

# Coastal Infrastructure Management Plan

Palauli East District  
and  
Tafua



## *Implementation Guidelines*

November 2001

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## Glossary

<b>Coastal Hazard Zones –</b>	Defined areas landward of the coast which are or are considered likely to be subject to the effects of hazards over a defined assessment period. In this study, reference is made to four coastal hazard zones: ASCHs (areas sensitive to coastal hazards); CEHZs (coastal erosion hazard zones); CFHZs (coastal flood hazard zones) and CLHZs (coastal landslip hazard zones).
<b>“Do Minimum” option -</b>	A Management option that involves continuing with the present maintenance and upgrading programme on an as and when required basis.
<b>Hazard -</b>	A source of potential harm or a situation with a potential to cause loss.
<b>Infrastructure –</b>	Built structures and networks which support the national, regional or local community.
<i>Lifeline infrastructure</i>	Infrastructure that contributes directly to the survival of the community and its ability to respond and recover at the time of extreme events.
<i>Secondary infrastructure</i>	Infrastructure that contributes to the every-day development of the community.
<b>Implementation Guidelines –</b>	A document to guide land use and resource practices to achieve specified goals, objectives and policies and provide a framework for the implementation of defences and works.
<b>Issue –</b>	A specific concern regarding both cause and effect.
<b>Land and Resource Use –</b>	The use of land and resources by the community for social, economic or other benefit (e.g. land use includes areas used for villages or crops, resource use includes activities such as sand mining, gravel extraction or fishing).
<b>Monitoring –</b>	Process of measuring the effectiveness or impacts of projects and works against predicted standards, levels or outcomes.
<b>Resilience -</b>	The ability to be adaptive, responsive and quick to recover.
<i>Community Resilience –</i>	The ability for the community to be adaptive, responsive and quick to recover from the adverse effects of hazard.
<i>Natural Resilience –</i>	The ability of natural systems to be adaptive, responsive and quick to recover from coastal processes or hazards.
<b>Risk –</b>	The chance of something happening that will have an impact on objectives. It is measured in terms of consequence and likelihood. In the Coastal Infrastructure Management Plan context it is the likelihood that infrastructure will be subject to coastal hazards and the potential for loss of property, life or land due to natural processes.
<b>Stakeholders -</b>	Those people and organisations who may affect, be affected by, or perceive themselves to be affected by, a decision or activity. The term stakeholder may also include interested parties.
<b>Strategy –</b>	Direction or course of action to achieve a defined vision.
<b>Susceptibility -</b>	The degree to which infrastructure at risk is likely to be damaged by coastal hazards and how easy/difficult, expensive/cheap it is to replace. In the context of the CIM Plan the term susceptibility is equivalent to the term vulnerability as the Samoan phrase for both susceptibility and vulnerability is the same.
<b>Vision –</b>	A desired destiny.

## Introduction to the CIM Plan

### The Strategic Vision

The District Coastal Infrastructure Management (CIM) Plan for Palauli East District and Tafua Tai has been prepared as part of the Government of Samoa's Infrastructure Asset Management Programme (IAMP). The CIM Plan is one of the primary means of implementing the CIM Strategy, which was formally approved by the Government of Samoa in February, 2001, as providing the Strategic direction for the management of infrastructure (both public and private) within the coastal area.

The Strategy has as its central vision "Resilience – Coastal Infrastructure and Communities Resilient to Natural Hazards". The CIM Plan takes this vision and provides the practical tools with which the communities and the government, in partnership, can implement the Strategy.

***To be resilient is to be adaptive, responsive and quick to recover so that communities are environmentally, socially and economically sustainable.***

*(CIM Strategy, January 2001).*

### The Aim of the CIM Plan

The Aim of the CIM Plan is to help communities and government improve resilience by identifying actions and solutions. Not all the solutions may be actioned immediately but the plan will ensure that issues and options are identified for the long-term improvement in resilience of both infrastructure and communities.

The CIM Plan will:

1. Improve the community's awareness of coastal hazard risks;
2. Enable the community and infrastructure providers to reduce coastal hazard risks in villages;
3. Enable the community and infrastructure providers to better adapt, respond and recover from cyclones.

### Structure of the Plan

The CIM Plan consists of two parts each serving a separate and distinct purpose.

