GOVERNMENT OF THE PEOPLE’S REPUBLIC OF BANGLADESH
MINISTRY OF COMMUNICATIONS

ROADS AND HIGHWAYS DEPARTMENT

RHD Management Plan
Volume 4
Technical Services Wing
Management Manual

DECEMBER 2003
ISSUE 1
FOREWORD

RHD MANAGEMENT PLAN

The RHD Management Plan has been developed as part of the commitment, as stated in the National Land Transport Policy, to ensure the effective planning, management and maintenance of the National Road Network.

The Management Plan has been prepared by RHD officers working through the MPITs, assisted by consultants from IDC3, SRNDP and RRMP3. The Plan covers all aspect of the Department operations and extends to all support services including human resources, financial, administration, information technology and health and safety. Care has been taken to build on existing systems and procedures.

The Management Plan is applied through the documented strategy papers, operational plans, job descriptions and procedures contained in eight volumes as follows:

Volume 1 - RHD Management Manual
Volume 2 - Management Services Wing Management Manual
Volume 3 - Planning and Maintenance Wing Management Manual
Volume 4 - Technical Services Wing Management Manual
Volume 5 - Bridge Management Wing Management Manual
Volume 6 - Mechanical Zone Management Manual
Volume 7 - Zonal Operations Management Manual
Volume 8 - Foreign Aided Projects Management Manual

Volume 1 contains the core documentation including the RHD strategy, general job descriptions, general procedures and a schedule of relevant GoB rules and regulations.

In Volumes 2 to 8, operational plans define the objectives, outputs and activities of each Wing and Circle and establish the necessary operational budgets and resource requirements. Operational procedures and specific job descriptions provide a systematic record of current practice and a framework for the further development of the management of the whole Department.

The RHD Management Plan is intended to be a live document, and will be maintained on the RHD Intranet. The implementation and future improvements of the documents will be conducted through MPITs under the overall directions of the ACE of management Services Wing.

I wish to thank and commend all of the officers of RHD who have devoted their time and energy to the preparation of this important document. I also extend my appreciation to the development partners who have actively supported this work particularly DFID, ADB and WB.

January 2004

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Roads and Highways Department
Sarak Bhaban, Ramna, Dhaka
VOLUME 4

TECHNICAL SERVICES WING MANAGEMENT MANUAL

CONTENTS

INTRODUCTION

ABBREVIATIONS

OPERATIONAL PLANS

SECTION 1 - STRATEGY

SECTION 2 - OFFICE OF THE ADDITIONAL CHIEF ENGINEER

SECTION 3 - ROAD DESIGN & SAFETY CIRCLE

SECTION 4 - BRRL CIRCLE

SECTION 5 - SOCIAL & ENVIRONMENT CIRCLE

SECTION 6 - ARBORICULTURE CIRCLE

SPECIFIC JOB DESCRIPTIONS

OPERATIONAL PROCEDURES
INTRODUCTION

OVERVIEW

The Management Manual for the Technical Services Wing forms a part of the RHD Management Plan, which consists of strategy papers, operational plans, job descriptions and procedures within a defined framework. Figure 1 ‘RHD Documentation Framework’ shows the hierarchy of documentation required to define the RHD Management Plan.

This document must be read in conjunction with the RHD Management Manual, Volume 1 of the RHD Management Plan, which contains the core documentation for the whole of the Department as follows:

- RHD Strategy
- Office of the Chief Engineer
- General Job Descriptions
- RHD General Procedures
- Government of Bangladesh Rules and Regulations

The Chief Engineer controls the overall RHD Management Plan Policy.

The Management Manual for the Technical Services Wing contains specific documentation that applies to the whole of the Wing, and is one of seven volumes for the Wings and Zones as follows:

- Volume 2 - Management Services Wing Management Manual
- Volume 3 - Planning & Maintenance Wing Management Manual
- Volume 4 - Technical Services Wing Management Manual
- Volume 5 - Bridge Management Wing Management Manual
- Volume 6 - Mechanical Zone Management Manual
- Volume 7 - Zonal Operations Management Manual
- Volume 8 - Foreign Aided Projects Management Manual

The Management Manuals are structured to achieve the flexibility required to control the varied activities and methods of operation of the Roads and Highways Department at the Wing/Zone level.

The Master Copies of the Management Manual documentation are filed on the RHD Intranet and the documentation will be updated on a regular basis and all amendments and additions will be advertised. Master hard copies of the documents are held in the office of the Chief Engineer, Additional Chief Engineer – Technical Services Wing, the Administration & Establishment Circle and the MIS & Estates
Circle. The documents are regarded as live documents, and proposals for amendment, addition or deletion are encouraged, and can be logged on the RHD Intranet.

RESPONSIBILITIES

The responsibility for determining the necessary controls within the Roads and Highways Department generally lies with the Chief Engineer, except where Government of Bangladesh rules and regulations apply.

The responsibility for determining the necessary controls within the Wing, Circle, Division and Sub-Division generally lies with the respective Additional Chief Engineer, except where Government of Bangladesh rules and regulations or the RHD General Procedures contained in Volume 1 - RHD Management Manual apply.

The management of the system is a function of the Management Services Wing under the control of the Additional Chief Engineer – Management Services Wing who reports on a routine basis to the Chief Engineer.

The main responsibilities of the Additional Chief Engineer – Management Services Wing are:

- Reporting to the Senior Management Committee on all Management Plan matters.
- The overall planning, development, monitoring and reporting of all aspects of the system
- Maintenance of the Management Plan documentation through the Superintending Engineer - Administration & Establishment Circle & Superintending Engineer - MIS & Estates Circle.
- Formal review of the adequacy and effectiveness of the Management Plan.

The master copies of the Management Plan documentation will be stored on the RHD Intranet, and will be managed by the Superintending Engineer – MIS & Estates Circle.

The main responsibilities of the Superintending Engineer – MIS & Estates Circle are:

- Liasing with the Superintending Engineer - Administration & Establishment Circle on all Management Plan documentation matters.
- Ensuring that the master documents stored on the RHD Intranet contain all current amendments and additions.
- Advertising changes to the documentation on the homepage of the RHD Intranet.
- Formal review of the adequacy and effectiveness of the Intranet documentation system.

To assist liaison, the Member-Secretary of MPIT or a member of staff will be nominated by the Additional Chief Engineer – Technical Services Wing as required. They will be responsible for:

- Liasing with the Superintending Engineer–Administration & Establishment Circle on Management Plan matters.
- Liaising with the Superintending Engineer – MIS & Estates Circle on Management Plan documentation matters.
- Assisting in the formal review of the adequacy and effectiveness of the Management Plan.

**MANAGEMENT MANUAL COMPONENTS**

The Management Manual for the Wing is structured to achieve the flexibility required controlling the varied activities and methods of operation of the Roads and Highways Department at the Wing level. It is not a static document and must be regularly updated to meet changing circumstances.

The Management Manual consists of:

- The Technical Services Wing Strategy
- Operational Plan and Specific Job Description for the Office of the Additional Chief Engineer
- Operational Plans, Specific Job Descriptions and Operational Procedures for each Circle

**Technical Services Wing Strategy**

The Technical Services Wing Strategy (See section 1) sets out the overall objective, outputs and activities of the Wing and provides a summary of total personnel numbers and budget. The overall objective is as follows:

*The objective of the Technical Services Wing is to ensure the best practices in RHD by establishing design and construction standards and providing in-house and outsourced services in road design, environmental and social impact mitigation, road safety, quality control and research.*

**OPERATIONAL PLANS**

The Operational Plans assist the planning and management in each Circle (See following Sections) by:

1. Defining the work of the Wing/Circle

   The **Objectives** of the Wing/Circle are established with defined **Outputs**. The **Activities** required to achieve the Outputs are listed and programmed in a logical manner in the **Workplan**.

2. Establishing the personnel, structure and resources to do the job:

   The required numbers of **Personnel** and the **Organisational Structure** required to manage the personnel effectively are detailed in the RHD Personnel and Organogram Databases. **Resources** such as transport and office equipment and the overall **Budget** requirements are tabulated. RHD has prepared a PCP titled 'Investigation, Survey, Planning, Design and Monitoring (ISPDM) of RHD Projects' showing budget requirements of all Wings/Circles, which is now under submission to the Planning Commission.
The Operational Plans are to be reviewed annually and an assessment made of

- Progress against the defined outputs
- Adequacy of the resources and personnel

The Operational Plan is then to be adjusted for the following year taking these factors into account, and also considering, for example, changes in priorities which may affect the overall objective, revised budget allocations and organisational changes within the RHD.

**SPECIFIC JOB DESCRIPTIONS**

In addition to the General Job Descriptions for each grade of officer, every post has specific duties and functions. These duties and functions are detailed in the Specific Job Descriptions for each post from Additional Chief Engineer to Sub-assistant Engineer.

The Specific Job Descriptions for individual posts may require modifications from time to time in order to respond to changing circumstances. Such modifications may be made with the approval of the Chief Engineer provided that all changes comply with Government rules and regulations.

**OPERATIONAL PROCEDURES**

The operational procedures relate to activities not covered by the RHD General Procedures, and are specifically for activities undertaken in the Wing, Circles and Divisions. They must not conflict with the RHD General Procedures.

The operational procedures provide an important record of the processes required to complete the activities undertaken by the Wing and Circles. The information provided by the operational procedures includes the steps in the process, responsibilities for tasks, the essential inputs and outputs, and the interactions with other departments.

The operational procedures are intended to compliment the various GoB rules and regulations, RHD manuals, standards and specifications by providing guidance on the application of these documents in a working environment. These are tools to assist officers in the effect execution of the work of the RHD, by encouraging consistency in the management of activities and providing continuity when officers move from one department to another.

The operational procedures are not intended to be an additional layer of regulation.

**General Procedure - GP3 - Preparation of RHD Management Plan Procedures** describes the process for preparing procedures, and aims to ensure that the procedures are produced in a consistent manner.
FIGURE 1 - RHD DOCUMENTATION FRAMEWORK
### ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AASHTO</td>
<td>American Association of State Highway &amp; Transportation Officials</td>
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<tr>
<td>AC (Land)</td>
<td>Assistant Commissioner (Land)</td>
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<td>ACE</td>
<td>Additional Chief Engineer</td>
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<td>ACE-TS</td>
<td>Additional Chief Engineer-Technical Services Wing</td>
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<td>ADB</td>
<td>Asian Development Bank</td>
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<td>ADC</td>
<td>Additional Deputy Commissioner</td>
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<td>Australian Road Research Board</td>
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<td>ASO</td>
<td>Arboriculture Section Officer</td>
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<td>ASOD</td>
<td>Assistance for Social Organization and Development</td>
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<td>BANSF</td>
<td>Bangladesh Special Fund</td>
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<td>BRRL</td>
<td>Bangladesh Road Research Laboratory</td>
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<td>BRTA</td>
<td>Bangladesh Road Transport Authority</td>
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<tr>
<td>BUET</td>
<td>Bangladesh University of Engineering and Technology</td>
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<td>BGFP</td>
<td>Bangladesh Govt. funded Project</td>
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<td>BWDB</td>
<td>Bangladesh Water Development Board</td>
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<td>CA</td>
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<td>CBR</td>
<td>California Bearing Ratio</td>
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<td>CCL</td>
<td>Cash Compensation under Law</td>
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<td>Centre for Environment and Geographic Information Systems</td>
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<td>Canadian International Development Agency</td>
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<td>Comparative Statement</td>
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<td>DANIDA</td>
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<td>DFP</td>
<td>Department for Film &amp; Publications</td>
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<td>DOF</td>
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<td>Executive Arboriculturist/Environmental Assessment/Executing Agency</td>
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<td>Equivalent Standard Axle</td>
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<td>Flood Action Plan</td>
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<td>Gender Impact Assessment</td>
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<td>GIS</td>
<td>Geographical Information System</td>
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<td>Government Order</td>
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<td>Government of Bangladesh</td>
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<td>GP</td>
<td>General Procedures</td>
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<td>Highways Development &amp; Management Model</td>
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<td>HHs</td>
<td>House Holds</td>
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<td>IDA</td>
<td>International Development Association</td>
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<td>Islamic Development Bank</td>
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<td>IDC</td>
<td>Institutional Development Component</td>
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<td>IEC</td>
<td>Important Environment Component</td>
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<td>IEE</td>
<td>Initial Environmental Examination</td>
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<td>IGA</td>
<td>Income Generating Activities</td>
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<td>INGO</td>
<td>Implementing Non-Government Organization</td>
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<td>JVS</td>
<td>Joint Verification Survey</td>
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<td>Land Acquisition Plan</td>
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<td>Land Acquisition &amp; Resettlement Guidelines</td>
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<td>MAAP</td>
<td>Micro Computer Accident Analysis Package</td>
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<td>MARV</td>
<td>Maximum Allowable Replacement Value</td>
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<td>MIS</td>
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<td>MLSS</td>
<td>Member of Lower Subordinate Staff</td>
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<td>MoL&amp;PA</td>
<td>Ministry of Law and Parliamentary Affairs</td>
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<td>MOU</td>
<td>Memorandum of Understanding</td>
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<td>MPIT</td>
<td>Management Plan Implementation Team</td>
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<td>Management Services Wing</td>
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<td>MTMD</td>
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<td>Motor Vehicle</td>
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<td>NGO</td>
<td>Non-Government Organisation</td>
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<td>NLTP</td>
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<td>Non-Motorised Vehicle</td>
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<td>NOC</td>
<td>No Objection Certificate</td>
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<td>PAPs</td>
<td>Project Affected Persons</td>
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<td>PC</td>
<td>Project Coordinator</td>
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<td>PCP</td>
<td>Project Concept Paper</td>
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<td>PCU</td>
<td>Passenger Car Unit</td>
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<td>PNGO</td>
<td>Partner Non-Government Organisation</td>
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<td>PPCP</td>
<td>Preliminary Project Concept Paper</td>
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<td>PWD</td>
<td>Public Works Department</td>
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<td>Abbreviation</td>
<td>Full Form</td>
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<tr>
<td>RAJUK</td>
<td>Rajdhani Unnayan Kartripakkha</td>
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<td>RAP</td>
<td>Resettlement Action Plan</td>
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<td>RSC</td>
<td>Resettlement Supervision Consultant</td>
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<td>RDS</td>
<td>Short form of RDSC</td>
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<td>Road Design &amp; Safety Circle</td>
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<td>RDSD</td>
<td>Road Design &amp; Standard Division</td>
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<td>Roads &amp; Highways Department</td>
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<td>RHD-COP</td>
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<td>RO</td>
<td>Resettlement Officer</td>
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<td>Right of Way</td>
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<td>RP</td>
<td>Resettlement Plan</td>
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<td>Road Rehabilitation &amp; Maintenance Project</td>
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<td>Sub-Assistant Engineer</td>
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<td>SAP</td>
<td>Social Action Plan</td>
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<td>Social and Environment Circle</td>
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<td>SE-FC</td>
<td>Superintending Engineer-Field Circle</td>
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<td>SES</td>
<td>Socio-Economic Survey</td>
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<td>SEI</td>
<td>Significant Environmental Impact</td>
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<td>Senior Management Committee</td>
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<td>Terms of Reference</td>
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<td>TRL</td>
<td>Transport &amp; Research Laboratory</td>
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<td>Technical Services Wing</td>
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<td>Technical Services Wing Management Team</td>
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<td>UDA</td>
<td>Upper Division Assistant</td>
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<td>United Nations</td>
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<td>VF</td>
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<td>WB</td>
<td>World Bank</td>
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<td>XEN</td>
<td>Executive Engineer</td>
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SECTION 1 STRATEGY

INTRODUCTION

The Technical Services Wing has been created to focus the service providers within the RHD into a single Wing to provide in-house services where possible, and manage outsourcing of such services when resources are inadequate to meet demand. The Training and Bridge Design functions are now located in the Management Services Wing and Bridge Management Wing respectively.

The Management Plan is based on the RHD Organisation as shown in figure 1.1.

OBJECTIVE

The objective of the Technical Services Wing is to ensure the best practices in RHD by establishing design and construction standards and providing in-house and outsourced services in road design, environmental and social impact mitigation, road safety, quality control and research.

MAIN OUTPUTS

The main outputs of the Technical Services Wing are:

♦ Road design and other standards for all RHD operations maintained and periodically updated.
♦ Design services for road rehabilitation, improvements and new construction produced and provided.
♦ All roads, bridges and other facilities within RHD afford the highest possible standards of safety to the public and that environmental mitigation measures are provided and maintained throughout the network.
♦ Impact of new construction or improvements minimises the social impacts to the population through participatory processes for land acquisition and resettlement.
♦ Standards of construction raised through research and quality control and the implementation of appropriate design standards, technical specifications and contract documents.
♦ Contribute to environmental improvements, protection of embankments and the demolition and utilisation of RHD land through the effective management of an arboriculture program.
ORGANISATION

The organogram for the training Wing (December 2003) is shown below:

Organogram of Technical Services Wing
The Technical Services Wing consists of four Circles each headed by an officer of Superintending Engineer Level. The total proposed staffing for the Wing is 413 persons comprising 53 Class I officers, 14 Class II officers, 193 Class III and 153 Class IV staff.

Certain officers in the Technical Services Wing are to be designated as specialists. Specialist posts for engineers with specialist training are star marked thus, EE*. Specialist posts for engineers, or non-engineers, with specialist qualifications are shown together with the equivalent engineering grade thus, Exec. Transport Economist (EEX).

The detailed personnel figures are shown in the Personnel and Organogram Databases.

**ACTIVITIES**

The main activities of the wing and its circles are summarised below:

♦ Develop a service-oriented culture within the wing focused on service to customers through provision of in-houses, services, and outsourced consultancy contracts.

♦ Establish the framework wherein services (investigation, survey, design and supervision) can be provided to the Department.

♦ Develop a demand for Technical Services and support from the other Wings by promoting the Wing’s capabilities throughout RHD.

♦ Identify and develop Design and Quality Standards (geometric, pavement, bridge, environment & resettlement, safety etc.).

♦ Undertake (or procure) detailed design services of roads.

♦ Undertake or procure additional surveys as may be necessary to carry out designs.

♦ Develop and regularly update specifications and contract documents to keep RHD in the forefront of technological improvements.

♦ Establish and periodically update Standard Test Procedures for quality control of all standards and types of work.

♦ Develop and apply quality control systems on all RHD projects (both development and maintenance).

♦ Monitor the operation of field and contract laboratories and ensure equipment is adequate for the purpose and correctly adjusted.
♦ Manage plantations and replanting through own resources and outsourced providers. This includes liaison with other departments and ministries involved in tree planting.

♦ Carry out environmental and resettlement audits on prospective and ongoing projects, advise projects on environmental & resettlement issues and monitor all environmental and resettlement activities.

Further details on the activities of the Wing may be found in the Operational Plans of individual Circles.

**INDICATIVE ANNUAL BUDGET**

The total indicative budget for the Wing is shown in TABLE-1.1. Individual budgets are included in the operational plan of each Circle.
FIGURE 1.1 - ORGANOGRAM OF ROADS AND HIGHWAYS DEPARTMENT
### 1) RUNNING COSTS:

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Rate (Taka)</th>
<th>Total Cost (Taka)</th>
<th>No. per Year</th>
<th>Annual Cost (Lacs)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operation &amp; Maintenance:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicle Operation &amp; Maintenance</td>
<td>48.00</td>
<td>15000.00</td>
<td>720000.00</td>
<td>12.00</td>
<td>86.40</td>
</tr>
<tr>
<td>Stationary, Copying &amp; Consumables</td>
<td>13.50</td>
<td>10000.00</td>
<td>135000.00</td>
<td>12.00</td>
<td>16.20</td>
</tr>
<tr>
<td>Computer Operations &amp; Maintenance</td>
<td>44.00</td>
<td>3000.00</td>
<td>132000.00</td>
<td>12.00</td>
<td>15.84</td>
</tr>
<tr>
<td>Printing (external printers)</td>
<td>41.00</td>
<td>1000.00</td>
<td>387000.00</td>
<td>12.00</td>
<td>5.19</td>
</tr>
<tr>
<td>Office Equipment Maintenance</td>
<td>7.00</td>
<td>10000.00</td>
<td>45000.00</td>
<td>12.00</td>
<td>2.10</td>
</tr>
<tr>
<td>Repair of AC/Fax/Photocopier etc./HLM M</td>
<td>11.00</td>
<td>300000.00</td>
<td>320000.00</td>
<td>12.00</td>
<td>3.20</td>
</tr>
<tr>
<td>Purchase/Rep.of lab.Equip./Chemicals/M.C.</td>
<td>22.00</td>
<td>200000.00</td>
<td>221000.00</td>
<td>12.00</td>
<td>4.52</td>
</tr>
<tr>
<td><strong>Services (investigations, surveys etc.)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investigation, survey, studies, designs etc.</td>
<td>2.00</td>
<td>15000000.00</td>
<td>15005000.00</td>
<td>1.00</td>
<td>150.30</td>
</tr>
<tr>
<td>(details in circle budget sheets)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blacksport design/EIA study/research work</td>
<td>27.00</td>
<td>15000000.00</td>
<td>9200000.00</td>
<td>1.00</td>
<td>107.00</td>
</tr>
<tr>
<td>Safety audit/Env. Invest./outsourcing</td>
<td>41.00</td>
<td>50000.00</td>
<td>1340000.00</td>
<td>1.00</td>
<td>45.80</td>
</tr>
<tr>
<td>Layout design/resettlement study/tree Inv.</td>
<td>16.00</td>
<td>300000.00</td>
<td>2925000.00</td>
<td>1.00</td>
<td>42.00</td>
</tr>
<tr>
<td>Const. of black spot &amp; survey of lands/tree</td>
<td>9.00</td>
<td>400000.00</td>
<td>3700000.00</td>
<td>1.00</td>
<td>37.00</td>
</tr>
<tr>
<td>Updating of manuals</td>
<td>1.00</td>
<td>180000.00</td>
<td>180000.00</td>
<td>1.00</td>
<td>1.80</td>
</tr>
<tr>
<td><strong>TOTAL 1: (Lacs)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>517.35</td>
</tr>
</tbody>
</table>

### 2) CAPITAL COSTS: (Purchase and periodic replacement of all equipment etc.)

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Rate (Lacs)</th>
<th>Total Cost (Lacs)</th>
<th>Life (Years)</th>
<th>Avg Annual Cost (Lacs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicles1: Jeep</td>
<td>21.00</td>
<td>25.00</td>
<td>400.00</td>
<td>8.00</td>
<td>65.63</td>
</tr>
<tr>
<td>Vehicles2: Pickup</td>
<td>25.00</td>
<td>15.00</td>
<td>375.00</td>
<td>10.00</td>
<td>37.50</td>
</tr>
<tr>
<td>Vehicles3: Car</td>
<td>23.00</td>
<td>20.00</td>
<td>71.50</td>
<td>8.00</td>
<td>8.94</td>
</tr>
<tr>
<td>Computer &amp; Accessories (general office)</td>
<td>41.00</td>
<td>1.00</td>
<td>41.00</td>
<td>10.00</td>
<td>10.25</td>
</tr>
<tr>
<td>Computer &amp; Accessories (specialist)</td>
<td>3.00</td>
<td>1.00</td>
<td>6.00</td>
<td>4.00</td>
<td>1.50</td>
</tr>
<tr>
<td>Specialist Computer Software</td>
<td>5.00</td>
<td>2.00</td>
<td>34.00</td>
<td>4.00</td>
<td>8.50</td>
</tr>
<tr>
<td>Photocopier</td>
<td>11.00</td>
<td>2.00</td>
<td>22.00</td>
<td>4.00</td>
<td>5.50</td>
</tr>
<tr>
<td>Fax machine</td>
<td>6.00</td>
<td>1.00</td>
<td>6.00</td>
<td>4.00</td>
<td>1.50</td>
</tr>
<tr>
<td>Air Conditioner</td>
<td>18.00</td>
<td>0.50</td>
<td>9.00</td>
<td>5.00</td>
<td>1.80</td>
</tr>
<tr>
<td>Specialist Equipment</td>
<td>9.00</td>
<td>3.00</td>
<td>55.00</td>
<td>5.00</td>
<td>13.00</td>
</tr>
<tr>
<td>Office Furniture &amp; Fixtures</td>
<td>11.00</td>
<td>0.50</td>
<td>8.50</td>
<td>10.00</td>
<td>0.85</td>
</tr>
<tr>
<td>Office Refurbishment</td>
<td>6.00</td>
<td>2.00</td>
<td>7.00</td>
<td>10.00</td>
<td>0.70</td>
</tr>
<tr>
<td>Replacement/Prepare of machine/guideline</td>
<td>7.00</td>
<td>200.00</td>
<td>222.00</td>
<td>10.00</td>
<td>20.50</td>
</tr>
<tr>
<td>Replacement/Prepare of machine/guideline</td>
<td>11.00</td>
<td>20.00</td>
<td>21.50</td>
<td>10.00</td>
<td>0.38</td>
</tr>
<tr>
<td><strong>TOTAL 2: (Lacs)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1278.50</td>
</tr>
<tr>
<td><strong>GRAND TOTAL (1 + 2)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>693.89</td>
</tr>
</tbody>
</table>

TOTAL EQUIVALENT ANNUAL BUDGET = Taka 694 Lacs

TOTAL INDICATIVE ANNUAL BUDGET - TECHNICAL SERVICES WING - TABLE 1.1

(Based on 2003-2004 Financial Year)
SECTION 2  OFFICE OF THE ADDITIONAL CHIEF ENGINEER
OPERATIONAL PLAN

INTRODUCTION

The Additional Chief Engineer’s Office is responsible for the overall management of the Technical Services Wing. The main outputs and activities are shown in Section 1.

OBJECTIVE

The objective of the office is to:

*Manage all operations in the Technical Services Wing and ensure that the Strategy for the Wing is fully achieved and the Management Plans are applied.*

ORGANISATION

The basic organisational structure of the office of Additional Chief Engineer is as follows:

<table>
<thead>
<tr>
<th>Additional Chief Engineer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical Services Wing</td>
</tr>
<tr>
<td>(AE-1, SAE-1)</td>
</tr>
</tbody>
</table>

The organisation of the Office of the Additional Chief Engineer consists of the ACE, a staff officer of AE level and office support staff. The total number of personnel is 15. The detailed personnel figures are shown in the Personnel and Organogram Databases.

RESOURCES

The Office of the Additional Chief Engineer requires resources for Head Office operations and to enable the ACE to make periodic field inspection visits.

The resources required are shown in the table below:

<table>
<thead>
<tr>
<th>Item</th>
<th>Existing (2003)</th>
<th>Proposed Total Requirement</th>
<th>Additional Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Inspection Vehicles</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2. Computer with printer</td>
<td>1</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>3. Photocopier</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>4. Air Cooler</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>5. Fax Machine</td>
<td>-</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
INDICATIVE BUDGET

The indicative budget for the Office of the Additional Chief Engineer is shown in TABLE-2.1. The budget table shows both the annual operation and maintenance costs and the capital costs of purchasing new and replacing old equipment. As not all equipment will be purchased or replaced immediately the capital cost has been annualised depending on the average life of the various items of equipment. The costs shown exclude the cost of personnel who are paid for from other sources.

On this basis the annual recurring cost for the Office of the Additional Chief Engineer is Taka 7 lacs and the capital costs on an annualised basis is Taka 8 lacs. This gives a total cost of Taka 15 lacs per annum.
1) **RUNNING COSTS:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Rate (Taka)</th>
<th>Total Cost (Taka)</th>
<th>No. per Year</th>
<th>Annual Cost (Lacs)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operation &amp; Maintenance:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicle Operation &amp; Maintenance</td>
<td>2.00</td>
<td>15000.00</td>
<td>30000.00</td>
<td>12.00</td>
<td>3.60</td>
</tr>
<tr>
<td>Stationary, Copying &amp; Consumables</td>
<td>0.50</td>
<td>10000.00</td>
<td>5000.00</td>
<td>12.00</td>
<td>0.60</td>
</tr>
<tr>
<td>Computer Operations &amp; Maintenance</td>
<td>3.00</td>
<td>3000.00</td>
<td>9000.00</td>
<td>12.00</td>
<td>1.08</td>
</tr>
<tr>
<td>Printing (external printers)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Office Equipment Maintenance</td>
<td>1.00</td>
<td>10000.00</td>
<td>10000.00</td>
<td>12.00</td>
<td>1.20</td>
</tr>
<tr>
<td><strong>Services (investigations, surveys etc.):</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inspection visit etc.</td>
<td>1.00</td>
<td>5000.00</td>
<td>5000.00</td>
<td>6.00</td>
<td>0.30</td>
</tr>
</tbody>
</table>

**Total 1:** (Lacs) 6.78

2) **CAPITAL COSTS:** (Purchase and periodic replacement of all equipment etc.)

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Rate (Lacs)</th>
<th>Total Cost (Lacs)</th>
<th>Life (Years)</th>
<th>Avg Annual Cost (Lacs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicles1: Jeep</td>
<td>2.00</td>
<td>25.00</td>
<td>50.00</td>
<td>8.00</td>
<td>6.25</td>
</tr>
<tr>
<td>Vehicles2: Pickup</td>
<td>0.00</td>
<td>15.00</td>
<td>0.00</td>
<td>10.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Vehicles3: Car</td>
<td>0.00</td>
<td>20.00</td>
<td>0.00</td>
<td>8.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Computer &amp; Accessories (general office)</td>
<td>3.00</td>
<td>1.00</td>
<td>3.00</td>
<td>4.00</td>
<td>0.75</td>
</tr>
<tr>
<td>Computer &amp; Accessories (specialist)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>4.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Specialist Computer Software</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>4.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Photocopier</td>
<td>1.00</td>
<td>2.00</td>
<td>2.00</td>
<td>4.00</td>
<td>0.50</td>
</tr>
<tr>
<td>Fax machine</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>4.00</td>
<td>0.25</td>
</tr>
<tr>
<td>Air Conditioner</td>
<td>2.00</td>
<td>0.50</td>
<td>1.00</td>
<td>5.00</td>
<td>0.20</td>
</tr>
<tr>
<td>Specialist Equipment</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Office Furniture &amp; Fixtures</td>
<td>1.00</td>
<td>2.00</td>
<td>2.00</td>
<td>10.00</td>
<td>0.20</td>
</tr>
<tr>
<td>Office Refurbishment</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>10.00</td>
<td>0.10</td>
</tr>
</tbody>
</table>

**Total 2:** (Lacs) 60.00

**Grand Total (1 + 2):** 15.03

**Total Equivalent Annual Budget = Taka 15 Lacs**

**Total Indicative Annual Budget - Office of Ace Technical Services - Table 2.1**

*(Based on 2003-2004 Financial Year)*
SECTION 3 ROAD DESIGN & SAFETY CIRCLE

OPERATIONAL PLAN

INTRODUCTION

This Road Design & Safety Circle consists of two divisions which are: the Road Design & Standards Division and the Road Safety Division (located at RHD Headquarters building).

OBJECTIVES

The objective of the Road Design & Safety Circle is to contribute to the overall strategy of the Technical Services Wing by:

*Developing and monitoring RHD road design standards and managing the design of new and upgraded RHD roads whilst ensuring that all roads on the existing and proposed RHD road network conform to acceptable standards of Road Safety Engineering.*

OUTPUTS

- To provide updated Standard Design Manuals and Technical Specifications maintained and updated, and new RHD Manuals developed as required.
- Annual Accident Report.
- Road Safety Counter-measure Designs of identified road accident hazards.
- Road Safety Audit reports on national, regional and major feeder road and bridge projects.
- Road Designs provided for national, regional and major feeder road projects and to provide Audit reports on undertaken projects.

ORGANISATION

The Road Design & Safety Circle is headed by a Superintending Engineer (SE) supported by two Executive Engineers in charge of divisions, namely:

- Road Design & Standard Division
- Road Safety Division
The organogram for the circle (December 2003) is shown below:

The number of existing and approved personnel in the circle are shown in the Personnel and Organogram databases. The total proposed number of personnel in the Circle to be 40, which is significantly more than sanctioned strength. The proposed number of personnel of the Circle is 9 Class I, 6 Class II, 17 Class III and 8 Class IV staff.

Certain officers in the Road Design & Safety Circle are to be designated as specialists. Specialist posts for engineers with specialist training are star marked thus, EE*.

**ACTIVITIES**

♦ Monitor, evaluate and updating the existing RHD Standard Design Manuals and Technical Specifications.

♦ Manage development of RHD Manuals.

♦ Liaise with Police Headquarters, Rangers and also RHD field offices for collection of accident data for RHD roads and processing of collected data.

♦ Manage Road Safety Audits of national, regional and major feeder road and bridge projects by internal sources or outsourcing.

♦ Provide technical advice to the Road Safety component of Foreign Aided and GoB projects.

♦ Undertake demonstration projects on accident reduction (one or two black spot/year).

♦ Manage Design Counter-measures of identified road accident hazards.

♦ Manage the design of layout of road signs and markings.

♦ Manage necessary surveys, traffic data collection and other geometric design parameters and collect information about the soil, river and water channel (for design of roads).

♦ Provide training on Road Design and Safety Engineering in conjunction with RHDTTC Training Circle’s engineers/support staff and build safety awareness and culture in RHD.
Manage auditing of design and safety on completed projects and roads acquired to ensure compliance with standards.

Procure small consultancy services for the circle.

Note: Ideally each year at least five engineers should be trained abroad and each year, and eighteen engineers and twenty staff should be trained in Bangladesh.

RESOURCES

The Road Design & Safety Circle requires resources for Head Quarters' operations and to enable the Circle to undertake necessary surveys, investigations etc., using both the Circles’ own resources and local consultants.

The resources required are shown in Table below:

<table>
<thead>
<tr>
<th>Item</th>
<th>Existing (2003)</th>
<th>Proposed Total Requirement</th>
<th>Additional Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Vehicles</td>
<td>1</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>2. Computer (general)</td>
<td>3*</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>3. Computer (specialised)</td>
<td>0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4. Photocopier</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>5. Fax Machine</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>6. Air Conditioner</td>
<td>1</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>8. Plotter</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>9. Scanner</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>10. Laser Jet Colour Printer</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

*Note: The existing computers are old and need replacement.

INDICATIVE BUDGET

The indicative budget for the Road Design & Safety Circle is shown in TABLE-3.1. The budget table shows both the annual operation and maintenance costs and the capital costs of purchasing new, and replacing old equipment. As not all equipment will be purchased or replaced immediately the capital cost has been annualised depending on the average life of the various items of equipment. The costs shown exclude the cost of personnel who are paid for from other sources.

On this basis the annual recurring cost for the Circle is Taka 120 lacs and the capital cost on an annualised basis is Taka 37 lacs. A total cost of Taka 157 lacs per annum. Of this total amount Taka 99 lacs is to cover the costs of studies carried out by local consultants. But this must be reflected separately in the ADP as “Road Design” cost in the Road Projects.

