

SEACAP 30

Rural Transport 3 (RT3) RRST-III TRIALS PREPARATION

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Background

SEACAP 30 is a logical continuation of the RRSR programme and extends this important trials programme to further road environments in Vietnam

Key Objective: Design and documentation for 3 to 4 trial pavements sections (500m - 1,000m) suitable for the relevant conditions



SEACAP 30: Key Questions

- **WHY** was the project undertaken ?
- **WHAT** has been achieved ?
- **HOW** can the project be moved forward ?

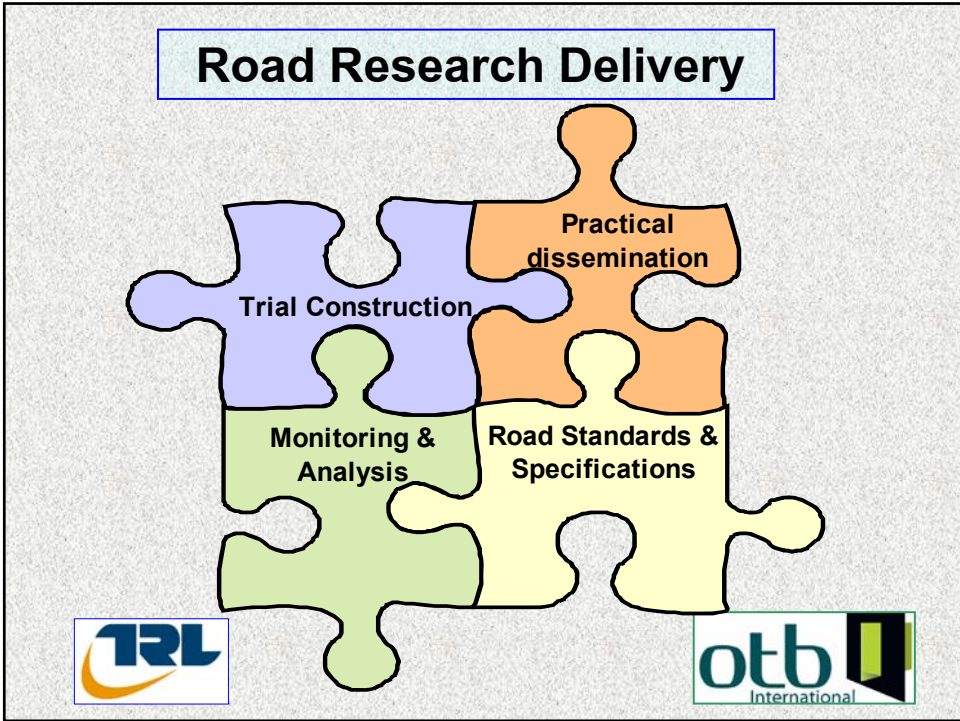


Why?

Previous presentations have clearly shown the diverse nature of Vietnamese rural road environments – for example rainfall, terrain and traffic.

It is accepted that **different areas require different solutions**





Province Priority

No	Province	Preferred Trial Location	Comments
1	Dien Bien	Mountain valley	New area
2	Phu Yen	Coastal Plain	Southern Central –High rainfall
3	Thai Nguyen	Hilly	North East
4	Cao Bang	Mountainous	North East
5	Thanh Hoa	Hilly-Mountainous	Northern central
6	Thai Binh	Red river delta	
7	Lang Son	Mountainous	North East
8	Bac Giang	Hilly,	
9	Nghe An	Hilly,	Same region as Ha Tinh
10	Quang Nam	Coastal	Similar to Phu Yen

Why? - The Matrix

Programme	Number of RRSST Province in Each Environment Group							
	Northern Mountains	Northern Hills	North Coastal	Red River	Central Coastal	Central Highlands	South Coastal	Mekong
RRST-I					2			2
RRST-II	1		2	2		3		
RRST-III	1 (+1)	1		1			2	

Overlain on this is a matrix of traffic, sub-grade strength, and local material availability



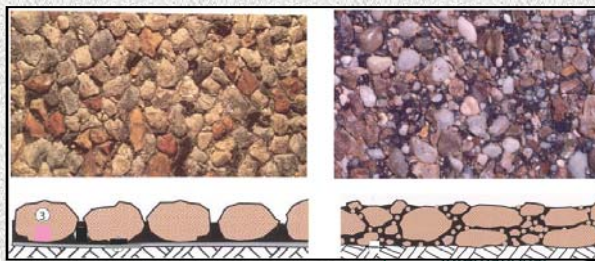
Why? – Further Option Trialling

Thickness of non-reinforced concrete: 150 – 200mm ?

