

FOOTBRIDGES

A Manual for Construction at Community and District Level

Produced by I.T. Transport Ltd, June 2004

BACKGROUND AND AIMS

Much rural travel takes place on local paths, tracks and village roads. These provide essential access to water, firewood, farm plots and the classified road network. Communities and/or local government are generally responsible for this infrastructure. One of the main problems they face is in providing effective water crossings. Particularly in the rainy season, the lack of an adequate crossing can prevent access to services, or detours of many km or taking risks, especially by women and children, on an unsafe crossing.

To provide safe and sustainable crossings, those providing technical assistance to local government and communities need simple, easily applied guidelines on the selection and construction of effective water crossings. This manual deals specifically with the construction of simple but effective footbridges for spans up to about 20m and is targeted at this local level of technical assistance. Although the bridges covered in the manual are termed 'footbridges', the designs also allow for use by livestock, IMT (Intermediate Means of Transport) such as oxcarts and the occasional light motorised vehicle, for instance a pick-up.

A considerable volume of information already exists on footbridges but it is spread around and difficult to access. A major aim of the manual has therefore been to bring this information together and present it in a form suitable for the target users. Case studies were carried out in 5 countries to collect data on specific types of footbridges. Good information and manuals already exist on certain types of bridges such as cable bridges in Nepal. In these cases the reference sources are given and detailed design information is not included in the manual.

CONTENTS

The manual starts from this planning process and works through the process of selecting the most appropriate design of footbridge to meet the specifications. Detailed construction and installation guidelines are then provided on a number of options that are considered the most appropriate. The information is presented largely through pictorial sketches with brief notes of explanation. An understanding of engineering drawing practice is therefore not needed.

Standard design data is included for the common types of footbridges found in rural areas – bamboo, timber log and sawn timber beam footbridges. A design for a plain slab steel reinforced concrete footbridge is also included because of its advantages of low maintenance and long life. These are suited to spans up to 10 to 12m and longer if intermediate pier supports can be used. For longer spans up to 20m a standard design for a modular steel truss footbridge has been developed and is included in the manual with full construction details.



I.T. Transport Ltd.
Consultants in Transport
for Rural Development

For further information contact Ron
Dennis on +44 (0)1235 833753 or
itt@ittransport.co.uk

DFID

This study was funded by the United
Kingdoms, Department for International
Development.

DFID can accept no responsibility for any
information provided or views expressed.

The content and layout of the manual are described in more detail below:

- Chapter 2:** *Footbridge Specifications*
 This chapter covers the planning stage to determine the specifications and layout of the bridge, including determining span, and identifying users to specify width and loading. The design loading and criteria used in the manual are derived.
- Chapter 3:** *Selecting a Footbridge Design*
 The range of design options for footbridges is outlined covering features and applications,. Typical examples of each type are illustrated by photographs or drawings. The types of designs included are:
- Bamboo bridges
 - Timber log and timber pole bridges
 - Sawn timber, beam and truss types
 - Steel beam and truss types
 - Reinforced concrete footbridges
 - Suspended and Suspension bridges
- The criteria for selecting a footbridge type are discussed.
- Chapter 4:** *Design of Timber Footbridges*
 Detailed designs and examples are given for 3 types: Bamboo footbridges; Timber log footbridges; Sawn-timber beam bridges
- Chapter 5:** *Design of Steel Footbridge*
 A standard design for a modular steel truss bridge for spans up to 20m is described.
- Chapter 6:** *Design of Reinforced Concrete Footbridges*
 Design details are given for a simple slab type of reinforced concrete (RCC) footbridge and the steps in construction are outlined.
- Chapter 7:** *Installation of Footbridges*
 Details of the construction of abutments and piers are given, covering both timber and masonry types. Procedures for installing and fixing footbridges in position are described.
- Appendix A:** *Site Survey and Layout of Bridge*
 This outlines the steps in carrying out the site survey with a questionnaire to collect the required information for planning the bridge installation.
- Appendix B:** *Construction of Steel Truss Footbridge*
 Detailed instructions are given for the manufacture of the modular steel truss footbridge.
- Appendix C:** *Construction of a Footbridge using a Scrap Chassis from a Truck or Bus*
 Details are given of a footbridge constructed using a scrap truck chassis to support the deck.
- Appendix D:** *Contact Details for Sources of Further Information*
 Contact details are given for the sources of further information referred to in the manual

SUPPLEMENTS

Two separate documents are available as supplements to the Manual:

SUPPLEMENT A – is a report of a case study carried out in Sri Lanka to test the modular steel truss footbridge and also the presentation of the sections of the Manual dealing with site survey and bridge installation.

SUPPLEMENT B – contains step-by-step instructions for the manufacture of a modular steel truss footbridge for use by a workshop, including working drawings in A3 format.

