

GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH  
MINISTRY OF IRRIGATION, WATER DEVELOPMENT AND FLOOD CONTROL  
BANGLADESH WATER DEVELOPMENT BOARD

**DHAKA INTEGRATED FLOOD PROTECTION PROJECT**  
**MID-TERM CONSULTANCY SERVICES**  
**ADB LOAN - 1124-BAN (SF)**



**FINAL REPORT**

MAIN VOLUME

TECHNOCONSULT INTERNATIONAL LIMITED, BANGLADESH  
in association with  
ASSOCIATED CONSULTING ENGINEERS LIMITED, BANGLADESH  
DESH UPODESH LIMITED, BANGLADESH  
and  
Individual Consultants from LOUIS BERGER INTERNATIONAL, INC., USA

MAY 1993

2

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1124-375  
13-02

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MAY 1993

**Dhaka Integrated Flood Protection Project  
(Bridging Period)**

**Technoconsult International Ltd.**

in Association with  
Associated Consulting Engineers Ltd.  
Desh Upadesh Limited  
and

Individual Consultants from Louis Berger Int'l Inc.

DIFP/RT-14/4  
May 31, 1993

The Project Director  
Project Management Office  
Dhaka Integrated Flood Protection Project  
Bangladesh Water Development Board  
Dhaka

**Sub : Final Report on Mid-term Consultancy Services for Dhaka Integrated Flood Protection Project under ADB LOAN No - 1124-BAN (SF)**

Dear Sir,

We are pleased to submit herewith twenty five copies of the Final Report on Mid-term consultancy services for Dhaka Integrated Flood Protection Project, for favour of your kind disposal.

The Final Report has 7 Annexures presented in 4 Volumes which are as follows :

- |              |                |   |
|--------------|----------------|---|
| Volume -I:   | Annexure -I:   | Design of Embankment Remedial Measures and Reinforced Earth Embankment Along Left Bank of Buriganga River having two Appendices A and B (B1-B6) furnished in two Volumes. |
| Volume -II:  | Annexure -II:  | Design of Sluices, Covered Drains and Flood Walls.  |
| Volume -III: | Annexure -III: | Study on Pump Station No. 3 at Goranchatbari including Appendix A.  |

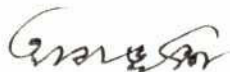
Volume - IV: Annexure - IV: Quality Control Measures.

Annexure - V: O&M Guidelines.

Annexure - VI: Implementation Guidelines for Community Development Aspect.

Annexure - VII: Strengthening of Accounting Procedures of PMO.

Yours faithfully,



**Abdul Barik Bhuiyan**  
Team Leader

Enclosure: As stated above.





## ABBREVIATIONS

ADB	-	Asian Development Bank
BWDB	-	Bangladesh Water Development Board
BSS	-	British Standard Specifications
BRAC	-	Bangladesh Rural Advancement Committee
BUET	-	Bangladesh University of Engineering & Technology
CSR	-	Central Spine Road
CC	-	Cement Concrete
C/S	-	Country Side
DCC	-	Dhaka City Corporation
DWASA	-	Dhaka Water Supply and Sewerage Authority
DIFPP	-	Dhaka Integrated Flood Protection Project
FAP	-	Flood Action Plan
FCD	-	Flood Control and Drainage
GOB	-	Government of Bangladesh
IR	-	Inception Report
JICA	-	Japan International Corporation Agency
MIWDFC	-	Ministry of Irrigation, Water Development & Flood Control
MS	-	Mild Steel
O&M	-	Operation and Maintenance
ORT	-	Oral Rehydration Therapy
PMO	-	Project Management Office
RAJUK	-	Rajdhani Unnayan Kattipaka (Capital Development Authority)
RCC	-	Reinforced Cement Concrete
R/S	-	River Side
SDE	-	Sub-Divisional Engineer
TA	-	Technical Assistance
TOR	-	Terms of Reference
TV	-	Television

## Physical Units

cm	-	centi meter	m	-	meter
m <sup>3</sup> /sec	-	cubic meters per second	mm	-	millimeter
ha	-	hectares	sq m	-	square meter
km	-	kilometer	sq km	-	square kilometer
m <sup>3</sup>	-	cubic meters			

## Contents

	<b>Page</b>
<b>Letter of Transmittal</b>	
<b>1. Introduction</b>	<b>1</b>
<b>2. The Project</b>	<b>1</b>
2.1 Background of the Project	1
2.1.1 Crash Flood Control Programme	3
2.1.2 Feasibility Study	4
2.2 Existing Flood Control Structures and Drainage System	5
2.2.1 Flood Control Structures	5
2.2.2 Drainage System	6
2.3 Problems	6
<b>3. The Mid-Term Consultancy Services and Terms of Reference</b>	<b>6</b>
3.1 Mid-Term Consultancy Services	6
3.2 Terms of Reference	7
<b>4. Consultant's Tasks as per TOR/IR. &amp; Tasks Accomplished</b>	<b>10</b>
<b>5. Man-Power and Project Organization</b>	<b>26</b>
Table:	
Table - I: Man-month Provision & Utilization	27
<b>Figures:</b>	
Fig. 1 Project Map	28
Fig. 2 Work Plan and Schedule (as Shown in the Inception Report)	29
Fig. 3 Project Map Showing the Demarcation of the Protective Measures of the Western Flood Embankment	34
Fig. 4 West Embankment - Remedial Measures Execution Schedule	35
Fig. 5 Organization Chart	36

## **Appendices:**

Appendix A-Part I: Statement of Openings/Breaches/Gaps and Damages in the Flood Wall

Appendix A-Part II: Statement of the Outlets of the Local Drains that Fall into the Buriganga within the Reach of the Existing Flood Wall

Appendix A-Part III: Schedule of Proposed Measures for Closing of Openings in the Flood Wall Under DIFP Project

Appendix B: Statement of Survey Done, Level Books Used and Map/Plan/Drawing Prepared

Appendix C: Statement of Sub-Soil Boring done and Bore-logs prepared

Appendix D: Statement of Laboratory Tests Performed on Soil Samples and Test Result Received

Appendix E: List of Drawings of Physical Components Designed

Appendix F: List of Estimates Prepared

Appendix G: List of Estimates Checked

Appendix H: List of Report, Maps, Data, etc. Collected from Different Sources

## **Annexures:**

### **Volume I**

Annexure I: Design of Embankment Remedial Measures and Reinforced Earth Embankment Along Left Bank of Buriganga River.

### **Volume II**

Annexure II: Design of Sluices, Protective Works of Embankment, Covered Drains and Flood Walls.

### **Volume III**

Annexure III: Study on Pump Station No. 3 at Goranchathari.

### **Volume IV**

Annexure IV: Quality Control Measures.

Annexure V: O&M Guidelines

Annexure VI: Implementation Guidelines for Community Development Aspect.

Annexure VII: Strengthening of Accounting Procedures of PMO

## **DHAKA INTEGRATED FLOOD PROTECTION PROJECT MID-TERM CONSULTANCY SERVICES**

### **1.0 INTRODUCTION**

The Feasibility Study on the Dhaka Integrated Flood Protection Project, FAP-8B, ADB TA No. 1318 BAN, was completed in September, 1991. With a view to continuing the project preparation uninterrupted following completion of the project preparatory technical assistance, the Government of the People's Republic of Bangladesh decided to engage the TA consultants of ADB to continue their services under ADB Loan-1124-BAN (SF) during the interim period before appointment of loan consultants. On the basis of the decision taken in the meeting of the National Committee for Flood Control held on January, 1992, Technoconsult International Ltd. (as Lead Firm) in association with Desh Upodesh Ltd. and Associated Consulting Engineers (Pvt) Ltd. with inclusion of key personnel of Louis Berger International Inc. USA, was engaged for the Mid-term Consultancy Services for the period from January 8, 1992 to June 30, 1992. Later, on consideration of the heavy work load, time for the Mid-term Consultancy Services was extended upto July 31, 1992 by the Government. The services provided by the consultants during the bridging period are (i) Project Management Advisory Services, and (ii) Detailed Engineering Design and Construction Supervision of the work programme of 1991-92. The assigned Mid-term Consultancy Services rendered by the consultants are presented in this report and in seven Annexures furnished in four volumes - volume I through volume IV.

## **2. The Project**

### **2.1 Background of the Project**

In the years 1987 and 1988, Bangladesh suffered two of the most serious floods on record. During 1988 flood (70 year return period), vast areas of the country, including the capital city of Dhaka with a population of about 4.8 million people, were flooded to an unprecedented degree with flood levels 1.5 meters higher than normal for periods of upto four weeks. In Dhaka city alone, about 200 sq. km, or 77% of the total area of 260 sq. km, were submerged to depths ranging from 0.3



to over 4.5 meters, and about 2.5 million people, or 60% of the city population, were directly affected by 1988 floods. City life was totally disrupted during the flood.

In the wake of 1988 flood, in October 1988, the Government of Bangladesh (GOB) established a committee for Flood Control and Drainage of Greater Dhaka, with the primary objective of preparing a flood control plan for the Greater Dhaka Metropolitan area, based primarily on the 1987 JICA Study on Storm Drainage System Improvements for Dhaka City, and the 1988 "Jansen Report" on causes of the 1988 flood and recommended solutions. In January, 1989, the Committee submitted a detailed scheme for phased investments in flood protection and drainage for Dhaka, Tongi, Narayanganj and Savar, which was approved by the Government in March, 1989.

The basic concept in formulation of the Dhaka Integrated Flood Protection Plan was to develop an integrated urban development program which would provide flood protection and environmental improvements for the residents of Dhaka within the planned future expanded area of 265 sq.km.

The total estimated cost of providing flood protection and drainage for all of Dhaka City (265 sq.km) has been preliminarily estimated at more than 450 million U.S. dollars (Taka 16,700 million) which greatly exceeds the presently available financing. The overall works are, however, well suited for incremental development in a phased program, as funding becomes available.

Considering available funding and other factors, the Government initiated a crash program in 1989 to provide flood protection for the high priority area, approximately 136.5 sq.km on the western part of Dhaka City (Figure 1). The Project area encompasses approximately 95% of commercial and industrial properties and approximately 87% of the total city population. The Project works are designed to be self-contained, and can be incorporated into the overall future development.



### 2.1.1 Crash Flood Control Programme

This crash flood control program included the following physical components:

- i) Construction of
  - flood embankment on western side of the city - 29.3 km.
  - RCC flood wall bordering the South-Western side of the city - 8.5 km.
  - flood embankment around the ZIA International Airport.
  - new road - 2.0 km.
  - 6 drainage sluices on the western flood embankment.
- ii) Improvement and raising of road on the eastern side of the project - 8.5 km.
- iii) Clearing and repair of drainage, khals and sewerage system of the city.

Implementation of the program was a coordinated effort involving the BWDB, DCC, DWASA, RAJUK, CAAB and the Army, with the BWDB taking the lead role. The crash programme was initiated in March 1989, and work taken up under the program was nearly, but not all, complete by the end of 1991.

However, the work on flood protection carried out by the Government using its own resources was started without a proper feasibility study and site investigations, and construction was done under extremely tight time constraints without adequate quality control or adequate scheduling and coordination of interlinking activities. As a result, there have been some serious failures at some points and erosion at many sections of the embankment, drainage congestion due to blocking of the natural drainage, and objections to the construction from taxpayers in the old Dhaka area where business are seen to be affected. The flood control and drainage system is not yet complete nor fully operative. In order to provide a minimum acceptable level of protection for the western part of Dhaka, and for benefits to be realized and the system to be made secure, it was essential that construction deficiencies be corrected, additional flood protection and drainage venting works be completed, improvements to the internal drainage system be done and environmental improvement be carried out. The works form the core group of activities under FAP-8B Study.

### 2.1.2 Feasibility Study

The feasibility study on the Dhaka Integrated Flood Protection Project, FAP-8B, ADB TA No. 1318 BAN, started in late January, 1991 and was completed in September, 1991.

As per recommendations of the feasibility study, the project activities scheduled to be completed over a five year period commencing in FY 1991-92, have been divided into four parts, viz - part A: Flood Protection under BWDB, part B; Drainage under DWASA and part C; Environmental Improvement Programs under DCC and part D: Implementation Assistance.

#### **Part A: Flood Protection (BWDB):**

**The major works to be executed under Flood Protection are:**

- Specialized remedial works on and stabilization of foundation of 7.8 Km of the existing embankment
- Erosion control and slope protection over 11.5 Km of the existing embankment
- Minor remedial works and slope protection over 24.2 Km of the existing embankment
- Repair and stabilization of parts of 5.3 Km of the existing concrete flood wall
- Construction of 1.6 Km of new flood wall/embankment
- Construction of 5 additional sluices on the existing embankment
- Raising and flood proofing of 10.40 km of Central Spine Road (Tongi Railway Bridge to Friendship Bridge over Buriganga)
- Construction of the first stage (capacity 22 cms) of the Pump Station No. 3 at Goranchatbari on the western embankment
- Construction of functional buildings
- Establishment of a maintenance programme and supply of maintenance equipment to safeguard the flood protection investment

#### **Part B: Drainage (DWASA):**

**The major works to be executed under Drainage are:**

- Rehabilitation and upgrading of 21 existing priority khals (including completion of the crash programme initiated by the Government) over a length of 78.6 Km



- R
- Rehabilitation and construction of 50.7 Km of piped drains
  - Establishment of a maintenance programme and supply of maintenance equipment to safeguard the drainage investment

### **Part C: Environmental Improvement Programme (DCC):**

**The major works to be executed under Environmental Improvement Programmes are:**

- Slum and squatter area improvement covering about 8725 families
- Solid waste management, including supply of 30 new trucks and complementary waste handling equipment
- Sanitation improvement, including 30 public toilets and 5 mobile toilets, 5500 low-cost sanitary latrines and 2 septic tank dislodging trucks

### **Part D: Implementation Assistance**

A Project Implementation Office headed by BWDB and strengthened by consulting and training services, will be established to provide the following support:

- Planning, detailed design, construction supervision, monitoring and evaluation
- Co-ordination and management of project activities
- Equipment and logistic facilities
- Quality assurance and control, including establishment of materials testing laboratory to complement and work in accordance with the existing laboratories

## **2.2 Existing Flood Control Structures and Drainage System**

### **2.2.1 Flood Control Structures**

The existing flood control structures under the project are:

- B
- flood embankment over a length of about 29.3 Km on the western side of the project area
  - R.C.C flood wall over a length about 4.7 Km on the southern and western side of the project area
  - 10 sluices on the flood embankment (including 4 temporary sluices)

The above structures were constructed during 1988-89 and 1989-90.



### 2.2.2 Drainage System

B The existing drainage system of the Dhaka city consists of about 110 Km of pipe drains and about 435 Km of khals. Besides, there is a storm water pumping station with a capacity of 9.60 m<sup>3</sup>/sec. 21 major open drains totalling about 79 Km in length and 51 Km of pipe drains of the drainage system of city are included in the Dhaka Integrated Flood protection project, Phase - I.

### 2.3. Problems

Due to exigency of the situation, the works on flood protection of the Dhaka City were taken up by the Government without proper study and site investigation and were executed under extremely tight time constraint and adverse site condition without adequate quality control and coordination of the inter-linking activities. Consequently, there has been serious failures at some points and erosion at many sections of the flood embankment and drainage congestion due to blocking of the natural drainage channels. The flood control and the drainage system is neither complete nor fully operative. The flood control measures and the piecemeal efforts made for flood control in the past have generally been ineffective and, in fact, have in some cases, inadvertently compounded environmental and health hazards in the Dhaka City. Inadequate drainage has resulted in polluted waters remaining stagnant in the low-lying land in densely populated slum areas for long periods of time. Uncoordinated collection and disposal of solid waste have contributed to localized flooding through clogging of drains. Besides, inadequate and ineffective excreta management has led to high level of exposure to water borne pathogens during floods.

## 3. Mid-Term Consultancy Services and Terms of Reference

### 3.1 Mid-Term Consultancy Services

The Mid-Term Consultancy Services in particular have been agreed upon, so that the project activities could proceed without interruption while selection of long-term consultants is made. Thus the work programme of FY 1991-92 could be taken up for implementation and could be made eligible for retroactive financing upon ADB loan effectiveness. Preparatory works for engineering design and construction could also be done for the following years' program (i.e. topographic surveys, subsoil investigations, laboratory testing, etc.). The following Terms of Reference (TOR) define the Mid-Term (Bridging Period) Consultancy Services for DIFPP.