Mortared brick paving

Lime stabilisation of natural clay-gravels

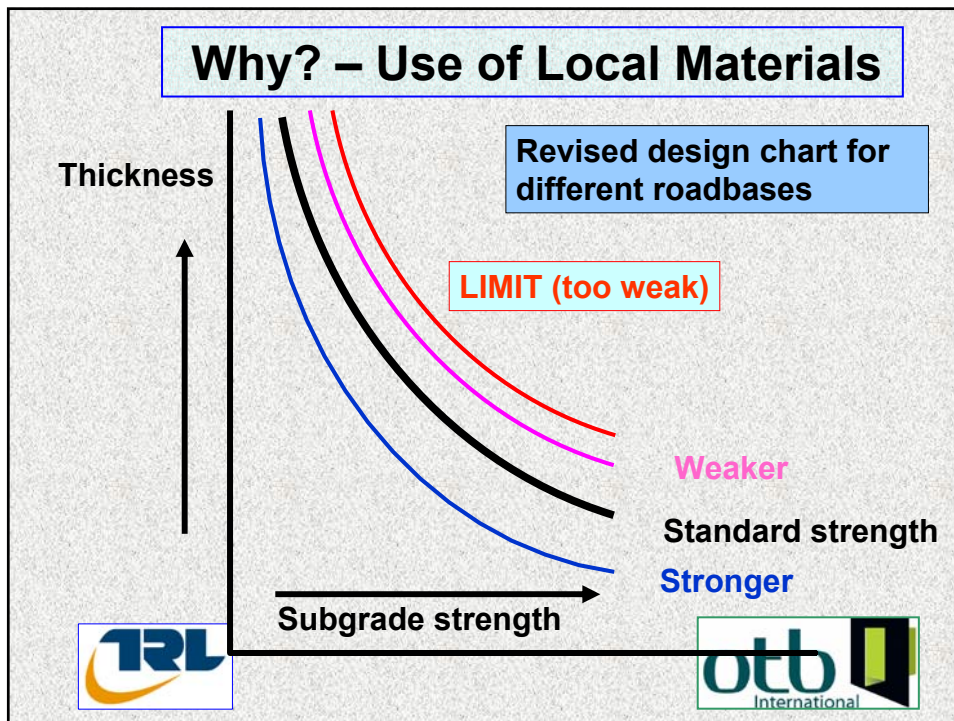
Use of Otta Seal



Why? – LVRR Regional Design Charts

Sub-grade Soaked CBR%	Layer	Traffic Group A Layer Thickness (mm)			Traffic Group B Layer Thickness (mm)		
		Unsealed	Sealed Flexible	Rigid	Unsealed	Sealed Flexible	Rigid
2-3	Surface	200	(Seal)	150	200	(Seal)	150
	Base		100			100	
	SBase		100	150		100	150
	SGrade	300	200	0	400	350	0
4-6	Surface	200	(Seal)	150	200	(Seal)	150
	Base		100			100	
	SBase		100	150		100	150
	SGrade	250	100	0	300	200	0

Why? – Use of Local Materials



Why? – The End Product

Practical application of science-based
Vietnamese rural road design charts

More cost-effective designs

More kilometres maintainable road
constructed within available budgets



What Has Been Achieved

SEACAP 30.01. This was the main SC30 contract concerned with the research and preparation of trial designs for the RRST-III programme.

SEACAP 30.02. was split between **ITST** and **TRL-OtB**. The former were tasked to undertake geotechnical surveys of the six identified trial roads whilst TRL-OtB supplied guidance and QA.

SEACAP 30.03. An enabling contract to allow funding to be made available to the 6 RRST-III provinces for road surveys and document preparation as per RT3 Guidelines. Five provinces agreed to this arrangement,



Draft trial documents.