- **Plan Development**, which describes the process undertaken in preparing the CIM Plan in conjunction with representatives of the Communities involved and the Government and other stakeholders with interests in the Plan area.
- **Implementation Guidelines**, which describes the Plans and Actions recommended as outcomes of the process, together with the partner responsible for implementing these outcomes. The participants of the CIM Plan preparation process are acknowledged in the **Implementation Guidelines**.

## Implementation Guidelines

### Purpose of the Implementation Guidelines

The Implementation Guidelines describe the solutions proposed that will increase the resilience of the villages in the Plan area and the ways these solutions can be implemented. The solutions are presented for each of the infrastructure items that have moderate to low resilience. Where one solution will provide benefits to other items of infrastructure these "Other Benefits" are also noted. Implementation is considered to be the joint responsibility of both the villages and the government in partnership. The government is responsible for the provision of national and district "Public", infrastructure, while villages are responsible for local and community infrastructure. The responsibility for implementing the proposed actions is also defined. Solutions for both District infrastructure and Village infrastructure, and the responsibility of both partners, should be considered together as they combine to provide for the integrated management of all coastal infrastructure.

The solutions for village infrastructure will usually be the responsibility of the Village and Families in the village to implement. Advice and resources may be available from government to assist the village in implementing these solutions. In most situations these solutions will also provide benefits to both village **and** district infrastructure and should be considered an integral part of managing coastal infrastructure at both levels.

### Duration of the Plan

The CIM Plan should be reviewed at five-yearly intervals. During the Plan period, the solutions implemented will be monitored to ensure that they are effective in improving resilience. Some solutions are likely to take longer than five years to implement and the review will take the progress of these into account.

The review of the **Implementation Guidelines** and the solutions proposed will be undertaken:

1. As part of the Five-yearly CIM Plan review programme.

2. Once implemented, the solutions will be monitored on either an annual or five-yearly basis to check the effectiveness of the solution. Detailed implementation of the solution will determine the monitoring requirements and Key Performance Indicators.

# Participants in the Plan

The CIM Plan is a Partnership between the Government of Samoa and the villages within the Plan area. Both partners have responsibility for different levels of infrastructure in the local communities and the Plan gives an integrated approach to the provision of services and improvement of resilience now and in the future.

This Plan incorporates the Faipule District of Palauli East and the Village of Tafua Tai from the Faipule District of Palauli le Falefa. Tafua Tai is included in this Plan because it is adjacent to the District of Palauli East and the coastline, services and network infrastructure located in Tafua form an integral part of the networks throughout the wider Palauli East District.

The Village Committee for the Faipule District of Palauli East and the Village of Tafua Tai, confirms the participation of the Villages in the preparation of this Coastal Infrastructure Management Plan for Palauli East District and Tafua Tai in partnership with the Government of Samoa and its adoption as a Management Plan for the implementation of the Coastal Infrastructure Management Strategy.

**Village Meetings:**

**Village Representatives:**

• Vailoa	26 July 2001	-----
• Vaito’omuli	27 July 2001	-----
• Fa’ala	30 July 2001	-----
• Tafua	31 July 2001	-----

The CIM Plan Committee representing all of the Villages in the area met on 9 and 29 August 2001.  
Comments on the draft CIM Plan were received from the Committee on 22 October 2001.

**Government Departments and Corporations:**

• Department of Lands, Survey and Environment	<p>The Department of Lands, Survey and Environment, as lead Department of Government, on behalf of the participating Government Departments and Corporations, confirms the participation of the Government of Samoa in the preparation of this Coastal Infrastructure Management Plan and its adoption as a Management Plan for the implementation of the Coastal Infrastructure Management Strategy.</p> <p><b>Signed:</b></p> <p>-----</p> <p><b>Director of Lands Survey and Environment</b></p> <p><b>Date:</b></p>
• Ministry of Internal Affairs	
• Treasury Department	
• Public Works Department	
• Samoa Water Authority	
• Electric Power Corporation	
• Samoa Communications Ltd	

**The Government of Samoa adopts the Coastal Infrastructure Management Plan for the Faipule District of Palauli East and the Village of Tafua Tai as a Management Plan for the implementation of the Coastal Infrastructure Management Strategy (CIMS).**

**Signed:**

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**Minister of Lands, Survey and Environment, Government of Samoa**

