Government of the Independent State of Samoa
Land Transport Authority

ENHANCING ROAD ACCESS PROJECT (ERAP)
Grant No: H884-WS

Construction of the New Access Road and Bridge Crossing of Mali’oli’o River
Samalaeulu, Savaii

EIA

Bidding Documents
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Abbreviations
COEP  Code of Environmental Practice
DC    Development Consent
EIA   Environmental Impact Assessment
ERAP  Enhanced Road Access Project
ESMP  Environmental and Social Management Plan
CESMP Contractors Environmental and Social Management Plan
ESMF  Environmental Social Management Framework
ESSAF Environmental and Social Screening Assessment Framework
GBV   Gender Based Violence
GoS   Government of Samoa
LARP  Land Acquisition and Resettlement Plan
LIDAR Light Detection and Ranging
LTA   Land Transport Authority of the Government of Samoa
MNRE Ministry of Natural Resources and the Environment of the Government of Samoa
MWTI  Ministry of Works, Transportation and Infrastructure of the Government of Samoa
OHS   Occupational Health and Safety
PEAR  Preliminary Environmental Assessment Report
PUMA  Planning and Urban Management Agency of the Government of Samoa
VAC   Violence Against Children
WB    World Bank
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1.0 INTRODUCTION

Replacement of the existing concrete ford in Samalae’ulu with a bridge is a proposed ERAP project, funded by the World Bank, recognised as an important part of increasing Samoa’s resilience to the impact of climate change and withstanding severe weather conditions. The ERAP program was initiated following Cyclone Evan in 2012 as a means for the Government of Samoa, through the Land Transport Authority of Samoa (LTA), to coordinate and oversee major infrastructure projects throughout the country.

LTA issued a request for proposal for the design and environmental assessment of a bridge in Samalae’ulu in July, 2016, and the project was awarded to Soosung Engineering in association with KEW Consulting Ltd. Phase One of the two-part process involved a preliminary design and environmental analysis by the consultants, which was reviewed and assessed by the Government of Samoa and the World Bank, resulting in permission to continue to the detailed design stage. Phase Two involves the detailed design and environmental assessment of the preferred location for the bridge, and is the subject of the following Environmental Impact Assessment document (EIA). According to the Environmental Impact Assessment Regulations, 2007, administered by PUMA, an environmental assessment must be completed for any major infrastructure project that potentially may have adverse impacts on the environment or human activities.

One of the requirements of an ERAP project is to use the ESSAF framework, which provides general policies, guidelines, codes of practice and procedures to implement the ERAP program. The ESSAF framework indicates that where an EIA is required, it should comply with the COEP (Code of Environmental Practice) of the GoS. The COEP is a policy document administered by the MNRE and describes restrictions, allowances and standards for road construction, erosion control, slope stability, drainage, earthworks, land acquisition and stakeholder consultation, among other things. The minimum standards in the COEP were used as a benchmark from which to assess and evaluate the environmental impacts of the Maliolio Bridge and Road Extension alternatives.

The following EIA is part of a comprehensive Preliminary Design Report, and should be read in conjunction with other sections, including a detailed description of the project background and engineering requirements, LARP (Land Acquisition and Resettlement Plan), surveys (hydrological, topographical, cadastral, geotechnical), and preliminary engineering design.

2.0 SITE DESCRIPTION

The area subject to the EIA surrounds the village of Samalae’ulu in the northeast portion of Savai’i. Samalae’ulu is located approximately 3 km inland from the coastline at approximately 38 m elevation. The Main Road that forms a loop around the island runs through the village, as does the Maliolio River, the second largest river in Savai’i. Surrounding the village are mainly forested areas, some of which have been cleared to grow taro and other crops. Most of the land north of the village, between it and the coast, is a barren lava field with only minimal vegetation.
3.0 PROJECT PROPOSAL

3.1 Alternatives Considered

A preliminary analysis (involving LTA, the consultants, and funding partners) considered three possible options as shown in Figure 2. Option 2 (west of the Maliolio River) was selected as the preferred location for the bridge and road extension as it will be the least disruptive to natural topography, river hydrology and drainage of the surrounding areas, and the least disruptive to the existing village.

The bridge in this location would be less costly to construct (compared to building it at the location of the existing concrete ford) since the river channel is narrow, V-shaped and deep (approximately 5.0 m distance from the top of the riverbank to the bottom). It would be less impacted by the consequences of flooding, and therefore have greater stability and longevity.

Figure 2: Preliminary Options

Option 2 was further refined into three possible scenarios for the location of the road extension, as shown in Figure 3, with the bridge located at the T-intersection for all three scenarios. After consideration of all possible environmental and social aspects, a preferred option (Option 2.3) was selected by LTA and stakeholders. This option has the road extending entirely through the forested area, avoiding the village entirely. This preferred option (Option 2.3) is the subject of this environmental assessment.
Figure 3: Three Alternatives for Road Extension
3.2 Proposed Bridge
The bridge is proposed to be located just west of the T-intersection of the Main Road south of Samalae’ulu as shown in Figure 3. Due to the landform and hydrological characteristics of the river, the concrete bridge has a travelled portion (top surface) proposed to be 30 m in length, and will have a 22.0m length elevated road extension situated on concrete footings immediately adjacent to it, see Figure 3. The design is intended to provide level access to the bridge and elevated road extension from the top portion of the river channel on both sides.

The span between bridge abutments is proposed to be 22.0 m. The eastern abutment will be constructed partway down the slope of the riverbank, while the western abutment is situated on the elevated floodplain above the channel. The concrete footings for the elevated road portion will all be located in the floodplain.

No changes to the hydrology of the river are proposed, nor will there be any changes to the river channel, floodplain or river banks. Instead, the intention is that the bridge will be designed to fit the topographic and hydrological characteristics of the existing landscape.

*Figure 4: Bridge Elevation and Profile*

**BRIDGE ELEVATION**

**BRIDGE PROFILE**
### 3.3 Proposed Road Extension

The proposed road extension will extend from the bridge through forested and farmed lands, roughly parallel to the Maliolio River, for approximately 1.5 km until it meets up again with the Main Road just east of the Primary School, see Figure 5, where it will merge directly with the Main Road in a curved alignment so that vehicles will not have to stop or slow down. In this location, a small road extension will be constructed to create a connection between the existing road extending through the village and the new road, which will terminate in a T-intersection.

The road extension will have a profile of 9.5 m in width and be two lanes, each one 3.25m in width as shown in Figure 5. A 2.0m wide shoulder treatment is proposed on both sides of the travelled lanes, and will consist of compacted subgrade with a 100mm layer of topsoil and seeded.

For construction, a 10m wide band will be cleared on both sides of the proposed road (as indicated in Figure 5), for a construction zone width of 20m. The two 10m wide bands are necessary for construction safety, vehicles, equipment, stockpiles and temporary storage, and will be restored to a natural condition at the end of the construction period.

When complete, the road right-of-way will be 22.0 m in width, in keeping with the standard for a National Road as set out in the Land Transport Authority Act, 2007.
ROAD EXTENSION PROFILE

ROAD EXTENSION LAYOUT

Primary School
Connection to Existing Road
Existing path to forms
Road Extension
Existing Concrete Ford
Existing Road
Proposed Bridge
4.0 JUSTIFICATION OF PROPOSAL

Cyclone Evan had a devastating impact in many areas of Samoa, leading to the formation of the Enhanced Road Access Project (ERAP) which funds reparations and improvements to Samoa’s infrastructure so it will be more resilient to the impacts of climate change. The Maliolio Bridge project has been identified by the Land Transport Authority (LTA) as a project subject to the requirements of the Environmental and Social Management Framework (ESMF), whose mandate is to establish clear procedures and methodologies for environmental and social planning, screening review, approval and implementation of ERAP projects.

