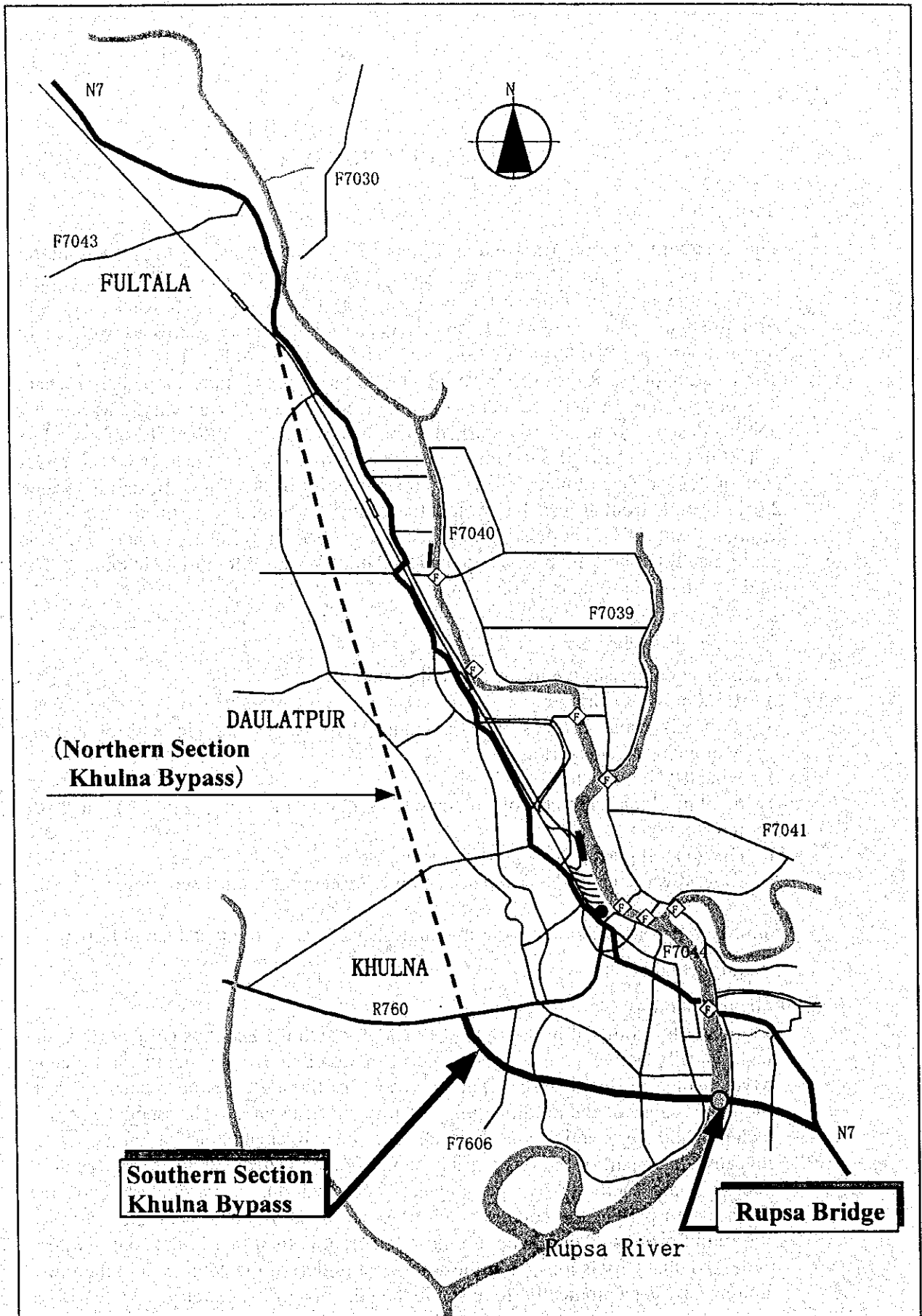


Fig. 1.1 Project Location Map

3.1.2 Air Temperature

Mean monthly temperature is summarized in Table 3.1.