# 1 District Infrastructure

## CIM Plan Solutions

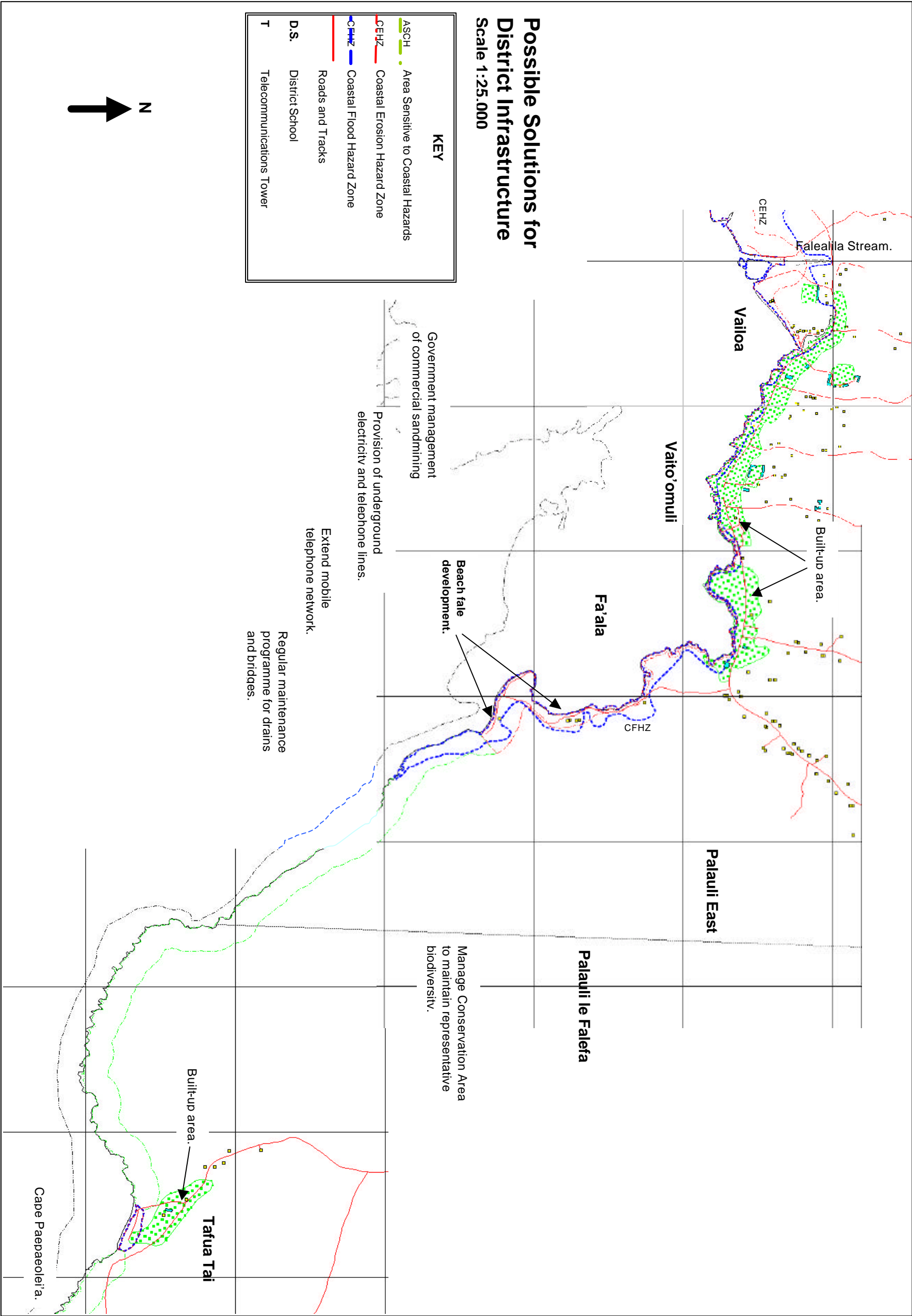
Infrastructure	Best Solutions and Other Solutions Proposed	Other Benefits	Implementation Guidelines
National and Local Electricity and Telephone Lines	<ul style="list-style-type: none"> <li>Provision of underground electricity and telephone lines</li> <li>Provide an upgraded mobile telephone network</li> </ul> <p><b>Responsibility: Electric Power Corporation/ Samoa Communications Ltd</b></p>	<ul style="list-style-type: none"> <li>Village</li> </ul>	<ul style="list-style-type: none"> <li>Include provision for underground electricity and telephone lines where practical and feasible in future programmes.</li> <li>Include provision for expansion of mobile telephone network in future programmes.</li> </ul>
Tafua Rain Forest and Conservation Area	<ul style="list-style-type: none"> <li>Ensure Conservation Area is managed and developed to maintain representative biodiversity in the area.</li> </ul> <p><b>Responsibility: Department of Lands, Survey and Environment</b></p>	<ul style="list-style-type: none"> <li>District</li> </ul>	<ul style="list-style-type: none"> <li>DLSE to investigate means of managing Tafua rain forest for the benefit of the local community and the sustainable development of the remnant rain forest environment.</li> </ul>
All infrastructure	<ul style="list-style-type: none"> <li>Government management of commercial sand mining.</li> <li>Government to identify alternative sources of sand for commercial use.</li> </ul> <p><b>Responsibility: Department of Lands, Survey and Environment</b></p>		<ul style="list-style-type: none"> <li>Identify specific sites for near shore sustainable sand mining to meet commercial demand. Further investigations should be undertaken to identify specific sites near shore close to suitable stock-pile areas that will meet commercial demand without depleting coastal resources.</li> <li>Prepare Environmental Impact Assessments for identified sites.</li> <li>Undertake consultation with villages affected by the proposed sand mining.</li> </ul>