The proposed bridge is part of the ERAP program, and was identified as a project of high priority to enable Savai‘i to be more resilient to the consequences of natural disasters. One of the requirements of an ERAP project is to use the ESSAF framework, which provides general policies, guidelines, codes of practice and procedures to implement the ERAP program. The ESSAF framework has now been replaced by the ESMF Framework, 2015, which provides recommendations and requirements for the preparation of an Environmental Assessment for this and other infrastructure projects in the ERAP program in Samoa.

Historical Precedence

Construction of a bridge over the Maliolio River near Samalae‘ulu was considered more than 30 years ago, when the Government of Samoa commissioned the construction of a bridge in the exact location of the bridge proposed in preferred Option 2.3. Construction was halted though when the decision was made to upgrade the existing concrete ford instead. Part of a concrete abutment is still there, but investigation by Soosung revealed that the abutments exhibit signs of weathering and decay, and cannot be re-used.

ERAP

The ERAP program was created in response to the devastating impacts of Cyclone Evan in 2012, and LTA, in consultation with the World Bank (WB) is the administration agent. Construction of a bridge in Samalae‘ulu was identified as one of five priority / example projects that the ERAP program would address. A bridge in this location is considered to be critical infrastructure so that people west of the Maliolio River are not isolated from relief efforts and supply chains in the aftermath of a natural disaster.

Endorsement by the Prime Ministers Office

In February, 2016, the Prime Ministers office announced its intention, after consultation with the WB, to proceed to the planning stage for the Maliolio Bridge, recognising the importance of the bridge as a means of adapting to the impacts of climate change.

World Bank

As the funding and chief administrative body for ERAP, the World Bank announced its endorsement of proceeding to the Preliminary Design stage after reviewing the Feasibility Report prepared by the consultants and submitted by the LTA.
5.0 POLICY AND LEGISLATIVE FRAMEWORK

A number of international and national policies, plans and regulations provide guidance and requirements for the preparation of an environmental assessment, and are listed below.

5.1 World Bank
Since the proposed bridge and road extension are funded by the World Bank, the social and environmental assessments are subject to WB safeguards policies and requirements. Two main Safeguards Policies are triggered – OP/BP 4.01 Environmental Assessment and OP/BP 4.12 Involuntary Resettlement.

World Bank Safeguards
OP/BP 4.01 Environmental Assessment, 1999
This policy document provides an outline of the scope of an environmental assessment, requirements for different types of environmental assessments, and when they are required for WB-funded development projects. Environmental assessments should include the following:

- an evaluation of a project’s potential environmental risks and impacts in its area of influence
- examination of project alternatives
- identification of ways of improving project selection, siting, planning, design, and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and enhancing positive impacts
- provision of a methodology of mitigating and managing adverse environmental impacts throughout project implementation.

The policy recognises that a number of different environmental assessment formats such as environmental impact assessment (EIA), regional or sectoral EIA, strategic environmental and social assessment (SESA), environmental audit, hazard or risk assessment, environmental management plan (EMP) and environmental and social management framework (ESMF), could be used to satisfy the EIA requirements depending on the specifics of the project and physical and socio-cultural characteristics.

WB OP/BP 4.12 Involuntary Resettlement
The Project involves the acquisition and use of land from customary landowners with potential impact on livelihoods, land ownership and other land uses. As a result, the WB Safeguards OP 4.12 Involuntary Resettlement policy is triggered. OP/BP 4.12 ensures Project affected people are not made worse off as a result of the Project, and does so by ensuring adverse impacts on land, livelihood sources, access to livelihood sources, and access to publicly shared and designated protected areas are avoided, or if avoidance is not possible, minimized and or fairly compensated. A separate Land Acquisition and Resettlement Plan (LARP) is prepared guided by the Project’s approved Land Acquisition and Resettlement Framework (LARF), to deal with the land acquisition and resettlement issues. Other social impacts identified through this EIA are to be avoided and or reduced to an acceptable level through modifications in project design, and other mitigation measures proposed in this Project Environment and Social Management Plan (PESMP).

ERAP Program, 2010
The ERAP program was initiated following Cyclone Evan in 2012 as a means for the Government of Samoa, through the Land Transport Authority of Samoa (LTA), to coordinate and oversee major infrastructure projects throughout the country funded by the World Bank. The Maliolio Bridge is recognised as one of three important projects that will increase Samoa’s resilience to the impact of climate change and severe weather conditions.

ESMF Framework, 2015
Published for use by the LTA, the ESMF Framework provides strategies and methodologies to enact the ERAP program (Enhanced Road Access Project) which aims to improve infrastructure in Samoa following Cyclone Evan.
The World Bank ESMF Framework has the following objectives:

- Provides guidance to ensure the EIA process is carried out in compliance with accepted best practices including identification, assessment and mitigation of potential environmental and social impacts by proposed works during the detailed design stage.

- Used as a reference document for assessing the potential environmental and social impacts during project construction, operation and maintenance

- Serves as guidelines for the development of site-specific Environmental Management Plans (EMPs), Environmental Impact Assessments (EIAs), due diligence reports, environmental audits, etc.

- Outline training and capacity-building arrangements needed to implement the EMF provisions

The ERAP program requires that the ESMF Framework, 2015, be used to guide the preparation and execution of an environmental assessment for this project. However, the ESMF Framework was issued after the award of the contract for this environmental assessment. Nevertheless, the principles and objectives of the ESMF Framework have been used to guide the preparation of this document.

5.2 Government of Samoan Policy and Regulations

The following policies and regulations of the Government of Samoa are applicable to the project:

Strategy for the Development of Samoa 2016 - 2020

This nation-wide policy, administered by the Ministry of Finance, is a top-level policy plan that provides objectives for the growth and sustainability of Samoa over a 5-year time frame, and is updated regularly. As a visioning plan, it provides objectives to guide developments to achieve a more sustainable future for a wide range of topics, including agriculture, fisheries, finance, mining and resource management, among others.

Objectives that are relative to this project include the following:

Priority Area 3: Infrastructure

Key Outcome 10: Transport Systems and Network Improved

A sustainable, safe, secure and environmentally responsible transport network that supports Samoa’s economic and social development.

Integration of climate change and disaster risks as well as energy efficiency use are listed as priorities for the design and implementation of transport projects in Samoa. The environmental assessment process is a mechanism to implement this objective.

Priority Area 4: Environment

Key Outcome 13: Environmental Resilience Improved

Improved environmental sustainability and disaster resilience.

Samoa’s built environment is to consider the health and sustainability of the natural system and prevent adverse impacts to the natural environment and human population, considering both regular use and resistance to disasters.

Key Outcome 14: Climate and Disaster Resilience

A climate and disaster resilient Samoa with planning, risk reduction, response and recovery improved with increased coordination amongst stakeholders.

All projects should be designed with a consideration for climate change and disaster resilience, ensuring that the built environment is structurally stable enough to withstand adverse impacts likely to occur during its
intended lifespan.

**COEP (Code of Environmental Practice), 2007**
The Code of Environmental Practice (COEP) is administered by MNRE, and provides standards that must be followed to reduce adverse effects on the environment. MNRE uses COEP to evaluate Development Consent applications and environmental impact assessments. Therefore, provisions in the COEP are applicable to the proposed bridge and road extension, and methods for incorporating the provisions into design, construction and post-construction are included in Section 9 of this report - Mitigation Measures (Environmental Management Plan).

The COEP is divided into 14 categories, each of which provides a description of intent, suggestions / requirements to be included in the design phase, activities to be enacted during construction, suggested wording for clauses to be included in construction contracts, and identification of any approvals needed and appropriate sequencing. The following are relevant to this project:

- COEP 2 - Road Planning, Design and Construction
- COEP 5 - Construction Camps
- COEP 6 - Road Construction Erosion Control
- COEP 8 - Quarry Development (if necessary to extract building material)
- COEP 9 - Gravel Extraction (if extracting material from a river channel)
- COEP 11 - Drainage
- COEP 13 - Earthworks

A thorough analysis of provisions in the above-noted COEPs has been conducted, and is included in chart form in Appendix A. All provisions included in the chart have been directly incorporated into Section 9 - Mitigation Measures (Environmental Management Plan, as indicated by the reference in the last column in the chart. The Environmental Management Plan, then, is an enactment of the appropriate provisions in the COEP.