Table 3.1 Air Temperature in Khulna Period 1988-1998

(Unit : °C)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Extreme Max	30.5	33.7	37.7	39.4	40.0	37.2	35.5	35.6	39.1	36.4	34.2	30.4	40.0
Mean Max	29.0	32.3	36.3	37.6	37.3	36.3	35.0	34.6	35.9	34.9	32.8	29.5	
Mean Min.	7.6	10.6	14.8	18.6	20.9	22.8	24.2	24.1	23.6	20.5	14.6	10.2	
Extreme Min.	6.8	9.0	12.8	15.8	19.4	20.8	22.2	22.3	22.2	18.4	11.9	8.0	6.8

Source: Provincial Meteorology Office - Khulna

3.1.3 Precipitation

Table 3.2 shows the summary of precipitation data recorded during a period of 30 years from 1969 to 1998 at Khulna station. The total annual precipitation ranges between a minimum of 475 mm (1971) and a maximum of 2,762 mm(1974), and the mean annual rainfall in Khulna is 1,754 mm.

Table 3.2 Monthly Precipitation in Khulna Period 1969-1998

(Unit : mm)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean	11.1	34.7	54.9	76.1	183.9	345.2	322.1	321.1	240.2	127.1	31.0	7.1	1754.5
Max	70.0	203.0	220.0	347.0	373.0	783.0	792.0	633.0	843.0	330.0	162.0	65.0	2762.0
Min	0.0	0.0	0.0	0.0	30.0	63.0	48.0	80.0	39.0	17.0	0.0	0.0	475.0

Source : Provincial Meteorology Office - Khulna

Table 3.3 also shows the record of the rainy days at Khulna station during the same period of past 30 years.

Table 3.3 Monthly Rainy Days & Max Dairy Precipitation in Khulna Period 1969-1998

(Unit : mm)

	January			February			March			April			May			June		
	Max Rain	0>	10>	Max Rain	0>	10>	Max Rain	0>	10>	Max Rain	0>	10>	Max Rain	0>	10>	Max Rain	0>	10>
Mean		1.2	0.3		2.6	1.1		2.6	1.6		5.5	2.6		9.9	5.5		15.4	8.4
Max	70	4	3	64	10	4	95	10	10	122	12	8	127	19	11	254	27	13
Min	0	0	0	0	0	0	0	0	0	0	0	0	22	2	1	36	3	2

	July			August			September			October			November			December		
	Max Rain	0>	10>	Max Rain	0>	10>	Max Rain	0>	10>	Max Rain	0>	10>	Max Rain	0>	10>	Max Rain	0>	10>
Mean		20.2	9.9		19.9	9.2		14.8	6.9		7.1	3.5		1.8	0.8		0.9	0.1
Max	153	27	19	391	26	15	430	22	14	115	14	8	113	8	4	62	4	2
Min	13	5	2	12	7	2	11	3	2	11	2	1	0	0	0	0	0	0

Source: Provincial Meteorology Office - Khulna (Unit : mm,days)

3.1.4 Humidity

Table 3.4 shows the data on relative humidity for 11 calendar years, the period from 1988 to 1998, recorded at Khulna station.

Table 3.4 Monthly Humidity in Khulna Period 1988-1998

(Unit : percent)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
Extreme Max	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Mean Max	100.0	100.0	99.8	99.3	99.8	100.0	99.8	99.8	99.8	99.9	99.7	100.0	99.8
Mean Min	26.9	29.7	23.6	27.5	43.2	53.1	57.1	60.8	57.5	45.5	38.0	33.2	41.3
Extreme Min	9.0	22.0	13.0	20.0	27.0	30.0	26.0	51.0	41.0	39.0	31.0	28.0	28.1

Source: Provincial Meteorology Office - Khulna

3.1.5 Wind Velocity

Table 3.5 shows the monthly maximum values of wind velocity for 11 years period from 1988 to 1998, measured at 10 meters height at Khulna meteorological station.