**Note: Refer to Maps to see proposed alignments and locations of intervention solutions.**

## Solutions Outside the CIM Plan

The following issues and solutions have been raised in consultation but fall outside the scope of the CIM Plan as they relate to infrastructure outside the coastal area. The issues are recorded for further investigation by the responsible agencies so that they may programme a suitable response as part of their Annual Plan and budget process.

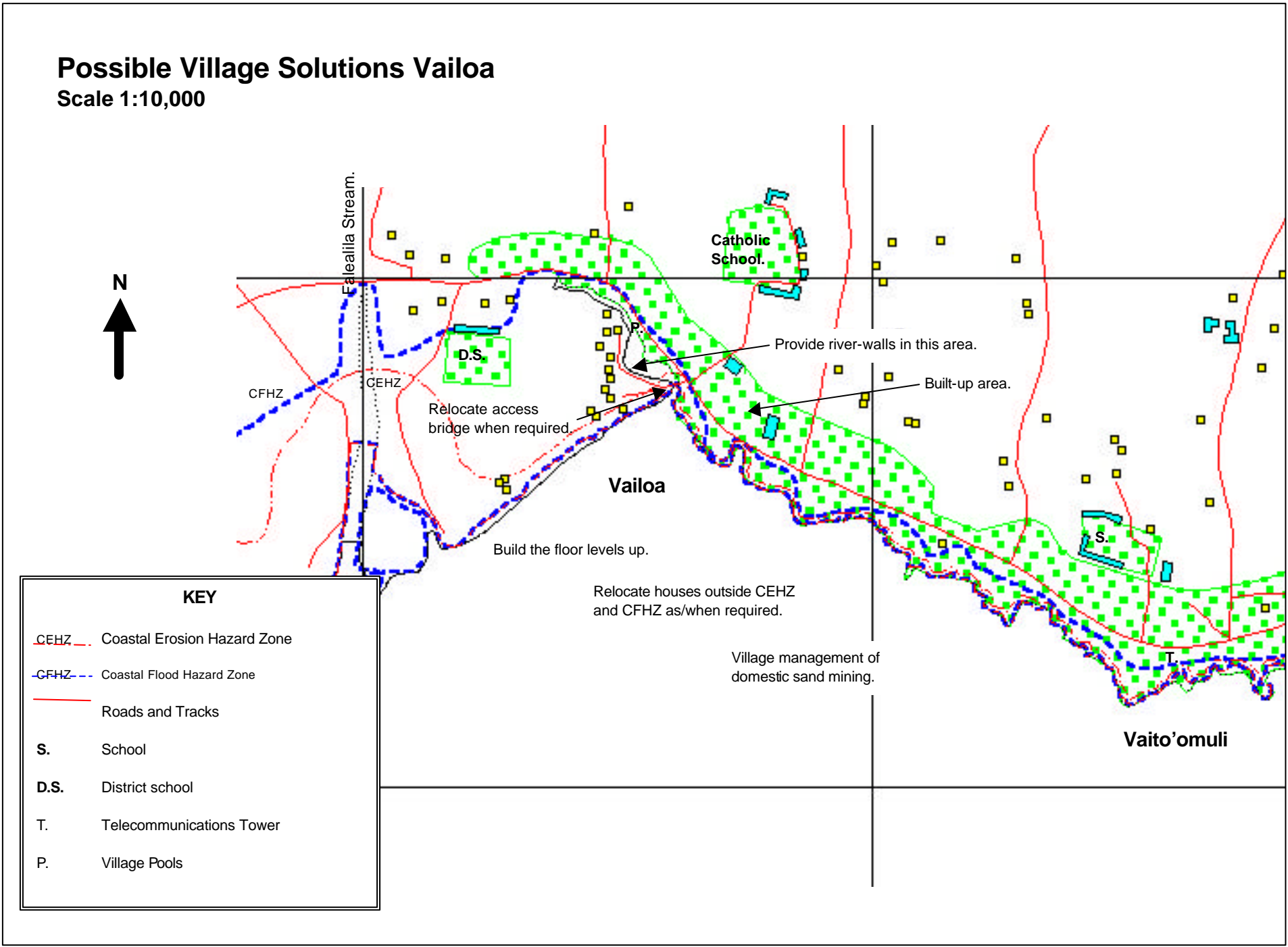
Issue	Responsibility	Reasons
Main water supply	Samoa Water Authority	<ul style="list-style-type: none"> <li>Water is a significant issue in the district and the provision of a consistent supply of water for domestic use is necessary for the health and safety of the community. The existing water supply and distribution network are not at risk from coastal hazards and therefore the issue lies outside the scope of this Coastal Infrastructure Management Plan. The Samoa Water Authority has advised that they are aware of, and are working towards resolving, the problems. The issue is recorded as an item for further investigation by the appropriate agencies.</li> </ul>
Drainage across/under main south coast road.	Public Works Department	<ul style="list-style-type: none"> <li>Inadequate drainage across/under main road is causing inland flooding affecting the District School and Hospital as well as village houses. Drainage across/under the main road should be considered as part of the regular maintenance of the main road in this area.</li> </ul>
Bridge on main road at Vailoa	Public Works Department	<ul style="list-style-type: none"> <li>The bridge foundation works at Vailoa are in need of regular maintenance work. This is not an exceptional coastal infrastructure management issue and should be incorporated into a regular maintenance programme.</li> </ul>