**National Building Code of Samoa, 2017**
The National Building Code (NBC) has recently been completed and will be ratified by Council at the end of March, 2017. It is administered by MWTI. While roads are not included in the NBC, the bridge is considered to be Major Infrastructure and a Building Permit will be required.

According to the NBC, a bridge is considered to be Building Group 1, so all provisions in this category apply. Applicable sections of the NBC that will need to be adhered to in order to be granted a Building Permit include the following:

**Section K2 - Major Infrastructure**
Safety features that must be incorporated in Major Infrastructure projects include:

a) requirement for provisions of fencing, barriers and/or other handrails where the change in grade exceeds 1.0 m - see Section D3.C Protection from Falling

b) provision of even, non-slip surfaces in publicly accessible areas
c) appropriate lighting for user safety and security

d) avoidance of details that would entrap a person inside or under a structure

e) warning signs that are easily visible and located appropriately

f) safety equipment for first aid and response

g) provision of security measures to restrict access to non-public or dangerous areas

Specific requirements for bridges are listed in Section K2.A, and are included in Appendix B of this report. We recommend that these provisions be thoroughly reviewed during the Detailed Design stage so that a Building Permit can be easily attained.

**EIA Regulations, 2007**

The EIA Regulations, 2007, are published and administered by PUMA, a branch of MNRE. Provisions for when an EIA is required, as well as requirements for contents and submission are detailed in the document.

The following two types of EIAs are recognised and regulated in the document, each with different submission and content requirements:

a) PEAR - Preliminary Environmental Assessment Report

b) CEAR - Comprehensive Environmental Assessment Report

Consultation with PUMA staff has confirmed that their process is to review the EIAs that are submitted, and at that time, based on the content, decide whether it is a PEAR or CEAR, and potentially request more information. Other than the EIA Guidelines, PUMA does not have a standard format that they recommend, so this report uses the WB standard format for PEAR and ESMF, and ESMP.

**Other Legislation**

The ESMF Framework identifies the following legislation as potentially being applicable to this project:

**Transportation and Safety**
- Land Transport Authority Act 2007
- Fire and Emergency Services Act 2007
- Samoa Disaster and Emergency Management Act 2006
- Samoa Occupational, Health and Safety (OHS) Act 2002 and OHS Regulation 2017
- Ministry of Works Act 2002

**Environment**
- Lands, Survey and Environment Act 1989
- Marine Pollution Prevention Act 2008
- Samoa Waste Management Act 2010
- Water Resources Management Act 2008
- Samoa Water Authority Act 2003
**Socio-cultural**

- Samoa Antiquities Ordinance 1954
- Village Fono Act 1990
- Taking of Land Act 1964;
- Alienation of Customary Land Act 1965
- Customary Land Advisory Commission Act 2013

Apart from the socio-cultural legislation listed above (which is discussed in detail in the LARP), only two of the above references provide direction for the design of the bridge and road extension, as shown in the following chart:

<table>
<thead>
<tr>
<th>Law Title</th>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Land Transport Authority Act, 2007</strong></td>
<td>s 41</td>
<td>Road Reserves - 11.0 m on either side of the centreline, for a total of 22.0 m</td>
</tr>
<tr>
<td><strong>Samoa Occupational Health and Safety Act, 2002</strong></td>
<td>s 12</td>
<td>Identification and Assessment of Hazards</td>
</tr>
<tr>
<td></td>
<td>s 13</td>
<td>Management of Identified Hazards</td>
</tr>
<tr>
<td></td>
<td>s 17</td>
<td>Dangerous Work Arising</td>
</tr>
<tr>
<td></td>
<td>s 20</td>
<td>Accident Register</td>
</tr>
<tr>
<td></td>
<td>s 21</td>
<td>Accident Notification and Investigation</td>
</tr>
</tbody>
</table>

The Samoa OHS Act 2002 is complemented by the Samoa OHS Regulation 2017 and which the Contractor is required to consult and scrutinized closely when preparing his Contractor’s EMSP (CESMP).

We recommend that the consultant review the sections listed in the chart above and ensure that the design drawings conform with standards and requirements.
6.0 STAKEHOLDER CONSULTATION

Two stakeholder meetings at Samalae’ulu were held as part of the EIA process. Both meetings were held at the Village Centre in Samalae’ulu. A third stakeholder consultation meeting was held in November to present the final road extension alignment and to finalize compensation issues. Details of the public consultation and subsequent compensation procedures can be found in the LARP, but a summary of the environmental issues and village concerns discussed at the meetings is given below.

Stakeholder Consultation 1 – 22 September, 2016
This first meeting presented the three road alignment alternatives west of the river, and solicited community feedback on issues, concerns, likes and a preferred alternative.

Two meetings were held, the first with the Village Matai, and the second with the Women’s Committee.

(i) Village of Village Matais
The meeting followed cultural protocol of an ava ceremony before LTA made presentations of the proposed alignment options using maps and design drawings, followed by an open questions-and-answers session.

At the first meeting, villagers were already well aware of the project, since the Prime Minister visited them six months previously to inform them of LTA’s intent to build a bridge and to solicit feedback, and they had attended several meetings with LTA to discuss implications.

The proposed Project received unanimous support by all the matai, recognizing the challenges faced by the village as a result of the periodic flooding and its impact on the village and the public, and the loss of assets and human lives as experienced with the Heta cyclone induced flooding.

The primary issue raised regarding the road location was that the matai wanted to have the new road close to the village so that villagers can easily access public transit. The consulting team advised that they would contact LTA to see if bus services could continue to operate on the old road after the new road is built.

No issues were raised regarding land acquisition as the matai are very much aware of the process and indicated they would be agreeable to any land acquisition that needed to be done providing appropriate compensation is provided.

The result of the meeting was that the Villagers wanted to discuss the three alternatives (Options 2.1, 2.2 and 2.3) among themselves, then meet again to give their preference.

(ii) Meeting of Women’s Committee
Following a presentation of the three alternatives (west of the river), the Women’s Committee discussed the extent of flooding based on recent and historical experiences, mapping out the extent of flooding within the village on the maps provided. They did not raise any concerns with the bridge or road extension, but strongly endorsed the Project as providing a lasting solution to the flooding problem.

Stakeholder Consultation 2 – 1 December 2016
The purpose of this meeting was to discuss the preferred concept (Option 2.3) and related issues. The meeting was attended by several engineers and social specialists representing the Consultant and fourteen village matais. The meeting was followed by a site visit along the proposed bridge location and road alignment.

The meeting heard the villages’ concern over any discontinuation of the bus service from the existing Main Road. Following LTA’s assurances that bus service will continue along the old road, the village matais decided to support Option 2.3.

The ensuing site walk visited the proposed bridge location and continued through the forested area until the location where the proposed road would meet up with the existing road. Participants noted that the land was very flat and wanted to know the width of the road right-of-way (10.5 m for the paved road, 22.0m right-of-way) and the extent of
area that would be cleared for construction (approximately 30 m). Villagers noted that the proposed road was very close to existing properties, which was looked upon as favourable. Several low rock walls which act as boundary markers were crossed, with Villagers identifying the families affected.

Following the walk, the head matai indicated that they favoured the location of the road extension (Option 2.3) as it did not seem to be too far from the village, but would need to discuss it among themselves before giving a formal approval.

**Stakeholder Consultation 3 – 22 November 2017**

This meeting was organized to finalize compensation packages for affected land owners and other beneficiaries. It follows other informal consultations that led to the confirmation of the road alignment, the completion of the cadastral survey, the confirmation of affected landowners and the inventory of losses (IOL) by LTA and the MNRE. The meeting was attended by the high chief of the Village (Afioga Tuala Peseta Vaifou) and over twenty village chiefs, and representatives of the Consultant (Soosung), MNRE and LTA.