### 3.2 Terms of Reference

#### Description of Tasks

- (1). To ensure that the Project preparation continues uninterrupted following completion of the Project Preparatory Technical Assistance, the Government will engage the ADB TA consultants to continue the work under the proposed loan for the interim period from 8 January to 30 June 1992 (6 months) before the recruitment process for the loan consultants is completed. The services to be provided during this bridging period will be a combination of Project Management advisory services, and of detailed engineering design and supervision for the priority first year 1991-92 construction work programme.
  
- (2). **The services to be provided during the Bridging Period will include the following:**
  - a) Assist with organizing the Project Management Office (PMO) headed by Project Director or secondment from BWDB, including recommending on equipment procurement and establishing and supervising the materials testing laboratory.
  
  - b) Assist the PMO in prequalifying local and international contractors for the flood control, drainage and environmental improvement components of the Project.
  
  - c) With the assistance of the PMO and the BWDB:
    - \* prepare site investigation programmes, terms of reference and bidding documents for subsoil investigation programmes for existing embankments, with emphasis on Class I and Class II embankment sections requiring respectively intensive and moderate remedial works, and negotiate sub-contracts;
  
    - \* prepare site investigation programme, terms of reference and bidding documents for topographic and cross-section survey programme for existing embankment and negotiate sub-contracts;

- \* supervise field investigation programme and laboratory testing, analyze test results and prepare detailed engineering designs for embankment remedial measures, with emphasis on Class-I and Class-II areas;
  - \* finalize construction schedule for remedial measures on the westerly embankment;
  - \* prepare detailed engineering designs, drawings, specifications and contract documents for embankment remedial measures;
  - \* prepare detailed engineering designs, drawings, specifications and contract documents for sluices along the West Embankment;
  - \* prepare detailed engineering designs, drawings, specifications and contract documents for slope protection works along westerly embankment;
  - \* perform study on Pump Station No. 3 at Goranchatbari to show costs of various pump discharge capacities against areas required for regulator ponds.
- d. With the assistance of the PMO, BWDB and DCC:
- \* perform detailed condition survey of existing floodwall; evaluate and prepare re-designs, specifications, drawings and contract documents as needed to: (i) restore unstable sections, and (ii) provide typical closure gates and/or sheet piling protection for various sized openings, and (iii) provide typical outlet structures for existing local drains with recommended measures for drainage during the flood season;
  - \* perform detailed survey of sections of incomplete floodwall/embankment from Kellarmorh to Mitford Hospital, recommend alignment for completion of the flood wall/embankment and prepare detailed

engineering design, drawings, specifications and contract documents, based on the recommended alignment.

e. With the assistance of the PMO, BWDB, RAJUK and DCC:

- \* perform detailed survey of the central road and determine required road raising and flood proofing measures;
- \* prepare detailed engineering designs, drawings, specifications and contract documents for Central Road raising and flood proofing works programmed for FY 1991-92 (5 sluices).

f. With the assistance of the PMO and DWASA:

- \* prepare detailed engineering designs, drawings, specifications and contract documents for priority first year drainage improvement works;
- \* initiate preparatory survey work for the FY 1992-93 work programme.

g. Assist the PMO, BWDB, DWASA, DCC and RAJUK:

- \* in tendering and evaluation for the first year's work programme components;
- \* to initiate quality assurance and quality control plans and programme and assist with implementation;
- \* to initiate O&M programmes, including preparation of operations manuals as required;
- \* with contract administration and construction supervision as required.



As a part of the Project management consulting services, the consultants team will initiate the work to support and assist the PMO in planning, implementing, and evaluating Project activities, with the overall objective of achieving the physical, financial, and scheduling targets established under the Project. Among other things, the consultants will begin the activities necessary to assist in overall technical monitoring and supervision, monitoring of the Action Plan including cost recovery measures, financial management, PBME activities, community development programme, standards and procedures for O&M, and on-the-job training of counterpart staff.

#### **4. Consultants' Task as per TOR/IR and Tasks Accomplished**

All the tasks as mentioned in the WORK PLAN, and prepared on the basis of TOR and furnished in the Inception Report, have been accomplished during the bridging period. The WORK PLAN with schedule is reproduced in this report (Fig. 2). Some tasks beyond the TOR, which were found to be necessary, have also been accomplished. The tasks accomplished during the Mid-Term Consultancy Services are presented in tabular form as follows:

2

Task Ref.No.		Task (activities) as per Work Plan Shown in I.R. and Stipulated/Not Stipulated in TOR	Task Accomplished
I.R. Work Plan Sl.No.	TOR Clause No.	Tasks beyond the Work Plan but Stipulated in TOR (*)	
		Task beyond the Work Plan but Not Stipulated in TOR **	
4a(i) fig-2		Condition survey of the existing flood embankment (29.3 km)	<p>Detailed condition survey of the flood embankment.</p> <p>The reaches of the embankment where calastropic failures have occurred and the other reaches of the embankment which require minor remedial measures (berm building, slope protection with geo-jute and sods and borrow-pit filling), slope protection with hard materials against wave actin and slope and toe protection with hard materials against river current were identified and demarcated in the field through condition survey. The reaches of the embankment so demarcated is shown in fig.3.</p>
4a(i)	2(d)	Condition survey of the existing flood wall (4.7 km)	<p>The existing condition of the flood wall has been assessed through condition survey. There are some gaps and many openings in the flood wall. There are also some breaches in the wall. Besides, the wall has collapsed at one location. The gaps, openings, and breaches in the wall and the collapsed section of the wall have been identified and located. A statement of the openings, breaches, gaps and damages has been prepared and is attached to this report (Appendix A part I). Also identified outfall of the local drains into the Buriganga river within the reach of the flood wall. A statement of the outlets of the drains is furnished in Appendix A-part II.</p>

Task Ref.No.		Task (activities) as per Work Plan Shown in I.R. and Stipulated/Not Stipulated in TOR	Task Accomplished
I.R. Work Plan SLNo.	TOR Clause No.	Tasks beyond the Work Plan but Stipulated in TOR (*)	
		Task beyond the Work Plan but Not Stipulated in TOR **	
-	*2(c) (2nd para)	Prepare site investigation program, terms of reference and bidding documents for topographic and cross section survey program for existing embankment and negotiate sub-contract.	TOR for cross-section survey of the western embankment was prepared and programme of cross-section survey of the embankment was drawn up. The survey work was awarded to a Survey Firm on negotiation.
4(a)(ii)	2(c) (2nd para)	Cross-section survey of the existing flood embankment.	Cross-section survey of the embankment, including the R/S borrow-pits, covering the entire length of the embankment (29.3 km).  As many as 642 cross sections (274 full 368 half) have been taken. A statement of cross-sections is furnished in Appendix B.
4(a) (iii)		Cross-section and plane-table survey in connection with field data collection for sluice design (9 Nos.)	Cross-section survey of the relevant inflow and outfall channels of the proposed 4 sluices on the western flood embankment (survey of 1 sluice done by BWDB).  Plan-table survey of the sites of the 10 sluices (4 on the flood embankment and 6 on the Central Spine Road (CSR) and Railway showing spot levels.  A statement of cross-sections taken and plane-table survey done is furnished in Appendix B.
4(a)(iv)	2(e) (1st para)	Cross-section survey of a part (10.40 km) of the C.S.Road.	Cross-section survey of the Central Spine Road covering a length of 10.40 km.  56 cross-sections of the road at intervals of 150 m have been taken and a statement of the cross-sections is furnished in Appendix B.



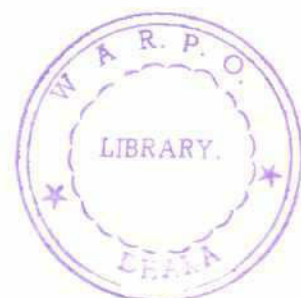
Task Ref.No.		Task (activities) as per Work Plan Shown in I.R. and Stipulated/Not Stipulated in TOR	Task Accomplished
I.R. Work Plan Sl.No.	TOR Clause No.	Tasks beyond the Work Plan but Stipulated in TOR (*)	
		Task beyond the Work Plan but Not Stipulated in TOR **	
4(a)(v)	2(d) (2nd para)	Cross-section survey of the left bank of Buriganga at the proposed site of sheet piling (0.8 km).	<p>Cross-section survey of the left bank of Buriganga river, including a part of the river bed, over a length 1.6 km from Kellarmorh to Mitford.</p> <p>Besides, cross-section of the entire width of the river has been taken at four locations within the above reach of the river.</p> <p>24 cross-sections (full 4, half 20) of the river have been taken and a statement of the cross-sections is furnished Appendix B.</p>
-	2(d) (2nd para)	*Plane-table survey of the area covering the alignment of the proposed extension of the existing flood embankment at Kellarmorh.	Plane-table survey with spot levels of area covering the proposed extension of the flood embankment for length of 0.4 km.
4(a)(vi)		Topographic survey of the catchment area of drainage channels	Topographic survey of the catchment area covering 17.63 km <sup>2</sup> of 3 drainage channels.
-	-	** Plane-table survey of the area in Goranchatbari in connection with selection of site for pump house.	Plane-table survey with spot levels of area covering 10 ha. in Goranchatbari.
-	2(f) (2nd para)	<p>*With the assistance of PMO &amp; DWASA:</p> <p>- initiate preparatory survey work for FY 1992-93 work programme.</p>	A programme of survey required to done in connection with work programme of 1992-93 has been prepared and submitted to DWASA for necessary action.



Task Ref.No.		Task (activities) as per Work Plan Shown in I.R. and Stipulated/Not Stipulated in TOR	Task Accomplished
I.R. Work Plan Sl.No.	TOR Clause No.	Tasks beyond the Work Plan but Stipulated in TOR (*)	
		Task beyond the Work Plan but Not Stipulated in TOR **	
-	2(c) (1st para)	*Prepare site investigation programs, terms of reference and bidding documents for sub-soil investigation programs for existing embankments, with emphasis on Class-I and Class-II sections and negotiate sub-contracts.	Prepared TOR and bidding documents for sub-soil investigation work of the existing flood embankment with emphasis on Class-I and Class-II sections. Prepared programme for the work and awarded the work to sub-contractors on negotiation.
4b(i)		Sub-soil boring at proposed sluice sites (9 Nos.) and laboratory testing of soil samples.	<p>Sub-soil boring at 11 sluice sites (5 on the western flood embankment and 6 on the Central Spine Road, preparation of bore-logs and testing of soil samples.</p> <p>49 bore holes have been made at the above sites. Site-wise number of bore-holes made and bore-logs prepared is furnished in Appendix-C.</p> <p>As per programme, 460 laboratory tests of soil samples were to be performed. The job of testing soil samples has been assigned to RRI. The number of different tests performed is furnished in Appendix-D.</p>

Task Ref.No.		Task (activities) as per Work Plan Shown in I.R. and Stipulated/Not Stipulated in TOR	Task Accomplished
I.R. Work Plan Sl.No.	TOR Clause No.	Tasks beyond the Work Plan but Stipulated in TOR (*)	
		Task beyond the Work Plan but Not Stipulated in TOR **	
4(b)(ii)	-	Sub-soil boring along the alignment of covered drain (6.19 km) and laboratory testing of soil samples.	<p>Sub-soil boring along the alignment of 7 covered drains totalling 6.19 km in length, preparation of bore-logs and testing of soil samples.</p> <p>50 bore holes have been made. The site-wise number of bore holes made and bore-logs prepared is furnished in Appendix-C.</p> <p>As per programme, 467 laboratory tests of soil samples are to be performed. The job of testing soil samples has been assigned to RRI. The number of different tests to be performed is furnished in Appendix - D</p>
4(b) (iii)	2(C) (3rd para)	Sub-soil boring, field testing and laboratory testing of soil samples and analysis of test results in connection with design of embankment remedial measures.	<p>Sub-soil boring at 83 locations of the flood embankment, preparation of bore-logs and testing and soil samples.</p> <p>A statement of boring done and bore-logs prepared is furnished in Appendix-C.</p> <p>5284 laboratory tests of soil samples have been performed as per programme and the test results have been analyzed. The number of different tests performed is furnished in Appendix-D.</p> <p>Bore logs have been furnished in Appendix-A and Laboratory test results of soil samples have been furnished in Appendix-B in Vol.-I of Annexure-I.</p> <p>Hand operated miniature Shear Vane tests and pocket Penetrometer tests were performed.</p>

Task Ref.No.		Task (activities) as per Work Plan Shown in I.R. and Stipulated/Not Stipulated in TOR	Task Accomplished
I.R. Work Plan Sl.No.	TOR Clause No.	Tasks beyond the Work Plan but Stipulated in TOR (*)	
		Task beyond the Work Plan but Not Stipulated in TOR **	
4(b) (iv)	-	Sub-soil boring at the sites of proposed embankment, sheet piling, flood wall and laboratory testing of soil samples.	<p>Sub-soil boring along the left bank of Buriganga river from Kellarmorh to Mitford (site of the proposed sheet piling and flood embankment/flood wall) preparation of bore-logs and testing of soil samples.</p> <p>35 bore holes have been made. A statement of boring done and bore-logs prepared is furnished in Appendix-C.</p> <p>As per programme, 471 laboratory tests of soil samples are to be performed. The job of testing soil samples has been assigned to BUET &amp; M. Ahmed (soil boring &amp; testing contractor). 240 test results of soil samples were received from them upto July, 92 and they have been analyzed. The number of different tests performed and test results received is furnished in Appendix-D.</p>



Task Ref.No.		Task (activities) as per Work Plan Shown in I.R. and Stipulated/Not Stipulated in TOR	Task Accomplished
I.R. Work Plan Sl.No.	TOR Clause No.	Tasks beyond the Work Plan but Stipulated in TOR (*)	
		Task beyond the Work Plan but Not Stipulated in TOR **	
5(a)	2(c) (6th para)	Design, drawing and specifications: Sluices on the western embankment	<p>Prepared design and construction drawings and specifications of proposed 4 sluices on the western embankment and detailed design and drawings of the proposed sluice (except the foundation) on the extension of the western embankment.</p> <p>Foundation soil of the proposed sluice on the extension of the western embankment is very weak and needs improvements. Foundation of the structure is to be designed after the measure for improvement of foundation soil of the proposed embankment is designed.</p> <p>Design of 4 sluices on the existing embankment has been approved by the competent authority. The design reports are furnished in Annexure-II of Volume-II of the completion report. The drawings prepared are listed in Appendix E.</p>
5(b)	2(c) (7th para)	Embankment (6.94 km) Slope protection with hard materials.	<p>Preparation of design, drawings and specifications of Slope protection measure of embankment for a length of 6.94 km with heavy and light C.C. blocks and geotextile.</p> <p>Design and drawings of the slope protection measure have been approved by the competent authority. The design report is furnished in Volume-II, Annexure-II of the final report. The drawings prepared are listed in Appendix E.</p>



Task Ref.No.		Task (activities) as per Work Plan Shown in I.R. and Stipulated/Not Stipulated in TOR	Task Accomplished
I.R. Work Plan Sl.No.	TOR Clause No.	Tasks beyond the Work Plan but Stipulated in TOR (*)	
		Task beyond the Work Plan but Not Stipulated in TOR **	
5(c)	-	Embankment (1.6 km) slope and toe protection with hard materials	Preparation of design, drawing and specifications of slope and toe protection measures of embankment for a length of 1.6km with light C.C. blocks and geotextile (only for slope protection).  Design and drawings of the slope and toe protection measures have been approved by the competent authority. The design report is furnished in volume-II, Annexure-II of the final report. The drawings prepared are listed in appendix-E.
5(d)	2(d) (2nd para)	Sheet piling (0.8 km)	} The sub-soil condition at the site of the proposed sheet piling is very poor. Single row of sheet piling in such soil is not feasible. The site of the proposed embankment/ flood wall is in a very densely populated area of the Dhaka city. It is not practically possible to build an embankment or a flood wall in such an area. In view of the site and soil condition, four alternative conceptual design options have been proposed for extension of the existing embankment along the left bank slope of the river. Several design alternatives have been investigated. Based on the available data four conceptual designs are recommended for the embankment extension.
5(e)	-do-	Embankment/Flood Wall(0.8km)	

Task Ref.No.		Task (activities) as per Work Plan Shown in I.R. and Stipulated/Not Stipulated in TOR	Task Accomplished
I.R. Work Plan Sl.No.	TOR Clause No.	Tasks beyond the Work Plan but Stipulated in TOR (*)	
		Task beyond the Work Plan but Not Stipulated in TOR **	
			<p>The option or combination of two or more of the options will be determined by the Geotechnical expert in the future. The design report is furnished in Annexure-I, Volume-I of the final report.</p> <p>Further study and investigation are needed for preparation of detail design of embankment extension measures.</p>
5(f)	2(c) (5th para)	Embankment (10.9 km) remedial measures	Prepared design, drawings and specifications of intensive and moderate remedial measures of the western flood embankment. The design report on the remedial measures is furnished in Volume-I, Annexure-I of the final report.
5(g)	2(d) (1st para)	Flood wall (5.3km) remedial measures	Determined the different types of measure for closing of openings in the flood wall. Prepared designs, drawings and specifications of the proposed remedial measures of flood wall.