Site works by ITST:

- Site survey & site DCP test of 6 trial roads of 6 provinces.
- Soil samples & local materials have been taken and LAB tested.
- Traffic count of 6 trial roads.
- Trial road survey & test Reports.

TRL-OtB has prepared the trial documents: technical specifications, cost norm, cross section drawings of trial options, proposed trial options for each province.



Traffic data & Sub-grade CBR

		ADT (12 Hours)	ADT (24 Hours)	Sub-grade CBR (%)
Cao Bang	Hong Viet – Lam Son	234	281	6
Thai Nguyen	Uc Son - Lu Van	840	1008	6
Thai Binh	Hong An	298	358	2
Dien Bien	Co Chai, Thanh An	126	151	8
Thanh Hoa	Quang Trung – Quang Chinh	102	122	3
Phu Yen	Phu Vang – Phu Luong	182	219	4



New updated trial options:

Road	From	To	Design Ref.	Surface/Base	Sub-Base	Subgrade	Shoulders
Cao Bang 0.2msa 6% CBR	0.000	1.1	CB1	15 cm Un-reinforced concrete	12 cm lime stabilised clay-gravel	> 6% CBR	Quarry-run
	1.2	2.2	CB2	OTTA seal on 15cm stabilised river gravel	15cm lime stabilised clay-gravel	> 6% CBR	Quarry-run
	2.2	3.3	CB3	Double Bitumen Emulsion Surface Treatment on 15cm dry-bound macadam	15cm lime stabilised clay-gravel	> 6% CBR	Quarry-run
	3.3	4.375	CB4	Hot bitumen seal on 15cm waterbound stone macadam	15cm water-bound macadam	> 6% CBR	Quarry-run



Road	From	To	Design ref.	Surface/Base	Sub-Base	Subgrade	Shoulders
Thai Nguyen 3.7msa 6% CBR	0.000	1.000	TN1	Double Bitumen Emulsion Surface Treatment on 20 cm dry-bound macadam	30 cm water-bound macadam	> 6% CBR	Sealed
	1.000	2.000	TN2	Hot bitumen seal on 20cm waterbound macadam	30cm water-bound macadam	> 6% CBR	Sealed
	2.000	3.000	TN3	20 cm Un-reinforced concrete	12 cm dry-bound macadam	> 6% CBR	Sealed
	3.000	4.000	TN4	Double Bitumen Emulsion Surface Treatment on 20 cm dry-bound stone macadam	30cm river gravel	> 6% CBR	Sealed
Thai Binh 0.7msa 2% CBR	0.000	0.5	TB1	Double Bitumen Emulsion Surface Treatment on 12 cm dry-bound macadam	15cm stabilised sand	Subgrade to be improved to a minimum thickness of 200mm at CBR> 6% - eg use additional quarry run layer	Quarry-run
	0.5	1.0	TB2	Hot bitumen seal on 12cm waterbound stone macadam	15cm water-bound macadam		Quarry-run
	1.0	1.5	TB3	15 cm Un-reinforced concrete	15cm stabilised sand		Quarry-run
	1.5	2.0	TB4	1 course mortared clay brick	15cm stabilised sand		Quarry-run