Table 3.5 Monthly Mean Wind Velocity in Khulna Period 1988-98

(Unit : m/s)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Max & Min
Mean	6.7	6.2	7.9	12.8	9.3	8.9	8.0	7.7	8.2	5.7	7.1	7.9	
Max	15.9	9.3	13.9	23.1	12.8	18.0	10.3	11.3	33.4	9.3	18.5	18.5	33.4
Min	4.1	4.1	4.6	6.2	6.2	5.1	4.6	5.1	3.1	2.1	2.1	3.1	2.1

Source : Provincial Meteorology Office - Khulna (Unit : m/s)

Strong cyclonic storm with the maximum velocity of 44.4m/s (160 km/hr) was recorded in Khulna region on 29, November, 1988.

3.1.6 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. 3.1 shows the mean monthly H.W.L and L.W.L at Khulna station from 1970 to 1998.

Fig. 3.2 shows the fluctuation of water level and flow velocity surveyed on July 29 1999.

Estimated water levels by frequency analysis are tabulated in Table 3.6.

Table 3.6 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. 3.1 Monthly H.W.L. & L.W.L at Khulna Station (4km upstream from proposed bridge location)

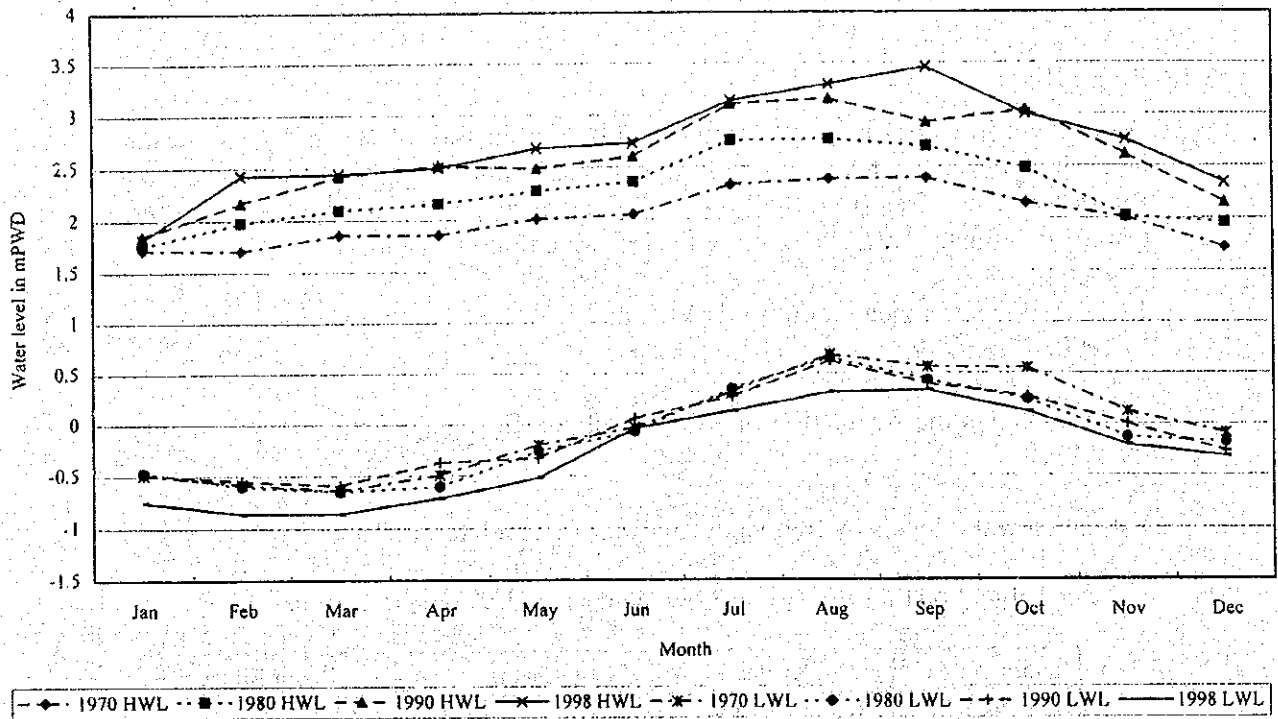
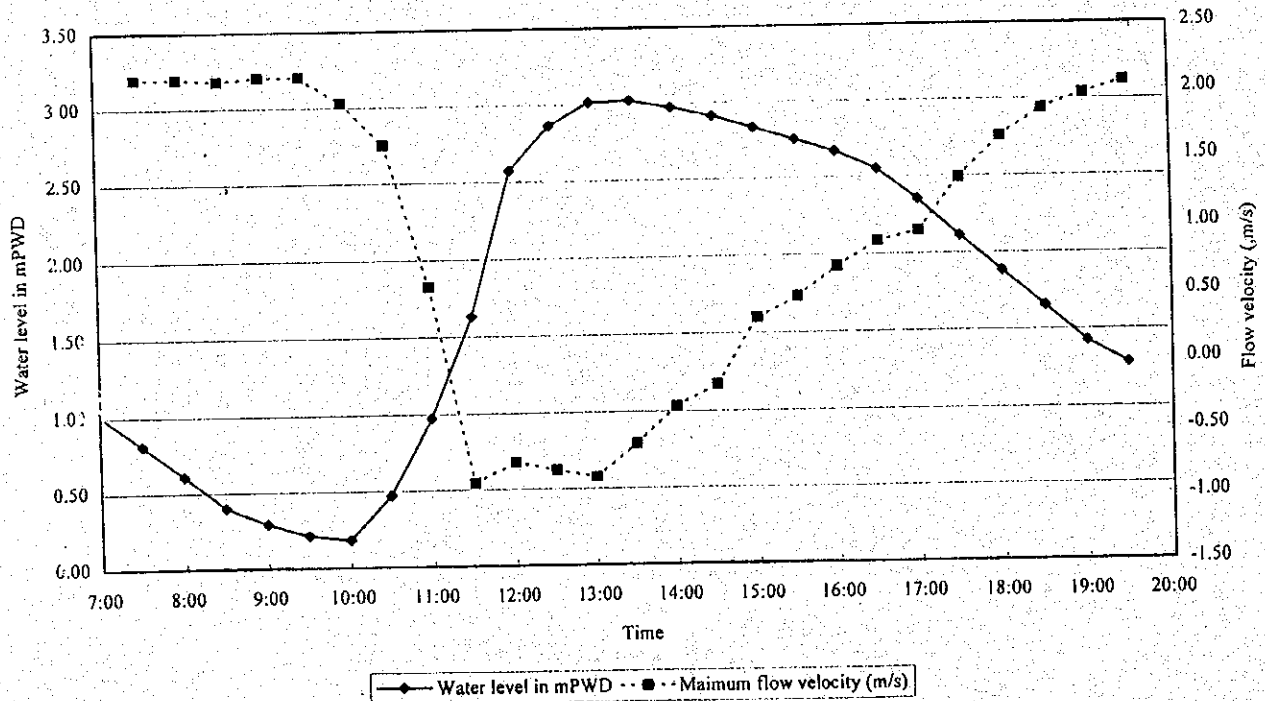


Fig. 3.2 Change in Hourly Water Level and Maximum Flow Velocity at Proposed Bridge Site
Date: 29.07.1999



3.1.7 Geology and Subsurface Soil Condition

The terrain of Khulna City is flat and the geological characteristics are classified into six major units, namely, natural levees, flood plains, old meander complex, bar, tidal marsh and back swamps.

There are several soil layers from the ground surface along the selected route.