## 2 Vailoa Village Infrastructure

Infrastructure	Best Solutions and Other Solutions Proposed	Other Benefits	Implementation Guidelines
Village houses in CEHZ and CFHZ	<ul style="list-style-type: none"><li>Village management of domestic sand mining.</li><li>Government to identify suitable sources of sand for domestic users.</li></ul> <b>Responsibility: Village/DLSE</b>	<ul style="list-style-type: none"><li>All infrastructure within CEHZ</li></ul>	<ul style="list-style-type: none"><li>Village to share with government control over sand mining activities.</li><li>Village/Families to take note of Hazard maps provided and to plan investment and structures accordingly.</li></ul>
	<ul style="list-style-type: none"><li>Build foundations higher, above flood limits.</li></ul> <b>Responsibility: Village/Families</b>		
	<ul style="list-style-type: none"><li>Relocate outside the CEHZ and CFHZ when buildings require replacement.</li></ul> <b>Responsibility: Village/Families</b>		
Inland water-way and pools	<ul style="list-style-type: none"><li>Provide river-walls along banks eroding from the inland side.</li></ul> <b>Responsibility: Village/DLSE</b>		<ul style="list-style-type: none"><li>Village and Government to discuss suitable protection of areas eroding along the inland water-way to maintain the social and cultural importance of the water-way.</li><li>Seek funding to implement agreed solution.</li><li>Undertake Environmental Impact Assessment of proposed work.</li><li>Implement construction of agreed work.</li></ul>
Local Access Bridge	<ul style="list-style-type: none"><li>Relocate when required.</li></ul> <b>Responsibility: Village/Families</b>		<ul style="list-style-type: none"><li>Village/Families to take note of Hazard maps provided and to plan for future replacement of access bridge accordingly.</li></ul>