Following the cultural welcoming protocol of the ovo, the Consultant and MNRE presented an update of the bridge and road extension design following on from agreements arrived at in previous consultations. After some clarifications of the road alignment (for some chiefs including the High Chief who weren’t present in previous consultations), including questions about some re-surveying work to avoid one family’s house, the alignment in Option 2.3 was reaffirmed.

The main outcomes of this meeting were

(i) Option 2.3 was reaffirmed;
(ii) The affected landowners were confirmed and agreement forms were signed for 9 Lots;
(iii) Lot 9 (4,000m2) was left unresolved, with the village to sort this matter out within the Village Council at a later day.
(iv) Three other lots were not signed due to absent matai, and other issues, with MNRE to work with the relevant affected parties in the meanwhile to address these.
(v) The Village Council agreed that the project construction phase should be delayed due to issues related to compensation and ownership identified.
7.0 ASSESSMENT OF ENVIRONMENTAL IMPACTS

The following section will describe, analyse and evaluate the environmental impacts of the operation and use of the proposed bridge and road extension. Environmental impacts are determined by assessing the degree to which the proposed development affects the environmental health and sustainability of natural features and processes, and uses the following scale:

- **Low**
  - No impact, or natural feature / ecosystem continues to function with only a few minor adjustments needed during or after construction to ensure its continued health

- **Medium**
  - Natural feature / ecosystem is modified or removed, but continues to function with some modifications, addition or removals needed during or post-construction

- **High**
  - Natural feature / ecosystem is removed / will have difficulty continuing to function without major modifications, additions or removals during or post-construction

A summary of environmental impacts and mitigation measures associated with the operation and use of the bridge and road extension is provided in Section 7.8. For a description of impacts expected during construction of the bridge and road extension, see Section 9 Mitigation Measures (Environmental Management Plan).

7.1 Ecosystem Function

Savai'i is made up of a system of landscape patches and corridors that together constitute an island ecosystem. Impacts on ecosystem function involve changes to the inputs, outputs, or exchanges that alter its sustainability.

Within the study area, the largest patch is the regenerating forest / farmland which relies on inputs of oxygen, water and nutrients to support a vegetative community that provides habitat for birds, reptiles, and insects. The regenerating forest / farmland patch in the study area is part of a much larger forest patch that extends up and over the central highlands, and extends toward the eastern and western coastlines.

The second largest patch is the village of Samalae'ulu, a settlement patch that provides homes, work opportunities, and places for social gatherings, learning and worship. Roads and footpaths provide access, and most homes have food and enjoyment gardens, each one providing a sources of energy and nutrients for the settlement patch. It is connected to other villages by the Main Road, and the road leading to Patamea in the south.

The Maliolio River divides the regenerating forest / farmland patch and the settlement patch, creating a distinct corridor. Since it is intermittent, the Maliolio River contains only a few unique species that are associated with a riparian landscape on the river banks. Periodic flooding associated with strong weather events and extremely porous soil results in no standing water that could sustain aquatic life. Instead, flooding disrupts the regenerating forest / farmland patch by harming species and the built environment, requiring these areas to continually regenerate naturally or be replanted.

Flooding also affects the functionality of the settlement patch as flood waters are reported to reach as high as 1.2m or greater, impacting the stability of buildings, landscape elements, household and farming equipment. People’s lives have been lost while trying to cross the flooded river at the concrete ford.
Proposed Bridge - Low Impact
The proposed bridge is located within the floodplain of the Maliolio River that is an intermittent riparian corridor. Construction of the bridge will involve removal of bedrock to permit installation of the footings and bridge abutments, and the placement of fill/hard-surface material to re-create the pre-construction grade and slope of the river channel and floodplain. The land around the footings is expected to be supported to reduce potential for erosion, through hardscape solutions such as gabion baskets and/or revegetation.

Hydrological modelling was completed for the Maliolio River for the preliminary design submission, and was the basis for determining the span and height of bridge abutments. A highwater mark was determined based on projected storm surge and flooding, and the amount of displacement caused by bridge abutments. The highwater mark was used to design the bridge and abutments to establish a 1.2m safety clearance from the highwater mark to the underside of the travelled portion of the bridge.

Since a sufficient safety clearance is incorporated into the preliminary design of the bridge, and erosion mitigation measures will be incorporated into the design, the impact on the ecosystem function of the intermittent riparian corridor is low. Migration routes for fauna, colonisation potential for floral species, and exchanges of energy and nutrients within the ecosystem is expected to return to its original state after construction is complete.

Ecosystem function could be impacted, however, by pollution from the use of the bridge and road. For this, please see Section 7.6 Pollution.

Road Extension – Low Impact
Placement of the road through the reforestation/farmland patch will permanently replace some of the natural features with non-living matters, but the landscape patch will continue to function as previous. The only ecosystem function permanently affected will be the movement of mammals and reptiles, which may incur injury or death when attempting to migrate across the road. The need for a migration route for a particular species was not identified during site investigations, but if it is warranted, then a mitigation strategy to assist with wildlife crossings of a road would be beneficial.

The road extension will not affect the operation of the settlement patch as the road alignment avoids existing buildings. Since there also is a minimal impact on the continuation of the regeneration/farmland patch, the road extension would have a low impact on the ecosystem function.

7.2 Natural Habitat and Significant Communities
The natural habitat in the study area is a young, regenerating forest that is colonising a recent lava formation. The study area consists of a lowland rainforest/volcanic scrub ecotype that is typically dominated by Diospyros samoense and D. elliptica, Calophyllum inophyllum, Dysoxylum samoense and D. maota, Pometia pinnata, Planchonella samoense, Syzygium spp., and Myristica fatua (Whistler, 1992). Samoa is floristically part of the “Fijian Region” that extends from the Santa Cruz Islands and Vanuatu to Niue, (Takhtajan 1969).

Two recent cyclones in 1990 and 1991 killed 53 percent of forest trees, large numbers of forest birds, and facilitated the spread of a wild fire that completely destroyed large areas of forest in Savai’i. Most of the study area demonstrates this pattern, consisting of regrowth that occurred over the last two decades since these events.

The flat tableland of the study area consists of a dense undergrowth layer, incomplete canopy, few mature trees, large patches of pioneer species, and colonising plants, see Photo 5. Tree species include Banksonia sp. which has a diameter at basal height from 10-30 cm. Vines dominate the under-storey where the thin
canopy allows sunlight to penetrate, but several species of fern were found in the few patches having shade conditions. The youthful, regenerating forest has no opportunity for habitat that would support significant, threatened, or endangered wildlife that typically inhabit forest interiors. Only two bird species were encountered, and one butterfly indicative of the open, regenerating landscape.

Within the flat tableland, sections of the regenerating forest have been cleared for crops such as taro, coconut, mango, breadfruit, and others, see Photo 7. In some areas, low stone walls are used to mark property boundaries and field edges. The Women’s Committee indicated that much of the study area is used for crops where growing conditions are favourable.

Vegetation in the floodplain of the river channel is more diverse than the flat tableland, including sedges, vines, perennials and scrub-type woody plants, see Photo 6. Soil here is much thinner, and only shallow-rooted species can survive. Many species are likely uprooted following a major storm event, and have to re-colonise once flood waters recede. The intermittent river means that no aquatic or riparian species are present, and there is no habitat for fish or other aquatic life.

According to the Rare Plants of Samoa, 2011, a publication by Conservation International, Samoa has 550 native species of flowering plants, and 108 of them are considered rare. A review of this document identified 14 plants that could potentially be located in the study area based on the plant physiology and known range. Of the 14 rare plants, the following three were identified in the study area. A detailed description of each one can be found in Appendix C:

1. **Geodorum densiflorum**
   - Plant Type: orchid, 30 cm height
   - Location: midway along the proposed road extension
   - Frequency: found in one location, 3 specimens

2. **Portulaca quadrifida**
   - Plant Type: succulent groundcover with a yellow flower, 10 cm height
   - Location: in floodplain within 6.0m of river channel edge
   - Frequency: prevalent

3. **Sida samoensis**
   - Plant Type: subshrub with a yellow flower, 35 cm height
   - Location: in floodplain within 6.0m of river channel edge
   - Frequency: prevalent
According to AviBase - Bird Checklist of the World, 105 bird species exist in Samoa (including American Samoa), 5 of which are endemic, and 14 which are threatened.