Silty Clay Layer and Clayey Silt Layer:

- i) Clayey Silt layer exists around the Rupsa River. Clayey Silt layers exist from ground surface to GL-12.5m, of which the N value by Standard Penetration Test (SPT) is in the range of 0 to 5.
- ii) Silty Clay layers exist at the west side of Rupsa River. The depth of Silty Clay layers varies from ground surface to GL-9.5m, of which the N values are in the range of 1 to 4.
- iii) Also another clayey silt layers exist below Silty Clay layer. The least depth of this layer is GL-6.0m, while the deepest existing depth is GL-16.0m. The N values are in the range of 2 to 5.

Silty Fine Sand I Layer:

Silty fine sand layers are found at all boring points. The least depth of Silty Fine Sand I layer is GL-6.0m, while the deepest layer is GL-52.5m. The N values are in the range of 0 to 84.

Clayey Silt Layer:

Clayey Silt layer exists in Silty Fine Sand I layer. The width and depth varies from place to place. The N values are in the range of 9 to 42.

Silty Fine Sand II Layer:

Silty Fine Sand II layer is segregated from Silty Fine Sand I layer, and the layer is situated GL-51.5m or deeper. Silty Fine Sand II layer is dense and N value exceeds 50.

3.2 Environmental Conditions

3.2.1 Hydrology

Flood in Bangladesh occurs from three different sources e.g. direct rainfall, over bank spillage from the major international rivers and over bank spillage from the internal regional rivers. Each phenomenon occurs during the monsoon rain either separately or in combination. The pattern of river level rise generally shows a 2-peaked response, the first peak being generated by internal regional excess that occurs normally in June / July and the second peak resulting from high cross-boundary flows in the major international rivers, that normally occurs in early September. The topography, local rainfall and local drainage pattern characterize hydrology of the proposed Rupsa Bridge project area. The tidal floodplain lying around the city of Khulna is occupied by level, lowland with nearly 2-m difference in elevation between the ridge top and basin bottoms. Tidal flood of this area has been restricted by poldering on both sides of the major rivers. Drainage congestion has been created locally due to closure of the minor rivers and subsequent rise of riverbeds by siltation. In general, the tidal flood plain to which the Khulna City area is a component has been protected from inundation by

pouldering. Hence, occasional floods, like other floodplain areas are not a serious problem for the project area.

3.2.2 Ecology and Forest

No reserve or protected forest exists in the vicinity of the selected route. Only few species of littoral plants that occur along the canal and riverbank are mostly non-commercial ones. Hence, the moratorium imposed on felling of trees in reserve forests, sal forests, and mangrove forests of the Sundarban in 1990 but no direct relationship nor influence to the Project may be ascertained due to its location and context. The ecological sub-units included in the project area are homesteads, agriculture land, and low land that occupy the basin bottoms.

3.2.3 Water Quality

Water in open water bodies becomes polluted mainly from industries, processing units, trading centers and from drainage out falls. There exist a large number of these units on both sides of Bhairab–Rupsa river channel in southern part of the project area. The toxic liquid affluent and solid waste of these industrial units affect the river-based bio-diversity and public health of the people who use river water. The Old Mayur river, the only water body in the west of Khulna city is under serious threat due to discharge of industrial wastes. Oil spill from increasing number of mechanized vessels pollutes the river water.

Water from shallow ground water table in Khulna City is not good enough either for drinking or for irrigation due to salinity. No information is available regarding the arsenic content of water in shallow ground water table.

Water quality at four sampling sites except Gabtala Ghat indicates marginal pollution level against the Environmental Quality Standards (EQS) in Bangladesh.

3.2.4 Air Quality

Concentration of NO_x in ambient air has been found 73-202 mg/m³ in commercial areas while the Bangladesh standards are 80 mg/m³ at residential site and 100 mg/m³ at commercial areas. Air pollution is caused due to industrial emission, automobile exhaust, smoke emitted from the kitchen that use bio-mass energy and bio-gas emitted from the city dumping grounds, drains, market places, agriculture fields and closed borrow pits that occur in large number in the Khulna city.