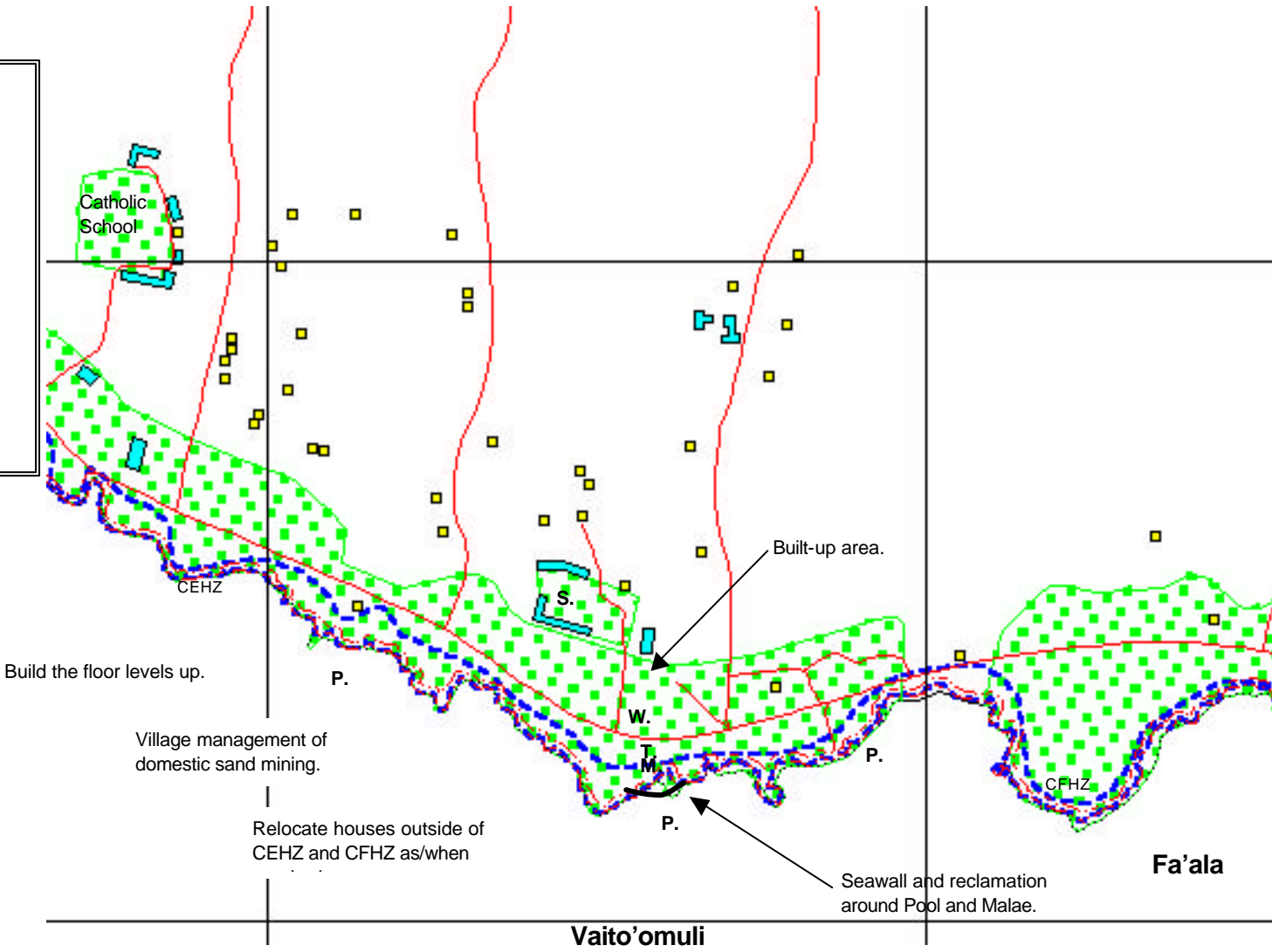


### 3 Vaito'omuli Village Infrastructure

Infrastructure	Best Solutions and Other Solutions Proposed	Other Benefits	Implementation Guidelines
Village houses in CEHZ and CFHZ	<ul style="list-style-type: none"> <li>Village management of domestic sand mining.</li> </ul> <p><b>Responsibility: Village/DLSE</b></p>	<ul style="list-style-type: none"> <li>All infrastructure within CEHZ</li> </ul>	<ul style="list-style-type: none"> <li>Village to share with government control over sand mining activities.</li> <li>Village/Families to take note of Hazard maps provided and to plan investment and structures accordingly.</li> </ul>
	<ul style="list-style-type: none"> <li>Build foundations higher, above flood limits.</li> </ul> <p><b>Responsibility: Village/Families</b></p>		
	<ul style="list-style-type: none"> <li>Relocate outside the CEHZ and CFHZ when buildings require replacement.</li> </ul> <p><b>Responsibility: Village/Families</b></p>		
Village pools	<ul style="list-style-type: none"> <li>Provide seawall and reclamation either side of the central pool in front of the malae.</li> </ul> <p>Length of seawall approximately 100 m Cost approximately \$T33,000 Area of reclamation approximately 750 m<sup>2</sup> Cost approximately \$T20,000</p> <p><b>Responsibility: Village/DLSE</b></p>		<ul style="list-style-type: none"> <li>Village and Government to discuss suitable protection of central pool and malae.</li> <li>Seek funding to implement agreed solution.</li> <li>Undertake Environmental Impact Assessment of proposed work.</li> <li>Implement construction of agreed work.</li> </ul>

#### Possible Village Solutions Vaito'omuli Scale 1:10,000

KEY	
CEHZ	Coastal Erosion Hazard Zone
CFHZ	Coastal Flood Hazard Zone
	Roads and Tracks
W.	Women's Committee House
T.	Telecommunications Tower
S.	School
M.	Malae