WORK PLAN

The work plan of the Circle for the financial year based on the activities and resources detailed above is shown in FIGURE-3.1.
### 1) RUNNING COSTS:

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Rate (Taka)</th>
<th>Total Cost (Taka)</th>
<th>No. per Year</th>
<th>Annual Cost (Lacs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation &amp; Maintenance:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicle Operation &amp; Maintenance</td>
<td>6.00</td>
<td>15000.00</td>
<td>90000.00</td>
<td>12.00</td>
<td>10.80</td>
</tr>
<tr>
<td>Stationary, Copying &amp; Consumables</td>
<td>6.00</td>
<td>10000.00</td>
<td>60000.00</td>
<td>12.00</td>
<td>7.20</td>
</tr>
<tr>
<td>Computer Operations &amp; Maintenance</td>
<td>6.00</td>
<td>3000.00</td>
<td>18000.00</td>
<td>12.00</td>
<td>2.16</td>
</tr>
<tr>
<td>Printing (external printers)</td>
<td>10.00</td>
<td>1000.00</td>
<td>10000.00</td>
<td>12.00</td>
<td>1.20</td>
</tr>
<tr>
<td>Services (investigations, surveys etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investigation, survey, studies, designs etc. (details in circle budget sheets)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Black spot Countermeasure Design (10 spot package)</td>
<td>1.00</td>
<td>1500000.00</td>
<td>1500000.00</td>
<td>2.00</td>
<td>30.00</td>
</tr>
<tr>
<td>Safety Audit</td>
<td>1.00</td>
<td>750000.00</td>
<td>750000.00</td>
<td>4.00</td>
<td>30.00</td>
</tr>
<tr>
<td>Layout Design of road signs and marking (50.00 km Section)</td>
<td>1.00</td>
<td>425000.00</td>
<td>425000.00</td>
<td>4.00</td>
<td>17.00</td>
</tr>
<tr>
<td>Construction (demonstration) of Road Safety Countermeasure of one Black Spot</td>
<td>1.00</td>
<td>2000000.00</td>
<td>2000000.00</td>
<td>1.00</td>
<td>20.00</td>
</tr>
<tr>
<td>One Senior Local consultant for updating of manuals (3 months/year)</td>
<td>1.00</td>
<td>1800000.00</td>
<td>1800000.00</td>
<td>1.00</td>
<td>1.80</td>
</tr>
</tbody>
</table>

**TOTAL 1: (Lacs)** 120.16

### 2) CAPITAL COSTS: (Purchase and periodic replacement of all equipment etc.)

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Rate (Lacs)</th>
<th>Total Cost (Lacs)</th>
<th>Life (Years)</th>
<th>Avg Annual Cost (Lacs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicles1: Jeep</td>
<td>4.00</td>
<td>25.00</td>
<td>100.00</td>
<td>8.00</td>
<td>12.50</td>
</tr>
<tr>
<td>Vehicles2: Pickup</td>
<td>2.00</td>
<td>15.00</td>
<td>30.00</td>
<td>10.00</td>
<td>3.00</td>
</tr>
<tr>
<td>Vehicles3: Car</td>
<td>0.00</td>
<td>20.00</td>
<td>0.00</td>
<td>8.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Computer &amp; Accessories (general office)</td>
<td>3.00</td>
<td>1.00</td>
<td>3.00</td>
<td>4.00</td>
<td>0.75</td>
</tr>
<tr>
<td>Computer &amp; Accessories (specialist)</td>
<td>3.00</td>
<td>2.00</td>
<td>6.00</td>
<td>4.00</td>
<td>1.50</td>
</tr>
<tr>
<td>Specialist Computer Software</td>
<td>3.00</td>
<td>10.00</td>
<td>30.00</td>
<td>4.00</td>
<td>7.50</td>
</tr>
<tr>
<td>Photocopier</td>
<td>2.00</td>
<td>2.00</td>
<td>4.00</td>
<td>4.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Fax machine</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>4.00</td>
<td>0.25</td>
</tr>
<tr>
<td>Air Conditioner</td>
<td>4.00</td>
<td>0.50</td>
<td>2.00</td>
<td>5.00</td>
<td>0.40</td>
</tr>
<tr>
<td>Specialist Equipment</td>
<td>4.00</td>
<td>10.00</td>
<td>40.00</td>
<td>4.00</td>
<td>10.00</td>
</tr>
<tr>
<td>Office Furniture &amp; Fixtures</td>
<td>2.00</td>
<td>0.50</td>
<td>1.00</td>
<td>10.00</td>
<td>0.10</td>
</tr>
<tr>
<td>Office Refurbishment</td>
<td>2.00</td>
<td>0.50</td>
<td>1.00</td>
<td>10.00</td>
<td>0.10</td>
</tr>
</tbody>
</table>

**TOTAL 2: (Lacs)** 218.00

**GRAND TOTAL (1 + 2)** 157.26

**TOTAL EQUIVALENT ANNUAL BUDGET = Taka 157 Lacs**

**TOTAL INDICATIVE ANNUAL BUDGET - ROAD DESIGN & SAFETY CIRCLE - TABLE 3.1**

*(Based on 2003-2004 Financial Year)*
<table>
<thead>
<tr>
<th>TASK / PROGRAM / ITEM</th>
<th>JUL</th>
<th>AUG</th>
<th>SEP</th>
<th>OCT</th>
<th>NOV</th>
<th>DEC</th>
<th>JAN</th>
<th>FEB</th>
<th>MAR</th>
<th>APR</th>
<th>MAY</th>
<th>JUN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Monitor &amp; evaluate the standard manuals &amp; technical specification</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Update existing RHD standard manuals &amp; technical specifications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Conduct surveys, collection or information on traffic data, soil condition, river &amp; water channels (for road design)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4. Design of Road Projects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>5. Audit of completed projects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>6. Liaison with Police, collection and processing of accident data</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>7. Undertake Road Safety Audit</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>8. Provide technical directions to the Road Safety Projects (Foreign Aided)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>9. Construction of (one/two) Black Spot Counter-measure for demonstration</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Design of black spot counter-measures</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>11. To provide training on Road Design and Safety Engineering in conjunction with RHDT C</td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>12. Holding of meetings/seminars/workshops for all RHD officers &amp; staff</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

FIGURE - 3.1
SECTION 4  BRRL CIRCLE OPERATIONAL PLAN

INTRODUCTION

Since its creation, BRRL and its zonal field offices have been performing tests on different road and bridge construction materials sampled and supplied by field divisions. In addition, the necessary soil investigation and testing for bridge foundations are carried out. These practices are not enough to improve the quality of RHD works, as presently required. Therefore, to meet the present needs, BRRL Standard Test Procedures have been introduced and BRRL given authority, through new RHD contract documents. This Circle Operational Plan (COP) has been prepared considering all these factors, so that BRRL can play a proper role in overviewing the quality control issues of RHD works.

OBJECTIVES

The objective of the BRRL Circle is to contribute to the overall strategy of the Technical Services Wing by:

Providing research, testing and advisory services to the Department in connection with all aspects of construction materials and investigating geological strata within the right-of-way in order to ensure that all RHD constructions are carried out using the most appropriate materials/quality and soil conditions are determined in an accurate manner.

OUTPUTS

◆ Quality control reports from all zones.
◆ Soil Investigation Reports for design purposes and road pavement designs.
◆ Publication of research reports on materials related issues.
◆ Standard specifications item and Standard Test Procedures maintained and updated.
◆ All laboratory officers and staff trained.

ORGANISATION

The BRRL Circle is headed by a Superintending Engineer supported by three Executive Engineers, in charge of Divisions, namely:
Soil Investigation Division.

Material Testing & Maintenance Division.

Quality Control Division (including responsibility for 9 Field Laboratories).

The organogram for the circle (December 2003) is shown below:

**Organogram of the BRRL Circle**

Certain officers in the BRRL Circle are to be designated as specialists. Specialist posts for engineers with specialist training are star marked thus, EE*. Specialist posts for engineers, or non-engineers, with specialist qualifications are shown together with the equivalent engineering grade thus, Exec. Transport Economist (EE\x).

The number of existing and approved personnel in the Circle are shown in the Personnel and Organogram Databases. The total proposed number of personnel will be 200 which is greater than the sanctioned strength. However the increase is mainly due to the need for additional manpower in each division and computer operators under this Circle. The proposed number of personnel of this Circle is 24 Class I, 23 Class II, 78 Class III and 75 Class IV staff.

In due course the 9 Field Laboratories are to be replaced by 7 Zonal Laboratories.
ACTIVITIES

♦ To conduct audit of procedures and quality of RHD construction and maintenance works.
♦ To conduct soil investigations and tests required for design purposes.
♦ To conduct appropriate research work.
♦ To review and recommend amendments to Standard Test Procedures and Standard Specifications.
♦ To investigate particular failures in road/bridge construction works.
♦ To conduct training on testing procedures and specifications to the field laboratory personnel.

RESOURCES

The BRRL Circle requires resources for Head Quarter and field laboratories to enable the Circle to undertake necessary surveys, investigations etc.

The resources required are shown in the Table below:

<table>
<thead>
<tr>
<th>Item</th>
<th>Existing (2003)</th>
<th>Proposed Total Requirement</th>
<th>Additional Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Vehicle (pickup)</td>
<td>11</td>
<td>16</td>
<td>5</td>
</tr>
<tr>
<td>2. Car</td>
<td>*2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>3. Micro Bus</td>
<td>*2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>4. Vehicle (jeep)</td>
<td>6</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>5. Computer</td>
<td>4</td>
<td>24</td>
<td>20</td>
</tr>
<tr>
<td>6. Photocopier</td>
<td>1</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>7. Fax Machine</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>8. Air Conditioner</td>
<td>3</td>
<td>6</td>
<td>3</td>
</tr>
</tbody>
</table>

*Note: One (1) car and one (1) microbus are very old and hence need replacement. Temporarily these two vehicles may be used to fill up the shortage of vehicles in serial 4.

INDICATIVE BUDGET

The indicative budget for the BRRL Circle is shown in TABLE-4.1. The budget table shows both the annual operation and maintenance costs and the capital costs of purchasing new, and replacing old, equipment. The BRRL is authorised for carrying out tests/verification on the quality of works according to the approved standard specifications and methods. The circle requires involvement in constant research and investigation on all on-going works and when required the investigations and research studies, designs etc. will be out-sourced. An annual figure of Taka 150 lacs is included in the recurring costs for this purpose. To update the Standard Specifications and Test Procedures with latest technology, consequent training of the laboratory officers and staff, the advisory services has been proposed at 5 year intervals, for which Taka 50 lacs per year will be required. Since all the equipment
will not be purchased or replaced immediately, the capital cost has been annualised depending on the
average life of the various items of equipment.

On this basis the annual recurring cost for the Circle is Taka 262 lacs and the capital cost on an
annualised basis is Taka 77 lacs. A total cost of Taka 339 lacs per annum.

WORK PLAN

The work plan of the Circle for the financial year based on the activities and resources detailed above
is shown in FIGURE-4.1.
### 1) RUNNING COSTS:

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Rate (Taka)</th>
<th>Total Cost (Taka)</th>
<th>No. per Year</th>
<th>Annual Cost (Lacs)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operation &amp; Maintenance:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicle Operation &amp; Maintenance</td>
<td>24.00</td>
<td>15000.00</td>
<td>360000.00</td>
<td>12.00</td>
<td>43.20</td>
</tr>
<tr>
<td>Stationary, Copying &amp; Consumables</td>
<td>4.00</td>
<td>10000.00</td>
<td>40000.00</td>
<td>12.00</td>
<td>4.80</td>
</tr>
<tr>
<td>Computer Operations &amp; Maintenance</td>
<td>24.00</td>
<td>3000.00</td>
<td>72000.00</td>
<td>12.00</td>
<td>8.64</td>
</tr>
<tr>
<td>Printing (external printers)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Internet Costs</td>
<td>1.00</td>
<td>5000.00</td>
<td>5000.00</td>
<td>12.00</td>
<td>0.60</td>
</tr>
<tr>
<td>Repair of AC/Fax/Photocopier etc.</td>
<td>1.00</td>
<td>300000.00</td>
<td>300000.00</td>
<td>1.00</td>
<td>3.00</td>
</tr>
<tr>
<td>Purchase/Rep. of Lab. Equip./Chemicals</td>
<td>1.00</td>
<td>200000.00</td>
<td>200000.00</td>
<td>1.00</td>
<td>2.00</td>
</tr>
<tr>
<td><strong>Services (investigations, surveys etc.)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investigation, research studies, designs etc.</td>
<td>1.00</td>
<td>15000000.00</td>
<td>15000000.00</td>
<td>1.00</td>
<td>150.00</td>
</tr>
<tr>
<td>Advisory Services for laboratory</td>
<td>5.00</td>
<td>1000000.00</td>
<td>5000000.00</td>
<td>1.00</td>
<td>50.00</td>
</tr>
</tbody>
</table>

**TOTAL 1: (Lacs)** 262.24

### 2) CAPITAL COSTS: (Purchase and periodic replacement of all equipment etc.)

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Rate (Lacs)</th>
<th>Total Cost (Lacs)</th>
<th>Life (Years)</th>
<th>Avg Annual Cost (Lacs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicles1: Jeep</td>
<td>6.00</td>
<td>25.00</td>
<td>150.00</td>
<td>8.00</td>
<td>18.75</td>
</tr>
<tr>
<td>Vehicles2: Pick-up</td>
<td>16.00</td>
<td>15.00</td>
<td>240.00</td>
<td>10.00</td>
<td>24.00</td>
</tr>
<tr>
<td>Vehicles3: Car/ Microbus</td>
<td>2.00</td>
<td>20.00</td>
<td>40.00</td>
<td>8.00</td>
<td>5.00</td>
</tr>
<tr>
<td>Computer &amp; Accessories (general office)</td>
<td>24.00</td>
<td>1.00</td>
<td>24.00</td>
<td>4.00</td>
<td>6.00</td>
</tr>
<tr>
<td>Computer &amp; Accessories (specialist)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>4.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Specialist Computer Software</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>4.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Photocopier</td>
<td>4.00</td>
<td>2.00</td>
<td>8.00</td>
<td>4.00</td>
<td>2.00</td>
</tr>
<tr>
<td>Fax machine</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>4.00</td>
<td>0.25</td>
</tr>
<tr>
<td>Air Conditioner</td>
<td>6.00</td>
<td>0.50</td>
<td>3.00</td>
<td>5.00</td>
<td>0.60</td>
</tr>
<tr>
<td>Specialist Equipment</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Office Furniture &amp; Fixtures</td>
<td>6.00</td>
<td>0.50</td>
<td>3.00</td>
<td>10.00</td>
<td>0.30</td>
</tr>
<tr>
<td>Office Refurbishment</td>
<td>1.00</td>
<td>2.00</td>
<td>2.00</td>
<td>10.00</td>
<td>0.20</td>
</tr>
<tr>
<td>Replacement &amp; New Lab Equipment</td>
<td>1.00</td>
<td>200.00</td>
<td>200.00</td>
<td>10.00</td>
<td>20.00</td>
</tr>
</tbody>
</table>

**TOTAL 2: (Lacs)** 671.00  77.10

**GRAND TOTAL (1 + 2)** 339.34

TOTAL EQUIVALENT ANNUAL BUDGET = Taka 339 Lacs

TOTAL INDICATIVE ANNUAL BUDGET - BRRL CIRCLE - TABLE 4.1

*(Based on 2003-2004 Financial Year)*
### Circle Work Plan

**Year:** Typical

<table>
<thead>
<tr>
<th>TASK / PROGRAM / ITEM</th>
<th>JUL</th>
<th>AUG</th>
<th>SEP</th>
<th>OCT</th>
<th>NOV</th>
<th>DEC</th>
<th>JAN</th>
<th>FEB</th>
<th>MAR</th>
<th>APR</th>
<th>MAY</th>
<th>JUN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Testing of construction materials.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Sub-Soil Investigation of bridges/road embankment.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. In-Situ tests e.g. field density, CBR etc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>5. Audit of Procedures of testing and construction/maintenance works.</td>
<td></td>
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</tr>
<tr>
<td>8. Training of Zonal staff.</td>
<td></td>
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</tr>
<tr>
<td>9. Conduct appropriate research work.</td>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

**FIGURE - 4.1**

- **Wing:** Technical Services
- **Circle:** BRRL
SECTION 5 SOCIAL & ENVIRONMENT CIRCLE OPERATIONAL PLAN

INTRODUCTION
The Social & Environment Circle is a new circle, which includes two divisions the Resettlement Division and the Environment Division.

OBJECTIVES
The objective of the Social & Environment Circle is to contribute to the overall strategy of the Technical Services Wing by:

* Ensuring all RHD works and projects are executed in accordance with appropriate environmental and social standards and practices.*

OUTPUTS
♦ Fair, effective, consistent re-settlement practices for RHD Road and Bridge Projects establishment.
♦ Social impact of RHD projects and works minimised.
♦ Highest possible environmental standards maintained on all RHD works and projects.

ORGANISATION
The Social & Environment Circle is headed by a Superintending Engineer (SE) supported by two Executive Engineer each in charge of a Division, namely:

♦ Resettlement Division.
♦ Environment Division.

The organogram for the circle (December 2003) is shown in the next page
Organogram of the Social & Environment Circle

The numbers of existing and approved personnel in the Circle are shown in the Personnel and Organogram Databases. The total proposed number of personnel in the Circle to be 47, which is greater than the current sanctioned strength. There are also some changes in the numbers of staff in individual posts. The proposed number of personnel of the Circle is 9 Class I, 6 Class II, 24 Class III and 8 Class IV staffs. The posts for engineers with specialist training are stars marked thus, EE*.

**ACTIVITIES**

♦ To establish appropriate Resettlement Standards and guidelines for RHD.
♦ To establish appropriate environmental standards and guidelines for RHD.
♦ To monitor the Resettlement, Social and Environmental issues of on-going and existing RHD projects and works.
♦ To procure necessary Environmental Impact Assessment (EIA) and Initial Environmental Examination (IEE) for RHD projects and works.
♦ To monitor environmental mitigation measures throughout implementation of projects.
♦ To monitor long-term environmental impact on selected projects.
♦ To procure preparation of environmental management plans for RHD projects.
♦ To monitoring implementation of environmental management plans for RHD projects.
♦ To disseminate the need for high social and environmental standards throughout RHD and to the general public through research, publicity, seminars and training.
♦ To procure training for 3(three) no. of officers per year through RHDTN in environmental and social issues.
RESOURCES

The Social & Environment Circle requires resources for Head Quarters' operations and to enable the Circle to undertake necessary surveys, investigations etc. using both the Circle’s own resources and local consultants.

The resources required are shown in the Table below:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Vehicles</td>
<td>2</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>2. Computer</td>
<td>3</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>3. Photocopier</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>4. Fax Machine</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>5. Air Conditioner</td>
<td>1</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

INDICATIVE BUDGET

The indicative budget for the Social & Environment Circle is shown in TABLE-5.1. The budget table shows both the annual operation and maintenance costs and the capital costs of purchasing new and replacing of old equipment. Since all the equipment will not be purchased or replaced immediately the capital cost has been annualised depending on the average life of the various items of equipment. The costs shown exclude the cost of personnel who are paid from other sources.

On this basis the annual recurring cost for the Circle is Taka 125 lacs and the capital cost on an annualised basis is Taka 22 lacs. A total cost of Taka 147 lacs per annum. Of this total amount Taka 107 lacs is to cover the costs of activities carried out by local consultants.

As this is a new circle an additional Taka 50 lacs will be required to cover the cost of 2 vehicles and essential new equipment in the first year. Guideline for Environmental standards and another one for Resettlement will be prepared in the first year at a cost Taka. 20 lacs each.

WORK PLAN

The work plan of the Circle for the financial year based on the activities and resources detailed above is shown in FIGURE-5.1.
### 1) RUNNING COSTS:

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Rate (Taka)</th>
<th>Total Cost (Taka)</th>
<th>No. per Year</th>
<th>Annual Cost (Lacs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation &amp; Maintenance:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicle Operation &amp; Maintenance</td>
<td>6.00</td>
<td>15000.00</td>
<td>90000.00</td>
<td>12.00</td>
<td>10.80</td>
</tr>
<tr>
<td>Stationary, Copying &amp; Consumables</td>
<td>1.00</td>
<td>10000.00</td>
<td>10000.00</td>
<td>12.00</td>
<td>1.20</td>
</tr>
<tr>
<td>Computer Operations &amp; Maintenance</td>
<td>6.00</td>
<td>3000.00</td>
<td>18000.00</td>
<td>12.00</td>
<td>2.16</td>
</tr>
<tr>
<td>Printing (external printers)</td>
<td>30.00</td>
<td>12500.00</td>
<td>375000.00</td>
<td>1.00</td>
<td>3.75</td>
</tr>
<tr>
<td>Services (investigations, surveys etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investigation, survey, studies, designs etc.</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>(details in circle budget sheets)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Environment Impact Assessment</td>
<td>25.00</td>
<td>300000.00</td>
<td>7500000.00</td>
<td>1.00</td>
<td>75.00</td>
</tr>
<tr>
<td>Environmental Investigation</td>
<td>10.00</td>
<td>500000.00</td>
<td>500000.00</td>
<td>1.00</td>
<td>5.00</td>
</tr>
<tr>
<td>Re-settlement Studies</td>
<td>5.00</td>
<td>300000.00</td>
<td>1500000.00</td>
<td>1.00</td>
<td>15.00</td>
</tr>
<tr>
<td>Land Surveys</td>
<td>3.00</td>
<td>400000.00</td>
<td>1200000.00</td>
<td>1.00</td>
<td>12.00</td>
</tr>
<tr>
<td><strong>TOTAL 1: (Lacs)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>124.91</td>
</tr>
</tbody>
</table>

### 2) CAPITAL COSTS: (Purchase and periodic replacement of all equipment etc.)

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Rate (Lacs)</th>
<th>Total Cost (Lacs)</th>
<th>Life (Years)</th>
<th>Avg Annual Cost (Lacs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicles1: Jeep</td>
<td>4.00</td>
<td>25.00</td>
<td>100.00</td>
<td>8.00</td>
<td>12.50</td>
</tr>
<tr>
<td>Vehicles2: Pickup</td>
<td>2.00</td>
<td>15.00</td>
<td>30.00</td>
<td>10.00</td>
<td>3.00</td>
</tr>
<tr>
<td>Vehicles3: Car</td>
<td>0.00</td>
<td>20.00</td>
<td>0.00</td>
<td>8.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Computer &amp; Accessories (general office)</td>
<td>6.00</td>
<td>1.00</td>
<td>6.00</td>
<td>4.00</td>
<td>1.50</td>
</tr>
<tr>
<td>Computer &amp; Accessories (specialist)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>4.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Specialist Computer Software</td>
<td>2.00</td>
<td>2.00</td>
<td>4.00</td>
<td>4.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Photocopyer</td>
<td>1.00</td>
<td>2.00</td>
<td>2.00</td>
<td>4.00</td>
<td>0.50</td>
</tr>
<tr>
<td>Fax machine</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>4.00</td>
<td>0.25</td>
</tr>
<tr>
<td>Air Conditioner</td>
<td>3.00</td>
<td>0.50</td>
<td>1.50</td>
<td>5.00</td>
<td>0.30</td>
</tr>
<tr>
<td>Specialist Equipment</td>
<td>5.00</td>
<td>3.00</td>
<td>15.00</td>
<td>5.00</td>
<td>3.00</td>
</tr>
<tr>
<td>Office Furniture &amp; Fixtures</td>
<td>1.00</td>
<td>2.00</td>
<td>2.00</td>
<td>10.00</td>
<td>0.20</td>
</tr>
<tr>
<td>Office Refurbishment</td>
<td>1.00</td>
<td>2.00</td>
<td>2.00</td>
<td>10.00</td>
<td>0.20</td>
</tr>
<tr>
<td>Preparation of Environmental Guidelines</td>
<td>1.00</td>
<td>20.00</td>
<td>20.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Preparation of Resettlement Guidelines</td>
<td>1.00</td>
<td>20.00</td>
<td>20.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>TOTAL 2: (Lacs)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>203.50</td>
</tr>
</tbody>
</table>

**GRAND TOTAL (1 + 2) = 147.36**

**TOTAL EQUIVALENT ANNUAL BUDGET = Taka 147 Lacs**

**TOTAL INDICATIVE ANNUAL BUDGET - SOCIAL & ENVIRONMENT CIRCLE - TABLE 5.1**

*(Based on 2003-2004 Financial Year)*
<table>
<thead>
<tr>
<th>TASK / PROGRAM / ITEM</th>
<th>JUL</th>
<th>AUG</th>
<th>SEP</th>
<th>OCT</th>
<th>NOV</th>
<th>DEC</th>
<th>JAN</th>
<th>FEB</th>
<th>MAR</th>
<th>APR</th>
<th>MAY</th>
<th>JUN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Establish Resettlement guideline</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Establish Environmental Manuals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Monitor resettlement &amp; environmental issues</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Procure EIAs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5. Monitor Environmental mitigation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>6. Monitor long-term Environment impacts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Procure &amp; implement Environmental Management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Disseminate good Environ. &amp; Social Practices</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. National Policy on Re-settlement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Staff Training/workshop</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**FIGURE - 5.1**
SECTION 6  ARBORICULTURE CIRCLE OPERATIONAL PLAN

INTRODUCTION

The Arboriculture Circle was created in 1976 with four divisions, covering the existing four administrative areas when the total length of roads under the RHD Road Network was less than 4000km. A major change was made in 1982 by the Enam Committee abolishing the Circle leaving only one division at Dhaka. The present operation is as per the 1992 re-organisation, which re-established the circle and created two divisions one at Dhaka and other at Rajshahi. These two divisions are required to cover the whole of Bangladesh for arboriculture operations and activities. Recently the Chief Engineer, RHD has issued instructions through an office-order no. Mis-11/02-413/1(100) dated 02/07/2003 , giving instructions on the procedures of arboriculture operations in the Zones, mandatory to be followed by the relevant offices. This gives authority to the field divisions to carry out a part of Government tree plantation programme, while overall responsibility remains with this Circle. The order has been appended at the end of this Circle Operational Plan as an annex for reference

OBJECTIVES

The objective of the Arboriculture Circle is to contribute to the overall strategy of the Technical Services Wing by:

Providing all plantation work on the RHD Road Network for improving landscapes, protecting against soil erosion and helping to sustain the ecological balance.

OUTPUTS

♦ Road embankments protected from erosion by plantation.
♦ Physical evidence established of RHD land ownership through tree planting.
♦ 'Green Spots'* created on lands along side the highways in order to sustain the ecological balance.
♦ Aesthetically pleasing landscapes developed for RHD stockyards and unutilised lands and establishment of nurseries for producing saplings.
♦ Effective management of RHD tree-stock.
♦ Technical advice and support provided on developing and maintaining ornamental gardens in the premises of RHD head office, residence & inspection bungalows.
♦ Report(s) produced of research/development on plantation.

*Note: Green Spot is an area of land adjacent to highways, which is planted with varieties of trees and herbs, on aesthetical reasons.
ORGANISATION

The Arboriculture Circle is headed by a Chief Arboriculturist (CA) supported by two Executive Arboriculturists (EA), who are each in charge of Division, namely:

♦ Operations Division (East)
♦ Operations Division (West)

The organogram for the circle (December 2003) is shown below:

Organogram of the Arboriculture Circle

The numbers of existing and approved personnel in the Circle are shown in the Personnel and Organogram Databases. The total proposed number of personnel in the Circle to be 136, which is slightly more than the sanctioned strength. There are also some changes in the numbers of staff in some posts. The proposed number of personnel of the Circle is 9 Class I, 2 Class II, 67 Class III and 58 Class IV.

Certain officers in the Arboriculture Circle are to be designated as specialists. Specialist posts for engineers, or non-engineers, with specialist qualifications are shown together with the equivalent engineering grade thus, Exec. Transport Economist (EEX).

Note: There are 21 numbers of Arboriculture Sectional Officers (ASO) who are now in class-III grade. The process for upgrading these posts to class-II grade as well as re-naming these posts as Sub-Assistant Arboriculturist is in progress.
ACTIVITIES

♦ Preparation of annual plantation programmes in RHD Zones and projects (including budget) in liaison with zonal field/project office and taking consideration of plantation programme of the forest department.

♦ Execution of plantation work on all new and existing roads by outsourcing/contractors.

♦ Facilitate demonstration programmes of plantation and raising awareness on arboricultural issues for example (tree plantation).

♦ Develop and manage “Green Spots” in RHD unused stock yards, borrow pits, berms, ditches and other fallow lands.

♦ Updating the inventory of existing trees and establishing linkages with road databases and GIS systems.

♦ Upgrading of existing nurseries and establishment of new nurseries to provide an adequate supply of the required species of saplings.

♦ Periodic monitoring of completed plantation work and providing regular feedback to the management.

♦ Managing removal and disposal of existing trees from RHD lands.

♦ Carry out research and development on types of trees and plants.

RESOURCES

The Arboriculture Circle needs requisite resources to enable the Circle to undertake the activities including necessary surveys, investigations etc. The present resources are inadequate to take up the existing responsibilities.

The resources required are shown in the Table below:

<table>
<thead>
<tr>
<th>Item</th>
<th>Existing (2003)</th>
<th>Proposed Total Requirement</th>
<th>Additional Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Vehicle (Jeep)</td>
<td>1</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>2. Vehicle (Pickup)</td>
<td>0</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>3. Motor Cycle</td>
<td>6</td>
<td>21</td>
<td>15</td>
</tr>
<tr>
<td>4. Computer</td>
<td>1</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>5. Photocopier</td>
<td>0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>6. Fax Machine</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>7. Air Conditioner</td>
<td>0</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>
INDICATIVE BUDGET

The indicative budget for the Arboriculture Circle is shown in TABLE-6.1. The budget table shows both the annual operation and maintenance costs and the capital costs of purchasing new, and replacing of old equipment. Since all the equipment will not be purchased or replaced immediately the capital cost has been annualised depending on the average life of the various items of equipment. The costs shown exclude the cost of personnel who are paid for from other sources.

On this basis the annual recurring cost for the Circle is Taka 53 lacs and the capital cost on an annualised basis is Taka 32 lacs. A total cost of Taka 85 lacs per annum. This budget is for maintenance expenditure of headquarters and other field offices excluding implementation of the annual plantation program.

The cost of plantation works are met from the annual development budget of RHD, which is about 2% of the total ADP allocation. This should be reflected separately in the ADP as “Arboriculture Operations” and be placed at the disposal of Arboriculture Circle in July to facilitate plantation work within the monsoon period.