Of the threatened species, only Gymnomyza samoensis, a large, dusky olive-green honeyeater native to Upolu and Savai‘i known as Mao, is likely to be found in a regenerating forest / scrubland ecosystem, and none were observed in the study area. Only two bird species were noted during a site investigation: the tree-dwelling, black and long-beaked Samoan Starling (Aplonis atrifusca), endemic to Samoa and found on all islands, and the Blue-Crowned Lorikeet (Vini austros) which inhabits regenerating forests and settlement areas.

Other than domesticated animals (dogs, chickens, pigs, horses, cats), no mammals were found on site. Several butterfly species were observed in open, sunny scrubland. No opportunity for aquatic or riparian wildlife exists as the river is intermittent, and no standing water (wetland, marsh, pond, or the like) is in the study area.

**Bridge – low impact**

Most of the soil and rock in the floodplain where the bridge is proposed is covered by undergrowth (vines, grasses, sedges, perennials) with scattered woody shrubs and pioneering trees. The vegetation is indicative of a landscape that is frequently flooded, containing a number of ferns and sedges. Plant species removed as part of the bridge construction will quickly re-establish once the final site grading is complete, and other than potential pollution from the use of the bridge (see Section 7.6), the impact of the use of the bridge on natural habitat and sensitive communities is low.

**Road Extension - Low Impact**

Construction of the 10.5m wide road profile will require a 20m wide clearance zone. The regenerating forest landscape (described above) will be removed during construction, and then is expected to quickly re-establish itself post-construction. Since there are no significant communities or threatened species, the environmental impact is low.

### 7.3 Hydrology and Drainage

The hydrology of the study area, with its gently sloping terrain and basalt volcanics, is characteristic of a large part of the coastal area of Savai‘i. With the highly porous nature of the roughly-textured clay soil, the underlying permeable basalt, and with few areas of level terrain, surface water tends to runoff or is quickly absorbed, with little water retained on the surface.

Although it is a permanent flowing river upstream near Patamea, the Maliolio River in the study area has intermittent stream flows, due to the high permeability of the underlying volcanics. The landform upstream allows for very few groundwater catchment areas, such as lakes or ponds, and that, combined with permeable soil, rock and a fast-flowing groundwater system, results in a river channel and floodplain that only carry high volumes of water during rainfall events. The bottom of the river channel reflects this as it is stepped and quite steeply sloped in some locations.

South of the proposed bridge, the channel has a base width of approximately 6.0m, with well-defined, vegetated banks, see Photo 8.
A sharp drop in the river channel occurs approximately 20.0 m south of the proposed bridge, where the rocky river base gives way to a narrow (less than 1.0m wide) drop of approximately 4.5m to the elevation below, see Photo 8. The basalt here is less resistant to erosion from the intermittent flow of the river, except for a narrow path in the centre that has eroded well below the downstream elevation near the proposed bridge. Evidence of whirlpools at the foot of the sharp drop was noticed in several locations where the rock at the base is eroding in a semi-circular pattern underneath the rock above.

The whirlpools and churning water at the foot of the sharp drop, if left to naturally evolve, would eventually make the channel unstable as the whirlpools would create wider and wider river bed under the rock above. In future there could be a collapse of the river banks in this location, after which natural erosion would rectify the situation. Due to the narrow channel drop, this area is prone to flooding during extreme weather events.

Approximately 12.0 m north of the sharp drop, the river base widens out again (to approximately 5.0m width), the elevation of the river base rises by approximately 1.5m, and the river banks lessen from vertical to steeply sloping. This more typical river profile is the location for the proposed bridge. The vegetated slopes offer protection from wind and water erosion, and the wider banks allow a greater volume of water to pass through the channel.

As the river approaches and passes through the built-up area of Samalae’ulu, the river banks become less steep and high, with a wide river base (approximately 20.0 m wide) at the ford crossing. From the top of the river bank, a gentle slope leads down to the river base, with a drop in elevation of only approximately 1.5m.

Figure 6: Modelled Flood Line - Extent of flooding is shown by the blue lines

![Figure 6](image-url)

Figure 7: Design Flood Level and Clearance for the Bridge

![Figure 7](image-url)
The extent of flooding has been modelled by the consulting team (Soosung Engineering and KEW Consultants Inc., and an outline of the Design Flood Level is shown in Figure 6 (plan view) and Figure 7 (section).

**Bridge: Low Impact**
The proposed bridge abutments will add to the extent of flooding during a storm event due to their massing. The increased amount is estimated in the preliminary design to result in an increase in height of the flood level upstream of the proposed bridge of approximately 1.2m. The underside of the travelled portion of the bridge is intended to be located a minimum of 0.6m above the Design Flood Level, and the abutments will be designed to withstand periodic flooding. Based on the preliminary design, the bridge construction will have a low impact on hydrology and drainage.

**Road Extension - Low Impact**
The road extension is proposed to traverse across land with a fairly even topography for at least 100 m on both sides. Since the proposed road extension will for the most part follow the existing shape of the land, drainage patterns are not expected to be significantly affected.

However, constructing the road extension on flat terrain means that there is the possibility of ponding in low lying areas. Along the straight section of the proposed road extension, the road will be designed with a centre crown resulting in runoff being diverted to both sides of the road. In the curved sections, the road will have a high point on the outside curve thereby directing water to the inside curve. To avoid flooding of the road or adjacent landscape, culverts and swales will need to be installed at the road curvatures. If this mitigative measure is constructed, there will be a low impact of the road extension on drainage. Without installing culverts and swales, the road extension and adjacent land may be subject to flooding.

**7.4 Landform Stability / Erosion**
Most of Savai’i is formed of basalt rock with the highest elevation in a central ridge line that slopes downward to the coastline on all sides of the island. According to Samoa: Mapping the Diversity, the study area lies in the Lefaga and Mulifanua volcanic regions, and is listed as moderately weathered, see Figure 8 and Figure 9. The medium grey coloured basalt rock can be seen throughout the study area, and forms the entire channel of the Malioilo River.

A large deposit of basalt, with little soil and vegetation, lies between the study area and the sea, deposited after the most recent eruption in 1911, known as the Aopo Formation. The study area lies just to the east of this and has sufficient soil depth to support vegetation growth.

**Figure 8: Geological Formations of Savai’i**

- Aopo volcanic (very slightly weathered)
- Recent formations (mainly alluvial and organic deposits)
- Puapua volcanics (slightly weathered)
- Lefaga and Mulifanua volcanics (moderately weathered)
- Salani volcanics (moderately to strongly weathered)
- Vini tuffs
- Fagaloa volcanics (strongly weathered)
Soil depth adjacent to the V-channel near the bridge location is, however, quite shallow, observed to be only 80mm or less in some locations, resulting in isolated pockets of vegetation where soil has managed to settle and remain stable during flooding periods. The nature of the landform following a severe storm event is such that the entire river channel within the study area is susceptible to flooding and erosion. As shown in Photo 9 and 10, the V-Channel near the proposed bridge has steep sides, vertical in some locations, that extend downward to the river bottom 4.0-5.0 m below. Smooth, thin layers of basalt, known as pahoehoe, can be seen on the banks of the V-channel, while the bottom consists of loose stone and boulders that have been deposited by river flows.

From the river channel, the basalt extends throughout the study area that will contain the road extension. This area is characterised by full vegetation cover and little evidence of exposed basalt beyond the top of bank of the floodplain. Soil was observed to be reddish brown in colour, medium textured, and had a good mix of humus in the top layer. Much of the forest floor along the proposed road alignment consisted of small stones (50 mm - 100 mm dia.) from the last volcanic eruption, some with a rounded shape indicating they were placed there by flooding. We encountered some small round, weathered stone (75-150 mm in diameter) well beyond the top of bank, that likely have been deposited there from flooding.
As shown in LIDAR imaging obtained from MNRE in **Figure 10**, the study area is located on gently sloping tableland that has a mean slope of approximately 2.0% and only a few irregular patterns that are perpendicular to the direction of slope. These undulations are a result of the cooling of pahoehoe lava flows. In some locations, the landform creates a shallow gully that is particularly rich in soil and vegetation. The difference in elevation from the top of the slope to the bottom of the gullies was observed to be no greater than 0.5m.

