

SEACAP 003

**Mainstreaming Appropriate Local
Standards and Specifications:
Low Cost Structures**

**Presented by
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Introduction

Although SEACAP 3 is currently focussing on pavement Standards and Specifications it is appreciated that road structures are a vital element in appropriate Low Volume Rural Road design and construction.

A parallel SEACAP project in Cambodia, also managed by TRL Ltd, is currently reviewing the status of a Low Cost Structures Manual and it is hoped that this work (SEACAP 19: Task 8) will be available in the future for application in Lao



Task 8: Low Cost Structures Manual

An existing draft Low Cost Structures manual was previously developed to a preliminary draft stage using DfID funding - it requires to be completed and finalised.

The defined aim of Task 8 was to assess the status and applicability of the existing document. The draft manual has been reviewed regarding its potential usefulness within the Cambodian rural road context, in particular and the regional environments in general.



Task 8:Low Cost Structures Manual

The initial preliminary draft LCS Manual was prepared in 2000, however the document was not completed, finalised or published.

Appreciating the importance of the initial work, one of the original author team members; Paul Larcher, took the initiative to secure the copyright and to work the document into a Final Draft form suitable for review.

This version has been obtained for review by the SEACAP 19 team and the Task 8 review has now been completed.



Task 8:Low Cost Structures Manual

- ❑ The Low Cost Structures (LCS) Manual is a **planning, design, construction and maintenance** guide for rural road, small structures in developing countries and economies in transition, intended to **optimise use of Local Resources**.
- ❑ Designed to supplement TRL Overseas Road Note 9.
- ❑ Volume 1: A4 Format, 178 pages: Main guidance text
- ❑ Volume 2: A3 and A4 format: Standard Drawings &BoQs.

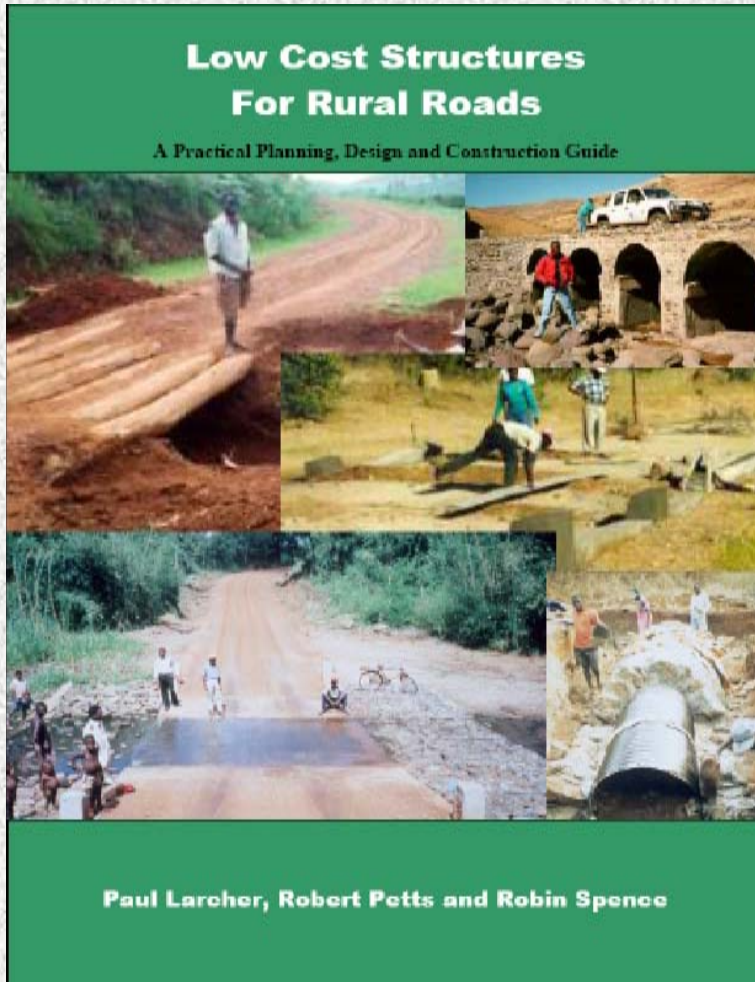


Task 8: Low Cost Structures Manual

Scope: reinforced concrete, un-reinforced concrete, stone and stone masonry, brick and block masonry, and timber.