WORK PLAN

The work plan of the Circle for the financial year based on the activities and resources detailed above is shown in FIGURE-6.1.
Appendix - Operation Plan of Arboriculture Circle

পশ্চিমবঙ্গ বাংলাদেশ সরকার
প্রধান প্রকৌশলী কার্যালয়
সড়ক ও জনপ্রফুল্ল অধিদপ্তর
সড়ক ভবন, রমনা, ঢাকা।

স্বার্থনাং

দণ্ডরাশি

বিষয়ঃ সড়ক ও জনপথ অধিদপ্তরের আওতাধীন সড়কের উভয় পার্শ্বে ও পতিত ভূমিতে বৃক্ষরোপন এবং।

দেশে বনজ সম্পন্ন বৃষ্টি ও পরিবেশ সংবংকরের লক্ষে বৃক্ষ রোপনের উপর সরকার কর্তৃক সর্বশক্তিযুক্ত দ্বারা দুর্বিধ হয়। এ প্রস্তুতি মানুষিক প্রকৌশলী আসন বর্ষা মৌসুমে বৃক্ষরোপন কর্মসূচীর আওতায় দেশে ব্যাপকভাবে বৃক্ষ রোপনের জন্য নির্দেশ প্রদান করেছেন।

সেই লক্ষে অধিদপ্তরের অধিনস্ত সড়ক সমূহের দুই পার্শ্বে বৃক্ষ রোপন কর্মক্ষেত্র ব্যাপক ও সুষ্ঠুভাবে সম্পাদনের জন্য নিযোগ নির্দেশনা সমূহ প্রদান করা হইল।

(1) প্রথম Sub-division এর অধিকার ৫ কিমি করিয়া বৃক্ষ রোপন করিতে হইবে। সংগঠন বিভাগীয় প্রকৌশলী অধিদপ্তরের বৃক্ষ পালন ইউনিটের অবস্থায় করিয়া বৃক্ষ পালন ইউনিট হইতে প্রণীত মনোপালন অনুসরণ পূর্বতন দরপত্র আবহাওয়ার মাধ্যমে অনিশ্চিত ৪৫ দিনের মধ্যে বৃক্ষ রোপন কর্মক্ষেত্র অবশেষ সম্পন্ন করিবেন। উক্ত রোপণ গাছ সমূহ রক্ষণাবেক্ষণের ব্যবস্থা দোদোদে অস্ত্রুভূত থাকিবে। উত্তর কাজের বিন্দুর পরিশোধের জন্য সংগঠন এলাকায় বৃক্ষ পালন ইউনিট থেকে "গাছ লাগান হইনা ও পরিচয় করা হইতেছে” মর্মে Certificate থাকিতে হইবে।

(2) বিভাগীয়ভাবে বৃক্ষ রোপন আওতার বাহির NGO, স্বায়ত্ত সমাধান সমূহের (জেলা পরিষদ, উপ-জেলা পরিষদ, ইউনিয়ন কাউন্সিল ইত্যাদি) কর্মকর্তাদের সহিত মোকাবেলা পূর্বক ইঙ্গিত প্রতিষ্ঠানের সহিত সম্পর্কে মারাক পূর্বক অধিক হারে বৃক্ষ রোপন কর্মসূচী বায়নায় ব্যবস্থা সংগঠন বিভাগ হইতে নিতে হইবে। একইভাবে সামাজিক বনায়ন স্থানীয় জনগণকে সম্পূর্ণ করিয়া বায়নায় ব্যবস্থা সংগঠন বিভাগ হইতে গ্রহণ করিতে হইবে।

(3) সংঘটিত নির্বাচনী প্রকৌশলী বৃক্ষ রোপনের গৃহীত কর্মক্ষেত্র বার্ষিকে প্রদর্শন পূর্বতন বায়নায় প্রতিভাবন ও জীবিত গাছের পরিসংখ্যান প্রতিভাবনের ১৫ তারিখের মধ্যে (জুলাই থেকে ডিসেম্বর পর্যন্ত) সংঘটিত এলাকার নির্বাচনী বৃক্ষপালনবিভাগ ও প্রধান বৃক্ষপালনবিভাগের অধিকার দায়িত্ব করিবেন। প্রধান বৃক্ষপালনবিভাগ Field Office থেকে প্রাপ্ত প্রতিভাবন একচরিত্র করিয়া ও প্রস্তুত করিবেন ও প্রতিভাবন (টেলি-সাইন) এর নিকট দাখিল করিবেন।

(4) সংঘটিত নির্বাচনী প্রকৌশলী বৃক্ষ রোপন কর্মক্ষেত্র ব্যাপক ও রোপণ গাছ সমূহ যথাযথ রক্ষণাবেক্ষণের জন্য প্রয়োজনীয় পদক্ষেপ গ্রহণ করিবেন। রোপিত গাছসমূহ সুস্থ রক্ষণাবেক্ষণের জন্য সংঘটিত শাখা প্রকৌশলী, উপ-বিভাগীয় প্রকৌশলী দৃষ্টিতে পরিচালন।

(5) সংঘটিত তত্ত্বাবধায়ক প্রকৌশলী তাঁবার অধিনস্ত বিভাগ সমূহের বৃক্ষ রোপন কর্মসূচী সঠিক ভাবে বায়নায় হইতেছে কিনা এবং রোপিত গাছ সমূহ যথাযথভাবে পরিচর্চা করা হইতেছে কিনা তারা। Monitor করিবেন।

Issue 1 December 2003 Page 6.5
(৬) বনবিভাগের সহিত সমঝোতা খাক্রের হেফিতে বনবিভাগ কর্তৃক অর্থ অধিদপ্তরের ৫০০০ কিলোগ্রাম রাস্তার ধারে বনায়ন করিবার যে কর্মসূচী রহিয়াছে সেই মোটামুটি বনবিভাগের সহিত সভা করিয়া অবিলম্বে প্রস্তাবিত সড়ক সমূহ চিহ্নিত করণ পূর্বক বনবিভাগ কর্তৃক যাহাতে সেই সমতল সড়ক পার্শ্বে বৃক্ষ রোপনের কর্মসূচী গৃহীত হয় সেই ব্যাপারে প্রধান বৃক্ষগানবিদ প্রয়োজনীয় ব্যবস্থা গ্রহণ করিবেন।

ইহা অতীব জরুরী।

(শেখ রবিউল ইসলাম)
প্রধান প্রকৌশলী (২৪ দাত)
সড়ক ও জলপথ অধিদপ্তর
সড়ক ভবন, রমনা, ঢাকা।

খারক নং

তারিখ : ।

অনুলিপি সন্য অবগতির জন্য প্রেরণ করা হইল ।

(১) সচিব, বোর্ডিং মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।

(শেখ রবিউল ইসলাম)
প্রধান প্রকৌশলী (২৪ দাত)
সড়ক ও জলপথ অধিদপ্তর
সড়ক ভবন, রমনা, ঢাকা।

খারক নং

তারিখ : ।

অনুলিপি অবগতি ও প্রয়োজনীয় ব্যবস্থা গ্রহণের জন্য প্রেরণ করা হইল ।

(১) অতিরিক্ত প্রধান প্রকৌশলী (সওজ) ------------------------------------------
(২) তৎক্ষনায়ক প্রকৌশলী (সওজ) ------------------------------------------
(৩) প্রধান বৃক্ষগানবিদ, সড়ক পরিষেবার, মিরপুর, ঢাকা।
(৪) নিবাসী প্রকৌশলী (সওজ) ------------------------------------------

(শেখ রবিউল ইসলাম)
প্রধান প্রকৌশলী (২৪ দাত)
সড়ক ও জলপথ অধিদপ্তর
সড়ক ভবন, রমনা, ঢাকা।
### 1) RUNNING COSTS:

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Rate (Taka)</th>
<th>Total Cost (Taka)</th>
<th>No. per Year</th>
<th>Annual Cost (Lacs)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operation &amp; Maintenance:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicle Operation &amp; Maintenance</td>
<td>10.00</td>
<td>15000.00</td>
<td>150000.00</td>
<td>12.00</td>
<td>18.00</td>
</tr>
<tr>
<td>Stationary, Copying &amp; Consumables</td>
<td>2.00</td>
<td>10000.00</td>
<td>20000.00</td>
<td>12.00</td>
<td>2.40</td>
</tr>
<tr>
<td>Computer Operations &amp; Maintenance</td>
<td>5.00</td>
<td>3000.00</td>
<td>15000.00</td>
<td>12.00</td>
<td>1.80</td>
</tr>
<tr>
<td>Printing (external printers)</td>
<td>1.00</td>
<td>2000.00</td>
<td>2000.00</td>
<td>12.00</td>
<td>0.24</td>
</tr>
<tr>
<td>Power Lawn Mower Machine</td>
<td>5.00</td>
<td>6000.00</td>
<td>30000.00</td>
<td>1.00</td>
<td>0.30</td>
</tr>
<tr>
<td>Hand Lawn Mower Machine</td>
<td>10.00</td>
<td>2000.00</td>
<td>20000.00</td>
<td>1.00</td>
<td>0.20</td>
</tr>
<tr>
<td>Motor Cycles</td>
<td>21.00</td>
<td>1000.00</td>
<td>21000.00</td>
<td>12.00</td>
<td>2.52</td>
</tr>
<tr>
<td><strong>Services (investigations, surveys etc.)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investigation, survey, studies, designs</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>(details in circle budget sheets)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Research work</td>
<td>1.00</td>
<td>200000.00</td>
<td>200000.00</td>
<td>1.00</td>
<td>2.00</td>
</tr>
<tr>
<td>Out source of specialized low level</td>
<td>30.00</td>
<td>3000.00</td>
<td>90000.00</td>
<td>12.00</td>
<td>10.80</td>
</tr>
<tr>
<td>worker (like Malies, Work Assistant,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Herbarium Assistant) as and when necessary</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inventory of trees on different roads</td>
<td>10.00</td>
<td>100000.00</td>
<td>1000000.00</td>
<td>1.00</td>
<td>10.00</td>
</tr>
<tr>
<td>Survey of Matured trees on different</td>
<td>5.00</td>
<td>100000.00</td>
<td>500000.00</td>
<td>1.00</td>
<td>5.00</td>
</tr>
</tbody>
</table>

**TOTAL 1: (Lacs)** 53.26

### 2) CAPITAL COSTS: (Purchase and periodic replacement of all equipment etc.)

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Rate (Lacs)</th>
<th>Total Cost (Lacs)</th>
<th>Life (Years)</th>
<th>Avg Annual Cost (Lacs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicles1: Jeep</td>
<td>5.00</td>
<td>25.00</td>
<td>125.00</td>
<td>8.00</td>
<td>15.63</td>
</tr>
<tr>
<td>Vehicles2: Pickup</td>
<td>5.00</td>
<td>15.00</td>
<td>75.00</td>
<td>10.00</td>
<td>7.50</td>
</tr>
<tr>
<td>Vehicles3: Motor Cycle</td>
<td>21.00</td>
<td>1.50</td>
<td>31.50</td>
<td>8.00</td>
<td>3.94</td>
</tr>
<tr>
<td>Computer &amp; Accessories (general office)</td>
<td>5.00</td>
<td>1.00</td>
<td>5.00</td>
<td>4.00</td>
<td>1.25</td>
</tr>
<tr>
<td>Computer &amp; Accessories (specialist)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>4.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Specialist Computer Software</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>4.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Photocopy</td>
<td>3.00</td>
<td>2.00</td>
<td>6.00</td>
<td>4.00</td>
<td>1.50</td>
</tr>
<tr>
<td>Fax machine</td>
<td>2.00</td>
<td>1.00</td>
<td>2.00</td>
<td>4.00</td>
<td>0.50</td>
</tr>
<tr>
<td>Air Conditioner</td>
<td>3.00</td>
<td>0.50</td>
<td>1.50</td>
<td>5.00</td>
<td>0.30</td>
</tr>
<tr>
<td>Specialist Equipment</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Office Furniture &amp; Fixtures</td>
<td>1.00</td>
<td>0.50</td>
<td>0.50</td>
<td>10.00</td>
<td>0.05</td>
</tr>
<tr>
<td>Office Refurbishment</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>10.00</td>
<td>0.10</td>
</tr>
<tr>
<td>Power Lawn Mower Machine</td>
<td>5.00</td>
<td>0.40</td>
<td>2.00</td>
<td>4.00</td>
<td>0.50</td>
</tr>
<tr>
<td>Hand Lawn Mower Machine</td>
<td>10.00</td>
<td>0.15</td>
<td>1.50</td>
<td>4.00</td>
<td>0.38</td>
</tr>
</tbody>
</table>

**TOTAL 2: (Lacs)** 251.00

**TOTAL EQUIVALENT ANNUAL BUDGET = Taka 85 Lacs**

**TOTAL INDICATIVE ANNUAL BUDGET - ARBORICULTURE CIRCLE - TABLE 6.1**

(Based on 2003-2004 Financial Year)
1. Preparation of annual plantation programmes in RHD Zones and projects (showing budget requirement)
2. Execution of plantation works on all new and old roads by outsourcing/contractors
3. Facilitate demonstration programs of plantation on a zonal basis through outsourcing
4. To develop and managing “Green Spots” in RHD unused stock yards, borrow pits, berms, ditches etc.
5. Updating inventory of existing trees and establishing linkage with road database and GIS
6. Upgrading of existing nurseries and establishment of new nurseries.
7. Periodic monitoring of plantation work and providing regular feedback
8. Removal and disposal of existing trees from RHD lands
9. To carry out research and development work for selection of appropriate type of saplings at different places.

**FIGURE - 6.1**
SPECIFIC JOB DESCRIPTIONS

INTRODUCTION

Written Job Descriptions will help officers understand their roles in the RHD organisation, and therefore help to avoid misunderstandings. The job descriptions will also serve as a good starting point when officers are transferred between wings/zones.

The Job Descriptions will be maintained by the Administration & Establishment Division - Administration & Establishment Circle and the current updated versions will be available on the RHD Intranet. Training will be given to the Class 1 Officers to enable them to develop the job descriptions of their subordinates.

Feedback is important and all officers are encouraged to discuss their job descriptions with their Superior Officer (s).

GENERAL JOB DESCRIPTIONS

All RHD officers are delegated with defined responsibilities according to their Grade. The details of these duties and authorities are given in the General Job Descriptions. These include both administrative duties and financial authorities, and are the same for each grade of officer irrespective of the specific details of his/her current post. The General Job Descriptions are detailed in the RHD Management Manual - Volume 1 of the RHD Management Plan.

SPECIFIC JOB DESCRIPTIONS

In addition to the General Job Descriptions for each grade of officer, every post has specific duties and functions. These duties and functions are detailed in the Specific Job Descriptions for each post, which form part of the Management Manuals for each Wing, Zone and Circle.

Specific Job Descriptions for the posts from Sub-Assistant Engineer grade to Additional Chief Engineer grade within the Technical Services Wing are included in this section.

Specific Job Descriptions for individual posts may require modification from time to time in order to respond to changing circumstances. Such modifications may be made with the approval of the Chief Engineer provided that these changes comply with Government rules.
GENERAL INFORMATION

Additional responsibilities and authorities for officers working on foreign aided projects may be modified by agreement between the Government of Bangladesh and the concerned Development Partner(s).

All the posts referred to in both the General and the Specific job descriptions are open to both male and female candidates and reference to he should always be taken to mean he or she.

The large majority of officers in the Road and Highways Department are from the engineering cadre. Non-engineering officers have the same general duties and responsibilities as engineers of equivalent grade as described in the relevant General Job Descriptions.

The terms ‘engineer’ and ‘engineering’ apply equally to both Civil and Mechanical Engineering disciplines.
<table>
<thead>
<tr>
<th>Job No.</th>
<th>Job Title</th>
<th>Wing/Zone/Circle/Division</th>
<th>No. Posts</th>
</tr>
</thead>
<tbody>
<tr>
<td>SJD/TSW/1.1</td>
<td>Additional Chief Engineer</td>
<td>Technical Services Wing</td>
<td>1</td>
</tr>
<tr>
<td>SJD/TSW/1.2</td>
<td>Assistant Engineer</td>
<td>Technical Services Wing</td>
<td>1</td>
</tr>
<tr>
<td>SJD/TSW/1.3</td>
<td>Sub-Assistant Engineer</td>
<td>Technical Services Wing</td>
<td>1</td>
</tr>
<tr>
<td>SJD/RDS/1.1</td>
<td>Superintending Engineer*</td>
<td>Road Design &amp; Safety Circle</td>
<td>1</td>
</tr>
<tr>
<td>SJD/RDS/1.2</td>
<td>Assistant Engineer</td>
<td>Road Design &amp; Safety Circle</td>
<td>1</td>
</tr>
<tr>
<td>SJD/RDS/1.3</td>
<td>Sub-Assistant Engineer</td>
<td>Road Design &amp; Safety Circle</td>
<td>1</td>
</tr>
<tr>
<td>SJD/RDS/2.1</td>
<td>Executive Engineer*</td>
<td>Road Design &amp; Standard Division</td>
<td>1</td>
</tr>
<tr>
<td>SJD/RDS/2.2</td>
<td>Assistant Engineer</td>
<td>Road Design &amp; Standard Division</td>
<td>2</td>
</tr>
<tr>
<td>SJD/RDS/2.3</td>
<td>Sub-Assistant Engineer</td>
<td>Road Design &amp; Standard Division</td>
<td>2</td>
</tr>
<tr>
<td>SJD/RDS/3.1</td>
<td>Executive Engineer*</td>
<td>Road Safety Division</td>
<td>1</td>
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<tr>
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<td>Sub-Divisional/Asst. Arboriculturist</td>
<td>Operations Division (East &amp; West)</td>
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*Specialist Training Required  
^Specialist Qualification Required
CIRCLES WITHIN THE WING:

- Road Design & Safety
- BRRL
- Social & Environment
- Arboriculture

DIVISIONS UNDER THIS WING: 9

OFFICERS UNDER THIS OFFICE:

1. Assistant Engineer 1 No.
2. Sub-Assistant Engineer 1 No.

PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of an Additional Chief Engineer as specified in the RHD Management Manual and as per recruitment rules.

The post holder should preferably be a Graduate in Civil Engineering with a broad experience and formal training / higher studies in one or more of the following subjects:

- highway design.
- road safety.
- quality control.
- environment assessment.
- testing of construction of materials.

He should have served for at least 2 years as SE in the Technical Services wing.

DUTIES AND RESPONSIBILITIES:

In addition to the general responsibilities of the post of Additional Chief Engineer, as specified in the RHD Management Manual the specific duties relating to this position are detailed below:

1. Develop a service-oriented culture within the Wing based on service to customers (internal and external) delivered through in-house personnel and out-sourced consultancy services.

2. Establish the framework wherein all services (investigation, survey, design and supervision) can be provided, or procured by, the Department.
3. Ensure that all designs carried out by projects/consultants (including foreign aided projects) are properly reviewed and maintained in respect of meeting all the standards.

4. Develop a demand for Technical Services and support from the other Wings by promoting the Wing’s capabilities throughout RHD.

5. Identify and develop design and quality standards (geometric, pavement, bridge, quality, environment & resettlement, safety etc.).

6. Facilitate the undertaking or procuring of all additional surveys as may be necessary to carry out designs.

7. Ensure the Wing undertakes (or procures) services for the detailed design of roads including road safety features.

8. Ensure road safety audits are carried out on all new roads and selected existing roads and road safety features including road signs and markings are incorporated.

9. Ensure the development and regular updating of specifications to keep RHD in the forefront of technological improvements.

10. Ensure that standard test procedures for quality control of all standards and types of work are periodically updated.

11. Oversee the development and application of quality control audit systems on all RHD projects (both development and maintenance).

12. Oversee the operation of field and contract laboratories and ensure equipment is adequate for the purpose and correctly adjusted.

13. Ensure the efficient operation of plantation and replanting works through the Departments’ own resources and outsourced providers. This includes liaison with other departments and ministries involved in tree planting.

14. Ensure environmental and resettlement audits on prospective and ongoing projects are carried out, advise projects on environmental & resettlement issues and monitor all environmental and resettlement activities.
PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of an Assistant Engineer as specified in the RHD Management Manual and as per recruitment rules.

He should have previously worked in any RHD division/circle for at least 2 years. He should have received training from RHRTC in maintenance and construction management.

DUTIES AND RESPONSIBILITIES:

In addition to the general responsibilities of the post of Assistant Engineer, as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Assistant Engineer attached to the Technical Services wing office shall act as technical staff officer to the Additional Chief Engineer and perform duties assigned to him.

2. Assist the ACE to check upgraded roads and newly designed roads conform to RHD standards of road geometry, safety and pavement design.

3. Assist the ACE for checking and updating of Standard manuals, Technical specifications or any other manuals where appropriate.

4. Assist the ACE to review the works done by consultants with supporting documents.

5. Assist the ACE for checking the reports of site investigations, soil investigations etc. done for the design purpose.

6. Assist the ACE to ensure that the RHD projects are executed in accordance with environmental and social standards and practice.

7. Assist the ACE to review the TOR and tender documents for procurement of environmental services for RHD projects.

8. Assist the ACE to follow up and ensure that the consultants while carrying out work at site follow the environmental guidelines and environmental manuals of RHD.

9. Assist the ACE for the implementation of environmental management plan during the operational phases of RHD projects.

10. Assist to review the requirement for bailey bridges and other equipment for emergency work.

11. Assist the ACE to make comments and reports on various issues as required by the Additional Chief Engineer.
PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of a Sub-Assistant Engineer as specified in the RHD Management Manual and as per recruitment rules.

He should have previously worked in RHD division/circle for at least 2 years. He should have received training from RHDTC in road maintenance and construction management.

DUTIES & RESPONSIBILITIES:

In addition to the general responsibilities of the post of Sub-Assistant Engineer, as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Will work under direct control of the Additional Chief Engineer, Technical Services Wing and perform the duties assigned to him from time to time.

2. Keeping records and maintaining register of all documents which will include tender documents, geometric design standards, pavement design standards, environmental guidelines, road safety manuals, site investigation reports, soil investigation reports, issues related to social matters, PCPP, PCP, TAPP, PP, all notices, districts/ Upozila/ thana /mouza maps et al.

3. Keeping records of Govt. circulars on all technical matters from MOC, CE-RHD and other offices.

4. Maintaining the account of all office furniture and equipment under the office of the Additional Chief Engineer, Technical Services Wing.

5. Report to the AE on specific duties on a regular basis.
DIVISIONS UNDER THIS CIRCLE:

- Road Design & Standard
- Road Safety

OFFICERS UNDER THIS OFFICE:

1. Assistant Engineer 1 No.
2. Sub-Assistant Engineer 1 No.

PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of a Superintending Engineer as specified in the RHD Management Manual and as per recruitment rules.

The post holder should preferably be a graduate in Civil Engineering. The post holder preferably should have worked, for at least 2 years, in the Road Safety and Design Circle. He should have formal training / undertaken post-graduate studies in the field of highway design (including road safety) from a recognized institution.

DUTIES AND RESPONSIBILITIES:

In addition to the general responsibilities of the post of Superintending Engineer, as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Manage the design of new and upgraded RHD roads whilst ensuring that all roads on the existing and proposed RHD road network conform to acceptable standards of road geometry and safety.

2. Review the updating of Standard (Design) Manuals and Technical Standards and develop New RHD Manuals where appropriate.

3. Ensure all necessary surveys, including traffic, hydrological and soil surveys, in order to carry out road designs and to be carried out Departmentally or out-sourced.

4. Ensure Road Designs for national, regional and major feeder road projects in accordance with RHD standards and to be carried out departmentally or out-sourced.
5. Ensure Road Safety Audit Reports on national, regional and major feeder road and bridge projects and to be carried out departmentally or out-sourced.

6. Ensure collection of road accident data on RHD roads from BRTA, Road Safety Cell, Police Head Quarters and also RHD field offices and utilise these in developing accident counter measures.

7. Recommend Road Safety Counter-measures at identified high prone Road Accident areas to minimize hazards.

8. Review and approve road designs carried out by consultants (including those on foreign aided projects).

9. Provide technical advice to Road Safety component of Foreign Aided and GoB Projects.

10. Promote road safety awareness throughout RHD by arranging meetings/seminars/workshops.
PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of an Assistant Engineer as specified in the RHD Management Manual and as per recruitment rules. He should have formal training/undertaken post-graduate studies in the field of highway design.

DUTIES AND RESPONSIBILITIES:

In addition to the general responsibilities of the post of Assistant Engineer, as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Assist the SE to design new and upgraded RHD roads and ensure that all roads on the existing and proposed roads conform to RHD standards of road geometry and safety.

2. Assist the SE for updating of Standard (Design) Manuals and Technical Standards and develop New RHD Manuals where appropriate.

3. Ensure all necessary surveys, including traffic, hydrological and soil surveys, in order to carry out road designs and to be carried out departmentally or out-sourced.

4. Ensure Road Designs being carried out in the department in accordance with RHD standards.

5. Assist the SE to review road designs carried out by consultants (including foreign aided projects).

6. Ensure Road Safety Reports are carried out departmentally or out-sourced.

7. Assist the SE to co-operate with BRTA Road Safety Cell, Police Head Quarters for collection of road accident data and utilise this for the development of accident counter measures to minimise hazards.

8. Assist to promote road safety awareness in RHD by arranging meetings/seminars/workshops.
PERSONNEL SPECIFICATIONS:
The post holder must meet the general requirements of a Sub-Assistant Engineer as specified in the RHD Management Manual and as per recruitment rules. He should have formal training in the RHD Training Centre.

DUTIES AND RESPONSIBILITIES:
In addition to the general responsibilities of the post of Sub-Assistant Engineer, as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Ensure all necessary surveys, including traffic, hydrological and soil surveys, in order to carry out road designs and to be carried out departmentally or out-sourced.

2. Assist the AE for the publication of Road Safety Report departmentally or out-sourced.

3. Assist the AE to co-operate with BRTA Road Safety Cell, Police Head Quarters for collection of road accident data and utilise this for the development of accident counter measures to minimise hazards.

4. Assist the SE, AE to promote road safety awareness in RHD in arranging meetings / seminars / workshops.
OFFICERS UNDER THE DIVISION:
1. Assistant Engineer 2 No.
2. Sub-Assistant Engineer 2 No.

PERSONNEL SPECIFICATIONS:
The post holder must meet the general requirements of an Executive Engineer as specified in the RHD Management Manual and as per recruitment rules.

The post holder should preferably be a graduate in Civil Engineering. He should preferably have work experience in Road Design & Standards Division. He should have received training / undertaken post-graduate study in highway engineering.

DUTIES & RESPONSIBILITIES:
In addition to the general responsibilities of the post of Executive Engineer, as specified in the RHD Management Manual the specific duties relating to this position are detailed below:

1. Establish and maintain RHD Manuals & Technical Specifications relating to road designs from time to time.
2. Manage procurement topographic and other surveys for road designs.
3. Monitor and design of roads (for new roads, road improvement and major rehabilitation schemes) in house and through consultants strictly following the RHD Standards and Specifications.
4. Review designs undertaken by RHD Development Partners and consultants to ensure compliance with all standards.
5. Visit ongoing and recently completed road schemes to ensure the adequacy, or otherwise, of current design standards.
6. Liase with the Road Research Laboratory and HDM circle for data required for the purpose of improving design of pavement.
7. Standardise the design of speed-breaker, diversion roads etc for different types of roads and highways.
PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of an Assistant Engineer as specified in the RHD Management Manual and as per recruitment rules.

He should preferably have work experience in Road Design & Safety Circle. He should have received training / undertaken post-graduate study in highway engineering.

DUTIES & RESPONSIBILITIES:

In addition to the general responsibilities of the post of Assistant Engineer, as specified in the RHD Management Manual the specific duties relating to this position are detailed below:

1. Assist the XEN incorporating changes in the RHD Manuals & Technical Specifications relating to road designs from time to time.

2. Leading survey team for carrying out topographic and other surveys for road designs.

3. Assist to carry out design of road pavement as directed by the EE/SDE following the RHD Standards and Specifications

4. Examine designs supplied by the donor agencies for foreign-aided projects as well as those done by the consultants to ensure compliance with RHD standards.

5. Carry out investigations at site as required for design purposes.

6. Collecting reports of traffic volume, soil investigation etc. from zones/projects or other available source.

7. Assist in developing database in the Division.
PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of a Sub-Assistant Engineer as specified in the RHD Management Manual and as per recruitment rules.

He should preferably have work experience in Road Design & Standards. He should have received training in highway engineering in RHD Training Centre.

DUTIES & RESPONSIBILITIES:

In addition to the general responsibilities of the post of Sub-Assistant Engineer, as specified in the RHD Management Manual the specific duties relating to this position are detailed below:

1. Carry out topographic and other surveys for road designs.
2. Carry out investigations at site as required for design purposes.
3. Collecting of reports such as traffic volume, soil investigation etc from zones/project or other available sources
4. Report to SDE/EE on all specific duties on a regular basis.
OFFICER UNDER THE DIVISION:

1. Sub-Divisional Engineer 1 No.
2. Assistant Engineer 2 No.
3. Sub-Assistant Engineer 3 No.

PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of an Executive Engineer as specified in the RHD Management Manual and as per recruitment rules.

The post holder should preferably be a Graduate in Civil Engineering. He should preferably have undertaken formal training / undergone post-graduate studies in Road Safety. He should have work experience in a junior position in the Road Design and Safety Circle.

DUTIES & RESPONSIBILITIES:

In addition to the general responsibilities of the post of Executive Engineer, as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Liase with BRTA, Road Safety Cell, the Police and also RHD field offices for collection of accident data for RHD roads & process the collected data.

2. Develop and update Road Safety Manuals for RHD.

3. Carry out Road Safety Audits for existing RHD roads (national, regional & other RHD road/bridge projects) and those included in a TAPP as well as in PCP in case of GoB projects.

4. Provide inputs to road safety component of foreign aided projects and promote new road safety projects.

5. Improve understanding of road safety issues by providing officers to RHD Training Centre to train RHD officers & others in road safety engineering.

6. Undertake annual road safety improvement demonstration projects.

7. Design in house and through consultants, countermeasures to mitigate road accident hazards including process of road markings and road signs.

PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of a Sub-divisional Engineer as specified in the RHD Management Manual and as per recruitment rules.

The post holder should preferably be a graduate in Civil Engineering. He should preferably have undertaken formal training / undergone post-graduate studies in Road Safety. He should have work experience in a junior position in the Road Design and Safety Circle.

DUTIES & RESPONSIBILITIES:

In addition to the general responsibilities of the post of Sub-divisional Engineer, as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Managing collection of accident data and other related data such as traffic data, speed data, pedestrian crossing data etc.

2. Interact with BRTA Road Safety Cell and the Police for collection of accident data.

3. Checking analysis of identification of black spot and design of remedial measures for accident prevention.

4. Prepare plan for Road Safety Audits of RHD roads by using RHD standards and guidelines for inclusion in TAPP/PCP.

5. Checking of Road Safety Manuals, Annual Road Safety Engineering reports etc. including proposal for it's updating as required.

6. Provide training to the RHD officers on Road safety issues and Engineering matters in conjunction with RHDTA.

7. Assist to design of Annual Road Safety Improvement demonstration projects.

8. Assist Executive Engineer –Road Safety Division in the following: -
   (i) In procuring consulting services on road safety issues of the circle.
   (ii) In developing database in the division.

9. Checking reports on progress of works in the Road Safety Division and appraises EE.

10. Arrange seminars/workshops on Road Safety engineering and safety awareness.
PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of an Assistant Engineer as specified in the RHD Management Manual and as per recruitment rules. He should preferably have undertaken formal training in Road Safety Engineering.

DUTIES & RESPONSIBILITIES:

In addition to the general responsibilities of the post of Assistant Engineer, as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Collate accident data, traffic data, conflict data, speed data, conflict data, pedestrian crossing data, road inventory data etc.
2. Co-operate with the Road Safety Cell (BRTA), the Police and zone offices for collection of accident data.
3. Preparation of Road Accident Engineering Reports with identifying of common accident factors.
4. Analysis of accident data (factual parameters), identification of black spot locations with investigation and design of remedial measures for accident prevention.
5. Assist in the preparation of plans for Road Safety Audits of RHD roads and the audit of projects included in TAPPs and PCPs, using RHD standards and guidelines.
6. Assist preparing/updating of Road Safety Manuals, Annual Road Safety Engineering Reports etc.
7. Assist the EE/SDE in procuring consulting services, as needed for road safety tasks within the circle.
8. Assist the EE/SDE in developing database in the Division.
9. Preparing reports on progress of works in the Road Safety Division.
10. Preparing estimates, tender documents, etc. for road safety works.
PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of a Sub-Assistant Engineer as specified in the RHD Management Manual and as per recruitment rules. He should preferably have undertaken formal training in Road Safety Engineering.

DUTIES & RESPONSIBILITIES:

In addition to the general responsibilities of the post of Sub-Assistant Engineer, as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Collect accident data, traffic data, conflict data, speed flow data, pedestrian crossing data, road inventory data, etc.

2. Collect further accident data from related Thanas for updating/improving the accident records, as per site visits.

3. Preparing sketches of accident locations, stick diagrams, accident reports and history, for the identification of the common accident factors and black spot locations.

4. Completion of route surveys for the identification of hazardous locations and visibility problem locations.

5. Assist the SDE/AE to identify the location of black spots and to prepare plans for road safety audit.

6. Topographical and plane-table surveying of sites, including taking photographs.

7. Collect data for updating Road Safety Manuals, Annual Road Safety Engineering reports.

8. Assist the SDE, AE–Road Safety Division in the following:-

   (i) In preparing and publishing road accident, annual road safety and other reports.

   (ii) Keeping in safe custody of all records/reports of the Division.

   (iii) Preparing estimates, tender documents, etc.

   (iv) Preparing Contractor's bills by measurement and quantity survey.
DIVISIONS UNDER THIS CIRCLE:

- Soil Investigation
- Material Testing & Maintenance
- Quality Control

OFFICERS UNDER THIS OFFICE:

1. Assistant Engineer 1 No.

PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of a Superintending Engineer as specified in the RHD Management Manual and as per recruitment rules.

The post holder should preferably be a graduate in Civil Engineering. The post holder should have worked for a minimum of 3 years in posts directly involving quality control and testing in BRRL/field or in design. He should have undertaken training/post-graduate study in the field of materials and testing.

DUTIES AND RESPONSIBILITIES:

In addition to the general responsibilities of the post of Superintending Engineer, as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Ensure the provision of research, testing and advisory services to various wings of the Department on the quality of construction materials, on the soil conditions for road/bridge design and on required quality of construction.

2. Review Quality Monitoring Reports of all Zones submitted by EE, Quality Control division and recommend measures if needed to be taken by ACE Technical Services Wing.

3. Ensure the provision (either using Departmental resources or by outsourcing) of soil and subsurface investigation reports for design purposes of special and complicated projects, such as, high embankments, embankments on soft foundations, foundations for bridges etc.

4. Managing RHD research programme and publish reports on materials related issues and appropriate advanced research work.
5. Managing investigation of particular failures in road/bridge construction works.


7. Managing major training for AEs of Zonal/Field Laboratories and all other laboratories staff.

8. Organise seminars on material testing and geotechnical issues.

9. Ensure administrative and technical control and supervision of zonal/Field Laboratories.

10. Review the utilisation of existing and the future needs for laboratory testing equipment in the Department.

11. Settle dispute between Zonal/Field Laboratories and project laboratories (provided by contracts as part of individual projects).
PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of an Assistant Engineer as specified in the RHD Management Manual and Government Recruitment Rules. He should undertake specific training/higher studies in the field of materials and testing.

DUTIES AND RESPONSIBILITIES:

In addition to the general responsibilities of the post of Assistant Engineer, as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Assist the SE to monitor the quality of construction materials, on the soil conditions for road/bridge design and on required quality of construction.

2. Assist the SE in reviewing monitoring reports of all Zones.

3. Assist the SE for soil and subsurface investigation reports on design purposes of special and complicated projects, such as high embankments, embankments on soft foundations, foundations for bridges etc.

4. Assist the SE on RHD research programmes and help publish reports on materials related issues.

5. Assist the SE to organise seminars on material testing and geotechnical issues.

6. Assist the SE for ensuring administrative and technical control and supervision of Zonal/Field Laboratories.

7. Assist the SE to review the utilisation of existing and the future needs for laboratory testing equipment.
OFFICERS UNDER THE DIVISION:

1. Sub-Divisional Engineer 1 No.
2. Assistant Engineer 2 No.
3. Geologist 1 No.

PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of an Executive Engineer as specified in the RHD Management Manual and as per recruitment rules.

The post holder should preferably be a graduate in Civil Engineering with post-graduate training/advanced studies in Soil Mechanics. He should have a minimum of 3 years previous experience working in BRRL/Field or in design.

DUTIES & RESPONSIBILITIES:

In addition to the general responsibilities of the post of Executive Engineer, as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Carry out field soil investigations departmentally or by outsourcing for major embankments, embankments on soft ground and foundation of bridge/culverts.

2. Identify the areas of research work required in soils & foundation engineering & prepare proposal for obtaining approval and budgets for research.

3. Review Standards & Specifications and Quality Control (QC) procedures.

4. Carry out investigation of particular failures in road/bridge construction works.

5. Assist RHDTCE in providing training on soil investigation.

6. Arrange tests for which testing facilities are not available in the Zonal/Field Laboratories.
PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of a Sub-Divisional Engineer as specified in the RHD Management Manual and as per recruitment rules.

The post holder should preferably have post-graduate training/advanced studies in Soil Mechanics. He should have a minimum of three years previous experience working in BRRL/Field division.

DUTIES & RESPONSIBILITIES:

In addition to the general responsibilities of the post of Sub-Divisional Engineer, as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Carry out field soil investigations departmentally or by outsourcing for major embankments, embankments on soft ground and foundation of bridge/culverts.

2. Identify the areas of research work required in soils & foundation engineering & prepare proposal for obtaining approval and budgets for research.

3. Assist the XEN to review Quality Control (QC) procedures.

4. Carry out investigation of particular failures in road/bridge construction works.

5. Assist RHDTTC in providing training on soil investigation.

6. Arrange tests for which testing facilities are not available in the Zonal/Field Laboratories.
PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of an Assistant Engineer as specified in the RHD Management Manual and as per recruitment rules.

He should undertake specific training/higher studies in Soil Mechanics.

DUTIES & RESPONSIBILITIES:

In addition to the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Carry out field soil investigations departmentally or by outsourcing for major embankments, embankments on soft ground and foundation of bridge/ culverts.

2. Assist the EE/SDE to identify the areas of research work required in soils & foundation engineering & prepares proposal for obtaining approval and budgets for research.

3. Assist RHDT C in providing training on soil investigation.

4. Assist to arrange tests for which testing facilities are not available in the Zonal/Field Laboratories.
PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of a Geologist as specified in the RHD Management Manual and as per recruitment rules.

The candidate for this post should be a Masters in Geology. He should have undertaken training/post-graduate studies in geology sector. He should have a minimum working experience of 3 years in soil sector, such as, soil investigation, research & testing.