The direction of slope follows the central ridge line of the tallest peaks in the centre of the island, and extends outward to the sea, following the path of the volcanic activity that created the landform. The gently sloping terrain is a result of lava flows that extended out to the sea and cooled as the lava was halted by the rock formations supporting the coral reefs.
Bridge: Low-Medium Impact
Since the bridge construction involves removal of bedrock and replacement of a suitable material, the potential for erosion in the floodplain could be quite substantial. However, if the replacement material (concrete, stone with reinforcement, etc.) is properly composed and installed to offset erosion potential, then the impact will be minimal. Prior to construction, boreholes will be drilled to determine the composition and strength of the bedrock/substrate, and a decision on an appropriate material to install surrounding the bridge abutments will be made at that time.

Road Extension - Low Impact
Since the road extension is proposed on relatively flat tableland, and it follows the existing slope of the land, the impact on landform and erosion potential is low.

7.5 Vulnerability to Natural Disasters
The CIM Plan, 2007, states that in Samalae’ulu Village there is no infrastructure that is at risk or susceptible to damage from coastal hazards. However, the village is at risk from flooding due to cyclones and tropical storms. The concern is whether the proposed bridge and road extension would increase the damage potential from the effects of natural disasters on the natural and built features in the study area.

As indicated in Table 1, any risk increase associated with natural disasters occurs if the bridge collapses, and not from the construction or use of the bridge and road extension alone. To safeguard against this, the bridge should be constructed with suitable strength to carry earth movement and wind loads so that it can withstand the effects of cyclones, earthquakes and landslips, and comply with stability requirements in the National Building Code of Samoa and COEP. Since a design solution can alleviate damaging effects, the impact for vulnerability to natural disasters is low for the bridge and road extension.

Table 1: Increased Risk to People and the Environment from Natural Disasters

<table>
<thead>
<tr>
<th>Natural Hazard</th>
<th>Damaging Impact</th>
<th>Impact of Bridge</th>
<th>Impact of Road Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclones / Tropical Storms</td>
<td>• wind • stormwater</td>
<td>• increases stormwater level • potential for damage if bridge collapses</td>
<td>• low impact</td>
</tr>
<tr>
<td>Tsunami</td>
<td>• storm surge</td>
<td>• not applicable</td>
<td>• not applicable</td>
</tr>
<tr>
<td>Earthquake</td>
<td>• earth movement</td>
<td>• potential collapse of bridge</td>
<td>• potential uplift of road surface</td>
</tr>
<tr>
<td>Landslips</td>
<td>• collapse of slopes</td>
<td>• potential collapse of bridge if not properly fortified</td>
<td>• low impact</td>
</tr>
<tr>
<td>Bushfire</td>
<td>• death/damage from intense heat</td>
<td>• non-combustible materials, so no impact</td>
<td>• non-combustible materials, so no impact</td>
</tr>
</tbody>
</table>

7.6 Pollution - Solid, Liquid and Air-Borne
Pollution of the air, water and land is possible as a result of the use of the bridge and road extension (waste emissions and leakages from vehicles), but can be lessened/eliminated by using appropriate design techniques.

Bridge: Low - Medium Impact
Use of the bridge could result in pollution of the river channel from motorised vehicles (such as oil and gas drippings, fluid leaks, car parts becoming loose and falling into the channel, etc.). Pollution from toxic by-products of vehicular combustion can be reduced and potentially eliminated by not allowing stormwater from the bridge to deposit directly into the river channel, but instead be directed to a suitable discharge area.
Road Extension - Low Impact

Similar to the bridge, use of the road extension could result in pollution of the adjacent land from toxic substances from motorised vehicles (such as oil and gas drippings, fluid leaks, car parts becoming loose and falling into the channel, etc.). Stormwater runoff from the road is intended to sheet off the high point in the centre and drain to both sides, where it will be absorbed into the soil and groundwater system. The location of the road extension is such that runoff from the road is not expected to affect any known wells, drinking water supplies or significant habitat, and will not drain directly to the Maliolio River. The amount of air pollution is also not expected to increase after construction, unless the volume of traffic increases.

Since groundwater and the river channel will not be directly affected, and the amount of air pollution is not expected to increase from the use of the bridge and road extension, the potential for pollution on hydrology and environmental features is low.

7.7 Waste Generation
Apart from construction waste (which will be discussed in Section 9.0, Mitigation Measures) and pollution mentioned in Section 7.6 above, there is no automation or production associated with the operation of the bridge or road extension that result in waste products.

7.8 Environmental Impact Summary
A summary of the environmental impacts and mitigation requirements listed in Sections 7.1 to 7.7 is provided in Table 2 for the proposed bridge and road extension.

<table>
<thead>
<tr>
<th>Environmental Impact</th>
<th>Proposed Bridge</th>
<th>Road Extension (Option 2.3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecosystem Function</td>
<td>Low</td>
<td>Low - Medium</td>
</tr>
<tr>
<td></td>
<td>• no disruption to continuity of aquatic or riparian ecosystems</td>
<td>• will permanently remove part of natural system</td>
</tr>
<tr>
<td></td>
<td>• minimal disruption of terrestrial and settlement patches</td>
<td>• re-vegetation to promote return to original condition post-construction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• no impact on settlement patch</td>
</tr>
<tr>
<td>Natural Habitat and Significant</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Communities</td>
<td>• no significant communities were documented or observed;</td>
<td>• no significant communities were documented or observed;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3 rare plants observed; potential threat of local extinction not likely</td>
</tr>
<tr>
<td>Hydrology and Drainage</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>• sufficient clearance above projected high water level during a storm or</td>
<td>• road extension follows natural contours in an event terrain</td>
</tr>
<tr>
<td></td>
<td>cyclone must be provided</td>
<td>• culverts and ditches needed to reduce potential for flooding at road curvatures</td>
</tr>
<tr>
<td></td>
<td>• bridge abutments must be protected from periodic flooding during a cyclone</td>
<td>• no significant grade changes</td>
</tr>
<tr>
<td></td>
<td>or major storm event</td>
<td>• any slopes create greater than 2:1 horizontal to vertical must have erosion control</td>
</tr>
<tr>
<td>Landform Stability / Erosion</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>• bedrock will be cut/blasted to construct bridge abutments</td>
<td>• no significant grade changes</td>
</tr>
<tr>
<td></td>
<td>• erosion control and structural stability of bridge abutments required</td>
<td>• any slopes create greater than 2:1 horizontal to vertical must have erosion control</td>
</tr>
<tr>
<td>Vulnerability to Natural Disasters</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>• structural support of bridge must meet requirements of NBC and COEP</td>
<td>• no impact</td>
</tr>
<tr>
<td>Pollution</td>
<td>Low - medium</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>• bridge must be designed to direct runoff to a suitable location</td>
<td>• no homes directly exposed to harmful fumes from motorised vehicles</td>
</tr>
<tr>
<td>Waste Generation and Removal</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>• no increase in waste generated expected</td>
<td>• no increase in waste generated expected</td>
</tr>
</tbody>
</table>
8.0 SOCIO-CULTURAL IMPACTS

The following section will describe, analyse and evaluate the socio-cultural impacts of the use of the proposed bridge and road extension. This section has been prepared in association with the LARP (Land Acquisition and Resettlement Plan) which provides a detailed description of the process, findings and outcome of the stakeholder consultation program for this project. Readers of this document should refer to the LARP if further details of stakeholder consultation are required.