Task Ref.No.		Task (activities) as per Work Plan Shown in I.R. and Stipulated/Not Stipulated in TOR	Task Accomplished
I.R. Work Plan Sl.No.	TOR Clause No.	Tasks beyond the Work Plan but Stipulated in TOR (*)	
		Task beyond the Work Plan but Not Stipulated in TOR **	
			Evaluated the design and checked the Stability of flood wall. Prepared design drawings and specifications of typical steel gates, stairs and ramps for the openings of flood wall. Also designed measures for restoration of the damaged sections of the flood wall. Prepared drawing of typical outlet structures for the existing local drains with recommended measures for drainage during flood season. The measures proposed for closing of the openings in the flood wall are furnished in Appendix A - Part III. The design report is furnished in Annexure-II, volume-II of the final report.
5(h)	2(e) (2nd para)	Central Spine Road raising and flood proofing works	
i		Road raising (10.40km)	Prepared designs, drawings and specifications of Central Spine Road raising, new median construction and existing median raising at the locations as required. The drawings prepared are listed in Appendix-F.
ii		Flood proofing (5 sluices)	Prepared designs, drawings and specifications of 6 sluices on the bridge/culvert openings in the Railway and Central Spine Road. The design report is furnished in Annexure-II of Volume-II of the final report. The drawings prepared are listed in Appendix-E.

Task Ref.No.		Task (activities) as per Work Plan Shown in I.R. and Stipulated/Not Stipulated in TOR	Task Accomplished
I.R. Work Plan Sl.No.	TOR Clause No.	Tasks beyond the Work Plan but Stipulated in TOR (*)	
		Task beyond the Work Plan but Not Stipulated in TOR **	
6	-	Review of design and checking estimates of drainage improvement works (for the first year priority works) under DWASA:	Review of the design and drawings of 17 pipe drains totalling about 16.60 km in length, and checking the estimates of the said drains.
-	2(f) (1st para)	*With the assistance of PMO and DWASA:  Prepare detailed engineering design, drawings, specifications and contract documents for priority first year drainage improvement works.	A list of estimates checked is furnished in Appendix-G.  Preparation of detailed engineering design, drawings and specifications of 5 covered drains (total length 6.19 km) on collection of field design data through survey and sub-soil investigation.  The design report is furnished in Volume-II, Annexure-II of the final report.  Contract documents were not required to be prepared by the consultants as they had been prepared by the executing agency itself (DWASA)
-	-	** Preparation of drawing and checking of estimate of repair work of the western flood embankment at Nawabganj.	Prepared drawing and checked estimate of the repair work of the western flood embankment at Nawabganj.
7	-	Preparation of estimate and contract documents:	
(a)	2(c) (6th para)	4 Sluices on the western embankment	Estimates of the sluices have been prepared and submitted to the concerned executing agency. Contract documents for the work included in the first year's programme were prepared by the concerned executing agency itself.



Task Ref.No.		Task (activities) as per Work Plan Shown in I.R. and Stipulated/Not Stipulated in TOR	Task Accomplished
I.R. Work Plan Sl.No.	TOR Clause No.	Tasks beyond the Work Plan but Stipulated in TOR (*)	
		Task beyond the Work Plan but Not Stipulated in TOR **	
(b)	2(c) (7th para)	Slope protection of embankment by hard materials	-do-
(c)	-	Slope and toe protection of embankment with hard materials.	-do-
(d)	2(c) (7th para)	Slope protection of embankment by geo-jute and sods and berm building	-do-
(e)	-	Borrow-pit filling	-do-
(f)	2(d) (2nd para)	Sheet piling	Estimates of the component of work is not required to be prepared as other options are to be considered in final design of the embankment extension measures.
(g)	-do-	Flood embankment	
(h)	2(d) (1st para)	Flood wall remedial measures	Estimate of the component of work has been prepared and submitted to the concerned executing agency. The work was not included in the first year's programme and as such no tender documents were prepared.
(i)	2(c) (5th para)	Embankment remedial measures	Estimates and International Competitive Bidding (ICB) documents of the component of work have been prepared and submitted to the PMO.
(j)	2(e) (2nd para)	Central spine Road raising and flood proofing work:	Estimate of the component of work has been prepared and submitted to Project Management Office. The work was not included in the first year's programme and as such tender documents were not prepared.

Task Ref.No.		Task (activities) as per Work Plan Shown in I.R. and Stipulated/Not Stipulated in TOR	Task Accomplished
I.R. Work Plan Sl.No.	TOR Clause No.	Tasks beyond the Work Plan but Stipulated in TOR (*)	
		Task beyond the Work Plan but Not Stipulated in TOR **	
8	2(c) (8th para)	Perform study on Pump Station No. 3 at Goranchatbari to show the costs of various pump discharge capacities against areas required for regulator pond.	Hydrological study on pump station with full capacity and partial capacity has been made, type and size of individual pump have been investigated, general layout plan of the pump station prepared and assessed the cost of the pump station.
9	2(g) (4th para)	Construction Supervision	The consultants supervised the works executed by BWDB and DWASA and reported their findings to the concerned officials of the executing agencies (No work under DCC and Rajuk was executed during the bridging period)
10	Last para of TOR	Project implementation monitoring and evaluation	Identified the tasks scheduled to be accomplished within the stipulated period; paid visit to work sites; held meeting with the concerned officials of the executing agencies; problems and constraints in execution of work were identified and remedial measures suggested.
11.	2(g) (2nd para)	Assist PMO in preparation of quality assurance and quality control programme.	The consultants formulated quality control measures as furnished in volume-IV Annexure-IV of the final report.
12.	2c (4th para)	Finalize construction schedule for remedial measure on the western embankment	Schedule of execution of remedial measures of the flood embankment has been prepared and is shown in fig. 4.
-	2(a)	*Assist with organizing the PMO and staff, including recommending on procurement of equipment and set-up of the materials testing laboratory.	Assisted the PMO in selecting the field and laboratory equipment and prepared estimate and specification of the said equipment. Also prepare estimate and specifications of micro computer to be procured for PMO.

Task Ref.No.		Task (activities) as per Work Plan Shown in I.R. and Stipulated/Not Stipulated in TOR	Task Accomplished
I.R. Work Plan Sl.No.	TOR Clause No.	Tasks beyond the Work Plan but Stipulated in TOR (*)	
		Task beyond the Work Plan but Not Stipulated in TOR **	
13.	2(b)	Assist the PMO in prequalifying local/international contractors for different components of work.	Prepared documents (draft) for prequalification of international contractor for embankment remedial measures and submitted them to PMO.
14	2(g) (1st para)	*Assist PMO BWDB DWASA, DCC and RAJUK in tendering and evaluation of tenders for the first years work.	BWDB and DWASA themselves floated and evaluated tenders. Assistance in tendering for procurement was provided to DCC. RAJUK did not invite any tender for any work under the project.
-	2g (3rd para)	* Assist the PMO, BWDB, DWASA, DCC and RAJUK to initiate O&M programme, including operation manuals as required.	O&M guidelines in respect of the existing works under the project have been formulated and are furnished in Volume-IV - Annexure-V, of the final report.
-	Last para of TOR	* Community development activities including establishing procedure for dissemination of project.	A report on procedure for dissemination of project publicity has been prepared analyzing the relevant data collected from different sources. The report is furnished in Annexure VI, Volume-IV of the final report.
-	Last para of TOR	* Strengthening of financial accounting procedures, budgetary control and reporting system.	Data relating to accounting procedures, budgetary control and reporting system have been collected from the concerned offices of BWDB and DWASA. The data have been analyzed and a report on financial management procedures has been prepared. The report is furnished in Annexure VII, Volume-IV of the final report.

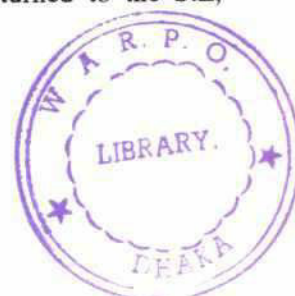


Task Ref.No.		Task (activities) as per Work Plan Shown in I.R. and Stipulated/Not Stipulated in TOR	Task Accomplished
I.R. Work Plan Sl.No.	TOR Clause No.	Tasks beyond the Work Plan but Stipulated in TOR (*)	
		Task beyond the Work Plan but Not Stipulated in TOR **	
15	-	Reporting :	The Inception Report was prepared in February, 1992 and submitted to the Project Director PMO.
(a)	-	Inception Report	
(b)	-	Monthly activity report	

As mentioned earlier, statement concerning condition of existing flood wall; field survey and sub-soil boring, laboratory tests; design, drawings and estimates reports, maps and data collected during the bridging period services are furnished in the following appendices A to H:

- Appendix A-Part I: Statement of Opening Gaps and Breaches in the Flood Wall
- Appendix A-Part II: Statement of the outlets of the local drains that fall into Buriganga
- Appendix A-Part III: Schedule of Proposed Measures for Closing of Openings in the Flood Wall Under DIFP Project
- Appendix B: Statement of survey done Level Books used and Map/Plan/drawings prepared
- Appendix C: Statement of sub-soil boring done and bore logs prepared
- Appendix D: Statement of laboratory tests performed on the Soil samples and test results received.
- Appendix E: List of drawings of physical components designed.
- Appendix F: List of estimates prepared (by Mid-term consultants).
- Appendix G: List of estimates checked.
- Appendix H: List of reports, maps, data, etc collected.

Level Books and Map/plan/drawings, bore-logs, laboratory test results of soil samples, drawings and estimates as mentioned in the Appendices B, C, D, E and F respectively have been handed over to the Project Director, PMO. The estimates as mentioned in Appendix G have been returned to the S.E,





66

DWASA. The reports, maps, data etc. as mentioned in Appendix-H have been returned to the office from where they were collected.

As mentioned in the foregoing statement of tasks performed, design, studies, quality control measures, guide lines and accounting procedures are presented in the annexures in four volumes as mentioned below:

Volume I

Annexure I: Design of Remedial Measures of Embankment.

Volume II

Annexure II: Design of Sluices, Protective Works of Embankment, Covered Drains and Flood Walls.

Volume III

Annexure III: Study on the Pumps Station No. 3 at Goranchatbari.

Volume IV

Annexure IV: Quality Control Measures.

Annexure V: O&M Guidelines

Annexure VI: Implementation Guidelines for Community Development Aspect.

Annexure VII: Strengthening of Accounting Procedures of PMO

## **5. Man-Power and Project Organization**

The man-month provision as per contract and its utilization are shown in table-1. Organization chart of the consultants team for the project is shown in fig.- 5.

# MAN-MONTH PROVISION & UTILISATION

TABLE-1

Position	Name	Man-Month Provision as per Contract			Man-Month Utilised		
		Expat.	Local	Total	Expat.	Local	Total
<b>A) DOMESTIC CONSULTANTS</b>							
01. Civil/Hydraulic Engineer (Team Leader)	A.B. Bhuiyan		6.80	6.80		6.80	6.80
02. Project Co-ordinator	Dr. Shadullah		6.80	6.80		6.80	6.80
03. Geotechnical Specialist	A. Zaman		6.50	6.50		6.50	6.50
04. Design Engineer	Muhibbullah		6.50	6.50		6.50	6.50
05. Design Engineer	M.A. Sattar		5.00	5.00		4.834	4.834
06. Drainage Engineer	F.Ahmed		1.50	1.50		1.50	1.50
07. Municipal Engineer	I. Haque		5.00	5.00		5.00	5.00
08. Construction Supervision Engineer	Mohiuddin		5.40	5.40		5.40	5.40
09. Junior Engineer	G.Mostafa		6.80	6.80			
10. Junior Engineer	Abu Jalal & } M. Morshed }		5.00	5.00		5.00	5.00
11. Financial Specialist	B.A. Hamid		1.00	1.00		1.00	1.00
12. Community Development Specialist	A.Mannan		0.50	0.50		0.50	0.50
<b>B) INTERNATIONAL CONSULTANTS</b>							
01. Project Implementation Advisor/(FC&D/ Hydraulic Engineer)	M. Williams	5.00		5.00	5.00		5.00
02. Drainage Engineer	D. Thirkill	3.50		3.50	0.00		0.00
03. Municipal Engineer	R. Berlin	0.50		0.50	0.50		0.50
04. Geotechnical Expert	Dr. N. Williams	1.233		1.233	1.233		1.233
05. Geotechnical Specialist	R. North & } Dr. K. Badu }	6.00		6.00	6.00		6.00
<b>Total:-</b>		<b>16.233</b>	<b>56.80</b>	<b>73.033</b>	<b>12.733</b>	<b>56.634</b>	<b>69.367</b>

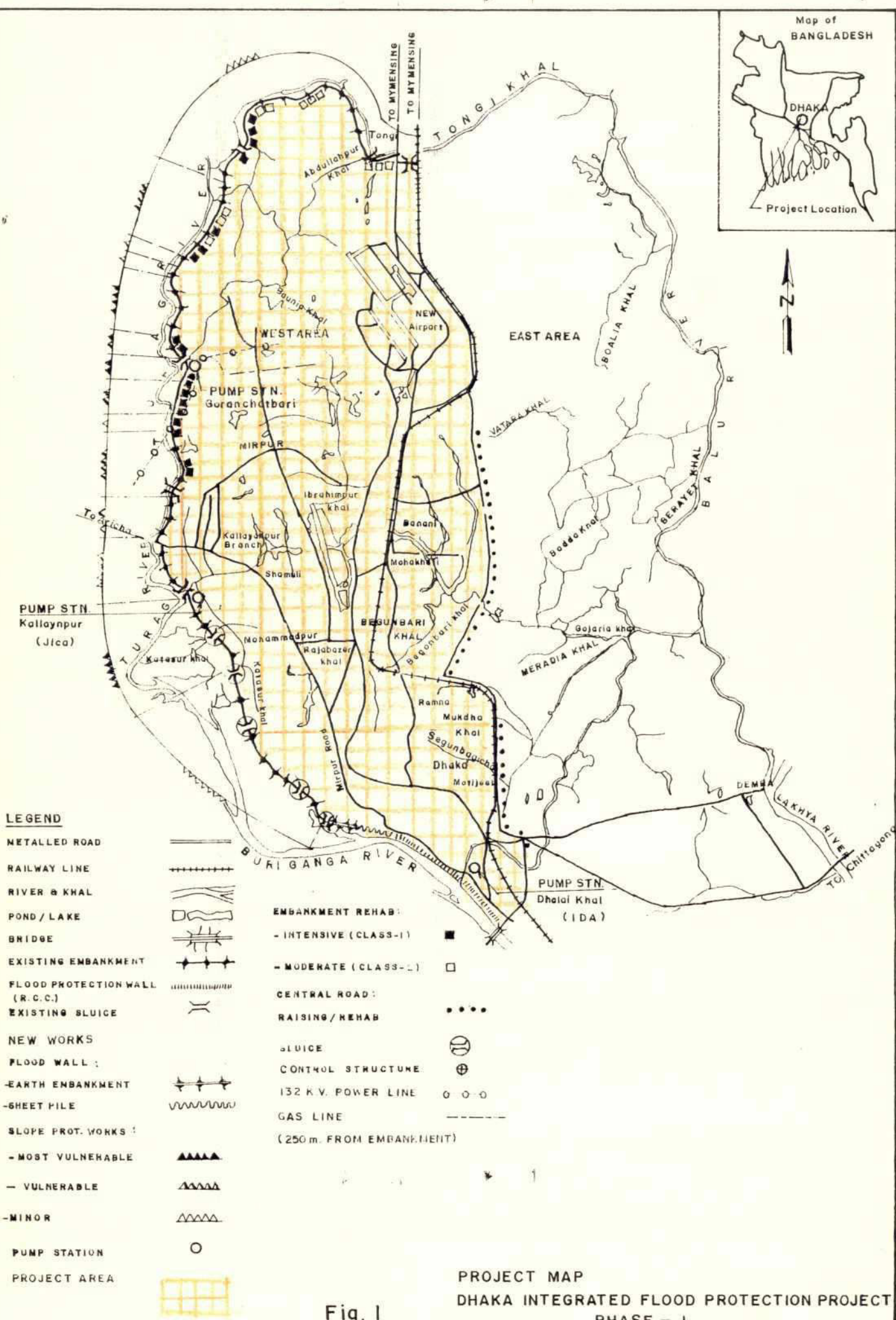


Fig. 1



Fig-2

## WORK PLAN AND SCHEDULE

Sl. No.	ACTIVITIES	MONTHS OF 1992											
		JANUARY			FEBRU.			MARCH			APRIL		
		WEEK			WEEK			WEEK			WEEK		
		1	2	3	4	1	2	3	4	1	2	3	4
01.	Collection & review of existing report, maps, data, drawings, site visits and assessment of additional data requirement												
02.	Collection of additional data												
03.	Revised Programme and Inception Report												
04.	Survey and investigations												
(a)	Field survey :												
i.	Condition survey of the existing flood embankment and flood wall (29.3 km)												
ii.	Cross-section survey of the existing flood embankment (29.3 km)												
iii.	Cross-section and plane table survey in connection with field data collection for sluice design (9 Nos.)												
iv.	Cross-section survey of part (10.40 km) of C.S. Road												
v.	Cross-section survey of left bank of Buriganga at the proposed site of sheet piling (0.8 km)												