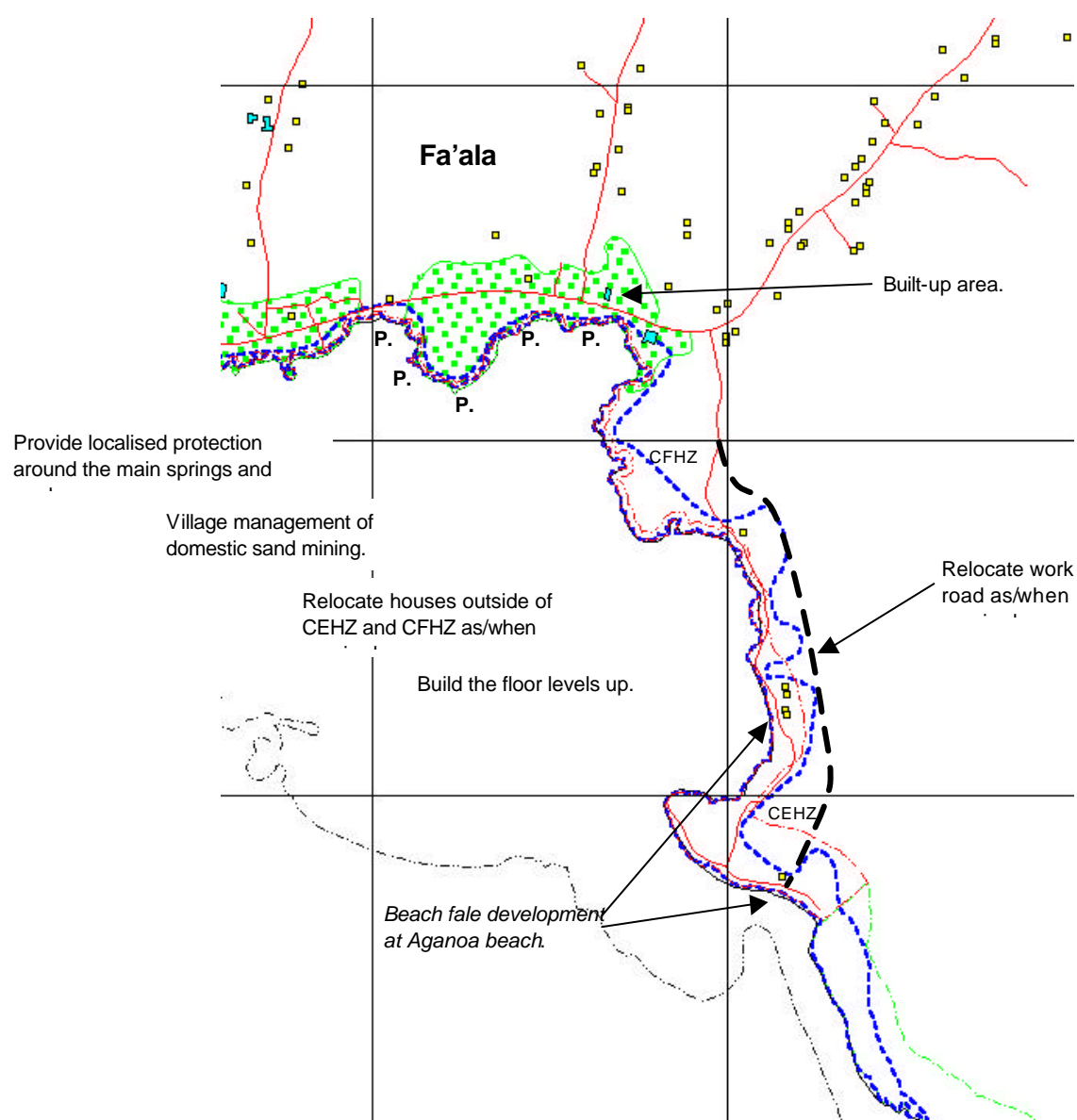


## 4 Fa'ala Village Infrastructure

Infrastructure	Best Solutions and Other Solutions Proposed	Other Benefits	Implementation Guidelines
Village houses in CEHZ and CFHZ	<ul style="list-style-type: none"> <li>Village management of domestic sand mining.</li> </ul> <b>Responsibility: Village/DLSE</b>	<ul style="list-style-type: none"> <li>All infrastructure within CEHZ</li> </ul>	<ul style="list-style-type: none"> <li>Village to share with government control over sand mining activities.</li> <li>Village/Families to take note of Hazard maps provided and to plan investment and structures accordingly.</li> </ul>
	<ul style="list-style-type: none"> <li>Build foundations higher, above flood limits.</li> </ul> <b>Responsibility: Village/Families</b>		
	<ul style="list-style-type: none"> <li>Relocate outside the CEHZ and CFHZ when buildings require replacement.</li> </ul> <b>Responsibility: Village/Families</b>		
Village pools	<ul style="list-style-type: none"> <li>Provide localised protection around the main springs and pools.</li> </ul> <b>Responsibility: Village/DLSE</b>		<ul style="list-style-type: none"> <li>Village and Government to discuss suitable protection.</li> <li>Seek funding to implement agreed solution.</li> <li>Undertake Environmental Impact Assessment of proposed work.</li> <li>Implement construction of agreed work.</li> </ul>
Beach fale development	<ul style="list-style-type: none"> <li>Management of domestic sand mining.</li> </ul> <b>Responsibility: Village/DLSE</b>	<ul style="list-style-type: none"> <li>All infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>See Village houses solution above and District infrastructure CIM Plan solutions in Section 1.</li> </ul>