DUTIES & RESPONSIBILITIES:

In addition to the general responsibilities of the post of Geologist, as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Prepare reports on the soil characteristics of samples collected from field.
2. Conduct laboratory tests for soil.
3. Assist SE/EE, BRRL in research work related with soil.
4. Inspection of major road embankment failure, identify the causes and submit report.
5. Analyse the soil strata, classification of soil and sub-soil materials.
6. Conduct geological survey on big project areas.
OFFICERS UNDER THE DIVISION:

1. Sub-Divisional Engineer 1 No.
2. Assistant Engineer 2 No.
3. Sub-Assistant Engineer 1 No.

PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of an Executive Engineer as specified in the RHD Management Manual and as per recruitment rules.

The post holder should preferably be a graduate in Civil Engineering with training/post-graduate studies in highway materials. He should a minimum working experience of 3 years in BRRL/field or in design.

DUTIES & RESPONSIBILITIES:

In addition to the general responsibilities of the post of Executive Engineer, as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Undertake research and testing in accordance with Standard Test Procedures.
2. Carry out periodic reviews of materials testing procedures to ensure they meet current needs.
3. Provide advice to field divisions on relevant issues of road and bridge construction materials.
4. Assist RHDTTC in providing training on construction materials and testing procedures.
5. Identifying areas of research required in connection with road construction materials and related issues.
6. Carry out maintenance works of BRRL offices, residential, establishment under BRRL Lab. equipment etc.
7. Ensure that all equipment under the BRRL is in correct working order and is properly calibrated.
8. Periodically review equipment needs for new equipment and report to the SE-BRRL Circle.
9. Arrange tests for which testing facilities are not available in the Zonal/Field Laboratories.
PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of a Sub-Divisional Engineer as specified in the RHD Management Manual and as per recruitment rules.

The post holder should have training/post-graduate studies in highway materials. He should have a minimum working experience of 3 years in BRRL/field divisions.

DUTIES & RESPONSIBILITIES:

In addition to the general responsibilities of the post of Sub-Divisional Engineer, as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Undertake research and testing in accordance with Standard Test Procedures.
2. Carry out periodic reviews of materials testing procedures to ensure they meet current needs.
3. Provide assistance to field divisions on issues of road, bridge construction materials.
4. Assist RHDC in providing training on construction materials and testing procedures.
5. Identifying areas of research required in connection with road construction materials and related issues.
6. Oversee maintenance works of BRRL offices, residential establishments and BRRL Lab. equipment etc.
7. Ensure that all equipment is in correct working order and properly calibrated.
8. Report to the Executive Engineer for the requirement of new equipment.
9. Carry out testing of material, for which testing facilities are not available in the Zonal/Field Laboratories.
PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of an Assistant Engineer as specified in the RHD Management Manual and as per recruitment rules. He should undertake specific training/higher studies in highway materials.

DUTIES & RESPONSIBILITIES:

In addition to the general responsibilities of the post of Assistant Engineer as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Undertake testing in accordance with Standard Test Procedures.
2. Carry out periodic reviews of materials testing procedures to ensure they meet current needs.
3. Provide assistance to field divisions on road and bridge construction materials.
4. Assist RHDT in providing training on construction materials and testing procedures.
5. Supervise maintenance works of BRRL offices, residential establishments and BRRL Lab. equipment etc.
6. Ensure that all equipment under the BRRL is in correct working order and is properly calibrated.
7. Assist EE/SDE to report for requirement of new equipment.
8. Arrange/carryout tests for which testing facilities are not available in the Zonal/Field Laboratories.
PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of a Sub-Assistant Engineer as specified in the RHD Management Manual and as per recruitment rules. He should undertake training in highway materials testing for Standard Test Procedures organised by RHDT. He should have a minimum working experience of 3 years in field divisions.

DUTIES & RESPONSIBILITIES:

In addition to the general responsibilities of the post of Sub-Assistant Engineer, as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Performing testing in accordance with Standard Test Procedures.

2. Inspect of maintenance works of BRRL offices, residential establishments and BRRL Lab. equipment etc.

3. Assist to ensure that all equipment under the BRRL is in correct working order and is properly calibrated.

4. Assist to review equipment needs and report for new equipment.

5. Assist to arrange tests for, which are not available in the Zonal/Field Laboratories.
OFFICERS UNDER THE DIVISION:

1. Sub-Divisional Engineer 1 No.
2. Assistant Engineer 2 No.
3. Assistant Engineer 9 No. (Field Circle Laboratories)

PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of an Executive Engineer as specified in the RHD Management Manual and as per recruitment rules.

The post holder should preferably be a graduate in Civil Engineering. He should have undertaken training/post-graduate studies in highway materials and testing. He should have a minimum working experience of 3 years in BRRL/field or in design.

DUTIES & RESPONSIBILITIES:

In addition to the general responsibilities of the post of Executive Engineer, as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Undertake quality control test of RHD on-going/completed (within defects liability period) maintenance, rehabilitation and new construction works to confirm compliance with the materials and testing standards.

2. Review and analyse quality control reports to identify non-conformities and recommend/process for appropriate measures.

3. Monitor operations of Zonal/Field Laboratories and Project Laboratories to ensure Quality & Standards are being maintained.

4. Conduct test of materials on-going/completed projects (within defects liability period).

5. Conduct training of Zonal/Field Laboratories staff including AE’s and SDE’s of field sub-division in liaison with RHDTC.


7. Arrange tests for which testing facilities are not available in the Zonal/Field Laboratories.
PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of a Sub-Divisional Engineer as specified in the RHD Management Manual and as per recruitment rules.

The post holder should preferably be a graduate in Civil Engineering. He should have undertaken training/post-graduate studies in highway materials and testing. He should have a minimum working experience of 3 years in BRRL/field division.

DUTIES & RESPONSIBILITIES:

In addition to the general responsibilities of the post of Sub-Divisional Engineer, as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Undertake quality control tests/quality of RHD on-going/completed (within defects liability period) maintenance, rehabilitation and new construction works to confirm compliance with the materials and testing standards.

2. Analyses of quality control test reports to identify non-conformities and process for appropriate measures.

3. Monitor operations of Zonal/Field Laboratories to ensure quality control standards.

4. Conduct training of Zonal/Field Laboratory staff.

5. Arrange tests for which testing facilities are not available in the Zonal/Field Laboratories.
PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of an Assistant Engineer as specified in the RHD Management Manual and as per recruitment rules.

He should undertake training/higher studies in highway materials and testing.

DUTIES & RESPONSIBILITIES:

In addition to the general responsibilities of the post of Assistant Engineer, as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Undertake quality control tests/quality audit of RHD on-going/completed (within defects liability period) maintenance, rehabilitation and new construction works.

2. Analyses of quality control test reports to identify non-conformities and process for appropriate measures.

3. Conduct training of Zonal/Field Laboratory staff.

4. Arrange tests for which testing facilities are not available in the Zonal/Field Laboratories.
PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of an Assistant Engineer as specified in the RHD Management Manual and as per recruitment rules.

He should undertake training/higher studies in highway materials and testing.

DUTIES & RESPONSIBILITIES:

In addition to the general responsibilities of the post of Assistant Engineer, as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Undertake quality control tests/quality audit of RHD on-going/completed (within defects liability period) works of the field divisions.

2. Prepare and submit a program for auditing of Zonal/Field Laboratories by the BRRL.

3. Ensure quality control test/quality audit reports are checked and identified for non-conformities and forwarded for appropriate measures.

4. Conduct and train Zonal/Field Laboratory staff.

5. Arrange tests for which testing facilities are not available in the Zonal/Field Laboratories.
DIVISIONS UNDER THIS CIRCLE:

- Resettlement
- Environment

OFFICERS UNDER THIS OFFICE:

1. Assistant Engineer 1 No.
2. Sub-Assistant Engineer 1 No.

PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of a Superintending Engineer as specified in the RHD Management Manual and as per recruitment rules.

The post holder should preferably be a graduate in Civil Engineering. He should have received training / undertaken post-graduate studies in the field of Environment and Resettlement.

DUTIES AND RESPONSIBILITIES:

In addition to the general responsibilities of the post of Superintending Engineer, as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Ensure that all RHD works and projects are executed in accordance with appropriate environmental and social standards and practices.

2. Liase with GoB organisations such as BWDB, DoE, DCC, LGED, RAJUK and other line agencies to ensure effective interagency co-operation on relevant projects.

3. Establish fair, effective and consistent re-settlement practices.

4. Establish and apply Environmental and Resettlement Guidelines and Manuals for Road and Bridge projects of RHD.

5. Review Environmental, Social or Resettlement assessment reports and consult Approving Authority.

6. Contribute towards drawing up the Request for Proposal (RFP) for Environmental and Social Studies.
7. Ensure the provision or procurement of the necessary services for carrying out Environmental Assessment, Land acquisition and Resettlement studies.

8. Implement Environmental Management Plan including monitoring and mitigation of specific issues, during construction and operational phases of RHD Projects.

9. Disseminate the need for high social and environmental standards throughout RHD and to the concerned public through research, publicity, seminars and training.

10. Co-ordination for the preparation and implementation of environmental and resettlement management plans for RHD projects.

11. Monitor long-term, cumulative environmental impacts and ensure mitigation measures for project sustainability.

12. Assist the Director RHD Training Centre in providing training the RHD officers in Environmental and Resettlement issues.

13. Review and approve the Environmental Assessment reports produced by the consultants.
PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of Assistant Engineer as specified in the RHD Management Manual and as per recruitment rules.

He should undertake specific training/higher studies in Environmental Engineering. He should have preferably previous experience in environmental work related to Road and Bridge Projects.

DUTIES AND RESPONSIBILITIES:

In addition to the general responsibilities of the post of the Assistant Engineer as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Co-ordinate to ensure that all RHD works and projects is executed in accordance with environmental and social standards and practices.

2. Liase with Government organisations and NGOs to ensure effective co-ordination on relevant projects.

3. Assist to establish fair, effective and consistent re-settlement practices.

4. Review Environmental, Social or Resettlement assessment reports and provide opinion to SDE, EE and SE.

5. Involve in Procurement of Services for carrying out Environmental and Resettlement studies.

6. Checking the ToR and tender documents for procurement of environmental services for RHD projects.
PERSONNEL SPECIFICATIONS:
The post holder must meet the general requirements of a Sub-Assistant Engineer as specified in the RHD Management Manual and as per recruitment rules.

He should undertake specific training/higher studies in Environmental Engineering. He should have preferably previous experience in environmental work related to Road and Bridge Projects.

DUTIES AND RESPONSIBILITIES:
In addition to the general responsibilities of the post of the Sub-Assistant Engineer as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Check that RHD works and projects are carried out in accordance with environmental and social standards and practices.

2. Assist to establish and maintain environmental database in the S & E Circle.

3. Co-ordinate in implementing EMP during construction and operational phases of RHD Projects.

4. Assist in disseminating the need for environmental standards throughout RHD and to the public through research and publicity.

5. Ensure procurement, preparation and implementation of environmental and resettlement management plans for RHD projects.

6. Involve in long-term monitoring of cumulative impacts and suggest mitigation measures for project sustainability.

7. Assist in preparing Progress Reports on all environmental activities.
OFFICERS UNDER THE DIVISION:

1. Assistant Engineer 2 No.
2. Sub-Assistant Engineer 2 No.

PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of an officer of Executive Engineer rank and status as specified in the RHD Management Manual and as per recruitment rules.

The post holder should preferably be a graduate in Civil Engineering with overseas or post-graduation degree or training in Resettlement. He should have previous sufficient work experiences in Resettlement and Social issues.

DUTIES & RESPONSIBILITIES:

In addition to the general responsibilities of an officer with the rank of Executive Engineer, as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

This post is spent both in RHD Head Quarters (Dhaka) and in the field (Project areas) as necessary and as directed or requested by PD, SE, ACE and CE of RHD.

1. Ensure that the relevant approved RHD Procedures and Standards on Land Acquisition and Resettlement (LAR) standards are adopted and maintained, and applied on all current RHD development and maintenance projects.

2. In coordination with the RHD Training Centre, plan for the training and awareness improvement of relevant RHD Field staff on current standards and procedures on LAR for RHD projects.

3. Review relevant Terms of Reference and monitor the appointment of qualified consultants or NGOs to manage and monitor the land acquisition and resettlement process on those RHD with a significant LAR component.

4. From monthly progress reports from Field Offices, consultants and NGOs, monitor the progress of the LAR process on current RHD projects.

5. Conduct intermittent direct reviews on a sample basis on the effective delivery of resettlement management services by NGOs hired by RHD for the implementation of resettlement.
RHD Specific Job Description – Technical Services Wing

SJD/SE/2.1 - EXECUTIVE ENGINEER

6. Assist with the preparation and publication of standard general information on Land Acquisition and Resettlement, intended for the general public of project affected areas to make aware of resettlement benefits and probable social and economic effects and impacts.

7. Assist SE-SEC of RHD with the establishment and maintenance of a Data Base on land acquisition and resettlement, and a Resettlement Library collecting all relevant resettlement documents, Maps, Reports, publications etc.

8. Monitor budgets for Land Acquisition and Resettlement as prepared by Deputy Commissioners or implementing NGOs, for payment of CCL and Resettlement Cost, following the compensation matrix, manual and guidelines.

9. Advise and where relevant intervene in case of major disputes between project affected people and authorities or contractors.
PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of an officer of Assistant Engineer rank and status as specified in the RHD Management Manual and as per recruitment rules.

The candidate for this post should have training in Resettlement. The candidate who has work experiences in Resettlement and Social issues will get preference.

DUTIES & RESPONSIBILITIES:

In addition to the general responsibilities of the post of an officer of the rank of Assistant Engineer as specified in the RHD Management Manual the specific duties relating to this position are detailed below:

1. Assist SE-SEC and EE-RD getting / collecting resettlement data / information of different Projects under RHD those have resettlement implementation activities.

2. In consultation with EE-RD and SE-SEC of RHD monitor (Sample basis) project-based delivery of resettlement services of NGOs appointed by RHD.

3. Assist EE-RD and SE-SEC of RHD preserving Resettlement Census / Surveys and JVS data, LA Maps of Right of Ways / Bridge areas, Topographic Surveyed Maps, Video Films, Project Inception, Terminal/ Completion, Progress Reports, etc. of different resettlement oriented projects under RHD to establish a Resettlement Library and Computerized Resettlement Data Bank.

4. Assist RHDTTC providing resettlement data and information of different Resettlement based projects of RHD.

5. Keep close liaison with Chief Resettlement Officers, Deputy Chief Resettlement Officers, Resettlement Consultants (Local and Expatriate) etc.

6. Checking of LA estimates and all sorts estimates.

7. Report to EE for all specific duties on a regular basis.
PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of an officer of Sub-Assistant Engineer rank and status as specified in the RHD Management Manual and as per recruitment rules.

The candidate for this post should have Resettlement and Social issues experience or training.

DUTIES & RESPONSIBILITIES:

In addition to the general responsibilities of the post of an officer of the rank of Sub-Assistant Engineer as specified in the RHD Management Manual the specific duties relating to this position are detailed below:

1. Assist AEs and EE-RD of SEC of RHD in dealing with resettlement issues and guidelines for RHD.

2. Keep close liaison with resettlement consultants, resettlement officers and staff working sitting at Dhaka` City or RHD Head Office.

3. Assist AEs, EE and SE of SEC in delivering training at RHDTO providing compiled resettlement data, information, etc.

4. Assist EE-RD and SE of SEC collecting LA, Resettlement and Social Impact related various documents, studies, reports (RHD, national and international) and preserve systematically in Resettlement Library.

5. Keep close contract with resettlement implementing NGOs Head Offices located at Dhaka for collected up-dated data, information and reports, etc.

6. Preparation of all sorts estimates viz. LA estimates, loss of entitlement estimates etc.

7. Report to EE for all specific duties on a regular basis.
OFFICERS UNDER THE DIVISION:

1. Sub-Divisional Engineer       1 No.
2. Assistant Engineer            2 No.
3. Sub-Assistant Engineer       3 No.

PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of an officer of the rank of Executive Engineer, Civil, as specified in the RHD Management Manual and as per recruitment rules.

The post holder should preferably be a graduate in Civil Engineering. He should have preferably previous experience and training in environmental science or related field.

DUTIES & RESPONSIBILITIES:

In addition to the general responsibilities of the post of Executive Environmental Specialist, as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. In association with the Executive Engineer-Field, review and develop Request for Proposal (RFP) for environmental study.
2. Establish and maintain environmental standards, guidelines and manuals in RHD.
3. Identify environmental issues and constraints at project planning stage, suggest alternatives, options.
4. Monitor major Important Environmental Concerns (IECs) throughout project cycle.
5. Ensure mitigation measures for the IECs.
6. Co-ordinate and assist the EE-FD in preparing or procurement of environmental management plans for projects.
7. Disseminate the need for high environmental standards throughout RHD, stakeholders and the project area people.
8. Assist RHD Training Centre in preparation and presentation of courses on environmental issues.
9. Reviewing IEE, EIA and EMP reports produced by the environmental consultant and providing recommendation to the higher authority for its acceptance.
10. Establish a reference library, containing relevant environmental documents (hard and soft copies) of domestic and overseas sources.
PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of an officer of the rank of Sub-divisional Engineer, Civil, as specified in the RHD Management Manual and as per recruitment rules.

The post holder should preferably be a graduate in Civil Engineering. He should have preferably previous experience in environmental work related to Road and Bridge Projects.

DUTIES AND RESPONSIBILITIES:

In addition to the general responsibilities of the post of the Sub-divisional Engineer as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Preparation of EMP, checking of all sorts of reports prepared by the consultants and provides opinion or comments on the environmental issues.

2. Ensure that the consultants while carrying out work at site follow the environmental standards, guidelines and manual of RHD. Also check that the DoE Environmental Clearance obtained on time.

3. Provide feedback to the EE-ED on all environmental issues of existing and on going RHD projects and works.

4. Review and preparation of Request for Proposal (RFP) and tender documents for procurement of Environmental Services (IEE, EIA and EMP) RHD projects.

5. Examine EA Report, list of SEIs and formulate the plan and methodology for further study by the consultant etc. and communicate observations to EE.

6. Checking progress report on all environmental activities of the division.

7. Assist EE in the following: -
   I) Monitoring long term environmental impacts on selected Projects
   II) Preparing annual budget, RFP, EMP and selection of consultants
   III) Disseminate the need for high environmental standards throughout RHD.
   IV) Providing training and presenting environmental courses to RHD officers in conjunction with RHDT.
   V) Developing database in the divisional office.

8. Liaise with Road Safety Circle, Arboriculture Head and maintain intra-departmental co-ordination.
PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of Assistant Engineer, Civil, as specified in the RHD Management Manual and as per recruitment rules. He should have preferably previous experience in environmental work related to Road and Bridge Projects.

DUTIES AND RESPONSIBILITIES:

In addition to the general responsibilities of the post of the Assistant Engineer as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Involve in public consultation process with the consultants regarding RHD projects and obtain community advice to modify any parameter at the detailed design stage.
2. Checking of Project Request for Proposal (RFP) and all sorts of reports prepared by the consultants and provide comments on the environmental issues.
3. Liaise with GoB and other line agencies for updating environmental database.
4. Follow up and ensure that the consultants while carrying out work at site follow the Environmental Guidelines and Environmental Manual of RHD.
5. Provide feedback to the EE on all environmental issues of on going and existing RHD projects and works.
6. Assist in preparing RFP and tender documents for procurement of environmental services for RHD projects.
7. Examine Environmental Assessment (EA) reports, list the SEIs and develop methodology for further study by the consultant etc. and communicate observations to EE.
8. Preparing Progress Report on all environmental activities of the division.
9. Assist SDE in the following: -
   I) Monitoring long-term environmental impacts on selected projects.
   II) Preparing RFP and EMP for projects.
III) Disseminating the need for high environmental standards throughout RHD.

IV) Providing training and presenting environmental courses to RHD officers.

V) Developing database in the divisional office.

VI) Preparing construction management checklist.

10. Report to Executive Engineer / Sub-Divisional Engineer on all specific duties on a regular basis.
PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of a Sub-Assistant Engineer as specified in the RHD Management Manual and as per recruitment rules. He should have preferably previous experience in environmental work related to Road and Bridge Projects.

DUTIES AND RESPONSIBILITIES:

In addition to the general responsibilities of the post of the Sub-Assistant Engineer as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Arrange public consultation meetings with the consultants regarding RHD projects and obtain community advice to modify any parameter at the detailed design stage.
2. Checking of Project Request for Proposal (RFP) and all sorts of reports prepared by the consultants and provide comments on the environmental issues.
3. Establish and maintain environmental database.
4. Follow up consultant's work at site and ensure that application of the Environmental Guidelines properly takes place.
5. Provide feedback to the Assistant Engineer on all environmental issues of on going and existing RHD projects and works.
6. Assist in preparing RFP and tender documents for procurement of environmental services for RHD projects.
7. Participate in environmental training and enable dialogue on environmental awareness to RHD officers and local community.
8. Preparing Progress Report on all environmental activities of the division.
9. Support the Assistant Engineer in the following: -
   I) Monitoring long-term environmental impacts on selected projects.
   II) Preparation of RFP and EMP for projects.
   III) Providing training and presenting environmental courses to RHD officers.
   IV) Developing database in the divisional office.
   V) Preparing construction management checklist.
10. Report to Sub-Divisional Engineer or Executive Engineer on all specific duties on a regular basis.
DIVISIONS UNDER THIS CIRCLE:

- Operations Division (East)
- Operations Division (West)

OFFICERS UNDER THIS OFFICE: None.

PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of an officer of the rank of Superintending Engineer as specified in the RHD Management Manual and as per recruitment rules.

The post holder must have a degree and/or post-graduate degree in Agriculture from a recognised University. He should have preferably served as an Executive Arboriculturist in this Circle. He should have specialised training in the field of landscaping with special attention to environmental impact/mitigation.

DUTIES AND RESPONSIBILITIES OF THIS POST:

In addition to the general responsibilities of the post of an officer of the rank of Superintending Engineer, as specified in the RHD Management Manual, the specific duties relating to this position are detailed below:

1. Responsible for the management of all plantation works of RHD, including the upgrade of existing nurseries and establishment of new nurseries.

2. Managing the preparation of plantation programmes in all RHD Zones/Projects and preparing budgets and proposals for inclusion under ADP and/or Revenue Budgets.

3. Managing the execution of plantation works on all new as well as old roads by outsourcing/through contractors.

4. Provision of advice to zonal field officers and undertake demonstration programmes of plantation and raising awareness on arboricultural issues among the RHD officers.

5. Preparation and maintenance of Tree Plantation Manual/Guide-lines for RHD officers in order to assist zonal officers in arboriculture activities.
6. Managing and Developing “Green Spots” RHD unused stockyards, borrow pits, berms, and other fallow lands to develop a number of roadside.

7. Managing and updating the inventory of existing trees and establishing linkages with road databases and GIS systems.

8. Periodic monitoring of completed plantation work and provide regular feedback to the RHD management.

9. Approval of the removal and disposal of existing trees from the road alignment and old/matured trees from the right of way.

10. Management of research and development on types of trees and plants needed for protection of road works and environmental improvement.

11. Identify species of the plants that are compatible with topography, soil type & climatic conditions.
OFFICERS UNDER THE DIVISIONS:

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<th>East</th>
<th>West</th>
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<tbody>
<tr>
<td>1. Sub-Divisional Arboriculturist</td>
<td>1 No.</td>
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<td>2. Assistant Arboriculturist</td>
<td>2 No.</td>
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PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of officer of the rank of Executive Engineer as specified in the RHD Management Manual and as per recruitment rules.

The candidate for this post should have a degree and / or post-graduate Degree in Agriculture from a recognised university and should preferably have experience in road landscaping and plantation work.

DUTIES & RESPONSIBILITIES:

In addition to the general responsibilities of the post of an officer of the rank of Executive Engineer as specified in the RHD Management Manual the specific duties relating to this position are detailed below:

1. Preparation of programmes (Zone wise) for plantation and budget requirements for the replacement of trees and provision of new trees on projects.

2. Carry out activities for plantation work on all new and old roads of RHD network by outsourcing/contractor.

3. Carry out activities for plantation in order to develop “Green Spots” by the side of the RHD Roads/Highways, unused stockyards and other fallow lands.

4. Improvement of existing nurseries and establishment of new nurseries to provide on adequate supply of the required species of saplings.

5. Monitoring completed plantation works periodically and provides regular feedback to management.

6. Prepare plan and programme for removal/disposal of matured and damaged trees, as well as trees on the road alignment.
7. Carryout removal/disposal of the trees according to the implementation plan as mentioned in the serial -6.

8. Maintain the database of tree-stock and other related issue and establish a linkage to the road database and GIS system.

9. Provide decoration plants from existing or out nursery to different offices and functions of RHD as required.
PERSONNEL SPECIFICATIONS:

The post holder must meet the general requirements of officer of the rank of sub-divisional/Assistant Engineer as specified in the RHD Management Manual and as per recruitment rules.

The candidate for this post should have a degree and/or post-graduate Degree in Agriculture from a recognised university and should preferably have experience in road landscaping and plantation work.

DUTIES & RESPONSIBILITIES:

In addition to the general responsibilities of the post of an officer of the rank of Sub-divisional/Assistant Engineer as specified in the RHD Management Manual the specific duties relating to this position are detailed below:

1. Prepare draft for 2 years plantation programmes for RHD roads in different field zones in consultation with the divisional officers.

2. Supervise plantation works in RHD roads as per approved Programme carried out departmentally as well as by the contractors.

3. Prepare all types of estimates of works for divisional and circle office mainly that for the plantation works.

4. Arrange production of seedlings in the RHD nurseries departmentally and preparing proposal for development of new nurseries.

5. Produce design/layout of ‘Green Spot’ on the RHD lands as per programme and instructions of the higher authorities.

6. Preparing and submitting monthly progress report on the arboricultural activities/plantation works under the sub-division.

7. Preparing survey reports for removal/disposal of matured/ damaged trees as well as trees on the road alignment in conjunction with the field/ project offices.

8. Arrange in carrying out inventory of trees under the jurisdiction of the sub-division an updating the inventory on a regular basis.
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<th>Arboriculture Circle – Operations Divisions</th>
<th>Approved:</th>
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9. Disposing the damaged/matured trees by calling tenders or quotations according to the delegated power.

10. Assist EA in developing divisional database on tree-stock and other related matters and establishing a linkage to the main RHD database and GIS system.

11. Assist EA in arranging seminars/workshops on the arboricultural activities.

12. Participate in the National Tree Fair and in the National Tree Plantation Programme of the government.

13. Assist in providing decorative plants in different offices and functions of RHD.

14. Report to CA/EA for assisting with full co-operation in the specific duties on a regular basis.
OPERATIONAL PROCEDURES

INTRODUCTION

The Operational Procedures have been developed with the RHD officers and generally represent current practice and existing processes with some adjustment where new initiatives have an impact. They should be seen as a useful aid both for existing staff, but particularly for new staff entering the Circle for the first time. The procedures should be reviewed and updated as the Circle develops in the future. Any suggestions for improvement should be communicated to the Management Plan Implementation Team for the Technical Services Wing.

These Operational Procedures describes the key responsibilities to carry out operations of the circles/wings/zones. The Executive Engineers of each division are therefore a pivot for the procedures. However within each division the Executive Engineer will be assisted by the Sub-Divisional Engineers, Assistant Engineers, Sub-Assistant Engineers and other officers and staff under him depending on the situations and requirements, although their involvement in many of the procedures has not been explicitly stated in the “Responsibilities” para of each procedure. Many of these operational procedures also cut across the circles and divisions and require cooperation between different parts of RHD. The Operational Procedures contained in this section are as overleaf.

This is not a full list of procedures, but could be considered as a handbook to help guide key tasks and functions within the RHD. The procedures reference the main standards, guidelines, manuals, directives and Government/RHD rules and regulations that should be followed to enable RHD to achieve its main outputs and goals. It is expected that these procedures will be changed, refined and further OPs will be developed and evolve with the passage of time.
<table>
<thead>
<tr>
<th>Technical Services Wing- Operational Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Road Design &amp; Safety Circle</strong></td>
</tr>
<tr>
<td><strong>Road Design &amp; Standard Division</strong></td>
</tr>
<tr>
<td>OP/RDS/2.1 Road Design</td>
</tr>
<tr>
<td>OP/RDS/2.2 Audit of External Road Designs</td>
</tr>
<tr>
<td>OP/RDS/2.3 Audit of Road Construction Projects</td>
</tr>
<tr>
<td><strong>Road Safety Division</strong></td>
</tr>
<tr>
<td>OP/RDS/3.1 Collection and Processing of Road Traffic Accident Data</td>
</tr>
<tr>
<td>OP/RDS/3.2 Design of a Road Safety Improvement Project</td>
</tr>
<tr>
<td>OP/RDS/3.3 Preparation of Annual Road Safety Engineering Report</td>
</tr>
<tr>
<td><strong>BRRL Circle</strong></td>
</tr>
<tr>
<td>OP/BRL/1.1 Organisation of Research Work</td>
</tr>
<tr>
<td><strong>Soil Investigation Division</strong></td>
</tr>
<tr>
<td>OP/BRL/2.1 Major Field Soil Investigation</td>
</tr>
<tr>
<td>OP/BRL/2.2 Defect Investigation and Management</td>
</tr>
<tr>
<td><strong>Material Testing &amp; Maintenance Division</strong></td>
</tr>
<tr>
<td>OP/BRL/3.1 Material Testing</td>
</tr>
<tr>
<td>OP/BRL/3.2 Audit of Material Testing</td>
</tr>
<tr>
<td><strong>Quality Control Division</strong></td>
</tr>
<tr>
<td>OP/BRL/4.1 Audit of Zonal &amp; Project Laboratories</td>
</tr>
<tr>
<td>OP/BRL/4.2 Compliance Monitoring of RHD Maintenance and Construction Works</td>
</tr>
<tr>
<td>OP/BRL/4.3 Management and Calibration of Equipment</td>
</tr>
<tr>
<td><strong>Social &amp; Environment Circle</strong></td>
</tr>
<tr>
<td>OP/SE/1.1 Social and Environmental Circle Reports</td>
</tr>
<tr>
<td><strong>Re-settlement Division</strong></td>
</tr>
<tr>
<td>OP/SE/2.1 Resettlement Practices</td>
</tr>
<tr>
<td>OP/SE/2.2 Procurement of Resettlement Services</td>
</tr>
<tr>
<td>OP/SE/2.3 Monitoring of Resettlement Projects</td>
</tr>
<tr>
<td>OP/SE/2.4 Entitlement Loss Assessment</td>
</tr>
<tr>
<td><strong>Environment Division</strong></td>
</tr>
<tr>
<td>OP/SE/3.1 Preparation of IEE &amp; EIA Report</td>
</tr>
<tr>
<td>OP/SE/3.2 Procurement and Monitoring of Environmental Services</td>
</tr>
<tr>
<td>OP/SE/3.3 Monitoring of Environmental Issues</td>
</tr>
<tr>
<td>OP/SE/3.4 Environmental Management Plan</td>
</tr>
<tr>
<td>OP/SE/3.5 Environmental Awareness Initiatives</td>
</tr>
<tr>
<td><strong>Arboriculture Circle</strong></td>
</tr>
<tr>
<td><strong>Operations Division (East and West)</strong></td>
</tr>
<tr>
<td>OP/ARB/2.1 Plantation Programming</td>
</tr>
<tr>
<td>OP/ARB/2.2 Management of Plantation</td>
</tr>
<tr>
<td>OP/ARB/2.3 Development and Management of Green Spots</td>
</tr>
<tr>
<td>OP/ARB/2.4 Disposal of matured and damaged trees</td>
</tr>
</tbody>
</table>
1 PURPOSE AND SCOPE

This procedure describes the design process to be adopted by Road Design & Safety Circle following a request for road design services from another Wing or Zone within RHD, or any other organization within the Government of Bangladesh. The procedure covers the main stages of the design process up to either the production of draft tender documents for the works or the production of design drawings for issuing to the Zones.

2 DEFINITIONS

Project - a proposed road scheme that could take the form of a new road, the upgrading of an existing road or improvements to an existing junction (for traffic capacity and / or safety reasons).

Superintending Officer - is the Additional Chief Engineer or Superintending Engineer of the Zone requesting design services for a Project from Road Design & Safety Circle.

Preliminary Design Report - a report that contains the results and analysis of data collected for the design together with a preliminary design of the project including alignment, typical sections, land acquisition and other significant factors, which influence the viability and / or detailed design of the scheme.

Detailed Design Report - a comprehensive report on the design of the project that provides the justification (and alternatives where they exist) for every aspect of the design, together with a operational and environmental impact assessment of the completed road project.

Tender Documents - comprises the standard tender documents based on the New Contracting Procedures including scheme specific drawings, Bills of Quantities, Particular Specifications and Contract Data.

3 RESPONSIBILITIES

Superintending Officer - will be responsible for obtaining the necessary authority and budget approval both for the scheme and for the recruitment of external consultants to undertake the design under the supervision of Road Design & Safety Circle if necessary.

Superintending Engineer - Road Design & Safety Circle (SE-RDSC) - will have overall responsibility for the design services provided by the Circle and for the audit of designs undertaken by external consultants.
Executive Engineer - Road Design & Standard Division (EE-RDSD) - will be responsible for undertaking the design of projects, including the preparation of tender documents, or alternatively the management of external consultants appointed to undertake these services.

4  METHOD

4.1  REQUEST FOR DESIGN SERVICES

A request for design services from Design & Safety Circle must be supported by an Office Order from Chief Engineer, RHD to undertake this work. If a request is made from another Wing or Zone within RHD, implicit in this will be the need for the concerned Superintending Officer to convince Chief Engineer, RHD that he does not have adequate resources either to undertake the design or supervise external consultants retained for the purpose.

All such requests shall be made to SE-RDSC by the concerned Superintending Officer.

4.2  ASSESS REQUIRED DESIGN RESOURCE

Upon receipt of a request for road design services SE-RDSC in consultation with EE-RDSD will review the current and projected workload of the Road Design and Standards Division to determine whether such services can be provided in-house or require to be outsourced to consultants.

Should consultants be required EE-RDSD will prepare a budget estimate for their services and advise the concerned Superintending Officer for him to obtain the required budget approval. Following this approval EE-RDSD will undertake the procurement of consultants in accordance with OP/PC/2.4 and audit their performance in accordance with OP/RDS/2.2.

In the event that surveys are required to undertake the design EE-RDSD will prepare estimates for these, and following budget approval being obtained by the Superintending Officer he will undertake procurement of these services in accordance with OP/PC/2.4.

4.3  PREPARATION OF PRELIMINARY DESIGN

Irrespective of whether designs are to be carried out in-house by Road Design & Safety Circle or by external consultants, a Preliminary Design Report must be prepared for acceptance by the concerned Superintending Officer before detailed design is undertaken. The scope and content of the Preliminary Design Report will to a large extent depend on the type of project being undertaken but in all cases for major projects it should contain the following:
• A review of existing data relating to the project (traffic counts, topographical mapping, hydrology, ground investigations, land ownership, utilities, etc.)