# WORK PLAN AND SCHEDULE

Sl. No.	ACTIVITIES	MONTHS OF 1992																			
		JANUARY				FEBRU.				MARCH				APRIL				MAY			
		WEEK				WEEK				WEEK				WEEK				WEEK			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
vi.	Topographic survey of the catchment area of drainage channels																				
(b)	Sub-soil investigation :																				
i.	Sub-soil boring at proposed sluice sites (9 Nos) and laboratory testing of soil samples																				
ii.	Sub-soil boring along the alignment of covered drain (6.19 km) and laboratory testing of soil samples																				
iii.	Sub-soil boring, field testing and laboratory testing of soil samples & analysis of test results in connection with design of embankment remedial measures																				
iv.	Sub-soil boring at the sites of proposed embankment, sheet piling, flood wall & laboratory testing of soil samples																				
05.	Design, drawings and specifications :																				
(a)	Sluices on the western embankment (4 Nos)																				
(b)	Embankment (6.94 km) slope protection with hard materials																				
(c)	Embankment (1.6 km) slope and toe protection with hard materials																				

# WORK PLAN AND SCHEDULE

Sl. No.	ACTIVITIES	MONTHS OF 1992																							
		JANUARY				FEBRU.				MARCH				APRIL				MAY				JUNE			
		WEEK				WEEK				WEEK				WEEK				WEEK				WEEK			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(d)	Sheet Piling (0.8 km)																								
(e)	Embankment/flood wall (0.8 km)																								
(f)	Embankment (2.5 km) remedial measures																								
(g)	Flood wall (5.3 km) remedial measures																								
(h)	Central spine road raising and flood proofing works																								
i.	Road raising (10.40 km)																								
ii.	Flood proofing (5 sluices)																								
06.	Review of design and checking estimates of drainage improvement works (for the first year priority works) under DWASA																								
07.	Preparation of estimate and contract documents :																								
(a)	4 sluices on the western embankment																								
(b)	Slope protection of embankment by hard materials																								
(c)	Slope and toe protection with hard materials																								

# WORK PLAN AND SCHEDULE

Sl. No.	ACTIVITIES	MONTHS OF 1992																							
		JANUARY				FEBRU.				MARCH				APRIL				MAY				JUNE			
		WEEK				WEEK				WEEK				WEEK				WEEK				WEEK			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(d)	Slope protection of embankment by geo-jute and sods and berm building																								
(e)	Borrow pit filling																								
(f)	Sheet piling																								
(g)	Flood embankment																								
(h)	Flood wall remedial measures																								
(i)	Embankment remedial measures																								
(j)	Central spine road raising and flood proofing work :																								
i.	Road raising																								
ii.	Flood proofing																								
08.	Study on the pump station No. 3 at Goran Chathari																								
09.	Construction supervision																								
10.	Project implementation monitoring and evaluation																								
11.	Assist PMO in preparation of quality assurance and quality control programme																								



# WORK PLAN AND SCHEDULE

Sl. No.	ACTIVITIES	MONTHS OF 1992											
		JANUARY			FEBRU.			MARCH			APRIL		
		WEEK			WEEK			WEEK			WEEK		
		1	2	3	4	1	2	3	4	1	2	3	4
12.	Finalize construction schedule for remedial measure on the westerly embankment												
13.	Assist the PMO in prequalifying local/international contractors for different components of work												
14.	Assist the PMO, WASA, DCC and RAJUK in tendering and evaluation of tenders for the first year's work												
15.	Reporting :												
(a)	Inception report												
(b)	Monthly activity report												
(c)	Assignment completion report												
i.	Draft												
ii.	Final												



**Abstract**



## WEST EMBANKMENT - REMEDIAL MEASURES EXECUTION SCHEDULE

ACTIVITY	1992		1993		1994		1995		1996	
	J	A	J	A	J	A	J	A	J	A
PREQUALIFICATION CLASS I	J	A	J	A	J	A	J	A	J	A
TENDERING AND AWARD OF CONTRACT										
EXCAVATE TOP OF EMBANKMENT										
FURNISH AND INSTALL WICK DRAINS										
FURNISH, PLACE AND COMPACT EMBANKMENT FILL										
FURNISH, PLACE, AND COMPACT EMBANKMENT SETTLEMENT FILL										
SLOPE PROTECTION										
PREQUALIFICATION CLASS II	J	A	J	A	J	A	J	A	J	A
TENDERING AND AWARD OF CONTRACT										
EXCAVATE TOP OF EMBANKMENT FOR TOE BERM										
FURNISH AND INSTALL WICK DRAINS										
FURNISH, PLACE AND COMPACT EMBANKMENT FILL										
FURNISH PLACE AND COMPACT EMBANKMENT SETTLEMENT FILL										
SLOPE PROTECTION										

**LEGEND:** 0 = Prequalification of contractor  
● = Tendering & award of contracts  
x = Construction

CORPORATE  
MANAGEMENT

36

**STATEMENT OF THE OPENINGS/BREACHES/GAPS AND DAMAGES IN THE FLOOD WALL CONSTRUCTED UNDER THE  
DIIAKA INTEGRATED FLOOD PROTECTION PROJECT**

Sl. No.	Opening Breach/ Gap/ Damage	Location of Opening/ Breach/Gap/ Damage		Width of Opening/ Breach/ Gap (m)	Height of wall above existing GL (m)	Thickness of wall (cm)	Objective of the Opening/ Cause of Breaching/Nature and Extent of Damage.	Type of Traffic	Remarks
		Name of Locality	Dist. From F. Bridge (m)						
01.	Breach	Below Friendship Bridge	0+51.10	5.70	1.43	20	To facilitate access and passage within the compound of Army	Army Truck, Car etc.	
02.	Opening	Shashanghat	0+466.6	8.30	1.54	19	Access to River	Truck	Ramp existing
03.	Opening	-do-	0+493	1.25	1.58	19	Access to Scrap yard (Private property)	Pedestrian	
04.	Opening	-do-	0+504.7	1.10	1.60	19	Access to Scrap yard (Private property)	Pedestrian	
05.	Opening	Postogola Shashanghat	0+526.80	1.20	1.66	19	Access to dwelling house and Scrap yard.	Pedestrian	
06.	Opening	-do-	0+551.55	1.23	1.47	20	Access to Scrap yard.	Pedestrian	
07.	Opening	-do-	0+594.00	2.10	1.58	20	Access to Scrap yard & dwelling house	Pedestrian	
08.	Opening	-do-	0+636.65	2.0	1.52	20	Access to Scrap yard & dwelling house	Pedestrian	



Sl. No.	Opening Breach/ Gap/ Damage	Location of Opening/Breach/Gap Damage		Width of Opening/ Breach/ Gap (m)	Height of wall above existing GL (m)	Thickness of wall (cm)	Objective of the Opening/ Cause of Breaching/Nature and Extent of Damage.	Type of Traffic	Remarks
		Name of Locality	Dist. From F. Bridge (m)						
09.	Damage	Archingate Habib Mills Ltd.	0+973.96 0+990.08	16.12	1.50	20	Settlement of foundation & tilting of wall & widening up expansion joints due to removal & softening of foundation soil by rain water drainage.	Pedestrian	
10.	Opening	Faridabad Archin gate (N.C.G. Road)	1+092.08	2	1.60	15	Ferry ghat (Dhopaghat)	-do-	Full ht. stairs existing
11.	Opening	-do-	1+105.08	+1.67	1.48/1.20	15	Saw Mill and timber stack yard	-do-	Half ht. stairs existing
12.	Opening	-do-	1+124.55	+1.18	1.32/0.74	14	-do-	-do-	Half ht. stairs existing
13.	Opening	-do-	1+134.07	+1.35	1.30/0.73	16	-do-	-do-	Half ht. stairs existing
14.	Opening	Nabin Ch. Goswami Rd	1+141.84	1.25	1.18/0.73	14	Access to Saw Mill & timber stack yard	-do-	Half ht. stairs existing
15.	Opening	-do-	1+156.00	5.10	1.14	15	Access to Saw Mill & timber stack yard	-do-	
16.	Opening	-do-	1+180.25	1.33	1.06/0.69	16	Access to timber stack yard	-do-	
17.	Opening	-do-	1+186.05	1.23	1.03/0.60	14	Ferry ghat (Called Majid ghat)	-do-	

Sl. No.	Opening Breach/ Gap/ Damage	Location of Opening/Breach/Gap/ Damage		Width of Opening/ Breach/ Gap (m)	Height of Wall above existing G.L (m)	Thickness of Wall (cm)	Objective of the Opening/ Cause of Breaching/Nature and Extent of Damage	Type of Traffic	Remarks
		Name of Locality	Dist. From F. Bridge (m)						
18.	Opening	N.C.G. Road	1+192.10	1.75	1.00/0.52	15	Access to Saw Mill & timber stack yard	Pedestrian	Half ht. ramp existing
19.	Opening	-do-	1+203.10	0.97	1.03/0.58	15	Access to dwelling house	-do-	Half ht. stairs existing
20.	Opening	-do-	1+215.29	0.92	1.10/0.55	15	Access to dwelling house	-do-	-do-
21.	Opening	-do-	1+225.38	0.83	1.10/0.46	16	Access to dwelling house	-do-	-do-
22.	Opening	-do-	1+233.68	0.87	1.16/0.48	15	-do-	-do-	-do-
23.	Opening	-do-	1+239.70	0.62	1.21/0.33	16	-do-	-do-	-do-
24.	Opening	-do-	1+248.30	1.18	1.16/0.92	15	Access to Saw Mill & timber stack yard	-do-	-do-
25.	Opening	-do-	1+254.20	1.68	1.15/0.71	17	-do-	-do-	-do-
26.	Opening	-do-	1+269.50	1.72	1.20/0.96	18	Access to Habib Match Factory ghat, timber stack yard and dwelling house	-do-	-
27.	Opening	-do-	1+276.00	1.43	1.19	20	Access to Habib Match Factory ghat and timber stack yard	-do-	
28.	Opening	-do-	1+284.18	1.70	1.22	20	Access to Saw Mill & timber stack yard	-do-	

Sl. No.	Opening Breach/ Gap/ Damage	Location of Opening/Breach/Gap/ Damage		Width of Opening/Breach/ Gap (m)	Height of Wall above existing G.L (m)	Thickness of wall (cm)	Objective of the Opening/ Cause of Breaching/Nature and Extent of Damage.	Type of Traffic	Remarks
		Name of Locality	Dist. From F. Bridge (m)						
29.	Opening	N.C.G.Road	1+298.48	1.20	1.10	19	Access to Saw mill & timber stack yard	Pedestrian	
30.	Opening	-do-	1+308.60	0.53	1.14/0.66	16	Access to dwelling house	-do-	Half ht. stair existing
31.	Opening	-do-	1+315.55	1.23	1.13/0.56	15	Access to timber stack yard & dwelling house	-do-	
32.	Opening	-do-	1+320.55	1.40	1.15/0.44	17	Access to dwelling house	-do-	Half ht. stair existing
33.	Opening	-do-	1+325.25	0.75	1.13/0.54	16	Access to dwelling house	-do-	-do-
34.	Opening	-do-	1+326.89	0.80	1.10/0.56	15	Access to dwelling houses	-do-	-do-
35.	Opening	-do-	1+334.72	1.14	1.11/0.71	14	Access to Saw mill and timber stack yard	-do-	
36.	Opening	-do-	1+350.90	1.30	1.23/0.65	15	Access to 5 star Karnafhuli Silk Mill	-do-	
37.	Opening	-do-	1+363.90	1.07	1.33/0.71	15	Access to dwelling house	-do-	Half ht. stair existing
38.	Opening	-do-	1+379.00	1.23	1.32/0.99	15	Access to Saw mill and dwelling house	-do-	
39.	Opening	-do-	1+399.32	2.20	1.42/0.76	16	Access to Saw mill and timber stack yard	-do-	



Sl. No.	Opening Breach/ Gap/ Damage	Location of Opening/Breach/Gap/ Damage		Width of Opening/ Breach/ Gap (m)	Height of Wall above existing GL (m)	Thickness of wall (cm)	Objective of the Opening/ Cause of Breaching/Nature and Extent of Damage.	Type of Traffic	Remarks.
		Name of Locality	Dist. From F. Bridge (m)						
40.	Opening	N.C.G.Road	1+408.79	2.40	1.48/0.78	15	Brick & sand stack yard	Pedestrian	Half ht. stair existing
41.	Opening	-do-	1+416.00	1.66	1.26/0.70	14	Saw Mill and timber stack yard	-do-	-do-
42.	Opening	-do-	1+422.00	1.17	1.22/0.72	16	Access to Ration shop and dwelling house	-do-	-do-
43.	Opening	-do-	1+431.00	1.71	1.22/0.65	16	Access to Saw mill and timber stack yard	-do-	-do-
44.	Opening	-do-	1+454.46	1.14	1.22/0.96	13	Access to dwelling house	-do-	
45.	Opening	-do-	1+461.46	2.30	1.30	15	Access to Saw mill and timber stack yard	-do-	
46.	Opening	-do-	1+477.28	2.06	1.28/0.75	15	Access to Old Scrap stack yard	-do-	
47.	Opening	-do-	1+490.53	1.83	1.22/0.88	15	Access to Saw mill and timber stack yard	-do-	
48.	Opening	-do-	1+501.48	2.13	1.19	14	Goshaibari Bazar Road Crossing	-do-	Full ht. stair existing
49.	Opening	Faridabad - Alamganj Road	1+522.54	0.94	1.07/0.54	15	Access to Ispahani (Govt. Property)	-do-	
50.	Opening	-do-	1+560.31	1.24	0.87/0.36	15	Access to School/dwelling house	-do-	Half stair existing



Sl. No.	Opening Breach/ Gap/ Damage	Location of Opening/Breach/Gap/ Damage		Width of Opening/ Breach/ Gap (m)	Height of Wall above existing GL (m)	Thickness of wall (cm)	Objective of the Opening/ Cause of Breaching/Nature and Extent of Damage	Type of Traffic	Remarks
		Name of Locality	Dist. From F. Bridge (m)						
51.	Opening	Alamganj Road	1+578.51	1.30	1.08/0.59	16	Access to dwelling house	Pedestrian	Half ht. stair existing
52.	Opening	-do-	1+604.46	1.98	1.22	14	Access to Mama Mazar	-do-	
53.	Opening	-do- (Mama Mazar)	1+661.22	0.88	1.25/.51	16	Access to Mama Mazar	-do-	Half ht. stair existing
54.	Opening	Mama Mazar	1+667.57	1.34	1.23/0.89	15	Access to Mama Mazar gate	-do-	
55.	Opening	Alamganj Road	1+692.02	7.20	-	15	Access to C.S.D. Ghat	Truck	Ramp existing
56.	Opening	Alamganj Road	1+712.87	0.97	1.33/0.83	16	Access to Restaurant (Alamganj crossing)	Pedestrian	
57.	Opening	Mill barrack ghat	1+719.75	7.20	1.0	20	Access to river	Truck	Ramp existing
58.	Opening	C.S.D. Main gate	1+740.15	20.40	2.0	20	Truck, Rickshaw		