Work road to beach fale	<ul style="list-style-type: none"> <li>Relocate inland when required. Length of road to be relocated approximately 1.3km. Approximate cost to current standard (sand track) approximately ST130,000</li> </ul> <b>Responsibility: Village/MIA</b>		<ul style="list-style-type: none"> <li>Identify new alignment, undertake Environmental Impact Assessment and seek funding when replacement of the existing road becomes necessary.</li> </ul>

### Possible Village Solutions Fa'ala Scale 1:20,000

KEY	
	ASCH Area Sensitive to Coastal Hazards
	CEHZ Coastal Erosion Hazard Zone
	CFHZ Coastal Flood Hazard Zone
	Roads and Tracks
	Relocated road



# 5 Tafua Tai Village Infrastructure

Infrastructure	Best Solutions and Other Solutions Proposed	Other Benefits	Implementation Guidelines
Beach and beach graves	<ul style="list-style-type: none"><li>Village management of domestic sand mining.</li></ul> <b>Responsibility: Village/DLSE</b>	<ul style="list-style-type: none"><li>All infrastructure within CEHZ</li></ul>	<ul style="list-style-type: none"><li>Village to share with government control over sand mining activities.</li></ul>
	<ul style="list-style-type: none"><li>Revegetation along beach.</li></ul> <b>Responsibility: Village/Families</b>		<ul style="list-style-type: none"><li>Village/Families to take note of Hazard maps provided and to plan investment and structures accordingly.</li></ul>
Work road to beach	<ul style="list-style-type: none"><li>Upgrade to sealed road standard.</li></ul> <b>Responsibility: Village/MIA</b>		<ul style="list-style-type: none"><li>Seek funding to implement upgrade.</li><li>Undertake Environmental Impact Assessment of proposed work (if required).</li><li>Implement construction of upgrade.</li></ul>