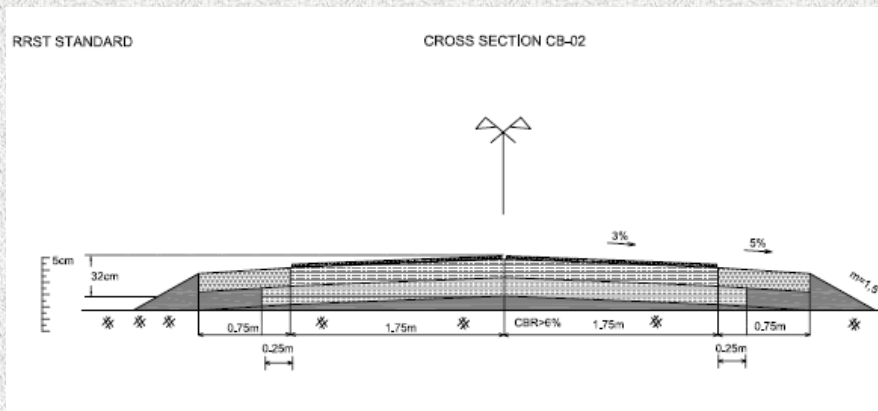


Road	From	To	Design Ref.	Surface/Base	Sub-Base	Subgrade	Shoulders
Thanh Hoa <0.01msa 3% CBR	0.000	0.75	TH1	Hot bitumen seal on 15cm dry-bound macadam	15cm dry-bound macadam	Subgrade to be improved to a minimum thickness of 200mm at CBR> 5%	Quarry-run
	0.75	1.75	TH2	15cm Non reinforced concrete	12 cm dry-bound macadam		Quarry-run
	1.75	2.625	TH3	Double Bitumen emulsion Surface Treatment on 15cm dry-bound macadam	15cm dry-bound macadam		Quarry-run
	3.5	3.5	TH4	One course concrete bricks	15cm dry-bound macadam		Quarry-run
Phu Yen* <0.01msa 4% CBR	0.000	0.75	PY1	Hot bitumen seal on 12cm dry-bound macadam	15cm dry-bound macadam	>4%	Quarry-run
	0.75	1.5	PY2	Double Bitumen Emulsion Surface Treatment on 12 cm dry-bound macadam	15cm dry-bound macadam None		Quarry-run
	1.5	2.25	PY3	Double Bitumen Emulsion Surface Treatment on 12 cm stabilised sand	15 cm stabilised sand		Quarry-run
	2.25	3.013	PY4	1 course mortared clay brick	15 cm stabilised sand		Quarry-run

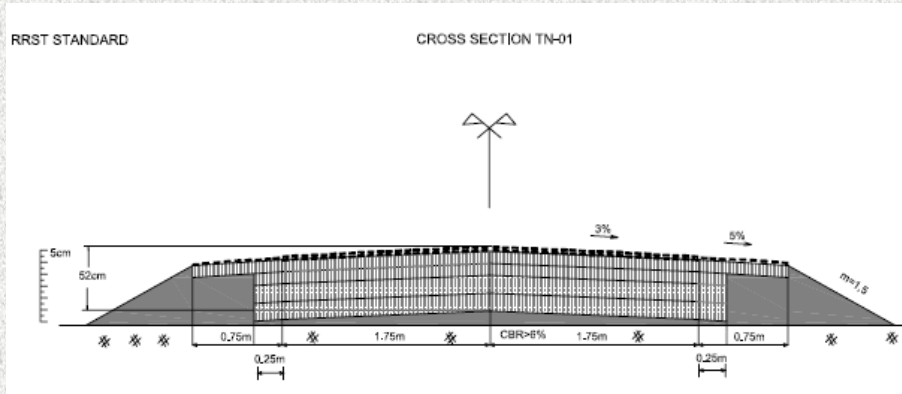


Typical cross section : Cao Bang

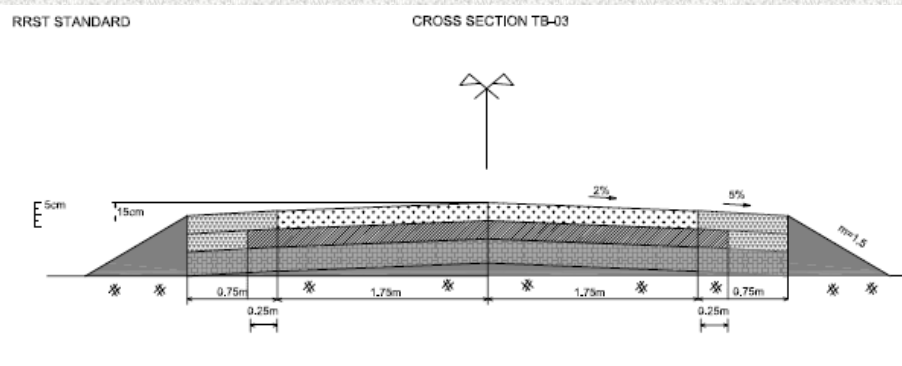
OTTA seal on 15cm stabilised gravel/ 15cm lime stabilised clay-gravel