Sl. No.	Opening Breach/ Gap/ Damage	Location of Opening/Breach/Gap/ Damage		Width of Opening/ Breach/ Gap (m)	Height of Wall above existing GL (m)	Thickness of wall (cm)	Objective of the Opening/ Cause of Breaching/Nature and Extent of Damage	Type of Traffic	Remarks
		Name of Locality	Dist. From F. Bridge (m)						
59.	Gap	Dhulai Khal	2+202.00	30.00	-	-	Dhulai Khal	-	
60.	Opening	Ultanganj Lane (Farashganj)	2+246.15	1.52	1.86	20	Access to Cold Storage	Pedestrian	
61.	Opening	Ultanganj Lane Farashganj	2+286.85	1.30	1.54	20	Access to Saw mills and timber stack yard	-do-	
62.	Opening	-do-	2+313.28	10.10	2.34	20	Access to Saw mills, timber stack yard and Ferry Ghat	-do-	
63.	Opening	-do-	2+356.00	1.50	1.79	20	Access to Saw mills and timber stack yard	-do-	
64.	Gap	-do-	2+369.8	237.0	1.24	17			flood wall not built up
65.	Opening	B.K. Das Road Farashganj	2+606.80	3.2	1.92	20	Access to United Brothers	Pedestrian	

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		Name of Locality	Dist. From F. Bridge (m)						
66.	Opening	B.K.Das Road Farasganj	2+651.30	1.40	1.86	20	Access to dwelling house	Pedestrian	
67.	Opening	Shambazar	2+669.70	1.87	1.25	13	Access to Sobhan Sarder Arot (Commercial Area)	-do-	
68.	Opening	-do-	2+685.60	1.12	2.07/1.60	20	Access to Shambazar	-do-	Half ht. stair existing
69.	Opening	-do-	2+713.22	2.2	2.00/1.45	20	Access to Vegetables Market	-do-	-do-
70.	Opening	-do-	2+738.52	2.36	2.00/1.73	20	Access to Vegetables Market	-do-	-do-
71.	Opening	-do-	2+756.02	1.90	2.00/1.48	20	-do-	-do-	-do-
72.	Opening	-do-	2+779.42	1.80	2.00/1.80	23	-do-	-do-	-do-
73.	Opening	-do-	2+797.82	1.35	2.00/1.45	23	-do-	-do-	-do-
74.	Opening	-do-	2+803.87	2.25	1.92/1.60	23	Access to Shambazar Jam-E-Masque	-do-	



Sl. No.	Opening Breach/ Gap/ Damage	Location of Opening/Breach/Gap/ Damage		Width of Opening/ Breach/ Gap (m)	Height of Wall above existing GL (m)	Thickness of wall (cm)	Objective of the Opening/ Cause of Breaching/Nature and Extent of Damage	Type of Traffic	Remarks
		Name of Locality	Dist. From F. Bridge (m)						
76.	Opening	Shambazar	2+823.47	3.10	1.90	20	Access to Whole sale Market and Ghat	Pedestrian	Half ht. stair existing
77.	Opening	-do-	2+863.72	1.30	1.94/1.55	19	Access to Whole Sale Market	-do-	Half ht. stair existing
78.	Opening	-do-	2+892.12	1.60	1.85/1.39	20	Access to Whole Sale Market	-do-	-do-
79.	Opening	-do-	2+907.52	1.76	2.06/1.65	21	Access to Whole Sale Market	-do-	-do-
80.	Opening	-do-	2+920.72	1.20	1.87/1.38	20	Access to Tinsed Restaurant	-do-	-do-
81.	Opening	-do-	2+948.27	1.90	1.98/1.33	19	Access to timber stack yard	-do-	-do-
82.	Opening	-do-	2+950.57	1.30	1.85/1.33	19	Access to fire wood stack yard	-do-	-do-
83.	Opening	Lalkuthi	2+963.62	1.35	1.88/1.23	21	-do-	-do-	-do-
84.	Opening	-do-	2+980.02	1.28	1.77	19	-do-	-do-	-do-
85.	Opening	-do-	2+990.37	1.10	2.00/1.27	21	-do-	-do-	Half ht. stair existing



Sl. No.	Opening Breach/ Gap/ Damage	Location of Opening/ Breach/Gap/Damage		Width of Opening/ Breach/ Gap (m)	Height of Wall above existing GL (m)	Thickness of wall (cm)	Objective of the Opening/ Cause of Breaching/Nature and Extent of Damage	Type of Traffic	Remarks
		Name of Locality	Dist. From F. Bridge (m)						
86.	Opening	Lalkuthi	2+994.72	6.30	1.92	20	Access to Lalkuthi Ghat	Truck, Car, etc.	
87.	Opening	-do-	3+009.27	1.65	1.75/1.24	21	Access to Lalkuthi Banijjalaya	Pedestrian	Half ht. stair existing
88.	Opening	-do-	3+025.79	1.80	1.78/1.13	19	Access to fire wood stack yard	-do-	-do-
89.	Opening	-do-	3+043.64	1.62	1.70/1.35	19	Access to Whole Sale Market Ghat	-do-	Half ht. ramp existing
90.	Opening	Sainik Shibir Camp	3+070.34	5.96	1.70/1.40	20	Access to Sainik Shibir Ghat	-do-	Half ht. stairs existing
91.	Opening	East Sadar Ghat	3+119.60	1.95	1.70	20	Access to Ferry ghat	-do-	
92.	Gap	Sadar Ghat	3+167.43	132.00	-	-	Access to Sadar Ghat Terminal Building	-do-	
93.	Opening	-do-	3+323.81	1.30	1.67	21	Access to B.I.W.T.A. Ghat,	-do-	
94.	Opening	Simpson Road Sadar Ghat	3+356.36	1.70	1.67	20	Access to Kaliganj Ferry Ghat	-do-	
95.	Opening	Simpson Road Ferry ghat	3+378.86	2.42	1.80	21	Access to Simpson Road Ferry Ghat	Car, Rickshaw	

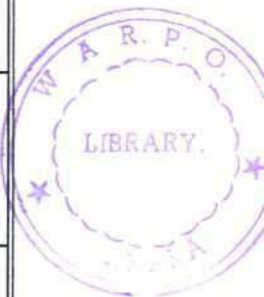
Sl. No.	Opening Breach/ Gap/ Damage	Location of Opening/ Breach/Gap/Damage		Width of Opening/ Breach/ Gap (m)	Height of Wall above existing G/L (m)	Thickness of wall (cm)	Objective of the Opening/ Cause of Breaching/Nature and Extent of Damage	Type of Traffic	Remarks
		Name of Locality	Dist. From F. Bridge (m)						
96.	Opening	Simpson Road Ferry ghat	3+390.16	1.85	1.57	20	Access to Mosque at Sadar Ghat	Pedestrian	
97.	Opening	Wise ghat	3+401.38	2.25	1.57	21	Access to B.I.W.T.A Ghat	-do-	
98.	Opening	Wise ghat	3+407.33	2.2	1.45	19	-do-	-do-	
99.	Opening	-do-	3+447.13	1.60	1.50	20	-do-	-do-	
100.	Opening	-do-	3+490.63	3.00	1.50	20	Access to High Speed Navigation Ghat	-do-	
101.	Opening	Wise ghat (Bakland Bund Road)	3+505.48	3.90	1.80	20	B.I.W.T.A Ferry ghat	-do-	
102.	Opening	-do-	3+523.68	3.70	1.57	20	-do-	-do-	
103.	Opening	Wise ghat	3+531.90	1.75	1.45	17	Access to Whole sale Market	-do-	
104.	Opening	-do-	3+548.65	2.05	1.64	21	-do-	-do-	

22

Sl. No.	Opening Breach/ Gap/ Damage	Location of Opening/ Breach/Gap/Damage		Width of Opening/ Breach/ Gap (m)	Height of Wall above existing GL (m)	Thickness of wall (cm)	Objective of the Opening/ Cause of Breaching/Nature and Extent of Damage	Type of Traffic	Remarks
		Name of Locality	Dist. From F. Bridge (m)						
105.	Opening	Ahasan Manjil	3+581.65	1.20	1.50/0.88	20	Access to B.I.W.T.A Ghat District Admn.	Pedestrian	Half ht. stair existing
106.	Opening	-do-	3+622.85	1.23	1.65/0.89	20	Access to Police Jetty	-do-	-do-
107.	Opening	-do-	3+663.25	2.10	1.65	20	Access to B.I.W.T.A. Jetty	-do-	-do-
108.	Opening	Nawab Bari	3+691.45	3.57	1.71	18	-do-	-do-	
109.	Opening	-do-	3+703.38	0.80	1.50/0.88	20	Access to Mosque	-do-	Half ht. stair existing
110.	Opening	-do-	3+706.98	1.02	1.50/0.87	19	-do-	-do-	-do-
111.	Opening	-do-	3+721.28	1.67	1.75	20	Access to Nawab Bari Ghat	-do-	
112.	Opening	Badamtali	3+763.08	9.0	1.63	19	Access to B.I.W.T.A. Jetty	Truck	
113.	Opening	-do-	3+809.08	2.20	1.70	20	Access to Country boat ghat	Pedestrian	



Sl. No.	Opening Breach/ Gap/ Damage	Location of Opening/ Breach/Gap/Damage		Width of Opening/ Breach/ Gap (m)	Height of Wall above existing GL (m)	Thickness of wall	Objective of the Opening/ Cause of Breaching/Nature and Extent of Damage	Type of Traffic	Remarks
		Name of Locality	Dist. From F. Bridge (m)						
114.	Opening	Badamtali	3+840.28	2.60	1.50	19	Access to Cement stack yard	Pedestrian	
115.	Opening	-do-	3+852.35	9.70	1.90	21	Access to B.I.W.T.A. Jetty No. 1- R.C.C. Jetty	Truck	
116.	Opening	-do-	3+905.08	2.40	1.65	20	Access to B.I.W.T.A. wooden Jetty	Pedestrian	
117.	Opening	-do-	3+936.18	3.75	1.73	20	Access to B.I.W.T.A. R.C.C. Jetty	-do-	
118.	Opening	-do-	3+969.28	2.20	1.75	22	Access to B.I.W.T.A Jetty and Steamer ghat	-do-	
119.	Opening	Badamtali (Steamer ghat)	3+991.58	4.60	1.58	21	Access to Steamer ghat	-do-	
120.	Opening	Badamtali (Masjid Ghat)	4+067.08	1.48	1.59	20	Access to Mosque ghat	-do-	
121.	Opening	Babu Bazar	4+078.48	5.90	1.59	19	Access to Babu Bazar Ferry ghat	Truck, Car, etc.	





Sl. No.	Opening Breach/ Gap/ Damage	Location of Opening/ Breach/Gap/Damage		Width of Opening/ Breach/ Gap (m)	Height of Wall above existing GL (m)	Thickness of wall (cm)	Objective of the Opening/ Cause of Breaching/Nature and Extent of Damage	Type of Traffic	Remarks
		Name of Locality	Dist. From Tongi Rly. Bridge (m)						
122.	Opening	Palpara	19050.60	5.50	1.58	20	Access to Ferry ghat	Truck	
123.	Opening	Zahanbad	19232.00	3.23	1.34	21	Access to Ferry ghat	Pedestrian	
124.	Opening	Mirpur Baro Bazar	19641.00	1.93	1.67	20	Access to Bazar	-do-	
125.	Opening	-do-	19652.10	2.65	1.40	19	Access to Bazar	-do-	
126.	Opening	-do-	19678.90	5.55	1.40	2			
127.	Opening	Mirpur Bridge Gabtali	20284.00	12	1.70	20	Access to Cattle Market/Brick Stack yard	Truck	

**STATEMENT OF THE OUTLETS OF THE LOCAL DRAINS THAT FALL INTO THE BURIGANGA  
WITHIN THE REACH OF THE EXISTING FLOOD WALL.**

Sl. No.	Name of Drain	Location	Type of Outlet			Size (mm) of Outlet	Remarks
			Pipe	Brick Drain	Natural Drain		
01.	Postagola-Sashanghat Drain	Postagola area, Sashanghat to Buriganga. CH. 439m from Friendship Bridge.	Iron Pipe	-	Khal	370 mm dia	Carrying Storm Water & waste water
02.	Postagola Sashanghat Drain	Bank Colony to Buriganga River CH. 505m	R.C.C.Pipe	-	-	750 mm dia	Carrying Storm Water & waste water.
03.	-do-	Postagola Bank colony to Buriganga River CH. 563.45	R.C.C.Pipe	-	-	750 mm dia	Carrying storm water & waste water
04.	Postagola-Dhaka Cotton Mill Drain	Postagola-Dhaka Cotton Mill to Buriganga CH. 702m	R.C.C. Pipe	-	-	400 mm dia	Carrying Storm Water & waste water
05.	-do-	Postagola Dhaka Cotton Mill to Buriganga River CH. 794.65	-	Brick Drain	-	750 mm wide	Carrying Storm Water, waste water & Sewage
06.	Faridabad (Archingate) Dhopa ghat Drain (Crossing N.C. Goswami Rd)	Dhopaghat to Buriganga River CH.1091.20	-	Brick Drain	-	320 mm wide	Carrying storm water & waste water
07.	Faridabad N.C. Goswami Road Drain	Faridabad to Buriganga River (N.C. Goswami Rd Crossing) CH. 1245.60	-	Brick Drain	-	200 mm wide	Carrying Storm Water & waste water

Sl. No.	Name of Drain	Location	Type of Outlet			Size (mm) of Outlet	Remarks
			Pipe	Brick Drain	Natural Drain		
08.	Faridabad N.C. Goswami Rd. Drain	Faridabad to Buriganga River CH. 1338.92	R.C.C. Pipe			620 mm dia	Carrying storm water & waste water
09.	Goshaibari Drain	Goshaibari Bazar to Buriganga River CH.1497.70	-	Brick Drain	-	220 mm wide	Carrying storm water & waste water
10.	Alamganj Khal	Faridabad Madrasa to Buriganga River via Alamganj Rd. crossing CH. 1555.51	-		Khal	1500 mm wide	Carrying storm water & sewage
11.	Mill Barrak (C.S.D. godwan) Drain	C.S.D. to Buriganga River CH. 1829.00	-	Brick Drain	-	470 mm wide	Carrying storm water & waste water
12.	Mill Barrak Drain	Mill Barrak mosque to Buriganga River CH. 2015.20	-	Brick Drain	-	600 mm wide	Carrying storm water
13.	Mill Barrak Drain	Mill Barrak area to Dhulai Khal	-	Brick Drain	-	400 mm wide	Carrying storm water & waste water
14.	Dhulai Khal	Narinda to Buriganga River CH. 2187.00	-	-	Khal	30000 mm wide	Carrying Storm water & Sweage.
15.	Ullinganj Lane Drain	Farashganj (Ullinganj) to Buriganga River CH. 2318.38	-	Brick Drain	-	200 mm wide	Carrying storm water & waste water

Sl. No.	Name of Drain	Location	Type of Outlet			Size (mm) of Outlet	Remarks
			Pipe	Brick Drain	Natural Drain		
16.	Ullinganj Lane drain	Farashganj (Ullinganj to Buriganga River CH. 2465.12	-	Brick Drain	-	270 mm wide	Carrying storm water & waste water & sewage
17.	Farashganj Drain	Farashganj to Buriganga River CH. 2631.58	-	Brick Drain	-	240 mm wide	Carrying storm water & waste water
18.	Shambazar drain	Shambazar to Buriganga River CH. 2691.00	R.C.C. Pipe	-	-	330 mm dia	Carrying storm water & waste water
19.	Shambazar drain	Shambazar to Buriganga River CH. 2770.22	-	Brick Sewer	-	900 mm dia	Carrying storm water & sewage
20.	Shambazar drain	Shambazar to Buriganga River CH. 2795.47	R.C.C. Pipe	-	-	400 mm dia	Carrying storm water & waste water
21.	Shambazar drain	Shambazar to Buriganga River CH. 2847.22	R.C.C. Pipe	-	-	300 mm dia	Carrying refused water & storm water
22.	Shambazar drain	Shambazar to Buriganga River CH. 2869.92	R.C.C. Pipe	-	-	400 mm dia	Carrying storm water & waste water
23.	Shambazar drain	Sham bazar to Buriganga River CH. 2891.17	-	Brick Drain	-	400 mm wide	Carrying storm water & Sewage.
24.	Shambazar drain	Shambazar to Buriganga River CH. 2940.27	-	Brick Drain	-	750 mm wide	Carrying Storm water & waste water