Socio-cultural impacts are determined by assessing the degree to which the proposed development affects the character, quality and continued existence of the socio-cultural features in the study area, using the following rating scale:

- **Low**: No impact, or socio-cultural feature continues to function with only a few minor adjustments needed during or after construction to ensure its continued operation.
- **Medium**: Socio-cultural feature is modified or removed, but continues to function with some modifications, addition or removals needed during or post-construction.
- **High**: Socio-cultural feature is removed / will have difficulty continuing to function without major modifications, additions or removals needed during or post-construction.

A summary of the impacts and mitigation measures is provided in Table 3 at the end of this section.

8.1 Places of Cultural Significance

Consultation with stakeholders from the village identified one place of cultural significance, which is a burial ground that has been in use for many years. It is located across the road from the Catholic Church, next to the Maliolio River. Our consulting team recognises three other significant places - the Catholic Church, the primary school, and the Samalae’ulu Centre (where our stakeholder consultation meetings were held), see Figure 11.

**Bridge: Low Impact**

The bridge is located more than 400 m from the closest place of cultural significance (the Catholic church), so the construction and use of the bridge will have a low impact on places of cultural significance in the study area. The existing bridge abutment will be removed, and should be considered as a source of crushed aggregate for the road construction if equipment is available for recycling.

**Road Extension - Low Impact**

The road extension is located far enough away from the four places of cultural significance that it will not have any impact on the character, quality or continued existence of these cultural features. The existing low stone walls that mark property boundaries will be removed, and the stone should be offered to the landowners, and if it is not wanted, considered for re-use in the construction.

The possibility of encountering chance finds, however, cannot be ruled out and must therefore be planned for. The Contractor’s CESMP shall include provisions for Chance Finds Procedures prescribed under WB Safeguards Policy OP/BP 4.11 Physical Cultural Resources and COEP 13.4 to apply as necessary.
8.2 Land Tenure
All of the land in the study area is Customary Land, meaning that it belongs collectively to the villagers of Samalae’ulu under the overarching authority of the Council of Chiefs. Customary Land is divided among the different families in the village with the Chief of the extended family or Sao the Several stone walls that act as boundary markers were encountered during a site visit to the regenerating forest / farmland, and will need to be removed for construction of the bridge and road extension. When the bridge and road extension are constructed, the Government of Samoa will assume the property under the Taking of Lands Act 1964.

Bridge: Low Impact
Since all the surrounding land, including the river channel, is Customary Land, there will be no impact on land tenure due to the construction of the bridge. The land affected by the bridge construction is in a single ownership, so no concerns are expected.

Road Extension - Low Impact
The road extension avoids the settlement area and is significantly removed from the closest buildings. Approximately thirteen families will be affected by the road extension in the regenerating forest / farmland as identified in the LARP. Measures for compensation for the affected families will be necessary, and should comply with the recommendations in the LARP.

8.3 Land Acquisition and Resettlement
Since land tenure is customary lands, the Government of Samoa will assume title to the land needed for the bridge and road extension. The paved portion of the road and vegetated shoulders are 10.5 m in width, and the road right-of-way will be approximately 22.0m in width. However, a 20.0m width is necessary for construction. Compensation for the 20.0m width, including transfer of 22.0m to the Government of Samoa for the road right-of-way, will be necessary to account for loss of land, livelihood sources, use and enjoyment.

Land acquisition is voluntary with affected landowners fully consulted and informed of options for road alignment as well as options for compensation (including voluntary land donation) available. All affected land parcels except one have confirmed beneficiaries for land compensation; with the disputed lot (Lot 9) to be resolved in the cultural way between the two parties – one matai and the Village Council. The total land to be taken is 26,403 m2. Land acquisition and compensation will be in accordance with the requirements of the Taking of Lands Act 1964, and the World Bank Safeguards Policy OP/BP 4.12 (Involuntary Resettlement). Details of this process, the list of beneficiaries and the detailed entitlement matrix is set out in the Land Acquisition and Resettlement Plan (LARP).

Bridge: Low Impact
A single land owner will be affected, with ___m2 of land taken. The owner has consented to the taking of his land, and has agreed to the financial compensation offered.

Road Extension – Low
The road extension avoids the village settlement area except one household’s ‘faleoó that will be relocated. Thirteen landowning families will be affected and a combined total of 26,403m2 of customary land will be permanently acquired. A construction corridor of 20m in width will be cleared which will affect areas under crops. A dispute over the ownership of one land parcel between one matai and the Village Council remains to be resolved but it wouldn’t delay project construction. Village consent to the use of the land and the Project is unanimous; the disputed lot ownership is being resolved through the cultural way, failing that, the Project’s GRM in the LARF will kick in.

8.4 Loss of Livelihood
The location of the proposed road extension will result in the limited loss of crops, mainly long term crops such as breadfruits and coconuts that people plant in remote lands to reinforce claims of ownership and to mark land boundaries, and which subsequently serve to augment short term crops for food and income. The extent of impact on livelihoods is thus minimal, with all affected households having more than one food garden to supply daily requirements, and the affected crops providing a reserve that are harvested intermittently when in need.
Bridge: No Impact
The land surrounding the proposed bridge is in a state of natural regeneration with no evidence of human activity (farming, leisure, development) and services. The stream is intermittent in flow and is not dependent on for food or income such as from freshwater fish, eels and prawns.

Road Extension - Low Impact
Limited crops, mainly of long term nature will be lost, and will be compensated for. The same types of crops are also grown in other family gardens.

8.5 Use and Enjoyment of Land
All stakeholders indicated acceptance and approval of a bridge and road extension in general, and see merit in locating the road extension outside of the area prone to flooding for safety reasons.

At the Samalaeulu village consultation meetings, the main village concern was continued access to bus services which was perceived under threat with two of the proposed road alignment options by-passing the village. As a result, the village initially did not favour Option 2.3 as it seemed too far removed from the village, making walking to the road to catch the bus difficult for some villagers, particularly the elderly.

In response to these concerns, LTA indicated that buses will continue to operate on the existing Main Road, except during times of flooding when the Main Road is impassible. This commitment satisfied villagers who subsequently withdrew their objections to Option 2.3.

Since the use and enjoyment of land is not expected to be impacted and any misgivings will be compensated by the continuation of the bus service, the bridge and road extension have a low impact on the use and enjoyment of land.

8.6 Traffic /Circulation
The proposed bridge and road extension will effectively bypass the village of Samamaeleulu diverting most of the western and eastern bound traffic from the existing Main Road that runs through the village. The reduced amount of traffic through the village will enhance community safety but roadside retail stores that get business from passing traffic will lose this clientele. Enhanced public safety will also result with the proposed bridge to provide a safe crossing during a storm event. For Samalaeulu, where village people have died trying to use the existing concrete ford during floods, the bridge is seen as the long overdue solution to their safety concerns.

Bridge: Low Impact
The proposed bridge is located within 5.0m of the existing T-intersection where the Main Road turns north to follow the river edge. During a storm event, the bridge will positively influence traffic flow by providing a safe crossing during times of flooding.

Road Extension - Low Impact
The entire road extension is about 50 m to the nearest village buildings. An existing village plantation road connects the existing Main Road to the new road extension. Upgrading this would improve the links to the new road for the village.

8.7 Noise and Vibration
The bridge and road extension will generate elevated levels of noise and vibration at the project site and the immediately surrounding environment during the construction phase, as a result of the operation of heavy machinery and equipment, and vehicles.

Standard noise and vibration mitigation measures are to be implemented throughout the construction period to reduce and control potential construction noise impacts. These measures minimize potential for disturbance at receptors, preserve the acoustic amenity of the surrounding environment and aim to control noise levels within the construction noise limits.
Bridge: Low Impact
The location of the proposed bridge (within 5.0m of the existing T-intersection where the Main Road turns north to follow the river edge) is close to the existing road. Noise from motorized vehicles using the bridge will be amplified by the river channel, a configuration that tends to amplify sound transmission. However, there are few homes and businesses in close proximity, so increased noise generation will have a minimal impact.

Road Extension - Low Impact
The entire road extension will bypass the village, and at least 50m of existing vegetation would buffer noise generated from the road extension, resulting in an expected minimal level of additional noise (over and above that already generated by the use of the Main Road). In the operational phase, with reduced traffic level through the village, the overall noise levels are expected to be lower.