NO_x values are higher than EQS Values and the SPM value is 20 times higher compared to EQS value at Sonadanga bus stop according to the sampling.

4. Project Components

4.1 Components and its Scale

The Southern Section of Khulna Bypass is of 10,039m long, comprising following components:

(1) Rupsa Bridge: L=1,360m W =16.0m

1) Rupsa Main Bridge (16m effective width)

Superstructure: Cast-insitu 7-span PC Box Girder with span length of
70m + 5@100m + 70m = 640m

Substructure: RC Bored Piles and Pile-cap on water level

2) Rupsa Approach Bridge (16m effective width)

Superstructure: Standard PC I-girder composite with RC deck slab,
2 x 12 @30m = 720m

Substructure: RC Bored Piles

(2) Roads and Canal Bridges : L=8,679m (West section L=5,880m,
East section L=2,799m)

1) Typical Cross section

Roadway Width : 21.5m

Through Traveled Way : 2x6m (Through traveled lane 3.5m, Slow-moving
track 2.5m)

Median : 5.5m

Inner Shoulder : 1.0m (part of median)

Outer Shoulder : 2.0m (used for sidewalk)

2) Canal Bridge : Hatia Br. (L=90m W=2x9m),

Molonghata Br. (L=30m W=2x9m)

Superstructure: Standard PC I-girder composite with RC deck slab

Hatia Br.: 3 x 30m = 90m, Molonghata Br.: 1 x 30m = 30m

Substructure: RC Bored Piles

3) Box Culvert : Nine (9) locations

No.	Station	Name	Unit	Length	Height	Width	Remarks
1	3+219	Alutala Canal	M	25	1.5	4.0	2-Cell
2	3+760	Aralia Canal	M	27	2.0	7.5	3-Cell
3	4+659	Narikal Baria Canal	M	36	5.0	16.5	3-Cell
4	5+436	Karate Canal	M	23	2.0	4.0	2-Cell
5	5+643	Laurir Canal	M	23	3.5	14.0	4-Cell
6	5+880	Moyur Canal	M	23	4.0	12.0	3-Cell
7	6+263	Khetra Canal	M	23	4.0	12.0	3-Cell
8	6+496	Malekana Canal	M	30	2.0	12.5	5-Cell
9	9+860	Besar Canal	M	30	4.0	8.0	2-Cell

4.2 Related Facilities

Following facilities are to be constructed related to the Southern Section of Khulna Bypass:

- 1) River Revetment : 50m x 150m wide river revetment on the East Bank
- 2) Pier Protection : at piers of the Main Bridge in the water against scouring
- 3) At-grade Intersections : Six (6) locations
- 4) Toll Plaza : Barrier type toll gates of five booths for fast-moving vehicles and four booths for slow-moving vehicles
- 5) Bus Bay : Two (2) locations
- 6) Staircases with Slope for Bicycle Pulling : Both sides and both ends of Rupsa Bridge

Annex-2

**FORM OF BANK'S LETTER OF COMMITMENT
FOR OPENING A REVOLVING LINE OF CREDIT
IN FAVOUR OF THE TENDERER**

_____ [date]

To : The Project Director, RHD
Rupsa Bridge Project
Sarak Bhaban, Ramna.
Dhaka-1000.

Sub : Letter of Commitment Confirming Bank's Undertaking for Opening a Line of Credit in favour of _____ [name of Tenderer] in case of award to them of works for Rupsa Bridge Construction Project.

Dear Sir,

We, the authorized representatives of _____ [name and address of Bank] in case of award of Rupsa Bridge Construction Project to _____ [name of Tenderer], do hereby agree and undertake that _____ [name of Tenderer] will be provided by us with a revolving line of credit for an amount not less than U.S. Dollar _____ million or an amount in equivalent Bangladesh Taka, as necessary, for the sole purpose of the execution of the above mentioned Contract. This revolving line of credit will be maintained until the issuance of the Taking-Over Certificate in respect of the whole of the Works,

In case you have reasons to believe that during the execution of the Contract, the construction activities at site suffer from lack of adequate cashflow and notifies in writing to that effect to us, we do hereby further undertake to place at your disposal on your first demand and without cavil or argument, any sum within the limit of above stated amount.