Sl. No.	Name of Drain	Location	Type of Outlet			Size (mm) of Outlet	Remarks
			Pipe	Brick Drain	Natural Drain		
25.	Shambazar Lalkuthi Drain	Shambazar (Lalkuthi) to Buriganga CH. 2971.42	-	Brick Drain	-	700 mm wide	Carrying storm water & waste water
26.	Lalkuthi Drain	Lalkuthi to Buriganga CH. 2988.97 River	R.CC. Pipe	-	-	400 mm dia	Carrying storm water & waste water
27.	Lalkuthi Drain	Lalkuthi to Buriganga River CH. 3104.60	-	Brick Drain	-	750 mm wide	Carrying storm water & Sewage, waste water
28.	Sadarghat Drain	Sadarghat to Buriganga River CH. 3328.01	-	Brick Drain	-	500 mm wide	Carrying storm water & Sewage
29.	Simpson Road (Sadarghat) Drain	Simpson Road to Buriganga River CH. 3374.16	R.CC. Pipe	-	-	900 mm dia	Carrying storm water & sewage.
30.	Simpson Road (Sadargahat) River	Simpson Road to Buriganga River CH. 3420.88	R.CC. Pipe	-	-	230 mm dia	Carrying waste water
31.	Wiseghat Drain	Wiseghat To Buriganga River CH. 3500.08	R.CC. Pipe	-	-	600 mm dia	Carrying storm water & sewage.
32.	Wiseghat Drain	Wiseghat to Buriganga River CH. 3522.90	R.CC. Pipe	-	-	230 mm dia	Carrying Storm water & waste water
33.	Wiseghat Drain	Wiseghat to Buriganga River CH. 3589.55	R.CC. Pipe	-	-	250 mm dia	Carrying storm water & waste water
34.	Wiseghat Nawabbari Drain	Ahasanulla Rd. to Buriganga River CH. 3600.65	R.CC. Pipe	-	-	230 mm dia	Carrying storm water & waste water

Sl. No.	Name of Drain	Location	Type of Outlet			Size (mm) of Outlet	Remarks
			Pipe	Brick Drain	Natural Drain		
35.	Ahasan Manjil Drain	Ahasan Monjil to buriganga River CH. 3640.75	R.CC. Pipe	-	-	230 mm dia	Carrying storm water & waste water
36.	Badamtali Ghat Drain	Badamtali to Buriganga River CH. 3790.88	R.CC. Pipe	-	-	230 mm dia	Carrying storm water & waste water
37.	Badamtali ghat Drain	Badamtali to Buriganga River CH. 3836.18	-	Brick Sewer	-	900 mm dia	Carrying storm water & sewage.
38.	Badamtali ghat drain	Badamtali to Buriganga River CH. 3875.18	-	Brick Sewer	-	600 mm dia	Carrying storm water & sewage.
39.	Badamtali ghat Drain	Badamtali to Buriganga River CH. 3943.68	-	Brick Sewer	-	600 mm dia	Carrying storm water, waste water & sewage.
40.	Babubazar Drain	Babubazar to Buriganga River CH. 4086.58	-	Brick Sewer	-	1300 mm dia	Carrying Storm water, waste water & sewage
41.	Babubazar Drain	Babubazar to Buriganga River CH. 4099.73	-	Brick Drain	-	500 mm wide	Carrying storm water & waste water.
42.	Mirpur Bazar Drain	Mirpur Bazar to Turag River CH. 19526.00 from Tongi Rly. Bridge	-	Brick Drain	-	250 mm wide	Carrying storm water & waste water
43.	-do-	Mirpur Bara Bazar to Turag River CH. 1954.90	-	Brick Drain	-	250 mm wide	Carrying storm water & waste water

**SCHEDULE OF PROPOSED MEASURES FOR CLOSING OF OPENINGS  
IN THE FLOOD WALL UNDER DIFP PROJECT**

Chainage from Friend-ship Bridge in m	Existing openings in the flood wall			Proposed Measures					Remarks
				Stair		Ramp	Steel gate	Sand filled gunny bags	
	Height of opening in m	Width of opening in m	Thick-ness of wall in cm	Full ht.	Half ht.				
051.10	1.43	5.70	20			✓			
493.00	1.58	1.25	19				✓		Gate type IA
504.70	1.60	1.10	19				✓		Gate type IA
526.80	1.66	1.20	19				✓		Gate type IB
551.55	1.47	1.23	20				✓		Gate type IA
594.00	1.58	2.10	20				✓		Gate type IIA
636.65	1.52	2.00	20				✓		Gate type IIA
1105.08	1.48	1.67	15				✓		Gate type IIA
1124.55	1.32	1.18	14				✓		Gate type IA
1134.07	1.30	1.35	16				✓		Gate type IA
1141.84	1.18	1.25	14				✓		Gate type IA
1156.00	1.14	5.10	15				✓		Gate type IIA
1180.25	1.06	1.33	16				✓		Gate type IA
1186.05	1.03	1.23	14				✓		Gate type IA
1192.10	1.00	1.75	15					✓	
1203.10	1.03	0.97	15	✓					Stair width 0.9 m
1215.29	1.10	0.92	15	✓					Stair width 0.9 m
1225.88	1.10	0.83	16		✓				Stair width 0.9 m
1233.68	1.16	0.87	15		✓				Stair width 0.9 m
1239.70	1.21	0.62	16		✓				Stair width 0.9 m
1248.30	1.16	1.18	15				✓		Gate type IA
1254.20	1.15	1.68	17				✓		Gate type IIA
1269.50	1.20	1.72	18					✓	
1276.00	1.19	1.43	20				✓		Gate type IA
1284.18	1.22	1.70	20				✓		Gate type IIA



Chainage from Friend- ship Bridge in m	Existing openings in in the flood wall			Proposed Measures					Remarks
				Stair		Ramp	Steel gate	Sand filled gunny bags	
	Height of opening in m	Width of opening in m	Thick- ness of wall in cm	Full ht.	Half ht.				
1298.48	1.10	1.20	19				✓		Gate type IA
1305.07	1.14	0.91	16		✓				Stair width 0.75 m
1308.60	1.14	0.53	16	✓					Stair width 0.75 m
1315.55	1.13	1.23	15				✓		Gate type IA
1320.55	1.15	1.40	17		✓				Stair width 0.75 m
1325.55	1.13	0.75	16		✓				Stair width 0.75 m
1326.89	1.10	0.80	15					✓	
1334.72	1.11	1.14	14				✓		Gate type IA
1350.50	1.23	1.30	15	✓					Stair width 0.75 m
1363.90	1.33	1.07	15	✓					Stair width 0.75 m
1379.00	1.32	1.23	15				✓		Gate type IA
1399.32	1.42	2.20	16				✓		Gate type IIA
1408.79	1.48	2.40	15				✓		Gate type IIA
1416.00	1.26	1.66	14				✓		Gate type IIA
1422.00	1.22	1.17	16				✓		Gate type IA
1426.71	1.24	2.80	14				✓		Gate type IIA
1431.00	1.22	1.71	16				✓		Gate type IIA
1456.46	1.22	1.14	13	✓					Stair width 0.75 m
1461.46	1.30	2.30	15				✓		Gate type IIA
1477.28	1.28	2.06	15				✓		Gate type IIA
1490.53	1.22	1.83	15				✓		Gate type IA
1495.12	1.25	2.35	14				✓		Gate type IIA
1522.54	1.07	0.94	15	✓					Stair width 0.75 m



Chainage from Friend-Ship Bridge in m	Existing openings in the flood wall			Proposed Measures					Remarks
				Stair		Ramp	Steel gate	Sand filled gunny bags	
	Height of opening in m	Width of opening in m	Thick-ness of wall in cm	Full ht.	Half ht.				
1560.31	0.87	1.24	15		✓				Stair width 0.75 m
1578.51	1.08	1.30	16				✓		Gate type IA
1661.22	1.25	0.88	16		✓				Stair width 0.75 m
1667.57	1.23	1.34	15				✓		Gate type IA
1712.87	1.23	0.97	15				✓		Gate type IA
2246.15	1.86	1.52	20				✓		Gate type IB
2286.85	1.54	1.30	20				✓		Gate type IA
2313.28	2.34	10.10	20					✓	
2356.00	1.70	1.50	20				✓		Gate type IB
2606.80	1.92	3.20	20				✓		Gate type IIB
2651.30	1.86	1.40	20				✓		Gate type IB
2669.79	1.25	1.87	13				✓		Gate type IIA
2685.60	2.07	1.12	20					✓	
2713.22	2.00	2.20	20					✓	
2738.52	2.00	2.36	20					✓	
2756.02	2.00	1.90	20					✓	
2779.42	2.00	1.80	23					✓	
2797.82	2.00	1.35	23					✓	

Chainage from Friendship Bridge in m	Existing openings in the flood wall			Proposed Measures					Remarks
				Stair		Ramp	Steel gate	Sand filled gunny bags	
	Height of opening in m	Width of opening (m)	Thick-ness of wall in cm	Full ht.	Half ht.				
2803.87	1.92	2.25	23				✓		Gate type IIB
2823.47	1.90	3.10	20					✓	
2863.72	1.94	1.30	19					✓	
2892.12	1.85	1.60	20					✓	
2907.52	2.06	1.76	21					✓	
2920.72	1.87	1.20	20				✓		Gate type IB
2948.27	1.98	1.90	19				✓		Gate type IIB
2950.57	1.85	1.30	19				✓		Gate type IB
2963.62	1.88	1.35	21				✓		Gate type IB
2980.02	1.77	1.28	19				✓		Gate type IB
2990.37	2.00	1.10	21				✓		Gate type IB
2994.72	1.92	6.30	20					✓	
3009.27	1.75	1.65	21					✓	
3025.79	1.78	1.80	19					✓	
3043.64	1.70	1.62	19					✓	
3070.34	1.70	5.96	20					✓	
3119.60	1.70	1.95	20					✓	
3323.81	1.67	1.30	21					✓	
3356.36	1.67	1.70	20					✓	
3378.86	1.80	2.42	21					✓	
3390.16	1.57	1.85	20					✓	
3401.38	1.57	2.25	21					✓	
3407.33	1.45	2.20	19					✓	

Chainage from Friendship Bridge in m	Existing openings in the flood wall			Proposed Measures					Remarks
				Stair		Ramp	Steel gate	Sand filled gunny bags	
	Height of opening in m	Width of opening in m	Thick-ness of wall in cm	Full ht.	Half ht.				
3447.13	1.50	1.60	20					✓	
3490.63	1.50	3.00	20					✓	
3505.48	1.80	3.90	20					✓	
3523.68	1.57	3.70	20					✓	
3531.90	1.45	1.75	17					✓	
3548.65	1.64	2.05	21					✓	
3581.65	1.50	1.20	20	✓					Stair width 0.75 m
3622.85	1.65	1.23	20	✓					Stair width 0.75 m
3663.25	1.65	2.10	20					✓	
3691.45	1.71	3.57	18					✓	
3703.38	1.50	0.80	20				✓		Gate type IA
3706.98	1.50	1.02	19				✓		Gate type IA
3721.28	1.75	1.67	20					✓	
3763.08	1.63	9.00	19					✓	
3809.08	1.70	2.20	20					✓	
3840.88	1.50	2.60	19				✓		Gate type IIA
3852.35	1.90	9.70	21					✓	
3905.08	1.65	2.40	20					✓	
3936.18	1.73	3.75	20					✓	
3969.28	1.75	2.20	22					✓	
3991.58	1.58	4.60	21					✓	
4067.08	2.00	1.48	20				✓		Gate type IB
4078.48	1.59	5.90	19			✓			



Cahinage from Tongi Railway Bridge in m	Existing openings in the flood wall			Proposed Measures					Remarks
				Stair		Ramp	Steel gate	Sand filled gunny bags	
	Height of opening in m	Width of opening in m	Thick-ness of in wall cm	Full ht.	Half ht.				
19050.60	1.58	5.50	20			✓			
19200.00	1.34	3.23	21				✓		Gate type IIA
19641.00	1.67	1.93	20					✓	
19652.10	1.40	2.65	19					✓	
19678.90	1.40	5.55	20					✓	

**Statement of Survey Done, Level Books Used & Map/Plan/Drawing Prepared**

Sl. No.	Name of physical Component/area Surveyed	Type of Survey	Relevant Field Book	Map/Plan/Drawing Prepared	Drawing No.
1.	Western Flood Embankment	Condition Survey	-	Index map Showing reaches of flood embankment requiring slop protection, berm building, borrow-pit filling and patch repair work.	DIFP/L/001 DIFP/L/001 A
2.	Chatchment area of sluices on the western flood embankment	Reconnaissance survey	-	Chatchment area map of sluices.	DIFP/L/002
3.	Site of the proposed sluice No.S-7 on the western flood embankment at Hazaribag	Plane Table Survey	-	Site plan with spot level. Layout plan. Site plan with bore logs.	DIFP/L/004  DIFP-S/011 DIFP-BL/02
4.	Site of the proposed sluice No.S-8 on the western flood embankment at Nawabganj	Plane Table Survey	-	Site plan with spot level Layout plan. Site plan with bore logs.	DIFP-D/007  DIFP-S/012 DIFP-BL/01
5.	Site of the proposed sluice No.S-9 on the western flood embankment at Shahidnagar	Plane Table Survey	-	Site plan with spot level. Layout plan. Site plan with bore logs.	DIFP-D/006  DIFP-S/014 DIFP-BL/03
6.	Site of the proposed sluice No.S-6 on the western flood embankment at Rayerbazar	Plane Table Survey	-	Site plan with spot level Layout plan.	DIFP-D/011  DIFP S/013

90

Sl. No.	Name of physical Component/area Surveyed	Type of Survey	Relevant Field Book	Map/Plan/Drawing Prepared	Drawing No.
7.	Out fall channel of the proposed sluice No-S-7 on the western flood embankment at Hazaribagh	Cross Section Survey	-	Cross Section drawing.	DIFP D/005
8.	Out fall channel of sluice No S-9 on the western flood embankment at Nawabganj	Cross Section survey	-	Cross Section drawing.	DIFP-D/008
9.	Out fall channel of sluice No-S-8 on the western flood embankment at Nawabganj	Cross Section Survey	-	Cross Section drawing.	DIFP-D/009
10	Left bank of Buriganga river from Kellermorh to Babu bazar	-	-	Cross Section and bore hole location map.	DIFP-RS/001
11.	Site of the proposed sluice on the Segunbagicha Khal	Plane Table Survey	-	Site plan with spot level. Lay out plan. Bore hole locations. Additional borrow hole location map.	DIFP-S/06 DIFP-Lay-01 DIFP-S/024 DIFP-S/025
12.	Site of the proposed sluice at the opening of railway bridge No-41	Plane Table Survey	-	Site plan with spot level. Bore hole location map.	DIFP-R/01 DIFP-S/030
13.	Site of the proposed sluice at the opening of railway bridge No-40	Plane Table Survey	-	Site plan with spot level. Bore hole location map.	DIFP-S/02 DIFP-S/028
14.	Site of proposed sluice at the opening of railway bridge No-40	Plane Table Survey	-	Site plan with spot level. Bore hole location map.	DIFP-R/03 DIFP-S/029



Sl. No.	Name of physical Component/area Surveyed	Type of Survey	Relevant Field Book	Map/Plan/Drawing Prepared	Drawing No.
15.	Site of the proposed Sluice at the opening of railway bridge No-39	Plane Table Survey	-	Site plan with spot level. Bore hole location map.	DIFP-RS/04 DIFP-S/027
16.	Site of the proposed sluice at Shazadpur on the central spain Road	Plane Table Survey	-	Site plan with spot level. Bore hole location map.	DIFP-RS/05 DIFP-S/026
17.	Alignment of the proposed extension of the flood embankment at kellermorh	Plane Table Survey	-	Site plan showing alignment of embankment.  Layout plane of sluice S-10.	DIFP-AL-01 DIFP-AL-02 DIFP-AL-03  DIFP-Lay-10
18.	Catchment areas of the sluice at openings of the Rly.Bridge No.-40.40A, and 41	Field Reconnaissance Survey	-	Map showing catchment area.	DIFP-SR/1
19.	Catchment Areas of the sluices at openings of the Rly. Bridge No.-39 and the opening of Progoti Sarani Bridge on the C.S. Road	Field Reconnaissance Survey	-	Map showing catchment area.	DIFP-SR/2
20.	Catchment area of the sluices on Segunbagicha Khal	Field Reconnaissance Survey	-	Map showing catchment area.	DIFP-SR/3
21.	Jatrabari Turn About	Plane Table Survey	-	Site Plan with spot level.	DIFP-JAT-01
22.	Proposed pump station area at Goranchatbari	Plane Table Survey	-	Map of the proposed pump station area.	DIFP-pump-01 DIFP-pump-02