Thai Nguyen
 Double Bitumen Emulsion / 20cm DBM/ 33cm WBM

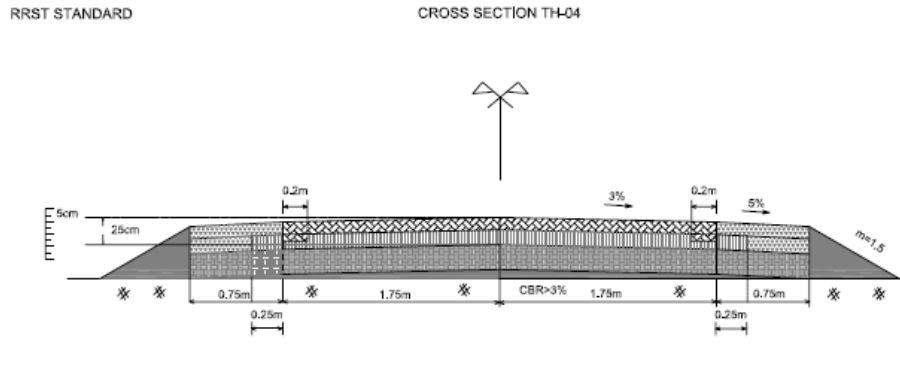


Thai Binh
 15 cm Un-reinforced concrete/ 15cm stabilised sand



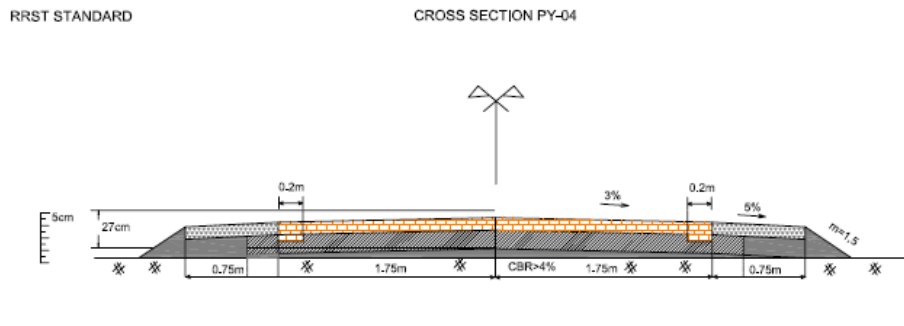
Thanh Hoa

One course concrete bricks / 15cm dry-bound macadam



Phu Yen

1 course mortared clay brick / 15 cm stabilised sand



Achievement Summary

SC30.01/02. 5 trial road identified, pavements designed, tested, and submitted with appropriate technical specifications. A 6th road selected and designed.

SC30.03. Substantial progress within a very short timescale. But still key issues outstanding.



Required Works	Cao Bang	Phu Yen	Thai Binh	Thai Nguyen	Thanh Hoa
Local consultant mobilisation	√	√	√	√	√
Site survey works	√	√	√	√	√
Submit interim progress report	√	√	√	√	√
Land acquisition surveys	√	NR	O	O	NR
Ethnic minorities survey	√	NR	O	O	NR
Detail design, drawings, cost estimation.	√	√	O	√	√
Submitting design, cost estimation.	O	O	O	O	O
Submitting land acquisition plan.	NR	NR	O	O	NR
Agreement design, MoT/PPCs/WB.	O	O	O	O	O

Outstanding SC 30 Issues

QA of documentation by TRL-OtB.
Responsibility issues.

Completion of RT3 submission-approvals
process

PPMU completion reports and fee
disbursement.

Not insurmountable problems – discussion
here this afternoon should move these
forward

Finally: Trials Construction Funding

This funding has to include **appropriate supervision and quality control** over and above that normally applied to rural road construction programmes.

Commitment to trials construction also carries with it a **commitment to monitor** the trial performance

Without the above provisos the trials construction is just not justifiable on research grounds

Recommendation

This RRSR programme initiated by the MoT has been a significant success in terms of initiating improvement in rural road pavement selection and design - regionally as well as in Vietnam.

The TRL-OtB clear recommendation is that the programme including RRST-III continues to its **logical practical conclusion** and is not artificially truncated.



Thank You