• A summary and analysis of both the existing data and any additional data collected, including CBR of the subgrade and existing pavement layers (if any), the design flood return event for the road, traffic forecasts in PCUs and ESAs for the agreed design year, together with traffic accident data for an existing road if to be upgraded.

• A statement of the particular design standards to be used cross-referenced with confirmation of compliance with the general requirements of the current RHD design manuals, standards and guidelines.

• Topographical mapping of the existing terrain including all permanent and temporary structures within the project corridor, land ownership boundaries/walls/fences, significant trees, utility services / poles, etc.

• The alignment and elevation for the proposed project together with typical cross sections.

• The location and typical size of cross-drainage structures.

• The Right of Way for the project (if an existing road) or required Right of Way (if a proposed new road).

• The additional land take required, and both temporary & permanent structures that would need to be demolished, for implementation of the Project.

• A preliminary cost estimate for the project (excluding compensation).

On the basis of the foregoing EE-RDSD, or consultants retained for the purpose, will prepare the Preliminary Design Report in sufficient detail to enable the Superintending Officer to make an informed decision with respect to his particular requirements for the detailed design of the Project.

### 4.4 DETAILED DESIGN

Upon approval of the Preliminary Design Report by the Superintending Officer EE-RDSD will prepare the detailed design of the project including the preparation of Tender Documents and the Engineer’s Estimate if necessary. The Tender Documents should comply with the New Tendering Procedure incorporating the latest version of the RHD Standard Tender Documents (Volumes 1–4) and the Engineer’s Estimate should be held confidential at all times.

As part of the design EE-RDSD will prepare a Design Report which will include a description of each element of the design and the justification for it, together with a complete set of design calculations as
an appendix. All title blocks for drawings and calculation sheets must be fully completed and signed (i.e. designed/checked/approved).

Upon completion EE-RDSD will submit a draft version of the Design Report and Tender Documents to the Superintending Officer for approval, and subject to any revisions he may require EE-RDSD will prepare and submit to the Superintending Officer the final version of the Design Report and Tender Documents in both hard copy and electronic form.

Since changes may be made to the designs and/or Tender Documents by the Superintending Officer or others at some future date, EE-RDSD must retain and archive a copy of the Design Report and Tender Documents clearly marked “As Approved” for future reference.

5 REFERENCES

- OP/ME/4.1 – Control of RHD Documents
- OP/PC/2.2 – Approval of Tender Documents
- OP/PC/2.4 – Appointment of Consultants
- RHD Standard Tender Documents (Volumes 1–4) (September 2001)

6 PROCEDURE FLOWCHART

The procedure flowchart for this procedure is detailed in the next page.
Start

Request for design services

Office Order from CE-RHD

Procure Consultants SE-RDSC

Assess need to outsource SE-RDSC

Operating Procedure OP/PC/2.4

Data collection and Review EE-RDSD

Surveys, counts, ground investigations etc

Draft Preliminary Design Report EE-RDSD

Preliminary Design Report

Approval

Yes

Draft Detailed Design Report EE-RDSD

No

Revise Design EE-RDSD

Yes

Final Design Report, Tender Documents, and Engineer's Estimate

Finalize Design EE-RDSD

Archive Final Design EE-RDSD

End
1 PURPOSE AND SCOPE

This procedure describes the audit process to be adopted by Road Design and Standards Division for road designs undertaken external to the Division. The purpose of the procedure is to ensure that such designs are carried out to current RHD standards as far as possible.

2 DEFINITIONS

External Road Designs - designs undertaken by other Wings, Circles, Divisions or Zones within RHD, as well as local and foreign consultants.

Preliminary Design Report - a report that contains the results and analysis of data collected for the design together with a preliminary design of the project including alignment, typical sections, land take and other significant factors which influence the viability and / or detailed design of the scheme.

Detailed Design Report - a comprehensive report on the design of the project that provides the justification (and alternatives where they exist) for every aspect of the design, together with a operational and environmental impact assessment of the completed road project.

3 RESPONSIBILITIES

Superintending Officer - the Superintending Officer for the road design will be responsible for the management and direction of the road designers, whether RHD in-house or external consultants, and will ensure that before such designs are commenced that the design team are aware of the current RHD design standards and guidelines.

Superintending Engineer - Road Design & Safety Circle (SE-RDSC) - will have overall responsibility for the design services provided by the Circle and for the audit of designs undertaken externally.

Executive Engineer - Road Design & Standard Division (EE-RDSD) - will be responsible for undertaking the audit of external road designs and for checking compliance with current RHD standards and guidelines.
4 METHOD

4.1 LIBRARY OF EXTERNAL DESIGNS

It will be the responsibility of the relevant Superintending Officer to notify SE-RDSC that an external road design is being undertaken on his behalf, whereupon EE-RDSD will open a new file for the project and include the following information on the Divisional library for external road designs:

- Project Title
- Road name, link no., and chainage from/to
- Superintending Officer
- Name of designers
- Date of notification

The new file for the project will take the form of a box file which, in due course, will be used to archive all correspondence, preliminary & detailed designs, reports, surveys and any other data relating to the project that have been received by Roads Design and Standards Division for the purposes of the design audit.

4.2 REVIEW OF PRELIMINARY DESIGN AND DESIGN REPORT

Upon receipt of the Preliminary Design and Preliminary Design Report for the road project EE-RDSD will first confirm that the design standards, which must be listed in the Report, correspond to the latest RHD Design standards. However in some instances it may have been necessary for departures from those standards or other (international) standards to be adopted.

Under these circumstances EE-RDSD should discuss such departures or alternative standards with SE-RDSC and other involved Divisions within RHD and, if necessary, seek approval from Chief Engineer RHD to such departures/alternatives.

Upon determining that the correct and/or approved standards have been used as a basis for the external design EE-RDSD should undertake a check that such standards have been correctly applied. In the event that departures from the approved standards are identified EE-RDSD shall refer the Preliminary Design back to the relevant Superintending Officer for corrections to be made.

4.3 REVIEW DETAILED DESIGN

Subject to approval of the Preliminary Design by the concerned Superintending Officer he will instruct those undertaking the road design to prepare the Detailed Design and corresponding Detailed Design
Report. Upon completion EE-RDSD will again check that the design complies with current RHD standards, and if not will refer it back to the relevant Superintending Officer for amendments.

When the final Detailed Design appears to comply with RHD standards EE-RDSD will notify the relevant Superintending Officer of this with the added disclaimer that the responsibility for the design and compliance with RHD standards remains with the designers, and that the audit carried out is neither a design check nor an approval of the design.

Finally, EE-RDSD will retain a copy of both the Design and the Detailed Design Report for archiving along with all correspondence, calculations, and other data relating to the project.

5 REFERENCES

- BRTA Traffic Signs Manual Volumes 1 & 2 (version Jan 00)
- Geometric Design Standards of Roads & Highways Department (Nov2000)
- Pavement Design Standards for Roads & Highways Department (Version 1.4)
- Standard Tender Documents Volume 3 of 4 – Technical Specifications (May 2001)
- Standard Test Procedures (May 2001)
- Standard Tender Documents Volume 4 of 4 – Standard Drawings (under preparation)

6 PROCEDURE FLOWCHART

The procedure flowchart for this procedure is detailed in the next page.
Start

Library of external designs

Update library of external designs (EE-RDSD)

RDS Circle notified of external road design

Review Preliminary Design (EE-RDSD)

Preliminary Design & Design Report

Approval

No

Review Detailed Design (EE-RDSD)

Detailed Design & Report

Approval

No

Archive correspondence, designs, reports etc

Yes

End
1 PURPOSE AND SCOPE

The purpose of this procedure is to ensure that the construction of roads by or on behalf of RHD comply with current RHD standards or variations/alternative standards that have been approved by the Chief Engineer, RHD. By definition audits that are carried out will be spot checks for compliance with RHD standards, while responsibility for ensuring contractor compliance with the contract documents for the works will remain with the designated “Engineer” for the contract.

2 DEFINITIONS

Audit - in this context is deemed to mean spot checks on various aspects of the construction works and will not be a comprehensive verification of compliance with RHD design standards

Contract documents - means the design, specifications, conditions of contract and other documents forming the contract with the contractor for the construction works.

3 RESPONSIBILITIES

Superintending Officer - has overall responsibility for the construction of an RHD road contract and supplying the Contract Documents to Road Design & Safety Circle for auditing.

The "Engineer" - is responsible for supervising the construction contract and ensuring compliance with the Contract Documents.

Executive Engineer - Road Design & Standard Division (EE-RDSD) - is responsible for visiting ongoing and recently completed road schemes to monitor compliance with the contract documents in terms of RHD design standards.

4 METHOD

4.1 PREPARE AND UPDATE LIBRARY OF ROAD CONSTRUCTION PROJECTS

EE-RDSD will liaise with HDM Circle to supply information for the library of current and future (committed) road construction projects containing the following minimum information:

- Road no., Link no., Link description, (from Km to Km)
- Brief description of the works
- Name and contact details for the Superintending Officer and the Engineer
- Name of designers plus contact details
• Name of contractor
• Start date for construction
• Anticipated completion date

To assist EE-RDSD to maintain this database it will be the responsibility of the relevant ACE/Zones to notify Road Design & Safety Circle of projects they are to undertake, and to again notify the Circle when the construction works have commenced.

4.2 CHECK CONTRACT DOCUMENTS FOR COMPLIANCE WITH STANDARDS

It will be the responsibility of the designers of RHD road projects to ensure that their designs comply with current RHD design standards. Although designs undertaken by external agencies (e.g. consultants) may have been subject to an audit by Road Design & Safety Circle, EE-RDSD should check that the designs being used for construction are certified correct by the designers and correspond to those that have been subject to audit (if carried out).

To this end the relevant Superintending Officer should advise EE-RDSD of any material changes that have been made to the original / audited designs and the authority under which these changes have been made.

4.3 UNDERTAKE PERIODIC SITE VISITS

At various times during the construction works EE-RDSD should make unannounced site visits to check that the works are being carried out in compliance with the contract documents i.e. RHD standards. Specifically EE-RDSD should check on the following:

• Safety - whether or not the contractor is undertaking the works with due regard to the safety of the public and his workforce e.g. signing, watching, lighting, fencing, shoring, etc.

• Standards - whether or not the contractor is using the correct materials and undertaking the required testing of these materials to show compliance with the standards, and whether or not the contractor is undertaking the works in compliance with the specifications for workmanship

• Environmental - whether or not the contractor is complying with the requirements of the specifications and conditions of contract with respect to mitigating the environmental impact of the works e.g. prevention of flooding, breeding of mosquitoes, pollution of watercourses, etc.

When visiting construction sites EE-RDSD will notify the “Engineer” in advance and whether accompanied or not during his site visit EE-RDSD should give no instructions to the contractor. Should he observe gross safety breaches in the contractor’s method of working he should immediately
communicate these to the “Engineer”, but for all other issues (including safety) he should prepare an interim audit report on the construction works for submission to the Superintending Officer.

### 4.4 Final Audit Report

Upon substantial completion of the works EE-RDSD should carry out an inspection to check that the finished road works comply with the design standards shown in the contract documents, in particular in relation to carriageway markings, signs and tidying-up of the site. Specifically side ditches, culverts and footways (where provided) should be clear of obstructions and all debris, plant and unused materials removed.

Following this visit EE-RDSD should prepare a final audit report for submission to the Superintending Officer and then archive this, along with previous reports, on the project file.

### 5 References

- BRTA Traffic Signs Manual Volumes 1 & 2 (version Jan 00)
- Geometric Design Standards of Roads & Highways Department (Nov2000)
- Pavement Design Standards for Roads & Highways Department (Version 1.4)
- Standard Tender Documents Volume 3 of 4 – Technical Specifications (May 2001)
- Standard Test Procedures (May 2001)
- Standard Tender Documents Volume 4 of 4 – Standard Drawings (under preparation)

### 6 Procedure Flowchart

The procedure flowchart for this procedure is detailed in the next page.
RHD Operational Procedure – Technical Services Wing

OP/RDS/2.3 - Audit of Road Construction Projects

Start

Library of road construction projects

Update library of road construction projects (EE-RDSD)

Notification of upcoming Projects (ACE-Zones)

Check designs in contract documents for compliance with standards (EE-RDSD)

Notification of changes to Design Report

Periodic audit Reports (EE-RDSD)

Undertake periodic site visits (EE-RDSD)

Completion audit Report (EE-RDSD)

Completion audit (EE-RDSD)

Archive audit Reports (EE-RDSD)

End
1 PURPOSE AND SCOPE

This procedure describes the process for the collection of road traffic accident (RTA) data for either a specific project area (including on a National basis for the Annual Road Safety Engineering Report), or for a specific route, or for a specific location. The procedure includes processing of the data into a reporting format and issuing a RTA Data Report.

2 DEFINITIONS

BRTA - Bangladesh Road Transport Authority, Old Airport Road, Allenbari, Tejgoan, Dhaka.

RSC - Road Safety Cell BRTA. The RSC is the custodian of the National RTA Database. The contact details for matters relating to the RTA Database are: The Manager, BRTA Road Safety Cell, House 10A, Road 25A, Banani, Dhaka. Attention: Accident Data Analyst.

RTA - Road traffic accident.

RTA Data Report - A brief report, which presents the collected data. This report is the outcome of this procedure. At the conclusion of the procedure, the report is issued by presenting a copy to the person who issued the instruction to collect accident data. A copy is also to be kept on file.

3 RESPONSIBILITIES

Executive Engineer, Road Safety Division - Normally the EE-RSD will be the person issuing the instruction to collect RTA data. The EE may receive a request to supply RTA data from the SE-RDS or from the EE-RDSD or the EE may initiate the instruction to collect accident data as part of another procedure. The EE is also responsible for commissioning the procurement of consultancy services, if required, for the collection of accident data and for receiving the Consultant’s Report.

4 METHOD

4.1 REQUEST RSC TO SEND RTA DATA

The RSC is the custodian of the National RTA Database. Accident data is collected by the Thana level Police by completion of a specially designed Police form. This information is sent to one of ten Accident Data Units (ADUs) where it is loaded onto a computer and an electronic copy of the data is sent via Police Headquarters to the RSC. The ADUs are managed by the Police Range and Metro Deputy Inspector Generals (DIGs), with their technical direction being provided by the RSC. The Police use the database information for their own road safety enforcement needs, but their is no need
for the RHD, or any other organisation, to approach the Police Range and Metro DIGs with a request for RTA database information.

The request for RTA data should be made directly to the RSC. The National RTA Report 2002 contains a section on how to access the database and it provides details of the content of the database and the scope of captured accident data. The request is made by completing a standard form, available from the RSC, which will guide the person requesting the information through the process for correctly specifying the area of interest and the selection of data fields (scope of the required data). The request for data can be made by fax, written correspondence or e-mail.

4.2 SUFFICIENCY OF DATA RECEIVED FROM THE RSC

Under-reporting is a significant feature of the RTA database. The data received from the RSC is likely to be sufficient for national or regional reporting, but it is not likely to be adequate for reporting on a specific short section of highway or a specific location. The data held in the National RTA database can be supplemented by data collected by RHD Zone and field offices and cross-checks can be made against data acquired from the media and others sources.

For specific routes or locations, following a site inspection to assess the potential accident occurrence (by observation of traffic conditions and potential conflicts, with casual interviewing of persons in the area), it may be considered appropriate to formally collect details of fatal accidents which have occurred in the past year and other accident in the past three months, through the structured interviewing of samples of persons living or working in the immediate environs of the site. Consultants could be commissioned to do this work. During the site inspection, discussions with the Thana Police may be useful in determining the actual incidence of traffic accidents in the area of interest and the identification of road user movement patterns and conflict locations.

4.3 RTA DATA REPORT

Once all the data is collected, it is assembled into a report for presentation to the person who issued the instruction to collect data. Depending on the brief given in the instruction to collect data, the data may need to be sorted and summarised before assembling it in the RTA Data Report. Ways of processing the data for reporting are contained in the Road Safety Engineering Procedures referenced below. MAAP software, used by the RSC, is a useful tool for expending the sorting and summarising of accident data.

After issuing and distributing the Report, copies of the report are filed together with all other documentation drafted or received during the execution of the procedure.
5 REFERENCES

- Road Safety Engineering Procedure Note 1: Identifying Hazardous Locations in Bangladesh – Site Selection Techniques (RRMP2, IDC)
- Road Safety Engineering Procedure Note 2: Treating Accident Black spots in Bangladesh (RRMP2, IDC)
- Road Safety Engineering Procedure Note 3: Route Studies in Bangladesh (RRMP2, IDC)
- RHD Operational Procedure for Procuring Consultants, OP/PC/2.4

6 PROCEDURE FLOWCHART

The procedure flowchart for this procedure is detailed in the next page.
Start

Receive instruction to provide data for specific project area, route or location (EE-RSD)

Request RSC to send RTA data

Is data sufficient and appropriate?

Yes

Site inspection to assess likely RTA occurrence in area of interest (SDE)

No

Is supplementary data collection required?

Yes

Commission procurement of consultancy services for on-site evaluation of RTA occurrence (EE-RSD)

No

RTA Data Report

Summarise data into reporting format

Report approved by EE-RSD

File Report and all other documentation

Distribute Report as per original instruction to provide data (SDE)

End
1 PURPOSE AND SCOPE

This procedure describes the process for the production of scheme plans and a report for a road safety improvement project. The procedure includes for the collection of all necessary and relevant data, site inspection, evaluation and analysis of the data, the identification and assessment of improvement options, and the preparation of scheme plans and report.

2 DEFINITIONS

Road Safety Improvement Report - The outcome of this procedure.

RSC - Road Safety Cell, BRTA. The RSC is the custodian of the National RTA Database. The contact details for matters relating to the RTA Database are: The Manager, Road Safety Cell, House 10A, Road 25A, Banani, Dhaka. Attention: Accident Data Analyst.

The meaning of acronyms used for common terms are described in the glossary at the beginning of this Manual. Other acronyms used in this procedure are:

RTA - Road traffic accident.

TMC - Turning movement count.

3 RESPONSIBILITIES

Superintending Engineer - Road Design & Safety Circle - Responsible for instigating the instruction to determine road safety engineering improvements for a specific project area, route or location, based either on instructions received from the Additional Chief Engineer-TSW or on his/her own initiative, either as part of a road safety programme, or as an outcome of the Annual Road Safety Engineering Report, or similar. The SE-RDS is responsible for implementing the Report's recommendations.

Executive Engineer - Road Safety Division - Receives the instruction to design road safety improvements and has overall responsibility for the procedure and for the design of the safety improvements and production of the scheme plans and report. The EE will assign the SDE-RSD and/or an AE-RSD to complete the tasks, which form the procedure, and the EE will commission the procurement of consultancy services, if needed. The EE must be familiar with the site and must have visited it at least once within the year prior to the identification of improvement options. The EE should visit the site prior to the finalisation of scheme plans.
4 METHOD

The procedure is easily divided into several phases, namely, data collection; site inspection; evaluation and analysis; option identification and assessment; scheme plan preparation; and reporting.

4.1 DATA COLLECTION

Data will need to be collected from several sources and should include at least the following:

- RTA data
- GIS information and site plans
- HDM & road inventory data
- Land use planning data
- MV & NMV traffic volumes counts (7-day and peak period); classification and TMC data
- Pedestrian volume counts and pedestrian density data
- Construction costs; economic costs of RTAs; costs for land acquisition & resettlement
- Records of recent and details of planned roadworks in the site area

Operational Procedure OP/RDS/3.1 describes the process for collecting RTA data from the RSC. All other data should be sourced initially from other Wings within the RHD (the Planning & Maintenance Wing, HDM Circle and Planning & Programming Circle, and the Bridge Management Wing, Planning & Data Circle) and from the Road Design & Standards Division. Land use planning data may also have to be sourced from other departments or Ministries. More than likely, the data collected from the RSC and the RHD Wings will have to be supplemented with on-site surveys. These can be carried out either by TSW staff or by consultants commissioned specifically for that purpose. The direct hire of labour for on-site surveys does not produce reliable results and should only be used in special circumstances.

4.2 SITE INSPECTION

Site inspection by the RSD staff is an important and necessary part of the design procedure. A site inspection must be carried out at the data collection phase with the purpose of making an initial assessment of road environment, travel demand, traffic conditions, roadside land utilisation and RTA occurrence.

The initial site inspection should include on-site discussions with the Zone Superintending Engineer. During the initial site inspection, discussions with the Thana Police and casual interviewing of persons in the area will supplement the observation of traffic conditions, travel demand and potential conflicts, may be useful in determining the actual incidence of traffic accidents in the area of interest and the
identification of road user movement patterns and conflict locations. An evaluation of travel conditions at different times and under different climatic and seasonal conditions should also be undertaken during the site visit. All this is essential information for the determination of effective road safety improvement schemes.

Desirably a second site inspection should be made prior to finalising the draft options and scheme plans. There is merit also in inspecting the site during the process of identifying the road safety improvement options or interventions.

4.3 DATA EVALUATION AND ANALYSIS

The data is to be evaluated and analysed to determine road safety engineering improvement options, which must be quantified and costed. Draft scheme plans of the improvement options are to be prepared as the basis for quantity estimation and for inclusion in the final Road Safety Improvements Report. Costs must include not only all construction and supervision costs, but also the cost of land acquisition & resettlement, if required.

The data is also to be evaluated and analysed to assess the expected change in RTA occurrence as a result of the improvement or intervention. Scheme benefits will be determined as the assessed change in the economic cost of RTA occurrence.

The IDC Road Safety Engineering Procedure Notes contain useful guides for the evaluation and analysis of data for the determination of road safety improvements.

4.4 OPTION IDENTIFICATION AND ASSESSMENT

Normally, road safety improvement projects will be commissioned for sites where there is a clustering of fatal accidents, commonly referred to as "black spots", and typically they will be sites where there are conflicts between different categories of road users. It is important in the determination of safety improvement options that the travel demands of all road users are considered. It is also important to look outside the site area to ensure that the safety improvement works will fit with the overall function of the road corridor(s) and to identify any potential for accident migration.

Options may be assessed on the basis of their capability to achieve improved safety, which may include a sensitivity analysis, and on the basis of an economic (cost/benefit) analysis.

The services of the RDS Division may be required for the drafting and production of scheme plans.
4.5 REPORTING

The final outcome of the procedure for designing a road safety improvement project is the report, which can contain options but must recommend a preferred option. The Report must contain recommendations for further action, probably in the form of including the preferred option in an annual construction programme or including it in a special programme for immediate implementation. The SE-RDS is responsible for implementing the Report’s recommendations.

In some cases, there may be no viable option, in which case a report should still be produced but with justification for such a conclusion.

The Road Safety Improvement Report is initially prepared as a draft and issued by the EE-RSD to the SE-RDS and the ACE-TSW. Following receipt of comments the report is finalised and distributed by the ACE-TSW to the Zone ACE and the ACE-Planning & Maintenance Wing (and Bridge Management Wing, is appropriate) with a copy to the Chief Engineer.

5 REFERENCES

- RHD Operational Procedure for the Collection and Processing of Road Traffic Accident Data, OP/RDS/3.1
- Road Safety Engineering Procedure Note 1: Identifying Hazardous Locations in Bangladesh – Site Selection Techniques (RRMP2, IDC)
- Road Safety Engineering Procedure Note 2: Treating Accident Black spots in Bangladesh (RRMP2, IDC)
- Road Safety Engineering Procedure Note 3: Route Studies in Bangladesh (RRMP2, IDC)
- Geometric Design Standards of Roads & Highways Department, July 2001
- Traffic Signs Manual, Volumes 1 & 2 (BRTA)

6 PROCEDURE FLOWCHART

The procedure flowchart for this procedure is detailed in the next page.
1 PURPOSE AND SCOPE

The Annual Road Safety Engineering Report provides a statement of the safety performance of the RHD road network with analysis of the road safety condition of the various highways and roads, which are under the jurisdiction of the RHD. The Annual Report may be divided into three sections, namely National and Regional Highways; Feeder and District Roads (under the RHD's jurisdiction); and Bridges and Culverts.

This procedure describes the process for the production of an Annual Road Safety Engineering Report, the content of which is outlined in the methodology below.

2 DEFINITIONS

RSC - Road Safety Cell BRTA. The RSC is the custodian of the National RTA Database. The contact details for matters relating to the RTA Database are: The Manager, Road Safety Cell, House 10A, Road 25A, Banani, Dhaka. Attention: Accident Data Analyst.

The meaning of acronyms used for common technical terms are described in the glossary at the beginning of this Manual. Other acronyms used in this procedure are:

RTA - Road traffic accident.

3 RESPONSIBILITIES

Additional Chief Engineer - Technical Services Wing - The ACE-TSW is the initial recipient of the Annual Road Safety Engineering Report. The ACE-TSW is responsible for distributing the Report to the Chief Engineer, to all Zone ACEs and to all Wing ACEs and for requesting the appropriate persons to implement the Report’s recommendations.

Superintending Engineer - Road Design & Safety Circle - Responsible for instigating the instruction to prepare the Annual Road Safety Engineering Report, and approves the final draft for issue and distribution.

Executive Engineer - Road Safety Division - Receives the instruction to prepare an Annual Road Safety Engineering Report. Directs and is responsible for the collection of data, preparation of the report, its editing and final completion. The EE will assign the SDE-RSD and/or an AE-RSD to complete tasks as necessary.
4 METHOD

4.1 INSTRUCTIONS

In February each year, the SE-RDS should direct the EE-RSD to prepare the Annual Road Safety Engineering Report for the previous annual period. A guide to the contents of the report is contained in Section 4.3 below.

4.2 DATA COLLECTION

Preparation of the report includes the collection of RTA data from the RSC (refer RHD Operational Procedure OP/RDS/3.1) and the collection of road and traffic data from other Circles within the RHD (the Planning & Maintenance Wing, HDM Circle and Planning & Programming Circle, and the Bridge Management Wing, Planning & Data Circle).

4.3 ANALYSIS AND REPORT PREPARATION

The data is to be analysed and assembled into various tables to illustrate

(a) the safety performance of the RHD road network, and

(b) the safety condition of the various highways and roads which are under the RHD’s jurisdiction.

Safety performance can be demonstrated as a summary of the total number of casualty RTAs which occurred during the reporting period on all National and Regional Highways and feeder roads which are under the jurisdiction of the RHD. The summary, which can be broken down into Zones, may also include a record of the number of fatalities and the number of persons injured.

Annual trends in the safety performance can be reported by comparing the number of RTAs in the reporting year with the number recorded in previous years.

The Report can also summarise casualty RTAs by accident features and factors such as type of collision, type of vehicle involved, etc., with comment on the significance of the information for targeting road safety initiatives.

By combining RTA data with traffic data, accident exposure and accident rates can be established for road sections within each Zone. This will facilitate the selection of Zones and road sections for the planning of road safety initiatives and interventions to maximise the effectiveness of such measures in terms of accident reduction.

The safety condition of the highways and roads which are under the jurisdiction of the RHD can be reported by tabulating the RTA data conjunction with traffic data and road carriageway data. The
proportion of roads which achieve the design standard can be reported and sub-standard sections can be identified. The Geometric Design Standards for RHD roads specifies the standards for several cross-section elements of which the following are significant to road safety: carriageway (lane) width; paved shoulder width; verge width; traffic volume (as proportion of design capacity); NMV/MV ratio; and NMV volume.

The outcome of the evaluation of the safety performance and safety condition of the RHD road network will be the selection of road sections warranting further analysis for inclusion in future road safety improvement programmes. The Report can list this selection with comments and recommendations for future action.

The Report should also contain a summary of the current road safety improvement programme with comments and recommendations as appropriate.

The final draft of the Report is to be submitted for comment before the end of March.

4.4 DISTRIBUTION

Following approval of the final draft, the Report is to be issued and distributed before the end of April. Refer Section 3 above for directions on distribution.

5 REFERENCES

- National Road Traffic Accident Report 2002, BRTA Road Safety Cell
- RHD Operational Procedure for the Collection and Processing of Road Traffic Accident Data, OP/RDS/3.1
- Geometric Design Standards of Roads & Highways Department, July 2001

6 PROCEDURE FLOWCHART

The procedure flowchart for this procedure is detailed in the next page.
Receive an instruction to prepare the Annual Road Safety engineering report (refer Section 4.1)

Collect RTA data (refer Section 4.2)
Collect road and traffic data (refer Section 4.2)

Data Analysis and Report Preparation (refer Section 4.3)
Submit Draft Final Report (refer Section 4.3)

Finalise Report (refer Section 4.3)

File Report and all other documentation

Distribute Report (refer section 4.4)

Receive Comment

Annual Road Safety Engineering Report

Start

End
1 PURPOSE AND SCOPE

This procedure describes how BRRL will compile and maintain a library of relevant research work relating to road design and construction carried out in Bangladesh and internationally, and undertake in-house research on new road construction materials or construction techniques.

2 DEFINITIONS

Design Standards and Specifications - are deemed to include all design standards, manuals and specifications that have been approved for use in Bangladesh by the Chief Engineer, RHD in relation to road design and construction.

International Road Research Agencies - are deemed to include the TRL in the UK, ARRB in Australia and other such overseas agencies engaged in research into the design and construction of roads in developing countries.

Technical Services Wing Management Team (TSWMT) - a committee chaired by the Additional Chief Engineer, RHD which can recommend amendments to existing design standards and specifications or the adoption of new ones where appropriate.

3 RESPONSIBILITIES

Superintending Engineer - BRRL Circle (SE-BRRL) - will have overall responsibility for ensuring that BRRL maintain a current library of research carried out by international road research agencies and others in relation to roads in developing countries, and for directing and controlling any similar research work undertaken by BRRL.

Executive Engineer - Soil Investigation Division (EE-SID) - will be responsible for maintaining the soils and foundation engineering aspects of the BRRL research library and for conducting research in these fields when required to do so.

Executive Engineer - Material Testing & Maintenance Division (EE-MTMD) - will be responsible for maintaining the materials aspects of the BRRL research library and for conducting research into construction materials when required to do so.

Executive Engineer - Road Design & Standard Division (EE-RDSD) - responsible for the preparation of technical papers for submission to TSWMT and sub-committees relating to proposed amendments/additions to RHD design manuals and specifications, and for notifying all interested parties if and when these are approved by CE-RHD.
4 METHOD

4.1 BACKGROUND

At the present time only limited research is undertaken by BRRL into soils and road construction materials. Given that significant research into these subjects is routinely undertaken by international research agencies specifically for the design and construction of roads in developing countries, clearly it would be inappropriate to attempt to duplicate this work.

However, much of the research carried out by international agencies, particularly in relation to locally available construction materials, is inappropriate to Bangladesh. Accordingly, such research has to be carefully monitored to identify any new construction techniques or materials that could be applicable in Bangladesh.

Various sources exist for obtaining this information, frequently free of charge or at a nominal cost, including the internet, the international research agencies themselves, professional institutions, etc. It will be the responsibility of BRRL to monitor this research and maintain a library of research relevant to Bangladesh; to draw the attention of the Chief Engineer, RHD to research undertaken by others which could lead to cost savings and / or improvements to RHD standard road maintenance / construction techniques; and to undertake limited new research on locally available materials and alternative construction techniques where identified.

4.2 SCREENING OF PUBLISHED RESEARCH

Under the direction of SE-BRRL both EE-SID and EE-MTMD will review published research, journals and other sources of information for new developments/techniques in their respective fields. A library will be maintained of all published research (for possible future reference), but where new developments/techniques may be directly applicable in Bangladesh, or where as a result of further research by BRRL they have the potential to become applicable, then EE-SID or EE-MTMD as appropriate will further investigate their potential.

4.3 IDENTIFY POSSIBLE NEW METHODS/MATERIALS APPLICABLE TO RHD

As a result of their review of published research EE-SID and/or EE-MTMD may identify new materials or construction techniques that have been developed in other developing countries that may be applicable in Bangladesh. Where these are identified EE-SID and/or EE-MTMD will investigate further sources of information on these topics and prepare a BRRL Research Report for submission to TWSMT by Road Design & Safety Circle for possible changes to RHD design standards and manuals.
4.4 IDENTIFY POSSIBLE NEW RESEARCH FOR BRRL

Where new techniques / materials have been developed for use in other developing countries they may not be directly applicable in Bangladesh e.g. due to the different climate, soil conditions, etc. Under these circumstances full-scale field trials or further laboratory testing by BRRL may be needed to determine whether or not they could be applied in Bangladesh.

Where field trials are required EE-SID or EE-MTMD as appropriate will prepare a budget proposal for consideration by the Chief Engineer, RHD containing a full justification for the trials including the potential benefits that would result if the field trials proved successful. In this it will frequently be the case that field trials can be undertaken as part of an upcoming road construction or maintenance project thereby keeping their cost to a minimum.

At their conclusion all field trials and/or laboratory testing will be fully documented in a BRRL Research Report, which will contain, amongst other things, a justification for the research, the results obtained, an analysis of those results and the conclusions that can be drawn from this analysis.

4.5 PREPARATION OF BRRL RESEARCH REPORTS

The primary purpose behind BRRL Research Reports will be to inform RHD management of possible new construction techniques and materials which have been successfully adopted in other developing countries, and their potential for application in Bangladesh.

In many cases it will be shown that the techniques/materials are not appropriate to Bangladesh, in which case the BRRL Report will have served it’s purpose by demonstrating that fact. In other cases it may be shown that considerable benefits could result by adopting new techniques/materials. Under these circumstances changes may be required to RHD Standards or Specifications.

4.6 AMENDMENTS TO RHD DESIGN STANDARDS & SPECIFICATIONS

Amendments to RHD Design Standards & Specifications cannot be made without the approval of the Chief Engineer, RHD. The updating of design standards and specifications is the responsibility of Road Design & Safety Circle under Operating Procedure OP/ME/4.1

Where amendments are proposed by BRRL, it will be the responsibility of the originating Executive Engineer to provide the technical justification and precise wording of the amendments to EE-RDSD for him to process under OP/ME/4.1.
5 REFERENCES

- Research Reports from TRL, ARRB, BUET, etc
- Professional Journals (e.g. New Civil Engineer, Institution of Engineers, Bangladesh etc.)
- Internet Web sites
- RHD Standard Tender Documents Volume 3 of 4
- Operational Procedure OP/ME/4.1

6 PROCEDURE FLOWCHART

The procedure flowchart for this procedure is detailed in the next page.
RHD Operational Procedure – Technical Services Wing

OP/BRL/1.1 - Organisation of Research Work

Library of published research

Update research library (EE-SID & EE-MTMD)

Screen research for topics relevant to RHD (EE-SID & EE-MTMD)

Identify possible new methods/materials applicable to RHD (EE-SID or EE-MTMD)

Identify possible new research for BRRL (EE-SID or EE-MTMD)

Prepare budget request for field trials (EE-SID or EE-MTMD)

Field trials

BRRL Research Report (EE-SID or EE-MTMD)

Report added to RHD database (MIS Circle)

Are changes proposed to specifications/procedures?