Sl. No.	Name of Physical Component/area Survey	Type of Survey	Relevant Field Book No.	Map/Plan/ Drawing Prepared	Drawing No.
23.	Western Flood Embankment	Cross Section Survey		Drawing (Cross-Section)	
(a)	<b>Reach requiring Patch repair: Ch.in.m:</b>	"		"	
	Ch.910 - 5494	"	36,37,39,40	"	DIFP P-1
	Ch. 5751 - 6410	"	36,37,39	"	" - P-2
	Ch. 6440 - 6470	"	37	"	" - P-3
	Ch. 6530 - 6890	"	38	"	" - P-4
	Ch. 6920 - 8488	"	38,39,40	"	" - P-5
	Ch. 8523 - 8986	"	40,41	"	" - P-6
	Ch. 9405 - 13402	"	39,41	"	" - P-7
	Ch. 15240 - 18260	"	41	"	" - P-8
(b)	<b>Reach Requiring Berm Building: Ch. in m:</b>	"			
	Ch. 750 - 860	"	1	"	DIFP, BERM-1
	Ch. 890 - 1050	"	1	"	"- 2
	Ch.1080 - 1300	"	1,2	"	"- 3
	Ch. 1330 - 1490	"	2	"	"- 4
	Ch. 3570 - 3690	"	3	"	"- 5
	Ch. 3720 - 3780	"	3	"	"- 6
	Ch. 3810 - 3960	"	4	"	"- 7
	Ch. 3990 - 4110	"	4	"	"- 8
	Ch. 4140 - 4260	"	4	"	"- 9
	Ch. 4290 - 4470	"	4	"	"- 10
	Ch. 4500 - 4590	"	4	"	"- 11
	Ch. 4620 - 4710	"	4	"	"- 12
	Ch. 4740 - 4830	"	5	"	"- 13
	Ch. 4860 - 4980	"	5	"	"- 14

Sl. No.	Name of Physical Component/area Survey	Type of Survey	Relevant Field Book No.	Map/Plan/ Drawing Prepared	Drawing No.
	Ch. 5010 - 5450	Cross Section Survey	5	"	DIFP, BERM-15
	Ch. 5530 - 5620	"	6	"	"- 16
	Ch. 5650 - 5860	"	6	"	"- 17
	Ch. 14077 - 14327	"		"	"- 18
	Ch. 14332 - 14377	"		"	"- 19
(c)	<b>Reach of the Embankment requiring slope &amp; toe Protection with hard materials: Ch. in m:</b>	"		"	
	Ch. 8050 - 8430	"	8	"	DIFP-BP-1
	Ch. 8460 - 8550	"	8	"	"- 2
	Ch. 8580 - 8670	"	9	"	"- 3
	Ch. 8700 - 8790	"	9	"	"- 4
	Ch. 8820 - 8910	"	9	"	"- 5
	Ch. 8940 - 9030	"	9	"	"- 6
	Ch. 9330 - 9420	"	10	"	"- 7
	Ch. 9450 - 9530	"	10,11	"	"- 8
	Ch. 11670 - 11730	"	13	"	"- 9
	Ch. 11760 - 11850	"	13	"	"- 10
	Ch. 11880 - 11970	"	13	"	"- 11
	Ch. 12000 - 12510	"	13,14	"	"- 12
	Ch. 12540 - 12630	"	14	"	"- 13
	Ch. 12650 - 13100	"	15	"	"- 14
	Ch. 13250 - 13450	"	15	"	"- 15
	Ch. 13480 - 13570	"	15	"	"- 16
	Ch. 13600 - 13690	"	15	"	"- 17
	Ch. 13750 - 13950	"	16	"	"- 18
	Ch. 15850 - 15910	"	18	"	"- 19
	Ch. 15940 - 16030	"	18	"	"- 20

98

Sl. No.	Name of Physical Component/area Survey	Type of Survey	Relevant Field Book No.	Map/Plan/ Drawing Prepared	Drawing No.
	Ch. 16060 - 16110	Cross Section Survey	19	"	DIFP-BP-21
	Ch. 16140 - 16200	"	19,20	"	"- 22
	Ch. 16250 - 16400	"	20	"	"- 23
	Ch. 18820 - 18970	"	21	"	"- 24
	Ch. 19000 - 19200	"	21	"	"- 25
	Ch. 19230 - 19260	"	21	"	"- 26
	Ch. 19340 - 19400	"	21	"	"- 27
	Ch. 19430 - 19490	"	21	"	"- 28
	Ch. 19570 - 19720	"	21	"	"- 29
	Ch. 19750 - 19840	"	21	"	"- 30
	Ch. 19870 - 19960	"	21	"	"- 31
	Ch. 20000 - 20450	"	21,23	"	"- 32
	Ch. 20680 - 20770	"	23,24,25	"	"- 33
	Ch. 20800 - 20920	"	25	"	"- 34
	Ch. 20950 - 21040	"	25,26	"	"- 35
	Ch. 21070 - 21130	"	25	"	"- 36
	Ch. 21160 - 21250	"	25	"	"- 37
	Ch. 21280 - 21370	"	25,26	"	"- 38
	Ch. 21400 - 21490	"	26	"	"- 39
	Ch. 21500 - 21590	"	26	"	"- 40
	Ch. 21620 - 21710	"	26	"	"- 41
	Ch. 21860 - 22040	"	27	"	"- 42
	Ch. 22070 - 22250	"	27	"	"- 43
	Ch. 22280 - 22500	"	27,28	"	"- 44
	Ch. 22530 - 22740	"	28	"	"- 45
	Ch. 22770 - 22950	"	28	"	"- 46
	Ch. 22980 - 23120	"	28,29	"	"- 47
	Ch. 23150 - 23300	"	28,29	"	"- 48



90

Sl. No.	Name of Physical Component/area Survey	Type of Survey	Relevant Field Book No.	Map/Plan/ Drawing Prepared	Drawing No.
	Ch. 23330 - 24000	Cross Section Survey	44	"	DIFP-BP-49
	Ch. 28300 - 28490	"	33,34	"	"- 50
	Ch. 28520 - 28580	"	34	"	"- 51
	Ch. 28610 - 28700	"	34	"	"- 52
	Ch. 28800 - 29000	"	34	"	"- 53
	Ch. 29100 - 29400	"	34,35	"	"- 54
	Ch. 29600 - 29948	"	35	"	"- 55
(d)	<b>Reach of the Embank. requiring Borrow-Pit Filling: Ch. in m:</b>	"		Cross-Section Drawing	
	Ch. 6800 - 7000	"	Bor.- 1	"	DIFP-BPF-1
	Ch. 6950 - 7120	"	"- 1	"	"- "- 2
	Ch. 7650 - 7750	"	"- 1	"	"- "- 3
	Ch. 7800 - 7866	"	"- 1	"	"- "- 4
	Ch. 10778 - 10830	"	"- 2	"	"- "- 5
	Ch. 10950 - 11042	"	"- 2	"	"- "- 6
	Ch. 11170 - 11250	"	"- 2	"	"- "- 7
	Ch. 13880 - 14080	"	"- 2	"	"- "- 8
	Ch. 14330 - 14490	"	"- 2	"	"- "- 9
	Ch. 14697 - 14770	"	"- 3	"	"- "- 10
	Ch. 14880 - 15030	"	"- 3	"	"- "- 11
	Ch. 15080 - 15100	"	"- 3	"	"- "- 12
	Ch. 15715 - 15800	"	"- 3	"	"- "- 13
	Ch. 17089 - 17189	"	"- 4	"	"- "- 14
	Ch. 17230 - 17300	"	"- 4	"	"- "- 15
	Ch. 17380 - 17500	"	"- 4	"	"- "- 16
24.	<b>Western Embankment:</b>	Cross-section for general purpose		Drawing	
	Ch. 000 - 600 m	"	!	"	DIFP-EMBK-1

Sl. No.	Name of Physical Component/area Survey	Type of Survey	Relevant Field Book No.	Map/Plan/ Drawing Prepared	Drawing No.
	Ch. 1500 - 1950 m	Cross-section for general purpose	3	Drawing	DIFP-EMBK- 2
	Ch. 2100 - 2490 m	"	3	"	"- 3
	Ch. 2550 - 2860 m	"	3	"	"- 4
	Ch. 3000 - 3225 m	"	3	"	"- 5
	Ch. 3300 - 3540 m	"	3	"	"- 6
	Ch. 6000 - 6450 m	"	7	"	"- 7
	Ch. 6600 - 6900 m	"	7	"	"- 8
	Ch. 7050 - 7350 m	"	7	"	"- 9
	Ch. 7500 - 7680 m	"	8	"	"- 10
	Ch. 7850 - 8000 m	"	8	"	"- 11
	Ch. 9060 - 9230 m	"	9	"	"- 12
	Ch. 9530 - 9800 m	"	11	"	"- 13
	Ch. 9950 - 10400 m	"	11	"	"- 14
	Ch. 11550 - 11640 m	"	13	"	"- 15
	Ch. 14550 - 14650 m	"	17	"	"- 16
	Ch. 14750 - 14850 m	"	17	"	"- 17
	Ch. 14885 - 15000 m	"	17	"	"- 18
	Ch. 15050 - 15200 m	"	18	"	"- 19
	Ch. 15250 - 15600 m	"	18	"	"- 20
	Ch. 16450 - 16600 m	"	20	"	"- 21
	Ch. 16650 - 16800 m	"	20	"	"- 22
	Ch. 16850 - 16950 m	"	20	"	"- 23
	Ch. 17000 - 17100 m	"	21	"	"- 24
	Ch. 17150 - 17238 m	"	21	"	"- 25
	Ch. 17364 - 17464 m	"	22	"	"- 26
	Ch. 17514 - 17750 m	"	22	"	"- 27
	Ch. 17900 - 18300 m	"	22	"	"- 28

Sl. No.	Name of Physical Component/area Survey	Type of Survey	Relevant Field Book No.	Map/Plan/ Drawing Prepared	Drawing No.
	Ch. 20450 - 20620 m	Cross-section for general purpose	24	Drawing	DIFP-EMBK- 29
	Ch. 21710 - 21950 m	"	26	"	"- 30
	Ch. 24000 - 25950 m	"	31	"	"- 31,32,33,34
	Ch. 26000 - 27350 m	"	30	"	"- 35,36,37
	Ch. 27400 - 27900 m	"	32	"	"- 38,39
	Ch. 28000 - 28200 m	"	33	"	"- 40
25.	<b>Western Embankment Ch.in m:</b>	Cross-section Survey in connection with boring		Drawing Cross-Section	
	Ch. 1000 - 4560	"	S-1	"	DIFP-BOP-1
	Ch. 4750 - 6860	"	S-1 S-2	"	"- 2
	Ch. 6890 - 7400	"	S-2	"	"- 3
	Ch. 7460 - 11000	"	S-1	"	"- 4
	Ch. 11220 - 15035	"	S-1	"	"- 5
	Ch. 15250 - 17260	"	S-1	"	"- 6
26.	<b>Western Embankment Ch.in m:</b>	Long profile	Level Books as mentioned at SL Nos 1 (a) to 1 (d)		
	Ch. 000 - 2250	"	-	"	DIFP- 1
	Ch. 2250 - 4770	"	-	"	"- 2
	Ch. 4770 - 5850	"	-	"	"- 3
	Ch. 5850 - 8050	"	-	"	"- 4
	Ch. 8050 - 10450	"	-	"	"- 5
	Ch. 10450 - 12330	"	-	"	"- 6
	Ch. 12330 - 14850	"	-	"	DIFP- 7
	Ch. 14885 - 17292	"	-	"	"- 8
	Ch. 17292 - 19690	"	-	"	"- 9
	Ch. 19690 - 22100	"	-	"	"- 10

Sl. No.	Name of Physical Component/area Survey	Type of Survey	Relevant Field Book No.	Map/Plan/ Drawing Prepared	Drawing No.
	Ch. 22100 - 24450	Long profile	-	Drawing Cross-Section	"- 11
	Ch. 24450 - 26750	"	-	"	"- 12
	Ch. 26750 - 29100	"	-	"	"- 13
	Ch. 29100 - 29948	"	-	"	"- 14
27.	<b>Western Embankment</b> <b>Ch. in m:</b>	Cross-section survey for wick drain		"	
	Ch. 9750, 10800 & 11000	"	W-2,3		DIFP-CWD-1
	Ch. 9850 - 10050	"	W-2	"	DIFP-CWD-2
	Ch. 10150 - 10350	"	W-2	"	DIFP-CWD-3
	Ch. 10450 - 10650	"	W-2	"	DIFP-CWD-4
	Ch. 10750 - 10950	"	W-2	"	DIFP-CWD-5
	Ch. 13000 - 13200	"	W-1	"	DIFP-CWD-6
	Ch. 13300 - 13500	"	W-1	"	DIFP-CWD-7
	Ch. 13600 - 13800	"	W-1	"	DIFP-CWD-8
	Ch. 13850 - 13950	"	W-1	"	DIFP-CWD-9
	Ch. 14000 - 14100	"	W-1	"	DIFP-CWD-10
	Ch. 14165 - 14320	"	W-1	"	DIFP-CWD-11
	Ch. 14195 & 14350	"	W-3	"	DIFP-CWD-12
	Ch. 9750 to 11000 Ch. 13000 to 14350	Long profile survey for wick drain	W-1,2,3	"	DIFP-CWD-13
28.	<b>Left bank of Buriganga river from Kellarmorh to Mitford</b>	Cross-section survey			
	C.S. 2	"	B-1	"	DIFP-BR-1
	C.S. 3,4,5,6	"	B-1	"	"- 2
	C.S. 7,8,9,10	"	B-1	"	"- 3
	C.S. 11,12,13	"	B-1	"	"- 4
	C.S. 14,15,16	"	B-1	"	"- 5



92

Sl. No.	Name of Physical Component/area Survey	Type of Survey	Relevant Field Book No.	Map/Plan/ Drawing Prepared	Drawing No.
	C.S. 17,18,19	Cross-section survey	B-1	Drawing Cross-Section	"-" - 6
	C.S. 20,21,22	"	B-1	"	"-" - 7
	C.S. 23,24	"	B-1	"	"-" - 8
29.	<b>Central Spine Road</b>	Leveling survey			
	Ch. 6900 - 15210	"	42,24	Long profile	DIFP-CR-01
	Ch. 15210 - 21079	"	43	"	DIFP-CR-02
	Ch. 6400 - 9430	Cross-Section Survey	42	Cross Section Drawing	DIFP-CR-03
	Ch. 9675 - 12175	"	42	"	DIFP-CR-04
	Ch. 12400 - 14900	"	42,24	"	DIFP-CR-05
	Ch. 15180 - 20112	"	43	"	DIFP-CR-06
	Ch. 20362 - 21097	"	43	"	DIFP-CR-07
30.	Ibrahimpur Khal	Field Reconnaissance Survey	-	Layout plan of Khal	DIFP-IB-001
31.	Ibrahimpur Khal	Field Reconnaissance Survey	-	Layout plan of Khal	DIFP-IB-002
32.	Mohakhali Khal	Field Reconnaissance Survey	-	Layout plan of Khal	DIFP-MR-001
33.	Mohakhali Khal	Field Reconnaissance Survey	-	Layout plan of Khal	DIFP-MR-002
34.	Segunbagicha Khal	Field Reconnaissance Survey	-	Layout plan of Khal	DIFP-SB-001
35.	Segunbagicha Khal	Field Reconnaissance Survey	-	Layout plan of Khal	DIFP-SB-002

Sl. No.	Name of Physical Component/area Survey	Type of Survey	Relevant Field Book No.	Map/Plan/ Drawing Prepared	Drawing No.
36.	Segunbagicha Khal	Field Reconnaissance Survey	-	Layout plan of Khal	DIFP-SB-003
37.	Begunbari Khal	Field Reconnaissance Survey	-	Layout plan of Khal	BIFP-BB-001
38.	Begunbari Khal	Cross Section Survey	-	Cross-Section drawing	DIFP-BB-002
39.	Rajabazar Khal	Cross Section Survey	-	Cross-Section drawing	DIFP-RB-001
40.	Kathalbagan Khal	Cross Section Survey	-	Cross-Section drawing	DIFP-KB-001
41.	Ibrahimpur Khal	Leveling Survey	-	Catchment area map	DIFP-CAT-01
42.	Begunbari Khal	Leveling Survey	-	Catchment area map	DIFP-CAT-02
43.	Rajabazar Khal	Leveling Survey	-	Catchment area map	DIFP-CAT-03