Task 8: Low Cost Structures Manual

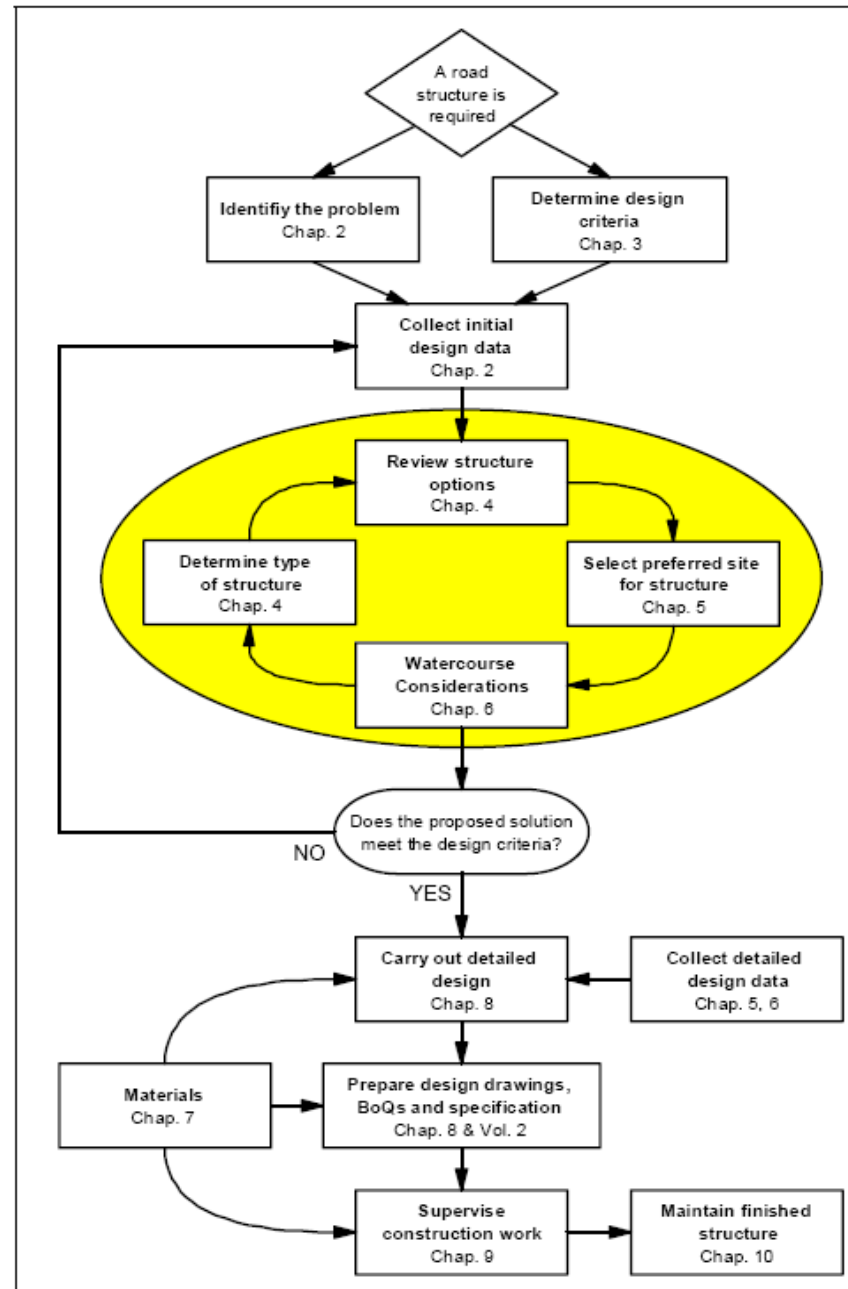


- ❑ **VOLUME 1 CONTENTS**
- ❑ Glossary
- ❑ Introduction
- ❑ Project Planning
- ❑ Design Criteria
- ❑ Structural Options
- ❑ Site Selection and Appraisal
- ❑ Watercourse Characteristics
- ❑ Materials
- ❑ Structural Design
- ❑ Construction
- ❑ Maintenance
- ❑ References