Submit proposals to Road Design & Safety Circle (EE-SID or EE-MTMD)

Assist RDS with Operational Procedure OP/ RDS/1.1 (EE-SID or EE-MTMD)

End

No

Yes

End
1 PURPOSE AND SCOPE

This procedure covers the process to be adopted following a request from a Circle or Zone within RHD for a major field soil investigation for a road or bridge project.

2 DEFINITIONS

Major Field Soil Investigation - is deemed to require the mobilisation of one or more drilling rigs, vehicles and testing equipment to site for a period of several days or more, with subsequent laboratory analysis on samples and preparation of a soil investigation report.

3 RESPONSIBILITIES

Superintending Engineer - BRRL (SE-BRRL) - has overall responsibility for services undertaken or provided by BRRL.

Executive Engineer - Soil Investigation Division (EE-SID) - has overall responsibility for the management and conduct of soil investigations including laboratory tests on samples and interpretation of results

Sub–Divisional Engineer - Soil Investigation Division (SDE-SID) - is responsible for the soil investigations on site and subsequent laboratory analysis of samples together with the preparation of the interpretive report for review by EE-SID/SDE-SID will be supported in this by the BRRL geologist and other BRRL support staff.

Additional Chief Engineer - Zone/Wing - as the originator of the request for a field investigation responsible for obtaining budget approval for it.

4 METHOD

4.1 REQUEST FOR A MAJOR FIELD SOIL INVESTIGATION

Requests for a major field soil investigation will generally arise during the early stages of project preparation for new road and bridge projects. As such they could arise from any of the Zones or Wings (e.g. the RHD Bridge Management Wing or Road Design & Safety Circle).

Upon receiving such a request EE-SID will agree with the originator of the request the scope and content of the required soil investigation, together with an estimate of the resources needed to carry it out and a programme for undertaking it.
EE-SID will submit the programme and resource estimate to SE-BRRL for a decision on whether or not BRRL will have to outsource the fieldwork due to other commitments.

4.2 PREPARATION OF BUDGET

Following a decision by SE-BRRL with respect to outsourcing the fieldwork, EE-SID will prepare a budget estimate for the soil investigation. If the fieldwork is to be undertaken by BRRL this budget should include for all expenses incurred by BRRL outside the laboratory whereas if the fieldwork is to be outsourced it should include for the procurement of a contractor to undertake this work. EE-SID should submit this budget estimate to the originator of the request for the soil investigation with a request for them to arrange the necessary funding.

4.3 PREPARATION OF WORK PLAN

Upon approval from the originator of the request to the budget estimate and confirmation from them that funds are available to undertake the soil investigation, EE-SID in consultation with SDE-SID should prepare a Work Plan for undertaking the investigations based on the approved programme.

Should outsourcing of the fieldwork be required then procurement of a contractor to undertake this work should be undertaken in accordance with RHD Procedures and included in the Work Plan.

4.4 FIELD INVESTIGATIONS AND LABORATORY TESTING

Prior to mobilisation for the field investigations SDE-SID should ensure that any necessary permits have been obtained and the location of any underground utilities identified by the originator of the request for the soil investigation. Immediately prior to mobilisation SDE-SID should check that equipment to be taken to site is fully operational (with spares as appropriate) with adequate fuel and other consumables. Similarly SDE-SID should check that laboratory equipment needed to test samples from the field is both operational and fit for the purpose.

All soil investigations for proposed bridge sites must conform to the requirements of the RHD Bridge Designer’s Handbook. Amongst other things this requires such investigations to comply with the relevant British Standards or AASHTO requirements, and where appropriate the RHD Standard Test Procedures. At locations other than bridge sites where the required soils information relates solely to the design of embankments and road pavements, then the RHD Standard Test Procedures alone are likely to suffice.
4.5 **FIELD LOG AND INTERPRETIVE REPORT**

Upon completion of all field work and laboratory testing on samples SDE-SID will prepare a report on the field investigations including borehole logs and raw data from both in-situ and laboratory tests carried out. Based on this SDE-SID will prepare an interpretive report on the soil properties, characteristics and strength parameters for review by EE-SID.

Subject to any amendments by EE-SID the field log and interpretive report will be finalised and submitted to the originator of the request for the field investigation. SDE-SID will ensure that an archive copy of both the field log and interpretive reports are retained by BRRL.

5 **REFERENCES**

- RHD Standard Test Procedures (May 2001)
- AASHTO Standard Test Procedures/British Standards
- RHD Bridge Designer’s Handbook
- OP/PC/2.1 – Pre-qualification of Contractors
- OP/PC/2.2 - Approval of Tender Documents
- OP/PC/2.3 – Evaluation of Tenders

6 **PROCEDURE FLOWCHART**

The procedure flowchart for this procedure is detailed in the next page.
Prepare programme and resource estimate (EE-SID)

Request for field investigation (ACE-Zone)

Need to outsource? (SE-BRRL)

Prepare budget estimate for fieldwork (EE-SID)

Obtain approval for budget (ACE-Zone)

Prepare work plan based on programme (EE-SID)

End

Request for field investigation (ACE-Zone)

Prepare budget estimate for contractor (EE-SID)

Obtain approval for budget (ACE-Zone)

Procure contractor under OP/PC/2.1, 2.2 and 2.3 (ACE-Zone)

Field log and interpretive report (SDE-SID & EE-SID)

Field investigations and laboratory tests (SDE-SID)

Archive field log and interpretive report (SDE-SID)

End
1 PURPOSE AND SCOPE

This procedure outlines the process to be adopted following a request to BRRL to investigate a major defect in an existing road.

2 DEFINITIONS

Defect - is deemed to include excessive settlement of a road pavement together with both embankment and cut slope failures.

Defect Investigation Report - includes the results of all field and laboratory tests deemed necessary to determine the cause of a defect, together with an analysis of those results and recommendations for remedial action to repair the defect.

3 RESPONSIBILITIES

Superintending Engineer - BRRL (SE-BRRL) - has overall responsibility for services undertaken or provided by BRRL.

Executive Engineer - Soil Investigation Division (EE-SID) - has overall responsibility for the management and conduct of defect investigations including both field and laboratory tests on samples and interpretation of results.

Executive Engineer - Material Testing & Maintenance Division (EE-MTMD) - is responsible for the laboratory testing of field samples from road pavements and interpretation of results.

Sub - Divisional Engineer - Soil Investigation Division (SDE-SID) - is responsible for the soil investigations on site and subsequent laboratory analysis of samples together with the preparation of the interpretive report for review by EE-SID.

4 METHOD

4.1 REQUEST FOR AN INVESTIGATION

Almost all requests for defect investigations will come from the Zones, and such requests must be made to SE-BRRL by the relevant ACE for the Zone or SE for the Circle in which the defect is located. Since the investigation and subsequent remedial works will take some time to implement, it will be the responsibility of the SE for the Circle to ensure that site of the defect is made safe and does not present a hazard to the public.
4.2 INITIAL SITE VISIT AND PRELIMINARY REPORT

Following receipt of a request for a defect investigation SE-BRRL will instruct EE-SID to undertake an initial site visit to make a visual assessment of the likely cause of the defect, and an estimate of the field and laboratory tests that would need to be carried out to prepare a Defect Investigation Report.

As part of this report EE-SID will prepare a programme for the investigation together with a budget estimate for any external costs that will be incurred, and will submit these to the originator of the request for them to obtain budget approval from CE-RHD.

4.3 FIELD INVESTIGATIONS AND LABORATORY TESTS

Following budget approval to undertake the defect investigation EE-SID will arrange for the field investigations in accordance with OP/BRL/2.1. Where the defect takes the form of severe deformation of a comparatively new road pavement, as part of the field investigations samples may need to be taken from the pavement layers for subsequent laboratory analysis to determine compliance or otherwise with the original pavement design.

At completion of the field and laboratory tests EE-SID, in conjunction with EE-MTMD as appropriate, will prepare a report on all tests carried out and an interpretive report based on an analysis of the results.

4.4 DEFECT INVESTIGATION REPORT

In parallel with the preparation of the interpretive report on test results EE-SID will prepare a Defect Investigation Report summarizing the results of the interpretive report forming conclusions as to the cause of the defect. The Defect Investigation Report will also make specific recommendations how to rectify the defect and general recommendations on how to avoid similar defects occurring on other road projects.

Upon completion and approval by SE-BRRL the Defect Investigation Report will be sent to the originator of the request by EE-SID, copied to Road Design & Safety Circle and / or Bridge Design Circle if general recommendations are made.

Following this EE-SID will ensure that a copy of the Report is archived within BRRL.

5 REFERENCES

- OP/BRL/2.1 – Major Field Soil Investigations
6  PROCEDURE FLOWCHART

The procedure flowchart for this procedure is detailed below:
1 PURPOSE AND SCOPE

This procedure outlines the process for materials testing requested by Zones or Circles within RHD, and is also applicable to both testing and research on possible new construction materials identified by BRRL or others/parties.

2 DEFINITIONS

Standard Test Procedures - are the test procedures contained in the Standard Test Procedures Manual (May 2001) authorised by the Chief Engineer, RHD.


Design Standards and Specifications - are deemed to include all design standards, manuals and specifications that have been approved for use in Bangladesh by the Chief Engineer, RHD in relation to road design and construction.

3 RESPONSIBILITIES

Superintending Engineer - BRRL Circle (SE-BRRL) - will have overall responsibility for ensuring that BRRL undertake the testing of materials in accordance with good practice and the requirements of the Standard Test Procedures.

Executive Engineer - Material Testing & Maintenance Division (EE-MTMD) - will be responsible for all material testing undertaken and for verification that the Standard Test Procedures have been followed.

4 METHOD

4.1 GENERAL

Most of the testing of road/bridge construction materials will be undertaken on site in Project laboratories (provided as part of the contract by the contractor for the use of the Engineer) or in BRRL Zonal laboratories.

In the event that these laboratories do not have the necessary equipment for specialist or complex tests BRRL may be requested to undertake these. In addition BRRL may be requested to undertake other standard tests as a crosscheck or audit of the Project and Zonal laboratories.
The need for all laboratories, and BRRL in particular, to undertake all tests in strict compliance with the Standard Test Procedures is paramount since the results obtained may well be used in a contractual dispute, and possibly litigation in court.

4.2 Compile Schedule of BRRL Testing Services

In the first instance EE-MTMD should discuss and agree with SE-BRRL the type of tests and testing service that BRRL can provide to the Zones and Circles within RHD and then advise those zones and circles accordingly. Should any new or specialist equipment be procured by BRRL to enable further tests to be carried out, again the Zones and Circles should be advised.

In advising the Zones and Circles of BRRL testing services it should be made clear that the primary responsibility for the testing, and hence quality control, of construction materials will remain with the Project laboratories and Field Divisions.

4.3 Request for Testing of Materials

Requests to BRRL for the testing of materials must be authorized by the Superintending Officer for the relevant road/bridge construction contract and must be supported by an appropriate justification e.g. as a quality control check on a Project laboratory.

Upon receipt of such a request EE-MTMD should discuss and agree with SE-BRRL the ability of BRRL to carry out the tests and a programme for them.

EE-MTMD should advise the relevant Superintending Officer of the ability and availability of BRRL to undertake the testing programme and agree procedures for the delivery of samples to BRRL Headquarters for testing.

4.4 Validation of Equipment/Storage/Staffing/Procedures

Prior to the arrival of samples for testing EE-MTMD should check that the equipment necessary for undertaking the tests is both operational and functioning correctly. Adequate storage space in a clearly defined area for the samples must be identified to avoid the possibility of samples from different Projects becoming mixed up.

EE-MTMD should also check that the staff to be used for undertaking the tests are conversant with the Standard Test Procedures and adequate Standard Laboratory Test Forms are available for each test.
4.5 TESTING OF MATERIALS

Materials that are received by BRRL for testing must be checked on arrival and any damaged or contaminated samples rejected. Those that are accepted must be properly logged-in and signed for.

The testing of samples must be carried out under the supervision of EE-MTMD or other authorized representative of BRRL who will be responsible for certifying that the tests were correctly carried out with the results accurately recorded in the appropriate forms.

4.6 ANALYSIS OF RESULTS AND REPORT ON TESTING

Following the testing of the materials EE-MTMD will undertake any required statistical analysis of the results and prepare a formal Report on Testing for review by SE-BRRL prior to submission to the relevant Superintending Officer.

EE-MTMD will retain a copy of the Report complete with the certified laboratory test forms for the BRRL library/archive.

5 REFERENCES

- RHD Standard Test Procedures (May 2001)
- RHD Standard Tender Documents (Volume 3 – Specifications)
- AASHTO Standard Test Procedures
- British Standards

6 PROCEDURE FLOWCHART

The procedure flowchart for this procedure is detailed in the next page.
Start

Advice Note to Zones & Circles (EE-MTMD)

Compile schedule of BRRL testing services (EE-MTMD)

Assess commitments and agree programme (EE-MTMD & SE-BRRL)

Request for testing of materials

Validation of equipment/storage/staffing/procedures (EE-MTMD)

Materials sent for testing

Testing of materials (EE-MTMD)

Compliance check/verification of results (EE-MTMD)

Report on testing to Zone (EE-MTMD)

Analysis of raw data and preparation of report (EE-MTMD)

End
1 PURPOSE AND SCOPE

This procedure covers the internal audit by BRRL of their testing procedures, equipment and training needs together with audits on material testing undertaken by BRRL Headquarters.

2 DEFINITIONS

**Standard Test Procedures (May 2001)** - the Standard Test Procedures authorised by the Chief Engineer, RHD.

**Standard Technical Specifications (May 2001)** - the Technical Specifications forming Volume 3 of the Standard Tender Documents (September 2001) authorised by the Chief Engineer, RHD.

**Proposed Changes** - proposed changes to the Standard Test Procedures and/or Standard Specifications.

**Authorised Amendments** - proposed changes to the Standard Test Procedures and/or Standard Specifications that have been authorised by the Chief Engineer, RHD.

3 RESPONSIBILITIES

**Superintending Engineer - BRRL (SE-BRRL)** - has overall responsibility for services undertaken or provided by BRRL.

**Executive Engineer - Material Testing & Maintenance Division (EE-MTMD)** - is responsible for periodic reviews of material testing procedures and equipment to ensure that they meet current needs.

4 METHOD

4.1 REVIEW OF TESTING PROCEDURES

EE-MTMD will maintain a register of the testing facilities and equipment available at BRRL and check for their compliance with the requirements of the Standard Test Procedures. For each test procedure EE-MTMD will prepare and maintain a stand-alone hard copy of the test procedure complete with blank data forms for recording test results. As an addendum to each test procedure EE-MTMD will prepare a schedule of safety procedures to be followed by staff undertaking that particular test.

As part of his review of testing procedures EE-MTMD should identify deficiencies in any of the existing BRRL testing equipment. In addition as part of his review of published research and professional journals/publications undertaken under Operating Procedure OP/BRL/1.2, EE-MTMD should seek to
identify any new testing procedures for materials or modifications being adopted with respect to established tested procedures in other countries.

4.2 Audit of Material Testing

EE-MTMD will periodically check on the material testing being undertaken at BRRL to ensure that all testing is carried out in compliance with the requirements of the Standard Test Procedures, and that test results are properly tabulated, recorded and filed. In particular EE-MTMD will check that all testing equipment is maintained in good working order and kept clean. EE-MTMD will maintain a register containing the date and time of all tests carried out at BRRL together with separate registers for each test procedure recording the date and time that the procedure is undertaken.

EE-MTMD will be responsible for checking test results for consistency and appropriateness for the material being tested, and where discrepancies arise he will organise additional tests on the materials in question. In addition, where the analysis of test results has been prepared by junior staff EE-MTMD will undertake a check of the calculations to confirm the conclusions drawn.

EE-MTMD will prepare a quarterly report for submission to SE-BRRL containing a complete record of testing carried out by test category, complete with a certification that all tests were carried out in compliance with the Standard Test Procedures and that the test results and conclusions have been checked and approved by him.

4.3 Identify Equipment and Training Needs

4.3.1 Equipment

Where EE-MTMD has identified deficiencies in BRRL testing equipment for which spares and / or replacements are required, or a new test procedure is proposed for which the appropriate testing equipment would need to be procured, then EE-MTMD should prepare a report for consideration by SE-BRRL containing a justification for this equipment and a budget estimate for it.

Upon approval by SE-BRRL the report should be submitted to ACE-TSW for budget approval, and if successful EE-MTMD should prepare detailed specifications of the required equipment for procurement.

4.3.2 Training

The majority of the material testing undertaken at BRRL will be carried out by Assistant Engineers and sub-Assistant Engineers under the supervision of EE-MTMD or SDE-MTMD. The junior staff may, or may not, be experienced in particular test procedures and it will be the responsibility of EE-MTMD to either train them, or arrange training for them, in these procedures.
4.4 **IDENTIFY CHANGES NEEDED TO TEST PROCEDURES AND SPECIFICATIONS**

As part of his review of published research, journals and the internet EE-MTMD may identify possible new test procedures or changes that should be made to existing procedures to comply with international practice. At the same time he may identify a need for additions to the RHD Standard Specifications to include new construction materials and / or changes to existing specifications that should be adopted.

Should this be the case EE-MTMD should submit a report on this through SE-BRRL to Road Design & Safety Circle to obtain authorization from the Chief Engineer RHD to these changes. Should approval in principle be obtained EE-MTMD should provide technical assistance to Road Design & Safety Circle to obtain approval to the actual amendments following Operational Procedure OP/ME/4.1.

5 **REFERENCES**

- RHD Standard Test Procedures (May 2001)
- RHD Standard Tender Documents Volume 3 of 4 - Technical Specifications (May 2001)
- Operational Procedure OP/ME/4.1
- Published Research
- Engineering Journals
- The Internet

6 **PROCEDURE FLOWCHART**

The procedure flowchart for this procedure is detailed in the next page.
**Start**

**Review testing procedures**
(EE-MTMD)

- Quarterly Report on material testing to SE-BRRL (EE-MTMD)
- Audit of material testing (EE-MTMD)
- Identify equipment and training needs (EE-MTMD)
- Submit proposals to Road Design & Safety Circle (EE-MTMD)

**Quarterly Report on material testing to SE-BRRL (EE-MTMD)**

- Audit of material testing (EE-MTMD)
- Identify changes needed to tests & specifications (EE-MTMD)
- Submit proposals to Road Design & Safety Circle (EE-MTMD)

**Audit of material testing (EE-MTMD)**

- Identify changes needed to tests & specifications (EE-MTMD)

**Identify changes needed to tests & specifications (EE-MTMD)**

- Submit proposals to Road Design & Safety Circle (EE-MTMD)

**Quarterly Report on material testing to SE-BRRL (EE-MTMD)**

- Audit of material testing (EE-MTMD)
- Identify equipment and training needs (EE-MTMD)
- Submit proposals to Road Design & Safety Circle (EE-MTMD)

**Audit of material testing (EE-MTMD)**

- Identify equipment and training needs (EE-MTMD)
- Submit proposals to Road Design & Safety Circle (EE-MTMD)

**Identify equipment and training needs (EE-MTMD)**

- Submit proposals to Road Design & Safety Circle (EE-MTMD)

**Submit proposals to Road Design & Safety Circle (EE-MTMD)**

- Submit proposals to Road Design & Safety Circle (EE-MTMD)

**Quarterly Report on material testing to SE-BRRL (EE-MTMD)**

- Audit of material testing (EE-MTMD)
- Identify equipment and training needs (EE-MTMD)
- Submit proposals to Road Design & Safety Circle (EE-MTMD)

**Audit of material testing (EE-MTMD)**

- Identify changes needed to tests & specifications (EE-MTMD)

**Identify changes needed to tests & specifications (EE-MTMD)**

- Submit proposals to Road Design & Safety Circle (EE-MTMD)

**Submit proposals to Road Design & Safety Circle (EE-MTMD)**

- Submit proposals to Road Design & Safety Circle (EE-MTMD)

**Quarterly Report on material testing to SE-BRRL (EE-MTMD)**

- Audit of material testing (EE-MTMD)
- Identify equipment and training needs (EE-MTMD)
- Submit proposals to Road Design & Safety Circle (EE-MTMD)

**Audit of material testing (EE-MTMD)**

- Identify changes needed to tests & specifications (EE-MTMD)

**Identify changes needed to tests & specifications (EE-MTMD)**

- Submit proposals to Road Design & Safety Circle (EE-MTMD)

**Submit proposals to Road Design & Safety Circle (EE-MTMD)**

- Submit proposals to Road Design & Safety Circle (EE-MTMD)

**Quarterly Report on material testing to SE-BRRL (EE-MTMD)**

- Audit of material testing (EE-MTMD)
- Identify equipment and training needs (EE-MTMD)
- Submit proposals to Road Design & Safety Circle (EE-MTMD)

**Audit of material testing (EE-MTMD)**

- Identify changes needed to tests & specifications (EE-MTMD)

**Identify changes needed to tests & specifications (EE-MTMD)**

- Submit proposals to Road Design & Safety Circle (EE-MTMD)

**Submit proposals to Road Design & Safety Circle (EE-MTMD)**

- Submit proposals to Road Design & Safety Circle (EE-MTMD)
1 PURPOSE AND SCOPE

This procedure covers the process for checking the compliance of both zonal/field and project laboratories with the requirements of the RHD Standard Test Procedures, together with an audit of the tests carried out, the equipment used and the staff undertaking the tests.

2 DEFINITIONS

RHD Standard Test Procedures - are the test procedures contained in the Standard Test Procedures Manual (May 2001) authorized by the Chief Engineer, RHD.

Zonal/Field Laboratories - are permanent BRRL laboratories located in the Zones, in occasions it is also called Zonal Laboratories also.

Project laboratories - are temporary site laboratories established by contractors for road and bridge projects as part of their contracts.

3 RESPONSIBILITIES

Superintending Engineer - BRRL (SE-BRRL) - has overall responsibility for services undertaken and provided by BRRL.

Executive Engineer - Quality Control Division (EE-QCD) - is responsible for carrying out quality audits on both Zonal/Field and project laboratories.

Superintending Officer - is the Additional Chief Engineer or Superintending Engineer named in the Contract Data for an RHD road or bridge project.

"Engineer" - is the Superintending Engineer or Executive Engineer named in the Contract Data for an RHD road or bridge project.

4 METHOD

4.1 INVENTORIES OF ZONAL AND PROJECT LABORATORIES

EE-QCD should prepare and regularly update inventories for both the zonal/field and project laboratories. This information should be supplied to him by the zonal/field laboratories who will be responsible for maintaining a register of current road and bridge projects within their zone i.e. those projects where project laboratories are required to be provided under the contract documents. This information should include:
• Location of the laboratory
• Details of staffing resources to undertake testing
• Equipment resources, including condition & date of last calibration/audit
• For project laboratories: details of the road/bridge contract, start date, end date and contact details for the Superintending Officer and the Engineer

4.2 MAINTAIN REGISTER OF TESTS CARRIED OUT

EE-QCD will be responsible for maintaining a register of all tests carried out in both zonal/field and project laboratories based on monthly reports from the zonal/field laboratories. To this end the zonal/field laboratories should obtain a monthly report from each project laboratory containing the following:

• A schedule of tests carried out
• The results of each test i.e. whether or not the test demonstrated compliance with the relevant workmanship and/or material specifications in the contract documents for the project

4.3 PREPARE ANNUAL PROGRAMME OF AUDITS

EE-QCD will prepare an annual programme of audits for both zonal/field and project laboratories and will discuss and agree this with SE-BRRL. In preparing this programme every effort should be made to ensure that laboratories that are to be subject to audit have little or no advance notice of the audit, i.e. there should be no regular pattern to them.

It will be a matter for SE-BRRL and EE-QCD to determine the staffing arrangements for undertaking audits, but in general the zonal/field laboratories should be audited by BRRL Dhaka and the project laboratories by the zonal/field laboratories, with an occasional audit (on a sampling basis) by BRRL Dhaka.

The frequency of audits will be a matter for SE-BRRL to determine but a target of two audits per annum for the zonal/field laboratories and two audits per contract for the project laboratories should be aimed for.

4.4 AUDIT OF ZONAL AND PROJECT LABORATORIES

For the audit of both zonal/field and project laboratories the following assessments should be made:

Assess records of Tests Carried Out
A comprehensive record of all tests carried out by the laboratory should be properly filed and stored at the laboratory. For each test there should be the following:

- Copy of the instruction from the Engineer to conduct a test
- Completed test data forms, signed, certified and dated
- Analysis sheets, calculations, or graphs as appropriate signed, certified and dated
- Confirmation that the test has been carried out according to RHD Standard Test Requirements
- Details of the equipment used
- Confirmation as to whether or not the material/workmanship tested met the requirements of the contract specifications, and an acknowledgement from the Engineer that he has been given this information

**Assess Test Procedures for Compliance**

All testing must be undertaken in accordance with the RHD Standard Test Procedures. During the audit some testing may be ongoing, in which case compliance with the procedures can be monitored. For tests already completed it is clearly difficult for an assessment to be made, but a check should be made that the appropriate testing equipment was at least available for tests already completed.

In addition, where for example the procedures call for a number of tests to be completed for the average or mean of the results to be obtained, then a check can be made that the correct number of tests were completed. Other similar checks should be possible and EE-QCD in consultation with SE-BRRL should develop a suitable checklist for completed tests.

**Assess laboratory Facilities and Equipment**

The checking and calibration of testing equipment for zonal/field and project laboratories is covered by Operating Procedure OP/BRL/4.4 and forms part of this Procedure.

For convenience it would be appropriate for this to be undertaken during one of the bi-annual audits of the zonal/field laboratories and during the first audit of project laboratories.

**Assess Staffing Capabilities**

During an audit of zonal/field and project laboratories a check should be made that all tests are being undertaken by staff that are familiar with the testing procedure, and if undertaken by junior staff that the tests are certified correct by a qualified engineer.
4.5 PREPARATION OF AUDIT REPORT

Upon completion of the audit of each zonal/field and project laboratory EE-QCD should prepare a draft audit report for review by SE-BRRL. This report should assess the adequacy of each laboratory in terms of testing equipment, procedures, staffing and quality control and make recommendations regarding changes that should be made.

With respect to the project laboratories the audit report should check for compliance with the requirements of the contract documents for the project in terms of facilities, equipment, and staffing provided, and at the same time assess whether those requirements are adequate for the particular project.

Subject to any comments from SE-BRRL the final audit report should be prepared by EE-QCD and distributed as follows:

(i) Zonal/Field Laboratories: ACE for the relevant Zone.

(ii) Project Laboratories: The Superintending Officer and the Engineer for the Contract.

5 REFERENCES

- RHD Standard Test Procedures (May 2001)
- RHD Standard Tender Documents (Volumes 1–4) September 2001
- OP/BRL/4.4 – Management and Calibration of Equipment

6 PROCEDURE FLOWCHART

The procedure flowchart for this procedure is detailed in the next page.
Inventories of zonal & project laboratories (EE-QCD)

Maintain register of tests carried out (EE-QCD)

Prepare annual programme of audits (EE-QCD)

Audit of zonal and project laboratories (EE-QCD)

Assess records of tests carried out (EE-QCD)

Assess test procedures for compliance (EE-QCD)

Assess laboratory facilities and equipment (EE-QCD)

Assess staffing capabilities (EE-QCD)

Prepare draft audit report (EE-QCD)

Prepare final audit report (EE-QCD)

Audit Report to ACE-Zone or Superintending Officer & Engineer

Details of zonal & project laboratories from zones (AE-Zonal lab)

Monthly report on tests carried out (AE-Zonal lab)
1 PURPOSE AND SCOPE

This procedure covers the process for identifying non-compliance with RHD testing procedures and/or the materials and workmanship specified in the Contract Documents for RHD maintenance and construction contracts.

2 DEFINITIONS

RHD Standard Test Procedures - are the test procedures contained in the Standard Test Procedures Manual (May 2001) authorized by the Chief Engineer, RHD.

Design Standards and Specifications - are deemed to include all design standards, manuals and specifications that have been approved for use in Bangladesh by the Chief Engineer, RHD in relation to road design and construction.

3 RESPONSIBILITIES

Superintending Engineer - BRRL (SE-BRRL) - has overall responsibility for services undertaken or provided by BRRL.

Executive Engineer - Quality Control Division (EE-QCD) - is responsible for carrying out quality audits for both zonal/field and project laboratories, and for on-going RHD maintenance and construction works.

Superintending Officer - is the Additional Chief Engineer or Superintending Engineer named in the Contract Data for an RHD road or bridge project

“Engineer” - is the Superintending Engineer or Executive Engineer named in the Contract Data for an RHD road or bridge project.

4 METHOD

4.1 GENERAL

The responsibility for ensuring compliance with the RHD Standards and Test Procedures for all RHD maintenance and construction contracts lies with the designated Engineer for each contract. He is supported in this by his site supervision staff, Project laboratories and testing staff, and by BRRL Zonal/Field laboratories for additional testing facilities when required.
With respect to the testing of materials it will be the responsibility of the Project and Zonal/Field laboratories to report to the respective Engineer for the Contract any non-compliances with the materials and workmanship specified in the Contract Documents they identify.

Under Operating Procedure OP/BRL/4.1 audits of both the Zonal/Field and Project laboratories are to be undertaken by EE-QCD on behalf of BRRL-Dhaka. In effect these audits are a check on the quality control and accuracy of these laboratories. In the event that EE-QCD identifies further non-compliances (possibly resulting from defective testing equipment or procedures adopted by the laboratories), he will immediately prepare a draft report on these for review by SE-BRRL.

Upon approval to the draft report by SE-BRRL it will be finalised and submitted to the respective Engineer for the contract to which it relates for his attention/action.

### 4.2 Audit of Materials and Workmanship

During his audit of the Zonal/Field and Project laboratories EE-QCD will assess whether or not these laboratories are undertaking tests in accordance with RHD procedures. However, even when these tests are correctly carried out it is still necessary to confirm that the results of these tests confirm, or otherwise, that the materials tested comply with the requirements of the Contract Documents for the Project.

As part of Operational Procedure OP/BRL/4.1, Zonal/Field and Project laboratories are required not only to carry out tests requested by the Engineer, but also to confirm whether or not those tests demonstrated compliance with the requirements of the Contract Documents. In addition to advising the Engineer for the relevant project of any non-compliance these laboratories are to submit monthly reports to BRRL Dhaka containing details of all tests carried out and their results.

EE-QCD should review these monthly reports and prepare a summary of all non-compliances identified for review by SE-BRRL. Where it is shown that a particular contractor over a period of months frequently, or persistently, fails to meet the requirements of the Contract Documents with respect to materials or workmanship then SE-BRRL will notify the Superintending Officer for the relevant Contract.

This notification should also be sent to SE-Procurement Circle for consideration in selecting contractors invited to tender for future works of a similar nature.

### 5 REFERENCES

- Operational Procedures OP/BRL/4.1.
6 PROCEDURE FLOWCHART

The procedure flowchart for this procedure is detailed below:

- **Start**
- **Prepare monthly report to SE-BRRL on non-compliances (EE-QCD)**
- **Monthly report from Zonal & Project laboratories**
- **Report submitted to Superintending Officer for Contract and SE-Procurement Circle (SE-BRRL)**
- **Prepare report on persistent or frequent non-compliance by contractors (SE-BRRL)**
- **End**
1 PURPOSE AND SCOPE

This procedure outlines the process to be adopted for the checking and calibration of equipment used by BRRL Dhaka, Zonal/Field laboratories and field laboratories for soil investigations and materials testing.

2 DEFINITIONS

**Equipment** - is deemed to include all measuring devices with moving parts, dials, gauges or other measuring features that would affect the accuracy of the device if worn or damaged.

**Calibration** - the process of checking the accuracy of a measuring device and making adjustments to it such that measurements determined as a result of using it are accurate.

**Primary Calibration** - the calibration of laboratory equipment at BRRL Dhaka by Bangladesh University of Engineering & Technology.

**Secondary Calibration** - the calibration of laboratory equipment at Zonal/Field laboratories by BRRL Dhaka.

**RHD Standard Test Procedures (May 2001)** - the Standard Test Procedures authorised by the Chief Engineer, RHD.

**Bangladesh University of Engineering & Technology (BUET)** - an institution that has and maintains accurate measuring devices.

3 RESPONSIBILITIES

**Superintending Engineer - BRRL (SE-BRRL)** - has overall responsibility for services undertaken or provided by BRRL.

**Executive Engineer - Quality Control Division (EE-QCD)** - is responsible for arranging the periodic checking and calibration of BRRL equipment and corresponding equipment in the Zonal/Field laboratories.

4 METHOD

4.1 GENERAL

Almost all-measuring equipment should be subjected to checking for accuracy and re-calibrated if necessary on a regular basis. The frequency of checking will to a large extent depend on the frequency
of use of the particular piece of equipment, but for highly sensitive equipment frequent testing will be required even with limited use – particularly if it is moved. The frequency of re-calibration is normally recommended by equipment manufacturers, but some equipment must be calibrated every time it is used, as documented in the Standard Test Procedures.

In order that equipment can be checked and re-calibrated if necessary, it is first necessary to have a standard that is known to be accurate against which the equipment can be checked. Usually the manufacturer of a particular piece of equipment maintains a standard for that equipment against which others can be checked and calibrated.

In the absence of the manufacturers or their representatives in Bangladesh it is assumed that the measuring devices held by Bangladesh University of Engineering & Technology are sufficiently accurate to provide a standard for the calibration of BRRL equipment.

4.2 CALIBRATION OF BRRL EQUIPMENT

4.2.1 INVENTORY

In the first instance EE-QCD should prepare an inventory of all measuring devices held by BRRL in Dhaka and in the field laboratories. This should include the make, type, model, condition, year of manufacture and date of last calibration. This inventory should be updated as and when new equipment is procured and existing equipment re-calibrated.

4.2.2 PRIMARY CALIBRATIONS

Clearly it would incur unnecessary expense to use BUET or the equipment manufacturers to re-calibrate all BRRL equipment on a routine basis. To avoid this EE-QCD should arrange for individual items of equipment at BRRL Dhaka to be re-calibrated and for this equipment to be used as the standard for the re-calibration of similar equipment at BRRL Dhaka and in the zonal/field laboratories.

EE-QCD should prepare a list of BRRL equipment that should be re-calibrated and used as a standard for the checking/calibration of all other BRRL equipment, and obtain estimates from the manufacturers or BUET for this primary calibration.

Subject to the agreement of SE-BRRL an application should be submitted by EE-QCD to SE-BRRL for obtaining budget approval from CE-RHD, and subject to this approval the primary calibration should be carried out.
4.2.3 SECONDARY CALibrATIONS

Upon completion of the primary calibration EE-QCD should initiate a rolling programme for the calibration of similar equipment at BRRL Dhaka and in the Zonal/Field laboratories as well as equipment provided by contractors in site laboratories for individual road contracts.