## Appendix-C

## Statement of Sub-Soil Borings Done &amp; Bore Logs Prepared

Sl. No.	Name of Physical Components/Place where Boring done	Number of Borings done & Bore Logs Prepared	Depth of Boring	Remarks
01.	Western Flood Embankment	83	20m to 35m	Boring made in Connection with design of remedial measures of embankment.
02.	Left bank & left bank slope of Buriganga river	35	15m on bank & 25m on slope	Boring made in Connection with design of reinforced earth Embankment along the River
03.	Drainage Khal			Boring made in Connection with design of storm water drainage box culvert foundation.
	a) Begun Bari	10	20m	
	b) Mohakhali	11	"	
	c) Ibrahim Pur	8	"	
	d) Segun Bagicha	13	"	
	e) Raja Bazar	2	"	
	f) Kathal Bagan	2	"	
	g) Tejkuni para	4	"	
04.	Proposed Sluice sites on the CSR & the Railway.			Boring made in Connection with design of Sluices.
	a) Progoti Sharani Bridge	2	20m	
	b) Railway Bridge No. 41	2	"	
	c) Railway Bridge No. 40A	2	"	
	d) Railway Bridge No. 40	2	"	
	e) Railway Bridge No. 39	2	"	
	f) Segun Bagicha Khal	8	"	
05.	Proposed Sluice site on the western embankment			Boring made in Connection with design of Sluices
	Sluice No. S-6	7	22m to 24m	
	" " S-7	7	-do-	
	" " S-8	7	-do-	
	" " S-9	7	-do-	
	" " S-10	3	-do-	



## Appendix-D

### Statement of Laboratory Tests Performed on Soil Samples & Test Results Received

Sl. No.	Name of Relevant Design Work	Name of Test	Number of Tests to be Done as per Programme	Number of Test Performed	Remarks
01.	Design of Remedial measures of western embankment	Moisture Content Atterberg Limit Gradation Unit Wt. Unconfined Compression Tri-axial Consolidation Direct shear (Slow test) Organic Content Sp. gravity	1342 1164 911 696 656 43 155 17 60 240	1342 1164 911 696 656 43 155 17 60 240	Laboratory tests have been formed by a) BUET b) RRI c) Foundation Consultant d) M. Ahmed
02.	Design of Reinforced Earth Embankment along the left bank of Buriganga river	Moisture Content Atterberg Limit Gradation Unit Wt. Unconfined Compression Tri-axial Consolidation Direct shear Organic Content Sp. gravity	71 35 223 30 0 20 1 26 4 61	41 5 193 0 0 0 1 0 0 0	Laboratory tests have been performed by a) BUET b) M. Ahmed.
03.	Design of storm water drainage box culvert.	Moisture Content Atterberg Limit Gradation Unit wt. Sp.Gravity Unconfined Compression Consolidation Direct shear	99 51 99 92 45 45 28 8	26 14 13 13 13 11 13 0	Laboratory tests are being performed by RRI
04.	Design of Sluice on Central Spine Road	Moisture Content Atterburge Limit Gradation Unit wt. Sp.Gravity Unconfined Compression Consolidation Direct shear	38 23 38 32 18 16 10 3	38 23 38 32 18 16 10 3	Laboratory tests are being performed by RRI



Appendix-D

Sl. No.	Name of Relevant Design Work	Name of Test	Number of Tests to be Done as per Programme	Number of Test Performed	Remarks
05.	Design of Sluice on western Embankment	Moisture content	88	88	Laboratory tests have been performed by RRI
		Atterberg Limit	28	28	
		Gradation	115	115	
		Unit wt.	12	12	
		Sp.Gravity	8	8	
		Unconfined Compression	3	3	
		Consolidation	8	8	
		Direct shear	9	9	
		Tri-axial	9	9	
		Organic Content	2	2	

### List of Drawings of the Physical Components Designed

Sl. No.	Name of the Physical Components	Title of Drawings	Drawings No.
1.	Western flood embankment	Protective works on river side slope of western embankment  Slope and toe protection works on river side of western embankment	DIFP-P/001  DIFP-P/002
2.	Sluice on the western embankment.  (a) Sluice No.S-6 (b) Sluice No.S-8 (c) Sluice No.S-9          (d) Sluice No.S-7	  (S-6) 1-Vent (1.5 m x 1.8 m) on Rayer Bazar Khal. (S-8) 1-Vent (1.5 m x 1.8 m) Near Nawabganj children park. (S-9) 1-vent (1.5 m x 1.8 m) at Shahidnagar. Hoist, Railing and Filter details  (S-6) 1-Vent (1.5 m x 1.8 m) on Rayer Bazar Khal. (S-8) 1-Vent (1.5 m x 1.8 m) Near Nawabganj children park. (S-9) 1-vent (1.5 m x 1.8 m) at Shahidnagar. Plan & Section details Wing Wall, Return Wall, Head wall and Box details  (S-6) 1-Vent (1.5 m x 1.8 m) on Rayer Bazar Khal. (S-8) 1-Vent (1.5 m x 1.8 m) Near Nawabganj children park. (S-9) 1-vent (1.5 m x 1.8 m) at Shahidnagar. Key Plan, Wing wall, Return wall and Block details  (S-7) Two vents (1.5 m x 1.8 m) on Hazaribagh Khal. Hoist, Railing, and Filter details.  (S-7) Two vents (1.5 m x 1.8 m) on Hazaribagh Khal. Box and Head wall detail Wing wall, Return wall, Key Plan and Block details  (S-7) Two vents on Hazaribagh Khal. Plan and Section.	  DIFP-S/023          DIFP-S/020 DIFP-S/021      DIFP-S/022      DIFP-S/019   DIFP-S/017 DIFP-S/018   DIFP-S/016
3.	Western flood embankment	Typical cross section of berm building bamboo pilling with Tarja walling.	Berm-01

Sl. No.	Name of the Physical Components	Title of Drawings	Drawings No.
4.	Flood wall	Detail of remedial measures for protection of R.C.C. flood wall openings (Full ht. stairs, Half ht. stairs, Wall closure and Ramp).  Details of steel gates for protection of R.C.C. flood wall openings  Details of flood walls for reconstruction and typical outlet structures for existing local drains running across the flood walls.	DIFP-FW-01  DIFP-FW-02  DIFP-FW-03
5.	Sluices on the Central Spain Road  (a) Segunbagicha Sluice  (b) Progotisarani Sluice	Segunbagicha Khal sluice details of barrel and operating deck  Segunbagicha Khal sluice plan and Long Section  Segunbagicha Khal sluice details of wing wall and flank wall  Pipe sluice at down stream of Progotisarani culvert	DIFP-SEG-01  DIFP-SEG-02  DIFP-SEG-03  DIFP-Pro-01
6.	Pipe sluices on the D/S of Rly. bridge openings	Pipe sluice at down stream of Rly bridge No-39 plan section site plan  Pipe sluice at down stream of Rly bridge No-40  Pipe sluice at the down stream of Rly bridge No-41 plan, section and site plan	DIFP-R39-03 DIFP-R39-05  DIFP-R40-01  DIFP-R41-02
7.	Central Spine road	Raising of central spine road details of R.C.C. median and raising of existing median	DIFP-CSR-01

63

Sl. No.	Name of the Physical Components	Title of Drawings	Drawings No.
8.	Western flood embankment (Extension)  (a) Kellarmorh sluice	1-Vent sluice (S-10) at Kellarmorh. Wing wall, Return wall, Head wall and Box details.	DIFP-S/0024
		1-Vent sluice (S-10) at Kellarmorh. Plan and Section.	DIFP-S/0025
		1-Vent sluice (S-10) at Kellarmorh. Key plan, Wing wall, Return wall and Block details.	DIFP-S/0026
9.	Western flood embankment	Layout plan of remedial measures	DIFP-ERM-01
		Boring plan on west embankment	DIFP-BP-01
		Wick drain typical details for remedial measures of western embankment	DIFP-WK-01
		Soil profile of the western embankment on longitudinal section	DIFP-SPL-01
			DIFP-SPL-02
			DIFP-SPL-03
			DIFP-SPL-04
			DIFP-SPL-05
			DIFP-SPL-06
			DIFP-SPL-07
			DIFP-SPL-08
			DIFP-SPL-09
			DIFP-SPL-10
		Soil profile of the western embankment on cross section	DIFP-SPC-01
			DIFP-SPC-02
			DIFP-SPC-03
			DIFP-SPC-04
			DIFP-SPC-05
			DIFP-SPC-06
10.	Drainage channels	Structural and foundation details of box channel culverts of different khals under DIFP	DIFP-BC-001
		Details of open channel section under DIFP	DIFP-OC-001
		Details of R.C.C. post for barbed wire fencing.	DIFP-BW-007
		Details of catchpits and manholes of box channel culverts of different khals, under DIFP.	DIFP-BC-002



## Appendix-F

## List of Estimates Prepared

Sl. No.	Name of Physical Components	Title of Estimate	Number of Estimates	
			Detailed Estimate	Cost Estimates
	<b>PART-A (Flood Protection) BWDB</b>			
1.	Embankment	Estimate of Patch repair.	01	01
2.	"	Estimate of Berm Building and Geo-Jute Sod work		
3.	"	Estimate of Borrow Pit filling by Dredger	01	01
4.	"	Estimate of Slope Protection work by hard materials (CC Blocks).	01	01
5.	"	Estimate for construction of remedial measures of embankment	01	01
6.	Sluice	Estimate for construction of Sluice on Segunbagicha Kahal.	01	01
7.	"	Estimate for Construction of Sluices (S-6, S-7, S-8 & S-9) on the Western embankment	04	04
8.	"	Estimate for construction of Sluice at the site of Progati Sarani Bridge on C.S.R.	01	01
9.	"	Estimates for construction of Sluices at the sites of Rly. bridge Nos.-39, 40, 40A & 41.	04	04
10.	Flood Wall:	Estimate for Construction of Full height Stairs	01	01
11.	"	Estimate for Construction of Half height Stairs	01	01
12.	"	Estimate for Construction of Ramp	01	01
13.	"	Estimate for manufacture & fitting of Steel gates  Type - I A " - IIA " - I B " - IIB	04	04

66

Sl. No.	Name of Physical Components	Title of Estimate	Number of Estimates	
			Detailed Estimate	Cost Estimates
	<b>PART -B (WASA)</b>			
1.	Mohakhali Khal	Estimate for Construction of RCC covered drain on Mahakhali Khal	01	01
2.	"	Estimate for Construction of Mohakhali Open drain.	01	01
3.	Ibrahimpur Khal	Estimate for Construction of RCC Covered drain on Ibrahimpur Khal	01	01
4.	"	Estimate for Construction of Open Drain on Ibrahimpur Khal	01	01
5.	Segunbagicha Khal	Estimate for Construction of RCC Covered drain on Segunbagicha Khal.	01	01
6.	"	Estimate for Construction of Open drain on Segunbagicha Khal	01	01
7.	Begunbari Khal	Estimate for Construction of RCC covered drain on Begunbari Khal	01	01
8.	Kathal Bagan Khal	Estimate for Construction of RCC covered drain on Kathal Bagan Khal	01	01
9.	Rajabazar Khal	Estimate for Construction of RCC Covered drain on Rajabazar Khal	01	01
	<b>PART-C (RAJUK)</b>			
1.	Road	Raising of Central Spine Road from Progoti Sarani to Jattarbari Morh.	01	01
		a) Raising of Road Surface	01	01
		b) Construction of RCC Median.	01	01
		c) Raising of Brick Median.	01	01
		d) Raising of Road Surface at Jattrabari Morh.	01	01

62

## Appendix-G

## List of Estimates Checked

Sl. No.	Name of work	Number of Estimate		Remarks
		Detailed Estimate	Cost Estimate	
01.	Construction of 600 mm to 900 mm dia pipe drain from science lab. to Paribagh Khal.	= 02 Nos.	= 02 Nos	
02.	Construction of 750 mm to 1370 mm dia pipe drain from Govt. New market to Buriganga River	= 02 Nos.	= 02 Nos	
03.	Construction of 450 mm to 750 mm dia pipe drain from Mirpur Road to BDR Compound.	= 01 No.	= 01 No.	
04.	Construction of 450 mm to 1220 mm dia pipe drain from Ibrahimpur Main Road to Kachu Khet Road.	= 03 Nos.	= 03 Nos.	
05.	Construction of 1050 mm dia Brick sewer at Tejkuni Para.	= 01 No.	= 01 No.	
06.	Construction of 600 mm to 1376 mm dia pipe drain and 1700 mm dia brick sewer from Santinagar to Navana culvert along Middle Circular Raod and DIT Extension Road.	= 05 Nos.	= 05 Nos.	
07.	Construction of 750 mm and 900 mm dia pipe drain along Inner Circular Road.	= 01 No.	= 01 No.	
08.	Construction of 450 mm to 1220 mm dia RCC pipe drain at Dilkhusha and Motijheel Com. Area.	= 02 No.	= 02 No.	
		= 17 Nos.	= 17 Nos.	



## APPENDIX-H

## List of Reports, Maps, Data, etc. Collected from Different Sources

Sl. No.	Reports/Maps/Data, etc. Collected	No.of Copy	Source of Collection
1.	Study on Storm Water Drainage System Improvement Project in Dhaka City-Main Report	1	Drainage Circle DWASA
2.	Do do Supporting Report	1	-do-
3.	Updating Study on Storm Water Drainage System Improvement Project in Dhaka City-Main Report	1	-do-
4.	Do do Supporting Report	1	-do-
5.	Dhaka Integrated Flood Protection Project, Final Report, Sept., 1991	1	Desh Upodesh Ltd.
6.	Dhaka Integrated Flood Protection, FAP-8B Interim Report No. 1	1	Louis Berger International Inc., (LBII)
7.	Dhaka Integrated Flood Protection FAP-8B Combined Interim Report No. 2 and Draft Final Report August, 1991	2	LBII
8.	Greater Dhaka Protection Project, Preliminary Report.	1	LBII
(a)	Greater Dhaka Protection Project, Inception Report	1	LBII
9.	Greater Dhaka Protection Project, FAP 8 A, Interim Report (Summary)	2	LBII
10.	Greater Dhaka Flood Protection FAP-8A Summary (Draft Final Report)	1	LBII
11.	Greater Dhaka Protection Project, FAP 8A, Preliminary Review Report	2	LBII
12.	Greater Dhaka Integrated Flood Protection, FAP-8A Supporting Report No. 1 (Draft Final Report)	1	LBII
13.	Preliminary Analysis and Design, phase 1, Dhaka Integrated Flood Protection plan, prepared by Geosyntec Consultants	1	LBII



Sl. No.	Reports/Maps/Data, etc. Collected	No.of Copy	Source of Collection
14.	Wick Drains, Brochures and case Histories	1	LBII
15.	Wick Drains, Embankments, Lab-Data, Sand Drain Design	1	LBII
16.	Wick Drains, Design	1	LBII
17.	Crash Programme for Removal of Water-logging from the Dhaka City Area, Drainage Circle, DWASA, Dhaka, June, 1991	1	Drainage Circle DWASA
18.	Topo maps of the Dhaka City Area. Map Inder Nos I, 1A, 2, 3, 4, 5, 6, 6, 7, 8, 9, 10, 11, 11A, 12, 13, 14 & 15,	1x18 = 18	PMO, BWDB
19.	Drawing Rly Bridge  Bridge No. 39 Bridge No. 40 A Bridge No. 40	1 1 1	Rly. Deptt. -do- -do-
20.	Maximum Discharge Data of Turag River at Mirpur (302) for 7 years	1 sheet	Hydrology Directorate, BWDB
21.	Water level Dhaka of Lakhya River at Demra (179) for the period from 1981-82 to 1990-91	30 sheets	-do-
22.	Detailed Design Report (Volume-1) Main Report for the Improvement of the storm water Drainage system in Dhaka City.	1	LBII
23.	Detailed Design Report (Volume-11), Design Notes and Calculations for the improvement of the storm water drainage system in Dhaka City.	1	Drainage Circle DWASA
24.	Tender Documents Volume F. for the Project for the improvement of the storm water drainage system in Dhaka City.	1	Drainage Circle DWASA

- Notes:
- o The reports, maps & data as mentioned at SL. Nos. 1 to 4, 17 to 21, 23 + 24 have been handed over to PMO
  - o The reports as mentioned at SL. Nos. 6 to 16 & 22 have been returned to LBII
  - o The report as mentioned at SL. No. 5 has been returned to Desh Upadesh Ltd.

A-392

Call No. :- B.N-317  
Author :- TEL, Bangladesh  
Title :- FAP-8B, Final Report, Main  
Volume, May 1993.

DATE	BORROWERS NAME	DEG SIGNATURE	LIB. USE
20/4/96	Mosaddique Khan	Consult WRE	Rabun 2.6.93