In witness whereof, authorized representative of the Bank has hereunto signed and sealed this Letter of Commitment.

SIGNATURE AND SEAL OF THE BANK
ISSUING THIS COMMITMENT LETTER _____

Name of Bank _____

Address _____

LETTER OF APPLICATION

[Letterhead paper of the Applicant, or partner responsible for a joint venture, including full postal address, telephone, fax, cable and telex addresses]

..... [date]

To :

.....

[name and address of the Employer]

Sirs,

1. Being duly authorized to represent and act on behalf of (hereinafter 'the Applicant'), and having reviewed and fully understood all the prequalification information provided, the undersigned hereby apply to be prequalified by yourselves as a bidder for the Contract.
2. Attached to this letter please find copies of original documents defining^{*(1)}
 - (a) the Applicant's legal status;
 - (b) his principal place of business; and
 - (c) the place of incorporation (for applicants who are corporations); or the place of registration and the nationality of the owners (for applicants who are partnerships or individually owned firms).

^{*(1)} For applications by joint ventures, all the information requested in the prequalification documents is to be provided for the joint venture, if it already exists, and for each party to the joint venture separately. The Lead Partner should be clearly identified. Each partner in the joint venture shall sign the letter.

3. Your Agency and its authorized representatives are hereby authorized to conduct any inquiries or investigations to verify the statements, documents and information submitted in connection with this application, and to seek clarification, from our bankers and clients regarding any financial and technical aspects. This Letter of Application will also serve as authorization to any individual or authorized representative of any institution referred to in the supporting information, to provide such information deemed necessary and requested by yourselves to verify statements and information provided in this application, or with regard to the resources, experience, and competence of the Applicant.

4. Your Agency and its authorized representatives may contact the following persons for further information^{*(2)}.

General and Managerial Inquiries:

Contact 1

Tel No. :

Contact 2

Tel No. :

Personnel Inquiries:

Contact 1

Tel No. :

Contact 2

Tel No. :

Technical inquiries:

Contact 1

Tel No. :

Contact 2

Tel No. :

Financial inquiries:

Contact 1

Tel No. :

Contact 2

Tel No. :

^{*(2)} Applications by joint ventures should provide, on a separate sheet equivalent information for each party to the application.

5. This application is made in the full understanding that:
- (a) bids by prequalified applicants will be subject to verification of all information submitted for prequalification at the time of bidding ;
 - (b) your Agency reserves the right to :
 - amend the scope and value of any contracts bid under this project. In such event, bids will only be called from prequalified bidders who meet the revised requirements; and
 - reject or accept any application, cancel the prequalification process and reject all applications; and
 - (c) your Agency shall not be liable for any such actions and shall be under no obligation to inform the Applicant of the grounds for them.

Applicants, who are not joint ventures, should delete paras. 6 and 7 and initial the deletions.

6. Appended to this application, we give details of the participation of each party, with supporting documents including capital contribution and profit/loss agreements, to the joint venture or association. We also specify the financial commitment in terms of the percentage of the value of the contract, and the responsibilities for execution of the contract.
7. We confirm that in the event that we bid, that bid as well as any resulting contract will be:
- (a) signed so as to legally bind all partners, jointly and severally; and
 - (b) submitted with a joint venture agreement providing the joint and several liability of all partners in the event the contract is awarded to us.

8. The undersigned declare that the statements made and the information provided in the duly completed application are complete, true and correct in every detail.

Signed:
Name:
for and on behalf of,
Applicant:
(Or Responsible Partner
for a Joint Venture)

Signed :
Name :
for and on behalf of,
Partner :

Signed:
Name:
for and on behalf of,
Partner:

Signed :
Name :
for and on behalf of,
Partner :