5 REFERENCES

- RHD Standard Test Procedures (May 2001)
- RHD Standard Tender Documents Volume 3 of 4 - Technical Specifications (May 2001)

6 PROCEDURE FLOWCHART

The procedure flowchart for this procedure is detailed below.
1 PURPOSE AND SCOPE

The purpose of this procedure is to establish a systematic process of collecting and preserving relevant documents (in hard copy as well as electronic copy), as prepared and submitted during project preparation and implementation, by RHD, NGOs, consultants and agencies. It is the aim to preserve not only documents prepared by this Circle, but also relevant reports produced by other Circles of RHD or external agencies.

SEC will produce or review reports on progress or the review of practices, such as Monthly or Quarterly Progress Reports, Pre-feasibility and Feasibility Reports, Inception and Final Reports, Environmental and Re-settlement Guidelines and Manuals, Social Action Plan (SAP), Demographic and Socio-economic Survey Reports, Re-settlement Action Plan (RAP) etc.

2 DEFINITIONS - None.

3 RESPONSIBILITIES

Additional Chief Engineer - Technical Services Wing (ACE-TSW)

- Responsible for suggesting to SE-SEC to procure, prepare and preserve relevant documents.
- Co-ordination with other Wings and Circles of RHD towards obtaining relevant documents for SEC.

Superintendent Engineer - Social & Environment Circle (SE-SEC)

- Arrange necessary budget towards preservation and archiving documents.
- Responsible for recommendation and archiving reports prepared by consultants under SEC.

Executive Engineers- (EE-RD & EE-ED)

- Liaison with different Wings and Circles, in order to collect information on project status.
- Establish archiving system and suggest additional measures for development.
- Maintain appropriate field database, review and edit accordingly for archiving.
4 METHOD

- SEC will collect relevant reports and documents useful for this Circle from different sources within RHD (from different projects under RHD) and from external sources.

- SEC will preserve hard and electronic copies in its Library. SEC will also help to preserve and archive copies (Hard and soft) of selected documents in RHD Central Library.

- Prepare and update a document database on the RHD Intranet.

- Strengthen SEC documentation, preservation and dissemination process.

- SEC will disseminate relevant selected data to users within RHD.

5 REFERENCES

- OP/ME/6.1, OP/SE/ 2.1 to 2.4 and OP/SE/3.1 to 3.5.

- Environmental Guidelines, Volume 1, Environmental Management in the Roads and Highways Department, Ministry of Communications, January 2003.


- Procedures for Land Acquisition and Re-settlement for RHD (under preparation).

6 PROCEDURE FLOWCHART

The procedure flowchart for this procedure is detailed in the next page.
Start

List of Projects dealing Re-settlement & Environment by EE-RD & EE-ED

Compilation required data (EE-RD & ED)

Prepare & archiving of Guidelines and Manuals, Progress, Study Reports, etc. by SE-SEC

Review the Reports prepared & archived by EE-RD, EE-ED & SE-SEC

Yes

Approval & Sign by SMC & CE

No

Approval from Ministry

Yes

Guidelines, Manual, Progress Report on Re-settlement & Environment

Distribution Reports of SE-SEC per List

Preservation of Reports by SE-SEC

End

Procurement/Collection of other Circles and Departmental Reports and External Reports
1 PURPOSE AND SCOPE

This procedure describes the practice of re-settlement, which results from RHD development projects. The main purpose of re-settlement is to ensure that the Project Affected People (PAPs), whose land, house, business, income and livelihood are affected by RHD projects, will be compensated properly for any losses that are incurred.

Under current practice, PAPs receive proper compensation against relocation losses if the project is funded by international agencies. Project preparation requires a detailed “Re-settlement Action Plan”. The cost for the compensation of re-settlement losses – and for any land acquisition – is always borne by the Government of Bangladesh (GoB).

Projects that are entirely funded by GoB currently do not include any resettlement plan or proper compensation for LA and re-settlement losses. GoB pays concise compensation under Land Acquisition only to the legal people and never pays any compensation to the illegal people for their losses due to LA and Eviction.

Initiatives are now underway to extend the principles of Re-settlement also to GoB funded projects. This will require changes in policies and procedures, to bring RHD practices in line with those of international agencies.

This procedure describes current re-settlement practice in general terms, awaiting the acceptance of specific relevant RHD guidelines and procedures.

2 DEFINITIONS

Project Affected Persons (PAPs) - People affected by the intervention of RHD projects and project-related changes in the use of land and other resources adversely affecting income and sources of living of the people of the vicinity.

Re-settlement - is the process of dealing with the inevitable losses suffered by the population, resulting from development projects.

Re-settlement effects - may be losses of physical and non-physical assets, including homes, communities, productive land, income-earning assets and sources, subsistence, resources, cultural sites, social structures, networks and ties, cultural identity and mutual help mechanisms.

Resettlement Plan - is a time-bound action plan with a budget, setting out re-settlement strategy, objectives, entitlement, actions, responsibilities, monitoring and evaluation.
Comparative Re-settlement Practices Report - is a consolidated, comparative and analytical study report, summarising and comparing progress on the re-settlement components of different projects.

3 RESPONSIBILITIES

Superintending Officer/Project Director - Responsible for the overall management of a development project, and thereby also for the re-settlement component of any project.

Additional Chief Engineer - Technical Services Wing (ACE-TSW) - Responsible for final review signing documents related to re-settlement expenditure (Re-settlement Budget, NGO Budget, Appointment of NGO/ Re-settlement Consultant, etc.) under RHD. Where necessary, sent to the Chief Engineer for final decision or approval.

Superintendent Engineer - Social & Environment Circle (SE-SEC) - Responsible for the overall monitoring of Re-settlement Plans and checking of re-settlement practices on a random sample basis.

Executive Engineer - Re-settlement Division (EE-RD) - Responsible for making regular monthly or quarterly re-settlement reports, based on re-settlement progress reports as sent by re-settlement management NGOs or a Re-settlement Consultant, working at project level.

He will prepare an analytical and consolidated Report on the progress of on-going re-settlement practices and status of re-settlement completion and proposed projects.

Responsible for arranging and compilation of re-settlement data and drafting reports and collecting and systematically preserving of re-settlement related documents, reports, studies, publications, maps, data, etc., with a view to establish a Re-settlement data bank and Library.

4 METHOD

The scope of re-settlement activities and the Re-settlement Plan will depend upon funding sources and on the degree of re-settlement involved. These will be described in detail in the draft RHD Guidelines on Land Acquisition and Re-settlement (currently under preparation).

A full Re-settlement Plan, required wherever there are significant re-settlement losses, is likely to include the following elements:

- Scope of land acquisition and re-settlement
- Socio-economic information
- Re-settlement Objectives, policy framework and Compensation entitlements
RHD Operational Procedure – Technical Services Wing

OP/SE/2.1 - Re-settlement Practices

Social & Environment Circle - Re-settlement Division

• Consultation and grievance redress participation
• Relocation of housing and re-settlements elsewhere voluntarily/involuntarily
• Lost Income and livelihood restoration strategy
• Institutional Framework
• Re-settlement budget
• Re-settlement Implementing NGO mobilisation
• Re-settlement Village/Commercial Site development
• Implementation Schedule
• Monitoring and Evaluation

5 REFERENCES

• RHD Guidelines on Land Acquisition and Resettlement (under preparation)
• Bangladesh Re-settlement Policy and Practice, Review and Recommendations, Jamuna Multipurpose Bridge Authority, RETA No. 5781, BCL, May 1999.

6 PROCEDURE FLOWCHART

The procedure flowchart for this procedure is detailed in the next page.
Start

Collection of Re-settlement Reports/ Data from PDs, Consultants & NGOs sources by SE-SEC

Review re-settlement practises against Re-settlement Policy Guidelines for on-going and completed projects

Consolidated Re-settlement Practiced Monitoring Reports issued by SE-SEC

Check and approve Re-settlement Practiced Report by EE-RD

In case of major discrepancy in Re-settlement practices under any project, inform ACE-TSW & CE-RHD for necessary action

End
1 PURPOSE AND SCOPE

This procedure describes the procurement of services to plan and manage the implementation of a Re-settlement Plan for RHD projects, and the process of monitoring the performance of those charged with delivering these services.

The scope of this procedure is to ensure consistency in dealing with projects that involve re-settlement activities.

2 DEFINITIONS

**Procurement** - in this context means the process of selecting, appointing and entering into a contract arrangement with a sub-contractor engaged for re-settlement management – such as a specialised NGO or Consultant.

**Monitoring** - is the process of regular review and inspection of on-going activities for the purpose of ensuring that progress is achieved as planned that agreed standards are maintained and that Terms of Reference as defined in a contract are followed.

**Re-settlement Plan** - is a time-bound resettlement action plan with a budget, setting out re-settlement strategy, objectives, entitlement, actions, responsibilities, monitoring and evaluation.

**Chief Re-settlement Officer (CRO)** - of any project under RHD is playing key role implementing involving re-settlement activities through NGO. S/he sometimes acts as Project Director of the Project or delegates the responsibilities to APD.

**Deputy Chief Re-settlement Officer (DCRO)** - S/he works as second key officer of the Project to implement re-settlement components under the PD and CRO. If DCRO is in the rank of SE or EE, PD must be in the rank ACE or SE respectively.

**Resettlement Officer** - EE or Sub-Divisional Engineer is posted in the Re-settlement Division.

3 RESPONSIBILITIES

**Additional Chief Engineer - Technical Services Wing (ACE-TSW)** - Responsible for reviewing and signing the documents submitted by SE-SEC.

**Superintending Engineer - Social & Environment Circle (SE-SEC)** - Responsible for the overall management of procurement and the monitoring of resettlement services, in accordance with RHD LAR Guidelines and the Re-settlement Plan and funding agencies.
Responsible for full review of reports and proposals, and communicating to the ACE and CE of RHD, in order to receive their approval of procuring the manpower and logistic support and services of NGOs.

Responsible for ensuring that sufficient budget is available to make compensation payments for resettlement losses and co-ordinating with other related GOs, INGOs, local NGOs, Donors and Banks.

**Executive Engineer - Re-settlement Division (EE-RD)** - Responsible for co-ordination with RHD Field staff/Engineers for the procurement of any re-settlement management services. Reviewing monthly progress reports from the re-settlement monitoring Consultant/Contractor or re-settlement implementing NGOs and highlighting problem areas to the SE-SEC of RHD for necessary action or visit the problematic areas and inform SE accordingly.

### 4 METHOD

The Project Director (PD) of a project involving re-settlement services deliveries will submit to SE-SEC, the requirements and full TORs for re-settlement management services. Proposals will be drafted by EE-RD of SE circle.

The SE-SEC (assisted by the EE-RD) will submit a proposal for procurement to the ACE-TSW of RHD. ACE-TSW will review and submit to CE-RHD for final approval. CE of RHD will pass an order for the timely procurement of resettlement services under the relevant PD.

SE-SEC will procure re-settlement services after a selection from experienced and reputable short listed candidates, and will arrange for the mobilisation of the winning concern PD.

EE-ED will prepare monthly monitoring and status report.

### 5 REFERENCES

- Bangladesh Re-settlement Policy and Practice, Review and Recommendations, Jamuna Bridge Authority, RETA No. 5781, BCL, May 1999.

### 6 PROCEDURE FLOWCHART

The procedure flowchart for this procedure is detailed in the next page.
Start

Re-settlement Services Requirement proposal prepared by PD-FAPs.

Proposal or Requirements of Re-settlement Services received and submitted to ACE TSW (SE-SEC)

Reviewed by ACE-TSW

Yes

Approved by CE-RHD

Yes

Procurement and timely placement of Re-settlement Services under PDs of the Re-settlement oriented Project by (SE-SEC)

Re-settlement services delivery status Progress Monitoring Report (SE-SEC)

Monitoring Re-settlement Services if any dispute/discrepancies/problems (EE-RD & SE-SEC)

End

Data from PDs and NGOs
1 PURPOSE AND SCOPE

This procedure describes the process of monitoring of any re-settlement related activities, as defined in a Re-settlement Action Plan.

2 DEFINITIONS

Monitoring - is the process of regular review and inspection of ongoing activities for the purpose of ensuring that progress is achieved as planned that agreed standards are maintained and that Terms of Reference as defined in a contract are followed.

Re-settlement - is the process of dealing with the inevitable losses suffered by the population, resulting from development projects.

Re-settlement Monitoring - is the collection, analysis, reporting and use of information about the process of re-settlement, based on the Re-settlement Plan. Monitoring should focus on physical and financial targets and the delivery of entitlements to people affected. Monitoring can be done by RHD, or can be by independent external specialists, such as NGOs. Monitoring reports should be sent to the RHD Project Director and to the Re-settlement Division.

Re-settlement Progress Monitoring Report - records in qualitative and quantitative data on the progress of the re-settlement programme. Should compare actual status with plans and forecasts as stated in the Re-settlement Plan.

Re-settlement Plan - is a time-bound action plan with a budget, setting out re-settlement strategy, objectives, entitlement, actions, responsibilities, monitoring and evaluation.

3 RESPONSIBILITIES

Additional Chief Engineer - Technical Services Wing (ACE-TSW) - ACE-TSW will review the consolidated resettlement progress reports prepared and submitted by SE-SEC of RHD.

Superintending Engineer - Social & Environment Circle (SE-SEC) - As Chief of Social and Environment Circle at RHD Head Quarter level, responsible for the overall monitoring of re-settlement components on ongoing Projects. In the event of any major discrepancy and dispute, responsible for resolution of the matter in consultation with ACE-TSW.

Responsible for approving and disseminating the Quarterly/Monthly Consolidated Progress Report on Re-settlement Projects prepared by EEs-SEC of RHD. Upon review, the report shall be submitted to ACE-TSW and CE-RHD for information and, where necessary, further decision or direction.
Executive Engineer - Re-settlement Division (EE-RD) - EE-RD will act as Executive Re-settlement Specialist at RHD Head Quarter level.

Responsible for monitoring ongoing re-settlement activities, from data furnished by NGOs and Project Re-settlement Officers through Monthly Re-settlement Progress Monitoring Reports. Responsible for informing and advising SE-SEC of RHD, in the event of major re-settlement discrepancy or dispute, which cannot be resolved in the field at project level.

Responsible for monitoring the performance of Re-settlement Implementing NGOs working at grass root level under different Re-settlement Projects.

Responsible for analysing and compiling all project re-settlement data into a Monthly Consolidated Progress Report on Re-settlement Projects. This report to be submitted to the SE-SEC for finalization. In the event of any adverse social and re-settlement impact or irregularities in the re-settlement process, responsible for arranging field inspection visits.

Responsible for keeping liaison with field level officers, PDs, Re-settlement Consultants and SE to CE of RHD.

4 METHOD

The detailed methodology for re-settlement monitoring for foreign-aided projects – and the data to be collected and recorded – will be described in the respective Re-settlement Plan. In the future, the RHD Procedures and Guidelines for Re-settlement (currently under preparation) will specify standard Re-settlement Progress Monitoring formats.

In general terms, the Re-settlement Division is to review all re-settlement progress reports, and make a comparative study of re-settlement data of preceding months for the same project and among the re-settlement projects. The findings of the review can be combined into a Quarterly or Monthly Consolidated Re-settlement Progress Report, comprising all re-settlement activities under different projects.

5 REFERENCES

6 PROCEDURE FLOWCHART

The procedure flowchart for this procedure is detailed below:
1 PURPOSE AND SCOPE

This procedure describes the process of assessing the loss of entitlements at the time of Land Acquisition (LA) and the evacuation of the user or owners from the land for the purpose of RHD construction and infrastructure development projects.

The main elements of assessing the loss of entitlements are to identify PAPs and make an inventory of affected land, structures, trees, etc on the LA planned area/alignment and to ensure the appropriate compensations to the PAPs so that they can resettle and restore their lost livelihood at least to a pre-project level on legal, humanitarian and social grounds.

The scope of the Entitlement Loss Assessment (ELA) is limited to a few items only (land, structures, standing crop, pond-fish and tree) under recorded price and concise compensation rate if the project is entirely funded by the Government of Bangladesh.

The scope of loss of entitlement assessment is wider and appropriate when the project's main investment comes from international sources/donors.

2 DEFINITIONS

Entitlement Loss Assessment (ELA) - is the process of preparing an inventory of the losses that will be incurred by the users or owners of land to be acquired for construction purposes under RHD projects. This loss includes land (any type and any nature), structures (living, commercial, business, religious, community, etc), standing crop, fish and tree (fruit bearing and timber). ELA should also include the cost of temporary or permanent transfer from an original location to a new location.

Loss of entitlement is the loss of legal ownership or legal right and usufruct or easement and social right on the land, properties, facilities, income, employment, livelihood, etc. by the owners and users caused by Land Acquisition for obtaining Right of Way for RHD.

Loss of entitlement covers a broad range. It does not only consider legally affected people and their legal properties but it also considers the affected people and families whose homesteads, business and place of work, etc, are located on illegally or informally occupied land. Entitlement losses may be for permanent or for temporary loss.

Squatters and Slum dwellers living on pre-acquisition land of RHD, or an Uthulee who is residing on others (privately owned) land, come under the purview of Loss of Entitlement on humanitarian grounds if areas are earmarked for the right of ways.
3 RESPONSIBILITIES

Additional Chief Engineer - Technical Services Wing (ACE-TSW) - Responsible for the overall approval of the final draft of the report prepared by the Re-settlement Division. S/he is responsible for overall management of loss of entitlement, implementation of land acquisition and re-settlement issues.

Superintending Engineer - Social & Environment Circle (SE-SEC) - Acts as the co-ordinator in preparing and receiving approval from the Technical Services Wing, Chief Engineer of RHD. Responsible for review and checking have consolidated monitoring reports on ELA, before submission to ACE and CE for further action or approval.

Executive Engineer - Re-settlement Division (EE-RD) - Responsible for assisting SE-SEC in respect of monitoring and assessing Entitlement Loss under different Projects, to ensure standard Re-settlement Compensation packages are being awarded to all PAPs, without discrimination. Based on monthly progress reports from the field, responsible for overall monitoring of the performance of NGOs, PVAT, GRC and LPC in respect of assessment of entitlement losses of EPs and Awardees and reporting to SE-SEC. Responsible to maintain close liaison with Estates and Land Records and Acquisition Divisions.

4 METHOD

- Conduct socio-economic surveys, make an inventory of affected population and their properties (both movable and immovable) and carry out Video Films of affected properties on land acquisition and RoWs areas.

- Conduct Joint Verification Surveys to assess the entitlement losses of each Awardees or EPs.

- Monitor the performance of DCs and NGOs in their work of assessing entitlement losses of Awardees or EPs.

- Assess the re-settlement/entitled losses budget for payment against losses of Awardees or EPs to be paid by DC and NGO/RHD respectively.

- Management of the Re-settlement losses and also restoration of losses of entitled persons under the process followed by Donors.

5 REFERENCES

- RHD Guidelines on Land Acquisition and Re-settlement (under preparation).


6 PROCEDURE FLOWCHART

The procedure flowchart for this procedure is detailed below.

Start

Examine Obtained Socio-Economic data, identify Categories of PAPs & Losses by NGOs during Feasibility Study of Projects (Field)

Socio-Economic Data from Survey NGO

JVS for Entitlement Loss Assessment conducted by JVT of DC & PVAT of Re-settlement Implementing NGO/RHD

Compilation and checking of Category-wise Entitlement Losses following LAR Guidelines & Matrix (SE-SEC)

Any unjust/discreminating practices identified (EE-RD)

Proposed for Amendment and Justice

RHD 'all Projects’ Consolidated Re-settlement Entitlement Losses and Compensations payment Reports dissemination (SE-SEC)

Reports/Data from Re-settlement INGO & DC regarding PAPs/Awardees’ entitlement losses

Approval (SE-SEC)

Yes

Informed Concern PD/CRO/DCRO for action

No

End
1 PURPOSE AND SCOPE

To meet DoE requirements all RHD road and bridge projects require an Initial Environmental Examination (IEE). This would be prepared (alongside any feasibility study report) for review in preparing all PCPs in RHD. All Road Projects, and Bridge Projects, over 100 m length are identified as having significant potential for environmental impact and are categorised into Red by the Department of Environment (DoE, clause-67 and 68). Therefore, a full EIA is also required. This should lead to sufficient focus given to environmental issues for all RHD road and bridge projects.

2 DEFINITIONS

Environmental Impact Assessment (EIA) - Environmental Impact Assessment is the systematic study, assessment and reporting of the impacts of a proposed programme, plan or project, including a management plan for dealing with negative impacts. EIA is prepared at the feasibility level and include quantification and valuation of the impacts.

Environmental Management Plan (EMP) - EMP is a plan for environmental activities during project implementation designed to ensure sound environmental management to mitigate adverse environmental impacts and maximise beneficial environmental effects.

Initial Environmental Examination (IEE) - The first stage in the Environmental Assessment of a project at pre-feasibility level, for identifying and assessing possible environmental impacts.

Description of the Environment - It include, collection, scrutiny, evaluation and presentation of environmental data on the relevant environmental characteristics of the study area. Including information on any changes anticipated before the project commences.

Physical Environment - Covers geology; topography; soils; climate; ambient air quality; surface and ground water hydrology; existing sources of air emissions; existing water pollution discharges and receiving water quality.

Biological Environment - Include flora; fauna; rare or endangered species; sensitive habitats; species of commercial importance etc.

Socio-cultural Environment - It include population; land use; community structure; employment; distribution of income; development activities; recreation; public health; cultural properties; tribal peoples; etc.

Red Category Projects - The Road Construction Projects are identified as having significant potential for environmental impact. The following types are significant;
• Road construction/ Re-construction/ Extension of Regional, National and International Road.

• Bridge construction/ Re-construction and Extension over 100-meter length require an IEE followed by EIA.

**Amber-B Category Projects:** The following types of project fall under this category.

• Construction/Reconstruction/Extension of Feeder Roads and Local Streets.

• Construction/Reconstruction and Extension of Bridges less than 100 meters length.

As per DoE an IEE is required for Amber-B Projects, but RHD realises that if significant environmental negative impacts occur, then an EIA should be prepared.

### 3 RESPONSIBILITIES

**Superintending Engineer - Social & Environment Circle (SE-SEC)**

• Ensure proper monitoring of the environmental assessment study of all RHD works.

• After a careful review, he will change or modify the EA reports (IEE and EIA) or send it to field level staff or Project Authority for cross checking of data and information. He also sends the approved EA report to EE-Field Circle for obtaining environmental clearance.

**Executive Engineer - Environment Division (EE-ED)**

• Responsible for reviewing environmental assessment RFP in relation to project description and design.

• Responsible for reviewing environmental assessment report (IEE or EIA), comment on the list of Significant Environmental Impacts (SEI's) identified by the consultant and participate in the discussion between EE-Field & the consultant on the magnitude of each impact, distribute the report to relevant sections. He also gives decision whether further study by the consultant is to be carried out on certain environmental issues or impacts.

• Responsible to review plan and methodology submitted by the consultant for further study of IEE or EIA. He also sends the report to the SE or sends back to the consultant for additional study.

• Review and comment on the EIA Report prepared by the consultant and submit the report with comments to the Superintending Engineer, Social and Environment Circle for further action.
Executive Engineer - Field Division (EE-FD)

- He is responsible to prepare RFP for Environmental Assessment in association with Environment Division, RHD.
- He is responsible towards selection of Consultant for Environmental Study.
- Responsible to issue work order to the selected Consultant.
- Familiarise the project area to the environmental study team.
- In consultation with the study team, involve in careful delineation of project area; study area and impact area.
- Evaluation of a study team, comprising multi-disciplinary personnel.
- Participate in the discussion on engineering, environmental and social issues, supply relevant maps and field level information, arrange discussion between the consultant and the EE-ED on significant issues and magnitude of each predicted impact, give decisions regarding supporting study needs.
- Initiate contacts and formal meetings with relevant agencies (City Corporation, LGED; BWDB etc).
- Responsible to distribute IEE or EIA reports to concerned sections of RHD.
- Prepare application for obtaining Environmental Clearance from the Department of Environment.
- Ensure safe working practices on site.

Superintending Engineer - Field (SE-F)

- He is responsible for initiating Environmental Clearance from the Department of Environment (DoE), accordingly he is to forward an application along with an IEE or EIA document to the DoE, he also distribute the approved IEE or EIA report to concerned RHD officers.

4 METHOD

4.1 OVERALL ENVIRONMENTAL ASSESSMENT PROCESS

The Request for Proposal (RFP) is the basis for Environmental Assessment, which is usually developed by the Executive Engineer-Field/Project Authority in consultation with Social and Environment Circle and following the procedures/guidelines of RHD. The RFP for an EA should state
the purpose of the EA, provide background and guidance for the study team, set the schedule and deliverables of the EA report and serve as the contractual basis for commissioning the work. The Executive Engineer, field divisions (EE-FD) initiate at the preparatory stage of EA field study and supply all projects related documents to the consultant. The consultant obtains detailed maps, initial information of the project area. The Sub-Divisional Engineer under the Field Division assists the EE and the consultants in this process.

4.2 **INITIAL ENVIRONMENTAL EVALUATION (IEE)**

The Consultant should review the existing environmental policies, guidelines, regulations and DoE procedures for obtaining Environmental Clearance. The secondary source data should be collected for preparation of IEE report by the consultants. The IEE Report should contain a) Description of the project, b) Policy and legislative aspects, c) Description of the environment, d) Identify predicted impacts and e) an environmental management Plan. Finally, the consultant submits a draft IEE report to Executive Engineer-Environment Division. After refinement, the IEE is finalised and sent to DoE for environmental clearance.

4.3 **ENVIRONMENTAL IMPACT ASSESSMENT (EIA)**

The consultant, in association with the Executive Engineer-Field Division (EE-FD), should identify regulations and guidelines that will govern the conduct of the assessment or specify the contents of its report. They may include a) RHD Environmental Guidelines, b) National laws and regulations on environmental reviews and impact assessments, c) Donor requirements, d) RHD environmental goals and objectives. At this stage checklists, formats etc. to be finalised following RHD requirement.

In some cases, the tasks to be carried out by the consultant will be known with sufficient certainty to be specified completely in the RFP. In other cases, information deficiencies need to be alleviated or specialised field studies performed to assess impacts, and the consultant will be asked to define particular tasks in more detail for RHD Social & Environment Circle review and approval. The EIA should contain:

- Project Description: Describe nature of the proposed project, location and type of roads, bridges, expected volume of use, construction activities etc.
- Legislative and Regulatory Considerations: Describe the pertinent regulations and standards governing environmental quality.
- Description of the present state of the environment (physical, biological, socio-cultural), collect primary and secondary data from field and relevant agencies.
Determination of potential impacts: The engineering plans should reflect ‘best practice’ in road alignment, design, construction methods etc. to ensure that potential negative environmental impacts are minimised.

Development of Environmental Management Plan (EMP) with focus on three generic areas: ie. Mitigation measures, institutional strengthening and training and monitoring.

After review of the EIA report, the Executive Engineer-Environment Division, determines whether further detailed study is required or not for the project. EIA is undertaken to clearly define the project with primary data support, the following sequences are carried out for additional refinement of the study.

Consultant, after discussions with the Executive Engineers-Field Division (EE-FD), carry out collection of additional field level primary data on the relevant environmental issues and follow the sequences such as, scoping, project definition, data collection, impact prediction and analysis etc.

The consultant in association with the Executive Engineers-Field Division (EE-FD), will finalise an EIA, which is a multidisciplinary, comprehensive, and detailed study at a feasibility level stage. In the EIA report predicted impacts are identified, quantified and valued, at the same time environmental management and mitigation measures are suggested. The Environment Division also reviews the EIA. Finally the SE-Field or Project Authority apply to the DoE for Environmental Clearance.

(Note: These operational procedures were prepared for use by RHD staff and are not necessarily complete treatments of the subject. For detailed advice please refer to the RHD Environmental Guidelines).

**4.4 APPROVAL FROM DoE**

This is shown in the diagram overleaf

**4.5 USE OF IEE AND EIA**

The two main uses of the IEE and EIA reports are:

- PCP
- EMP (Environmental Management Plan-see OP/SE/3.4)

This should result in different and prepared site practices.
5 REFERENCES

- Environmental Guidelines, Volume 1, Environmental Management in the Roads and Highways Department, Ministry of Communications, January 2003
- Project Contract Document
- Consultants Contract Document
- Checklist / Formats
- Site Plan

6 PROCEDURE FLOWCHART

The procedure flowcharts for this procedure are detailed in the pages 8 to 10.
OVERALL ENVIRONMENT PROCESS

DoE Environmental Clearance Procedures for Road Projects

The application should enable:

i) General information;

ii) Description of raw materials and finished products;

iii) An NOC

The Application should enclose:

i) General information;

ii) Description of raw materials and finished products;

iii) An NOC;

iv) Process flow diagram, layout plan, effluent disposal system; etc.

The application should enclose:

i) Feasibility Study Report


iii) Environmental Management Plan;

iv) An NOC;

v) Pollution minimisation plan;

vi) Outline of relocation plan; etc.

Note: These requirements vary from those of the DoE (1997) in requiring EMPs for Proposed as well as current projects.
Start

Development Project Proposal

National Road, Regional Road or Bridge >100m long

IEE produced (see flowchart over procure if required OP/SE/3.2)

Feeder, local road & bridge/culvert <100m long

IEE produced (see flowchart over procure if required OP/SE/3.2)

EIA Produces (see flowchart over) procure services if required OP/SE/3.2

Yes

Decide if significant Environmental Impact (EE-ED)

No

Environmental awareness raised in RHD (see OP/SE/3.5)

Send and obtain approval from DoE Project Director/SE-Field

Submit to EE Preparing PCP (EE-Field Division)

Prepare EMP (see OP/SE/3.4) Procure Services if required (see OP/SE/3.2)

For major environmental impact projects conduct Post Project Environmental Evaluation

Monitoring of Environmental Issues (see OP/SE/3.3)

Project Completed with Environmental Impact Minimised

End
End
**Initial Environmental Evaluation**

Start

IEE Required

Scoping (Desk Study)

May have public involvement

Data Collection (Secondary Data)

Approval Quality of Report (EE-ED)

Impact Analyses, Mitigation and Prepare Report

Revise

Submit to EE responsible for PCP Preparation (EE-Field Division)

Yes

Submit to DoE (Project Director/SE-Field Circle)

Review whether significant Environmental Impact (EE-ED)

EIA (Follow the Procedure OP/SE/3.1)

No

End

**Note:** IEE required for all RHD Projects where EIA not automatically required
**EIA Study and Report**

1. **Start**
2. **EIA Required**
3. **Scoping (including site visit)**
4. **Data Collection (Primary & Secondary Data)**
5. **Impact Analysis in three stages:**
   - Identify Impacts
   - Quality Impacts
   - Evaluate Impacts
6. **Design mitigation & Impact Management**
7. **Public Involvement**
8. **Prepare EIA Report**
9. **Approval of EIA Study and Report (SE-SEC)**
   - **Yes**
   - **No**
10. **Submit to DoE in application as required (Project Director/SE-Field Division)**
11. **Receive Environment clearance subject to renewal**
12. **Prepare EMP (see OP/SE/3.4) and ensure Implement within clearance period**
13. **End**
1 PURPOSE AND SCOPE
This Operational Procedure describes the need for procurement of environmental services and monitoring of those services for project sustainability. Environmental Assessment is a multidisciplinary activity and requires special equipment and skills, such as measuring and predicting noise levels and assessing noise nuisance, air quality, wildlife study, water quality, vegetation study etc. The Environment Circle has limited capacity to conduct these so, there is a need to deploy the consultants or freelance specialists for the purpose. Accordingly, Request for Proposal (RFP) will be prepared by the consultants and subsequently approved by the RHD appropriate authority. The procurement process may be conducted either by the Environment Division or by the Field Divisions considering relevant RHD procedures. Environment Division in association with the Project Authority or Field Division will be responsible for monitoring of consultant's work.

2 DEFINITIONS - None.

3 RESPONSIBILITIES

Additional Chief Engineer - Technical Services Wing (ACE-TSW)
- In consultation with the ACE-Field, he will approve the estimates and RFP required for the study.

Superintending Engineer - Social & Environment Circle (SE-SEC)
- He will arrange to shortlist the Firms/Organisations or Freelance Consultant through asking to submit 'Expression of Interest' to provide consulting service.
- Review the Proposals submitted by the Firms/consultant, and send to the ACE-TSW for approval.
- Arrange necessary budget for study and send the Terms of Reference (ToR) to the ACE-TSW for approval.
- Enable dialogue with the EE-Field for recruitment of the consultant.
- Ensure technical capacity of staff for understanding environmental monitoring issues, effective screening and services provided by the consultants.

Executive Engineer - Environment Division (EE-ED)
- He will assist the EE-Field Division for preparation of ToR.
• Prepare additional environmental requirements for inclusion into the TOR, such as monitoring of induced impacts, corrective action plans etc.

• Consult Operational Procedure No. OP/SE/3.3. (Monitoring of Environmental Issues on Projects).

Executive Engineer - Field Division (EE-FD)

• He will prepare the ToR in consultation with the EE-ED.

• Supervision and monitoring of consultant's work.

• Conduct periodic audits of site inspections.

• Consult Operational Procedure No. OP/SE/3.3. (Monitoring of Environmental Issues on Projects).

Superintending Engineer - Field Circle (SE-FC)

• He will arrange necessary budget and send the ToR to the Additional Chief Engineer, Zone (ACE-Z) for approval.

• Ensure that the consultant services consider existing relevant Government policies, rules and regulations and liase with DOE for data sharing.

• Consult Operational Procedure No. OP/SE/3.3. (Monitoring of Environmental Issues on Projects).

4 METHOD

1. Preparation of Terms of Reference (TOR): The TOR should be prepared for procurement or outsourcing of services highlighting the key issues and outputs to be addressed in the IEE, EIA and EMP.

2. Advertisement in the newspaper asking “Expression of Interest”.

3. Careful review of Proposals submitted by the Consultant.

4. Selections of consultant also ensure that the consultant has all necessary skills, experience and operating permits.

5. Prepare related requirements for inclusion into agreement contract (such as obligations including environmental monitoring, cross-checking parameters, etc.)