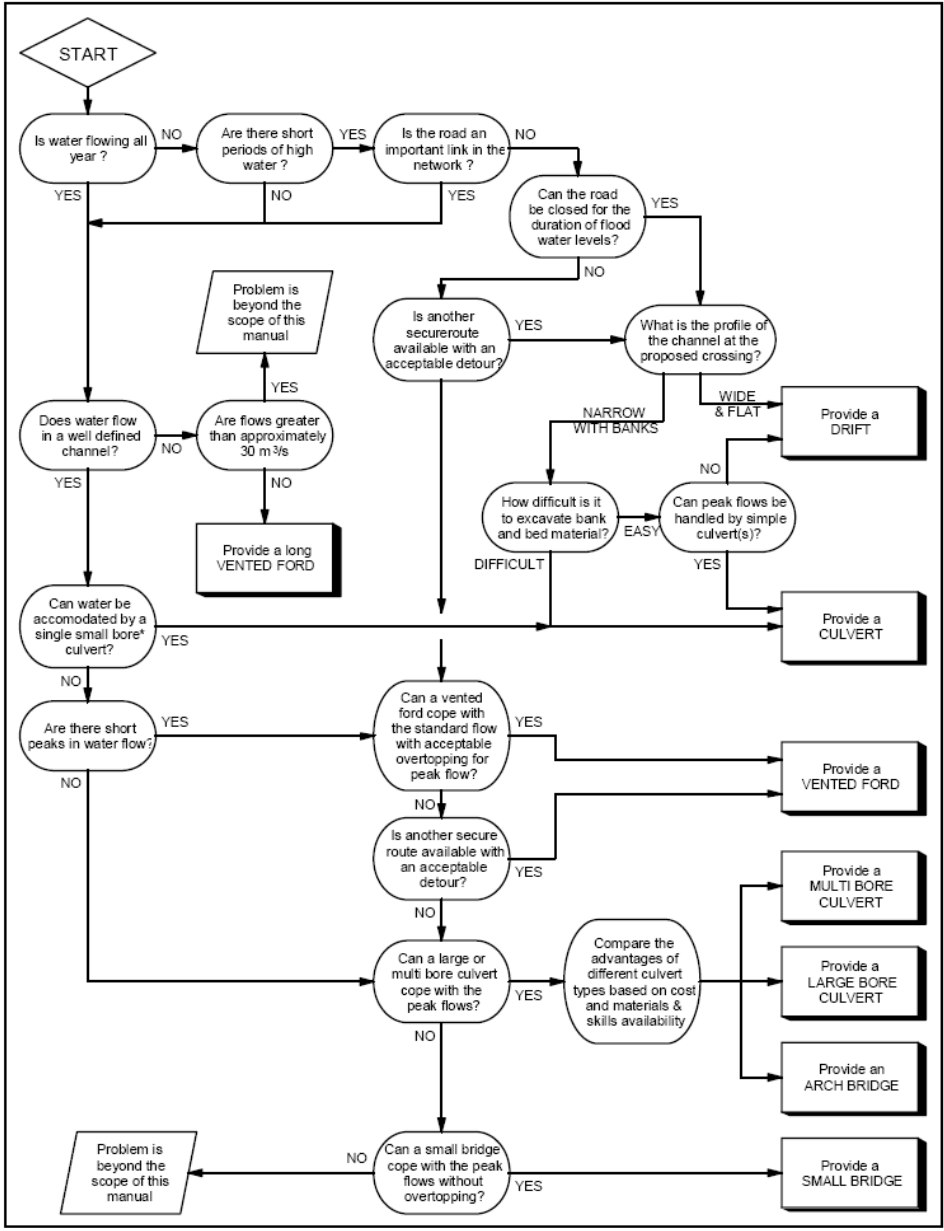
Flow Diagram of the Planning Design and Construction Process