6. Review reports produced and overall progress of work.
7. Conduct periodic audits of work undertaken.

5 REFERENCES

- Standard RHD Procedures for Advertisement
- Documents on proposed projects
- Environmental Guidelines, Volume 1, Environmental Management in the Roads and Highways Department, Ministry of Communications, January 2003
- Environmental Manual, Volume 2 (under preparation), Environmental Management in the Roads and Highways Department, Ministry of Communications
- Guidebook for Preparation and Review of EA, World Bank, January 2000

6 PROCEDURE FLOWCHART

The procedure flowchart for this procedure is detailed in the next page.
RHD Operational Procedure – Technical Services Wing

OP/SE/3.2 - Procurement and Monitoring of Environmental Services

Start

Preparation of Terms of Reference (ToR) for Project (EE-Field in consultation with EE-ED)

Advertise for Consultant Services (EE-FD)

Evaluation by a Committee formed by the ACE-TSW/ACE-Zone. Committee report approved by ACE-TSW

Recruit Consultant (EE-FD)

Monitoring the Procurement Activities (EE/SDE-ED, EE-FD)

Environmentas Assessment Study and Report by the Consultant (IEE or EIA)

Approve IEE/EIA Conduct (EE-ED)

Yes

SE-SEC and ACE-TSW for Approval

Send to EE for PCP Preparation

No

Revise Study

Conduct Periodic Audit & regular site Inspection and submission of Progress Report (EE/SDE-ED)

1. Allocation of budget (SE-SEC/ACE TSW)
2. Sent to ACE-TSW

ACE-TSW approve the ToR/RFP
1 PURPOSE AND SCOPE

This procedure describes monitoring of Environmental Issues associated with RHD works. The purpose is to measure the impacts, mitigate impacts and improve the database for future impact prediction. In the EMP report, significant environmental issues are identified, as well as monitoring and mitigation measures are suggested for project sustainability. Environmental Monitoring would be carried out at different stages of a project cycle, such as detailed design and implementation stages. Monitoring should address both emission and ambient levels of pollutants where these may be detrimental to human health. Monitoring activities should provide important feedback mechanisms to:

a) Ensure that mitigating actions recommended in the EMP are incorporated in project design and implementation, and b) Identify additional mitigating actions required.

2 DEFINITIONS

Environmental Monitoring - Environmental Monitoring consist of one or more surveillance programmes initiated prior to construction and continued for a predetermined period, possibly beyond the life of the project. It allows the actual impact of the project to be measured and improves the database for future impact prediction.

Environmental Characteristics - Environmental Characteristics are broad environmental categories, such as noise, solid waste, suspended particulate matter (SPM), species and population, health and safety that are listed on the preliminary Assessment Matrix.

Matrix - A matrix is a two dimensional checklist of environmental components and project activities used to identify and communicate the potential environmental impacts of a proposed project.

Project Sustainability - The probability that a project will maintain the achievements generated in relation to its major objectives or the achievements expected in the operational plan. In evaluating sustainability the following are taken into account management or institutional effectiveness, economic, environmental viability, social impact and local participation. Sustainability may also be affected by a follow-on project that continues or expands activities in the project under review.

Soil Composition - The chemical and mineral composition of the soil influences its engineering and agricultural capability. Changes in the soil composition can occur either by subtraction e.g. acid or alkali leaching or by addition e.g. caution exchange extraction, nitrogen fixation.
Water quality - Water quality is important for economic, ecological, aesthetic and recreational purposes. Changes in water quality may affect water treatment costs or even deny some uses of the water. These changes can be chemical, biological or physical.

Noise Intensity - This can have a direct effect on biological and human communities. The intensity of a noise determines the distance over which it can be heard. The acceptability and impact of a new noise depends on existing noise levels.

Terrestrial Wildlife - Included in this group is native mammals, birds, reptiles, amphibians and invertebrate. Migration routes, nesting areas, feeding grounds and water sources concentrate wildlife so that such places are particularly sensitive to road development.

Employment - Monitoring which consider the changes in the number of employment opportunities resulting from the project but also any new diversity of employment opportunities and whether the population have the skills to fill the jobs created by the project.

3 RESPONSIBILITIES

Superintending Engineer - Social & Environment Circle (SE-SEC)
- Allocate budget to undertake environmental monitoring.
- Ensure post project monitoring of environmental issues identified during feasibility study.
- Review mitigation measures for any adverse impacts, using the monitoring data.

Executive Engineer - Environment Division (EE-ED)
- Check the monitoring activities carried out by the RHD staff or consultant maintains appropriate environmental standards.
- Review quarterly environmental monitoring reports and suggest additional mitigation measures.

Executive Engineer - Field Division (EE-FD)
- Implementation of required monitoring measures as reflected in the EMP report.
- Review incorporation of mitigation measures into engineering design and technical specification.

Superintending Engineer - Field (SE-F)
- Review and approve environmental monitoring and mitigation measures.
### 4 METHOD

#### MONITORING PROGRAMME

This is an indicative example programme. Monitoring programme for each project site should be developed in accordance with the Environmental Guidelines and Manual.

<table>
<thead>
<tr>
<th>Project Impact</th>
<th>Parameters</th>
<th>Frequency</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise</td>
<td>Daytime and at night.</td>
<td>Two days a week for 2 times per day.</td>
<td>Construction sites, borrow areas, residential and sensitive areas such as Schools, Hospitals, Located within 200m.</td>
</tr>
<tr>
<td>Air Quality: Asphalt Plant/Tarboiler</td>
<td>Total Suspended Particulate (TSP), smokes.</td>
<td>During Construction 2-3 times a day, random sampling.</td>
<td>Construction sites and vicinity.</td>
</tr>
<tr>
<td>Vibration</td>
<td>Monitoring of each Contract Section when Pile-Driving Work is Scheduled.</td>
<td>When piling is in progress.</td>
<td>Particularly at Residential and Sensitive Locations.</td>
</tr>
<tr>
<td>Pollutants</td>
<td>Pollutants, e.g. Total Suspended Solid (TSS), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Oil And Grease.</td>
<td>Three Measurements a day, in dry and wet seasons.</td>
<td>Floodplains, Khals, Rivers, Bridge points.</td>
</tr>
</tbody>
</table>

*Other Impacts* (To Be Assessed)

- Waste
- Air Quality
- Water

(Note: These Operational Procedures were prepared for use by RHD staff and are not necessarily complete treatments of the subject)
5 REFERENCES

- Relevant EIA Report
- Environmental Guidelines, Volume 1, Environmental Management in the Roads and Highways Department, Ministry of Communications, January 2003
- Environmental Manual, Volume 2 (under Preparation), Environmental Management in the Roads and Highways Department, Ministry of Communications
- Project Map

6 PROCEDURE FLOWCHART

The procedure flowchart for this procedure is detailed in the next page.
Start

Implementation of Prescribed Monitoring Activity (EE-Field, EE-ED)

Detailed Assessment of Monitoring Parameters (EE-Field, Consultant)

Checking of Monitoring Activities (EE-Field, EE-ED)

Ensure Mitigation actions, identify additional Mitigation actions required (Consultant, EE-Field, EE-ED)

Report preparation and review (Compare with EMP, Consultant, EE-Field, SE-Field)

Additional cross checking required?

Approval Authority

Cross check, additional assessment

Report Accepted

End
1 PURPOSE AND SCOPE

The purpose of Environmental Management Plan (EMP) is to structure environmentally sound working practices and mitigation measures during road and bridge construction and maintenance works. The EMP should be drawn up during development/maintenance works design, based upon the IEE and EIA prepared.

2 DEFINITIONS

**Base Camps** - Base camps are constructed at any stage of a project to accommodate the work force. They may be temporary, semi-permanent or permanent.

**Barriers** - Barriers are a means of security. Such obstructions however are not selective. Relevant factors exist pedestrian and vehicular traffic patterns, wildlife migration, aesthetic impact, effect on adjacent land or water use.

**Buffer Zones** - Buffer Zones are spaces that provide natural environmental protection from damage by external events. They are usually vegetated, depending on the purpose and can provide windbreaks, erosion control, sediment traps, wildlife shelter, sound insulation and visual screening.

**Environmental Management Plan** - EMP is a plan for environmental activities during project construction, designed to ensure sound environmental management, mitigating adverse environmental impacts and maximising beneficial effects within an overall objective of sustainable development.

**Residual Impact** - Environmental impacts that remain after implementation of the measures specified in the Environmental Management Plan.

**Mitigation** - The minimisation, elimination, reduction or control of adverse environmental impacts of RHD projects.

3 RESPONSIBILITIES

**Superintending Engineer - Social & Environment Circle (SE-SEC)**

- The Superintending Engineer (SE) should arrange sufficient budget and technical staff to accomplish the stated environmental management objectives.

- The SE should review the EMP document and ensure that, with required adjustment, its conclusions are taken forward in conformity with the advice provided in the EA report.
Executive Engineer - Environment Division (EE-ED)

• The Executive Engineer (EE) should check whether environmental management components are appropriately selected or not.

• Review the document and verify that, the management components make sufficient provision for mitigation, enhancement and compensation.

Executive Engineer - Field Division (EE-FD)

• Check and ensure that the EMP is carried out in terms of:
  
  • Reliability of data - related to the project stages
  
  • Adequacy of people’s involvement- related to maintenance exercise at different project stages

• Identify major cumulative and residual impacts after EMP implementation.

Superintending Engineer - Field (SE-F)

• The Superintending Engineer (SE) in association with the SE-S&EC, should arrange sufficient budget and technical staff to accomplish the stated environmental management objectives.

• The Superintending Engineer is responsible for preparation and implementation of EMP at different stages of the project.

• He should check and review that; the EMP ensures conciseness and relevance of summary, conclusions and recommendations.

• He should also verify whether the EMP addresses appropriate management measures and monitoring plan and their cost estimates.

• Arrange institutional co-ordination with DoE, LGED, BWDB, FD, DOF and relevant NGOs for effective implementation of EMP.

4 METHOD

4.1 PROCUREMENT/PREPARE EMP

1. EMP is formulated during preparation of EIA, which include details of the management initiatives to be implemented during both the construction and operational phase of the road and bridge.
2. In special cases, depending on the local conditions and to incorporate in the contractors Contract Document, EMP needs to be procured following OP/SE/3.2.

4.2 PREPARE, REVIEW AND APPROVE EMP

EMP is carried out where each of the major project components and the management of their respective impacts are described by project phase. The methods and procedures that need to be maintained in formulating EMP are:

1. **Mitigation and enhancement measures** by introducing alternative project design, construction method or modification of a component to enhance a secondary benefit or minimise an impact. Waste disposal procedures (include oil, diesel, construction waste, etc).

2. Ensure **environmental protection and monitoring** activities, which should run through construction, operation and decommissioning stages of road and bridge projects. This will allow early detection of unexpected impacts and development of measures to deal with them.

3. **Compensation and rehabilitation** measures should be included in the EMP. In all RHD projects significant residual impacts remain after implementation of mitigation actions, such as re-settlement of displaced people need infrastructure support (schools, mosque, market, water supply, sanitation, healthcare, road network etc).

4. **Institutional arrangements** should be outlined in the EMP for the mitigation, enhancement, monitoring and other components of environmental management. Institutional support should be developed in close co-operation with RHD; supporting agencies include LGED, BWDB, DOF, FD, DoE and relevant NGOs.

5. Accidental activities should be dealt with by **contingency plans** specific to the predicted accidents or hazards for road and bridge projects.

6. Prepare **Cost Estimates** for 1 to 5 above.

7. The EMP should be prepared through **consultation and participation** arrangement with local people. This process will achieve consensus between the RHD project planning and design engineers, local government organisations (LGED), local people and NGOs.

4.3 EM ON SITE

EMP should result in improving environmental performance by the Contractor: either through spending money on this activity. This should include a monitoring programme, such as the indicative one included as an example in OP/SE/3.3.
This is likely to require allowance in the budget (approved by RHD) and will affect on site working practices. Monitoring of a Contractor's Environmental performance will be needed to ensure due attention is given to environmental activity. This process is outlined in Procedure OP/SE/3.3.

5 REFERENCES


- Site Plan.

6 PROCEDURE FLOWCHART

The procedure flowchart for this procedure is detailed in the next page.
Start

EIA Completed (see OP/SE/3.1)

EMP Prepared (SDE-ED)

Liaise with Project Design

Revise EMP (SDE-ED)

No

Approved (EE-ED)

Yes

Send to EE-Field to incorporate into Contract Documents

Review Contract Documents for EMP included (SDE/EE-ED)

Monitor Construction in accordance with EMP (see OP/SE/3.3)

Contract award + Contractor Starts work on site

End
1 PURPOSE AND SCOPE

The purpose of this procedure is to describe how to raise environmental awareness among RHD staff, contractors, vehicle operators, and local community to ensure optimum environmental planning and management of new road and bridge projects or to the expansion of existing projects takes place. The overall aim is to ensure all realise the environmental impact of RHD development works and how remedial measures can improve project sustainability.

2 DEFINITIONS

**Autonomous developments** - Developments of variables of the system to be analysed when no change in present management actions takes place (zero policy alternatives). Future states of the system with no change of the present management.

**Avifauna** - Bird species of a particular area.

**Base conditions** - Existing physical, economic, social and environmental characteristics of the study area.

**Bio-diversity** - Variety and variability among living organisms.

**Biota** - Animal and plant species.

**Clay** - Common air pollutant as particulate.

**Coal Tar & Pitch** - It is a recognised car-cinogen causing cancer of skin, scrotum, lip, larynx & lung and possibly cancer of bladder.

**Cement Particulate or Dust** - The small cement particulate or dust enter the respiratory system and get deposited on the respiratory tract and lungs thereby making breathing difficult. Tuberculosis and asthma patients suffer the most at times. Constant exposure induces unconsciousness and even death.

**Carbon dioxide** - A gas taken up by green plants to make food. It is given off into the air when living organisms breaks down food molecules.

**Compensation** - The provision of replacement, enhancement, restoration measures for persons of unavoidable negative impacts of road project development.

**Conservation** - The practice of using natural resources wisely.

**Database** - A collection of various types of data sets (usually stored in a computer).
Erosion - The carrying away of soil by wind or moving water.

Flora - The plant life of a region or of a geological period, corresponding to the term Fauna for animal life.

Fauna - The animal life of a region or of a geological period, corresponding to the term Flora for plant life.

Intrusion - Entering into a place or encroachment without invitation.

Land take - The action of taking land for development.

Noise - ‘Noise’ is sound unwanted by the recipient. Consequently the two terms ‘sound’ and ‘noise’ can be used interchangeably from a physical viewpoint, but subjectively they evoke quite different responses. Environmental noise heard by people inside or outside of their homes can have a number of adverse effects. The main effect is annoyance, but secondary effects such as a reduction in property values can also be important.

Renewable resources - Resources that can be regenerated by the system within a reasonable time interval.

Smog - This is a coined word denoting a persistent combination of smoke and fog occurring under appropriate meteorological conditions.

Stakeholder - An individual; community or organisation likely to be directly or indirectly affected by or having an interest in a proposed road and bridge project. Stakeholders include general public, beneficiaries, project affected people, community representatives, government officials, technical persons and overseas donor agencies.

Topography - A detailed description or representation of the features, both natural and artificial of an area.

3 RESPONSIBILITIES

Superintending Engineer - Social & Environment Circle (SE-SEC)

- Approval of year wise awareness programme through training, seminar, workshop, advertisement and posters at strategic nodal points.

- Liase with DoE, LGED, CEGIS, WARPO, and SPARRSO, obtain relevant data and information and update S & E Circle database.
• Maintain interagency co-ordination (DCC, LGED, BWDB, WASA etc.) at the time of planning and implementation of projects to ensure that environmental considerations are incorporated into the projects.

Executive Engineer - Environment Division (EE-ED)

• Initiate Awareness Programme of the year. Arrange training, seminars and workshops, advertise through posters and pamphlets.
• Initiate Social & Environmental Circle staff development programme.
• Organise environmental training to RHD management Staff to incorporate environmental issues into project planning.
• Act as a Trainer in RHDT for training on environmental issues.

Executive Engineer - Field Division (EE-FD)

• Liase with stakeholders and ensure that local people realise the environmental issues and impacts of projects, involve the community in project planning and implementation.
• Enable dialogue between RHD project planners and local people on all projects relevant environmental issues and distribute environmental handbook (containing basic environmental understanding related to road project).
• Increase technical capacity of RHD staff, contractors and local people for understanding environmental issues and effective screening of projects.

Superintending Engineer - Field (SE-F)

• Ensure that, Environment Field Division and Technical Services Wing (engineering design specialists) of RHD respond to community concerns about the potential impacts of the road project.
• Effective consultation with local people on environmental management process.

4 METHOD

4.1 ENVIRONMENTAL AWARENESS WITHIN SOCIAL & ENVIRONMENTAL CIRCLE

• Initiate Social & Environment Circle staff development programme
• Liase with DoE, LGED, CEGIS, WARPO and SPARRSO, obtain relevant data and information and update environmental database.
• Liase with the RHDT to arrange environmental training for the officers in the Circle.

4.2 ENVIRONMENTAL AWARENESS WITHIN RHD

• Organise environmental training to RHD management staff to incorporate environmental issues into project planning
• Increase technical capacity of RHD staff for understanding environmental issues and effective screening of projects
• Develop intra-departmental co-ordination on environmental assessment issues for RHD projects
• Include Environmental Management Plans in RHD Contract documents and train Contractors to use RHD Resettlement Guidelines, Environmental Guidelines and Environmental Manual at the time of their operation
• Enable dialogue between RHD project planners and local people on all projects relevant environmental issues and distribute environmental handbook (containing basic environmental understanding related to road projects).

4.3 ENVIRONMENTAL AWARENESS FOR LOCAL COMMUNITIES

• Liase with stakeholders and ensure that local people realise the environmental issues and impacts of projects, involve the community in project planning and implementation
• Ensure that, Executive Engineer, Field Division and Technical Services Wing (engineering design specialists) of RHD respond to community concerns about the potential impacts of the road project.
• Effective consultation with local people on environmental management process.

4.4 ENVIRONMENTAL AWARENESS THROUGH INTERAGENCY CO-ORDINATION

• Maintain interagency co-ordination (DCC, LGED, BWDB, WASA etc.) at the time of planning and implementation of projects to ensure that environmental considerations are incorporated into the projects.
5 REFERENCES

- Department of Environment (DoE) 1997, EIA Guidelines for Industries, Ministry of Environment and Forest. Dhaka
- Operational Procedures; OP/SE/3.1, OP/SE/ 3.2, OP/SE/ 3.3, OP/SE/ 3.4
- Environmental Guidelines, Volume 1, Environmental Management in the Roads and Highways Department, Ministry of Communications, January 2003
- Environmental Manual, Volume 2 (under preparation), Environmental Management in the Roads and Highways Department, Ministry of Communications.

6 PROCEDURE FLOWCHART

The procedure flowchart for this procedure is detailed in the next page.
Start

Training by Environmental Consultants

Training on EA Procedures for RHD staff, IEE, EIA, EMP, Environmental Monitoring (SAE-SEC)

Introduce basic environmental concepts related to RHD Operation (SE-SEC, EE-SEC)

Explain Environmental advantages, disadvantages, associated with projects (SE, EE-Field)

Record, sources of information (SDE-ED)

Review Environmental Policies, Rules, Guidelines

Disseminate environmental Performance of RHD

Environmental aspects covered in project design, contracts and construction

Environmental Awareness Initiatives for Local Communities

Quarterly consolidated progress Report on RHD SEC activity

Improved Environmental Awareness through intergency coordination (RHD, LGED, DOE, BWDE, WASA, DCC etc)

End

Local Community

Secondary Sources

Social & Environment Circle - Environment Division

Approved:
1 PURPOSE AND SCOPE

The purpose of this procedure is to describe how the Arboriculture Circle, in consultation with all of the field zones of RHD, arranges the annual programme for plantation.

2 DEFINITIONS

Memorandum of Understanding (MOU) - is an agreement between the RHD (represented by the CE) and the Forest Department (represented by the Chief Conservator of Forest). The MOU is an agreement between the RHD and the Forest Department for plantation along the RHD roadside land during the following five years.

Divisional Forest Officer (DFO) - a district level officer of the Forest Department.

Plantation Manual - produced by the RHD and gives guidelines on all aspects of planting, and includes maintenance of new plantations.

Annual Development Programme (ADP) - is the operational document of the GOB's 5-year plan and includes all types of GOB funded and Foreign Aided Projects, which are ongoing and newly included. The ADP consists of the main investment programme, technical assistance programme and self-financed programme, which are sub-divided into the different government sectors. The ADP is published in June and is available to the public.

3 RESPONSIBILITIES

Chief Engineer (CE) - responsible for according approval of the final Annual Plantation Programme.

Additional Chief Engineer - Technical Services Wing (ACE-TSW) - responsible for the final review of the draft Annual Plantation Programme.

Chief Arboriculturist - Arboriculture Circle (CA) - responsible for according approval of the draft Annual Plantation Programme.

Executive Arboriculturist - Operations Division (EA) - reviews/prepares the draft Annual Plantation Programme.

Sub-divisional Arboriculturist - Operations Division (SDA) - prepares part of the draft Annual Plantation Programme.
4  METHOD

4.1  CONSULTATION WITH THE FIELD DIVISIONS.
For preparation of the Annual Plantation Programme, the SDA/AA will consult with the EE’s of the field zones, commencing in February of each year. A draft plantation programme will be prepared following the guidelines and instructions of the CA/CE, which will be submitted to the EA after field inspection.

4.2  CONSOLIDATION AND REVIEW OF THE PROGRAMME BY EAS.
The draft programmes submitted by the SDA/AAs are examined, consolidated and processed by the EAs of the Arboriculture Operations Division giving consideration to priority of location, available funds, available resources, road stability, road beautification etc. The EAs will also discuss their programmes with the officers of the Forest Department and give due consideration to implementation of other projects, for example the ADB ‘Forestry Sector Project’. The consolidated programme is then submitted to the CA.

4.3  REVIEW OF THE PROGRAMME BY CA.
The programme submitted by the EAs of the two Arboriculture Operation Divisions is reviewed with particular attention to the guidelines and national policy on plantation, the ADP and the MOU. The CA will also consult with ‘Social and Environment’ and ‘Road Design and Safety’ Circles. The draft Annual Plantation Programme for the RHD is then finalised and sent to the ACE-TS.

4.4  FINAL REVIEW AND APPROVAL OF THE PROGRAMME
The draft Annual Plantation Programme will be reviewed by the ACE-TS and recommended to the Chief Engineer for approval. When the Programme is finally approved, in May of each year, it is returned to the EA through the organisational structure, for necessary preparation for implementation.

5  REFERENCES
- Annual Development Programme - RHD
- Memorandum of Understanding - RHD/Forest Department
- Plantation Manual - RHD

6  PROCEDURE FLOWCHART
The procedure flowchart for this procedure is detailed in the next page.
RHD Operational Procedure – technical Services Wing

OP/ARB/2.1 - Preparation of Annual Plantation Programme

Arboriculture Circle - Operations Divisions

Start

1. Receive & consolidate programmes EA's
2. Submit draft programme EAs
3. Consult with RHD HQ Circles CA
4. Send to ACE-TSW for approval CA

Okay

Yes

Draft Program

1. Draft programmes SDA/AA's
2. Consult EEs in field zones
3. Prepare draft programme SDA/AA's
4. Guidelines for plantation (DFO)
5. Annual Development Programme
6. MOU

No

Program finalised and accepted by ACE-TSW

Submit to CE for approval ACE-TSW

Approved

Yes

Program approved by CE

End
1 PURPOSE AND SCOPE

The purpose of this procedure is to describe how to manage annual plantation works by the Arboriculture Circle for all the field zones of RHD including the Head Quarter premises of RHD.

2 DEFINITIONS

Memorandum of Understanding (MOU) - is an agreement between the RHD (represented by the CE) and the Forest Department (represented by the Chief Conservator of Forest). The MOU is an agreement between the RHD and the Forest Department for plantation along the RHD roadside land during the following five years.

Divisional Forest Officer (DFO) - a district level officer of the Forest Department.

Plantation Manual - produced by the RHD and gives guidelines on all aspects of planting, and includes maintenance of new plantations.

Annual Development Programme (ADP) - is the operational document of the GOB’s 5-year plan and includes all types of GOB funded and Foreign Aided Projects, which are ongoing and newly included. The ADP consists of the main investment programme, technical assistance programme and self-financed programme, which are sub-divided into the different government sectors. The ADP is published in June and is available to the public.

3 RESPONSIBILITIES

Chief Arboriculturist - Arboriculture Circle (CA) - has overall responsibility for the management of the plantation work.

Executive Arboriculturist - Operations Division (EA) - responsible for issuing work-orders, periodic inspection of work and issuing instructions to contractors.

Sub-divisional Arboriculturist - Operations Division (SDA) - responsible for hand over of the site to the contractor, periodic inspection of work and certification of plantation and maintenance work.

Assistant Arboriculturist (AA) - responsible for checking of saplings supplied by the contractor and site supervision of plantation and maintenance work. Normally referred to as a Section Officer.
4 METHOD

4.1 TRANSMISSION OF APPROVED PLANTATION WORK PROGRAMME AND WORK-ORDER

As soon as the Operations Division selects the contractor, the EA sends the approved programme of work to the SDA/AA's and a work-order to the contractor. On receipt of the work-order, the contractor will contact the office of the SDA/AA to make arrangements for taking over the site of the plantation works. The SDA/AA take the necessary actions and issue instructions to his Arboriculture Section Officer in the division, who will hand over the site to the contractor.

to the Deputy Commissioner (Thana), Superintendent of Police, Superintending Engineer (respective Zone), Divisional Forest Officer, and the contractor.

4.2 BRIEFING OF CONTRACTORS AND GENERAL LIAISON

The CA will hold a briefing meeting with each contractor on the plantation works. He then issues a letter of notification to the Deputy Commissioner (Thana), Superintendent of Police, Superintending Engineer and Divisional Forest Officer under whose jurisdiction the plantation site is located, requesting that necessary co-operation is given to the contractor. The letter is copied to the contractor.

4.3 PLANTATION WORKS

The AA (Section Officer) will examine the saplings obtained by the contractor to ensure that they comply with the specification and schedule of works and give clearance to proceed with the plantation work.

After completion of all preparatory works the AA will inform the SDA who will make an inspection on-site and give clearance to the contractor to start the plantation works. On completion of the works, the SDA or the EA will make an inspection and instruct the contractor to replace dead and weak saplings. When the replacement work is completed satisfactorily, the AA will inspect the site, certify the completion of plantation works and report to the SDA.

4.4 MAINTENANCE OF PLANTATION WORK.

The contract provision is normally for a two-year maintenance period. The EA will agree the completion date for the plantation work with the contractor, from which date the maintenance period will start. The contractor will carry out maintenance as per the terms and conditions of the tender and maintenance guidelines for the period as provided in his contract.

During the maintenance period the plantation works are inspected every four months by the EA, SDA or AA. The contractors are instructed to fulfil all the maintenance requirements including replacement
of plants if any of those planted earlier is found to be dead or damaged. Subject to satisfactory completion of the plantation work, a completion certificate is issued by the EA.

5 REFERENCES

- Annual Development Programme - RHD
- Memorandum of Understanding - RHD/Forest Department
- Plantation Manual - RHD

6 PROCEDURE FLOWCHART

The procedure flowchart for this procedure is detailed in the next page.
Start

Handover of site (SDA/AA)

Approved programme and w/o for plantation

RHD Plantation Manual

Briefing contractors on plantation CA

Issue notification letter CA

Collection of saplings by contractor

From RHD/private nursery

Verification of saplings by AA

No

Approval

Yes

Preparation of plantation site by contractor

Inspection SDA

No

Satisfactory

Yes

Starts Plantation work Contractor

Maintenance starts contractor

Maintenance Specification

Inspection during maintenance period EA/SDA/AA

Maintenance Work Contractor

Satisfactory

No

Yes

Final Inspection EA

Verification of plantation as per contract EA

Plantation work completed

End

No

Yes

Inspection report

Completion Certificate
1 PURPOSE AND SCOPE
Green Spot Development is an initiative to improve the management and utility of land-acquired by the RHD along highways. Through tree planting and subsequent management the amenity and habitat valve of this roadside land is increased and encroachment should be discouraged.

2 DEFINITIONS
Development of RHD owned roadside land to improve management of RHD estate, discourage encroachment and improve quality of road-side habitat, and its amenity.

3 RESPONSIBILITIES

Chief Arboriculturist - Arboriculture Circle (CA-AC)

- Arrange necessary budget to undertake Green Spot development and management of subsequent projects.
- Develop project ToR with assistance from Executive Arboriculturist and obtain approval from the Chief Engineer, RHD.
- Ensure project implementation and monitoring.
- Review mitigation measures for any adverse impacts, using the monitoring data.

Executive Arboriculturist - Arboriculture Circle (EA-AC)

- Develop PCP in association with the Social & Environment Circle and Road Design & Safety Circle.
- Review relevant GoB policies, guidelines and regulations.
- Check project implementation activities carried out by the RHD staff or consultant.
- Review progress reports and suggest additional measures.

Sub-divisional Arboriculturist - Arboriculture Circle (SDA-AC)

- Maintain appropriate records, liase with Social and Environment Circle and Road Design & Safety Circle during development of Green Spot sites.
- Liase with Forest Department, Bangladesh National Herbarium, review Draft National Land Use Policy for data sharing.

Assistant Arboriculturist - Arboriculture Circle (AA-AC)

- Assist Sub-divisional Arboriculturist for preparation of ToR, project implementation and monitoring, management of records.
4  METHOD

Green Spot development and management is an initiative of Arboriculture Section of RHD, that must take into account factors such as RHD landmarks, cultural and ecological characteristics. Landmarks may be relating to local history, historical bridges, cherished views. Green Spots are used for temporary break of journey, amplify visual appeal or quality. In Bangladesh, much of RHD highway land is unremarkable and not attractive and the majority of travellers and viewers are neither interested in nor impressed by the roadside landscapes past, which they drive. This procedure describes development and management of Green Spots as part of a highway improvement activity, it also provide some basic information as to how this might be achieved.

- Acquire technical information relating to Green Spot development and management.
- Ensure and clearly demarcate RHD owned roadside land.
- Introduce community participation for development and management of such sites.
- Design landscape in association with relevant Wings and Circles of RHD.
- Maintain grassed areas at intervals and ensure plant protection in the early years of establishment of Green Spots. Weed control litter clearance.
- Pruning of shrubs and trees (to improve their shape for ornamental species) and produce a balanced, stable head for individual trees.
- Thinning of planting plots intended to provide a woodland effect in the longer term.
- Removal of tall trees close to roads to prevent blockage onto the carriageway and accidents during storms.
- Green spot developed and maintained discourages illegal encroachment.

5  REFERENCES

- Department of Botany, Dhaka University
  Phone: 880-2-966 1900
- Books available in the Forest Department Library, Mohakhali, Dhaka
  Phone: 880-2-882 8364
- Bangladesh National Herbarium, Mirpur, Dhaka
  Phone: 880-2-900 0676, 880-2-802 0607

6  PROCEDURE FLOWCHART

The procedure flowchart for this procedure is detailed in the next page.
Start

Implementation of Prescribed Monitoring Activity (EE-Field, EE-ED)

Detailed Assessment of Monitoring Parameters (EE-Field, Consultant)

Checking of Monitoring Activities (EE-Field, EE-ED)

Ensure Mitigation actions, identify additional Mitigation actions required (Consultant, EE-Field, EE-ED)

Report preparation and review (Compare with EMP, Consultant, EE-Field, SE-FC)

Additional cross checking required? (Approving Authority)

Cross check, additional assessment

Report Accepted

End
1 PURPOSE AND SCOPE

The purpose of this procedure is to demonstrate how the disposal of matured or damaged trees is managed within the right-of-way and roadside land on the RHD road network, and in premises owned by the RHD.

2 DEFINITIONS

Plantation Manual - produced by the RHD and gives guidelines on all aspects of planting, and includes maintenance of new plantations.

Survey Report (SR) - is a P.W. Accounts Form with a table showing description of trees for disposal, quantity, book values etc

Comparative Statement (CS) - is a statement showing the names of bidders, book value and the values of various bids in the auction for the disposal of matured/damaged trees.

3 RESPONSIBILITIES

Chief Engineer (CE) - responsible for final approval of survey reports having a book value greater than 0.5 lac and not exceeding 3 lac. Also makes recommendations on proposals in SRs for book values greater than 3 lac, which are sent to the MoC.

Additional Chief Engineer - Technical Services Wing (ACE-TSW) - responsible for final approval of SRs having a book value greater than 0.3 lac and not exceeding 0.5 lac, when the CA believes that the disposal is of a sensitive nature.

Chief Arboriculturist - Arboriculture Circle (CA) - responsible for final approval of SRs having a book value greater than 0.3 lac and not exceeding 0.5 lac.

Executive Arboriculturist - Operations Division (EA) - responsible for final approval of all disposals having a value less than 0.3 lac, and managing the overall disposal process.

Sub-divisional Arboriculturist/Assistant Arboriculturist - Operations Division (SDA/AA) – responsible for the preparation and checking of SRs and submission of the final SRs on disposal of trees to the EA. Also responsible for the survey, marking and handing over of the trees.

*Note: For sanction of SRs relating to development works, the total authority lies with the MoC. The CE’s recommendation on survey reports will be required to obtain sanction from the MoC.
4  METHOD

4.1  SURVEY REPORT PREPARED

The surveys of mature, dead and damaged trees are undertaken jointly by the field officers of the Arboriculture Circle and the officers of the Field Zone or Project. Survey reports (SRs) are then prepared and checked by the SDAs and AAs, in accordance with RHD guidelines. The SRs are prepared in a standard format which is maintained by the Arboriculture Circle. PWD/Forest Department rates are used to prepare the estimated values in the reports. The completed reports are then submitted to the EA for review.

4.2  CHECK AND REVIEW BY EA

The EA checks and reviews all of the SRs and approves those, which have an estimated value of less than 0.3 Lac. When the estimated value is greater than 0.3 Lac the SR is sent to the CA for further review.

4.3  APPROVAL OF SURVEY REPORTS VALUE GREATER THAN 0.3 LAC

In normal circumstances, the CA reviews and finally approves SRs, which have an estimated value of greater than 0.3 lac but less than 0.5 lac. However, if any complication arises then the SR is sent to the ACE-TS for further review. The ACE can only give final approval to reports of value greater than 0.3 lac but less than 0.5 lac.

For SRs having an estimated value greater than 0.5 lac but not exceeding 3 lac, the CE is responsible for final approval. The CA ensures that the SRs are submitted to the CE via the ACE-TS and receives approval.

When the estimated value exceeds 3 lac, the SRs have to be submitted to the MoC for final approval, via the RHD chain of command.

The final approved SRs are then sent to the disposal section of the Arboriculture Circle by the CA and the EA is instructed to begin the disposal process.

4.4  DISPOSAL PROCESS

On receipt of the approved survey reports, the EA publishes auction notices for the disposal of the matured, dead and damaged trees. The EA receives the bids and prepares the Comparative Statement (CS) of the bid process.

When the value of the bid is less than 0.5 Lac, the EA has the authority to issue the Work Order directly to the successful bidder. For all contracts in excess of 0.5 Lac the EA submits all relevant
documentation to the CA, including approved SR, auction notice, bid documents, and CS. If the CA is satisfied, then the EA is instructed to proceed with the disposal process and issue the Work Order, if not the EA will be asked to review the auction process and resubmit to the CA.

The SDA receives a copy of the Work Order and organises the hand over of trees. The Arboriculture Circle Sectional Officers will provide close supervision during cutting and removal of trees from the site. The SDA/AAs inspect the disposal work, liaise with the forest department and submit a final report on the disposal to the EA.

5 REFERENCES

- Plantation Manual - RHD.

6 PROCEDURE FLOWCHART

The procedure flowchart for this procedure is detailed in the next page.