Flow diagram of the planning, design and construction process



Route Map for the Selection of an Appropriate Structure

'Route map' for the selection of a suitable structure

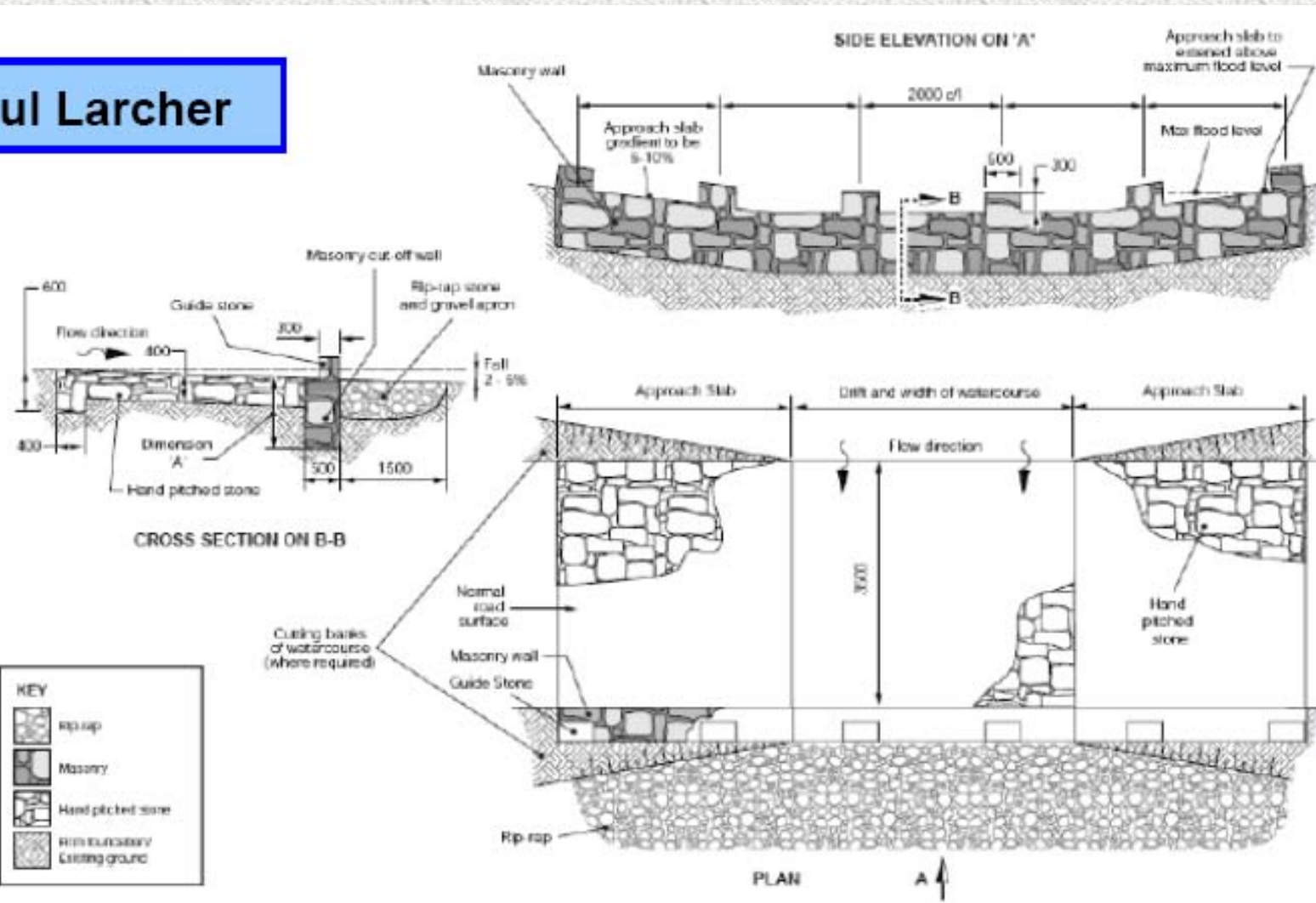


*Small bore – diameters less than 900mm



Task 8: Low Cost Structures Manual

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NOTES: (1) All dimensions in mm. (2) Dimension A 1m - 1.5m depending on road class. (3) Rip-rap diversion protection may be substituted for hand pitched stone, reinforced with vegetation. (4) Guide stones to be painted white. (5) Maximum flow velocity 4 m/s per hour depending on road importance. (6) Off setting sign to be placed at approach from either side. (7) Top of drift to be at setting out level. (8) Off setting width may be increased according to station numbers.

Low cost structures for Rural Roads

Pitched Stone Drift

Natural stone & gravel for occasional small and low velocity flow.

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 Centre of Development Engineering, Loughborough University, Leicestershire, LE11 3TU

Scale: 1 : 50 (at A3)

Drawing No: 1.2

Task 8:Low Cost Structures Manual

Lao PDR RELEVANCE

The manual is particularly relevant to the environment of the Lao rural road sector. This is characterised by:-

- ❑ *Severely under-developed rural road network*
- ❑ *Acute shortage of financial resources and technical skills*
- ❑ *Challenging physical environment including high rainfall, flooding, poor foundation conditions and shortage of construction materials in many areas*
- ❑ *Traditional 'mainstream' construction materials (cement and steel products) likely to be imported making reinforced concrete construction methods expensive.*
- ❑ *Poor operational environment and difficulties with operating a functional maintenance regime*



Task 8:Low Cost Structures Manual

SUGGESTED NEXT STEPS – CAMBODIA

- ❑ *Incorporate comments of this review into a Final Draft*
- ❑ *Number and label all photographs, tables and figures.*
- ❑ *Prepare an index for the document.*
- ❑ *Agree Copyright and Publishing arrangements*
- ❑ *Circulate a Final pre-publishing version of the manual and invite comments*
- ❑ *Incorporate comments from consultative exercise*
- ❑ *Arrange for electronic posting of the document on gTKP etc.*
- ❑ *Arrange for a limited print run of the documents for dissemination to selected target audience.*
- ❑ *Support dissemination & mainstreaming of Edition 1 through gTKP etc.*



Task 8:Low Cost Structures Manual

SUGGESTED NEXT STEPS – LAO PDR

- ❑ *Following on from Cambodian steps*
- ❑ *Recommendation from SEACAP 3*
- ❑ *MCTPC-DoR Discussion on need for Manual*
- ❑ *Request for Donor support.*
- ❑ *Minor editing to bring into Lao PDR context*
- ❑ *Stakeholder consultations*
- ❑ *Production etc as per Cambodian steps*



Task 8:Low Cost Structures Manual

SIMPLE DESIGN ANKORIAN ROAD
STRUCTURES STILL IN SERVICE TODAY!



Thank You