The only place where noise may be increased is where the road extension meets up with the Existing Main Road, but since these properties experience noise from the use of the existing Main Road, the overall level of noise generated is not expected to significantly increase.

8.8. Air Quality
Air quality will be adversely impacted during the project construction phase as a result of dust, fumes and other airborne particulates from the operation of heavy machinery and vehicles, exposed stockpiles of materials, soil and the cleared ground where vegetation have been uprooted and removed. This impact is temporary and will vary within and between days depending on weather conditions.

Excavation and other earth and rock moving activities within quarries and borrow pits will also degrade air quality that affect quarry workers, vehicle drivers, quarry neighbors populations as well as populations along approved haul routes.

Bridge and Road Extension – Low to Medium Impact.
During the construction phase, the adverse impact of dust, fumes etc will be mitigated with a range of measures prescribed in the ESMP, consistent with the requirements of COEP 12 and standard international good practice. Once operational, air quality at both the bridge and new road will improve significant and over time, and will return to pre-project levels once the surrounding vegetation reestablishes and the normal air purifying service of forests restored.

8.9. Environment Social Health and Safety (ESHS)
ESHS related impacts are relevant during the construction phase. Workers and visitors to the project site will be exposed to the risk of injury as a result of on-going construction activities at both the bridge and the road extension sites.

The safety of workers and visitors in the work site is an obligation for employers/contractors mandated by the Occupational Safety and Health Act 2002 and OSH regulation 2017 and a requirement of COEP 12.2. The Contractor must take all reasonably practical steps to protect the safety, health and welfare at work of employees and to provide and maintain a safe and healthy working environment including substances, systems of work and any building or public or private area in which work takes place.

The ESHS and Occupational Health and Safety (OHS) Implementation Guidelines in Appendix D provide the Contractor minimum standards acceptable to the Employer. The Contractor will use these to prepare an OHS Implementation Plan as an annex to its CESMP. This must be submitted and cleared prior to starting any civil works. Guidance in the preparation of OHS Plans are in Appendix D of this ESMP.

Bridge and Road Extension – ESHS impacts are expected to be insignificant/low assuming Contractors’ and personnel’s full compliance with the Codes of Conduct.

8.10. Gender-based Violence (GBV) and Violence Against Children (VAC)
GBV and VAC related impacts are possible during the construction phase. Labour mobilization associated with project construction often transplant workers in unfamiliar cultural and social settings. Contractor offices in laydown areas and workers camps also attract men and women from surrounding communities looking for paid employment. Local vendors and sellers (including children) of fresh produce, cook food etc. are potential visitors. The types of social interactions
resulting from these and other situations involves the risk of culturally insensitive behavior and relationships, including incidences of gender-based violence (GBV), violence against children (VAC) and sexual harassment.

To reduce the risk of such behavior taking place, the Employer will review the risks associated with GBV and VAC prior to project construction and, if deemed necessary, will instruct the Contractor(s) and all project personnel, including foreign workers and international consultants, to sign codes of conduct. Mechanisms for reporting offensive incidents and redressing related complaints must accompany these measures and to form part of project monitoring for the Employer and the Contractor(s). The Contractor must review the Draft Codes of Conduct (CoC) and the guidelines for a GBV and VAC Action Plan in Appendix D. Upon signing, the Contractor, its managers, and all workers will be committed to preventing, reporting and addressing GBV and VAC within the work site and in its immediate surrounding communities.

**Bridge** – Impact is expected to be low but requires close monitoring on the part of Contractor(s) and LTA.

**Road Extension** - Impact is expected to be low but requires close monitoring on the part of Contractor(s) and LTA.

### 8.11 Summary of Socio-Cultural Impacts

The overall socio-economic impacts of the Project is positive, with enhanced and secured access for vehicles and pedestrians year-round and in particular during floods the most important. The adverse impacts during the construction phase are localized, mostly minimal and can be reduced to acceptable levels by available mitigation measures. Effectively applied, these measures will ensure the overall adverse impact is low, and insignificant. A summary of the socio-cultural impacts and mitigation measures are shown in Table 3 for the proposed bridge and road extension.

<table>
<thead>
<tr>
<th>Socio-cultural Impacts</th>
<th>Proposed Bridge</th>
<th>New Road Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical Cultural Resources</strong></td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>• no known nearby cultural features</td>
<td>• No identified places of cultural significance affected;</td>
<td></td>
</tr>
<tr>
<td>• previous bridge abutments to be removed / recycled</td>
<td>• Low stone walls removed should first be offered to the landowner(s), then consider for re-use;</td>
<td></td>
</tr>
<tr>
<td><strong>Land Tenure</strong></td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>• Customary land; no change expected;</td>
<td>• Customary land; no change expected;</td>
<td></td>
</tr>
<tr>
<td><strong>Land Acquisition</strong></td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>• Minimum area to be acquired permanently</td>
<td>• Permanent acquisition of customary land</td>
<td></td>
</tr>
<tr>
<td>• No displacement of people;</td>
<td>• Temporary use of land for construction corridor and laydown area(s) for contractor</td>
<td></td>
</tr>
<tr>
<td>• Enhanced safety during floods</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Undisrupted traffic movement during floods,</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Loss of livelihoods</strong></td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>• Potential loss of sales for small roadside retail shops and roadside vendors</td>
<td>• Permanent occupation of some arable land</td>
<td></td>
</tr>
<tr>
<td><strong>Use and Enjoyment of Land</strong></td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>• No change identified or expected</td>
<td>• No impact on village access to public bus transport with LTA to continue the existing bus route along the existing Main Road</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Mid way trail to new road extension to be upgraded to provide access for villagers.</td>
</tr>
<tr>
<td>Socio-cultural Impacts</td>
<td>Proposed Bridge</td>
<td>New Road Extension</td>
</tr>
<tr>
<td>------------------------</td>
<td>-----------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Traffic / Circulation</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>• Close proximity to existing road</td>
<td>• Village by-pass allows uninterrupted travel and straight road alignment has reduced potential for accidents;</td>
</tr>
<tr>
<td></td>
<td>• Improve access across island during storm events post project</td>
<td>• Roadside micro-businesses along existing road may lose sales due to a reduced volume of traffic;</td>
</tr>
<tr>
<td>Noise</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>• No discernible increase in noise levels for nearby residents;</td>
<td>• No discernible increase in noise levels for nearby residents;</td>
</tr>
<tr>
<td></td>
<td>• Existing trees will buffer noise from new road.</td>
<td>• Existing trees will buffer noise from new road.</td>
</tr>
<tr>
<td>Air Quality</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>• Air quality reduced minimally during construction phase</td>
<td>• Air quality reduced minimally during construction phase</td>
</tr>
<tr>
<td>OHS</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>• Potential for accidents involving workers and visitors/public during project construction</td>
<td>• Potential for accidents involving workers and visitors/public during project construction</td>
</tr>
<tr>
<td>GBV and VAC</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>• Potential occurrence of GBV and VAC during project;</td>
<td>• Potential occurrence of GBV and VAC during project;</td>
</tr>
</tbody>
</table>
9.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

To reduce environmental impacts of construction and use of the bridge and road extension, mitigation measures have been prepared to address specific concerns, a summary of which is outlined in Tables 4 to 7. The mitigation measures are based on a combination of the following:

a) Policy Framework and Legislation (see Appendix A and B for details), including:
   (i) COEP
   (ii) NBC
   (iii) EIA Regulations
   (iv) WB Operation Manual OP 4.01 Environmental Assessment, 1999
   (v) ESMF Framework
   (vi) OHS Act 2002 and OHS Regulation 2017
   (vii) Other Legislation

b) International Best Practices based on site conditions

Tables 4 - 8 separate expected impacts into socio-cultural and environmental categories, then further divide them into "During Construction" and "Post-Construction". Recommendations for the mitigation measure, the agency responsible for implementation, and activities for monitoring are included. Many of the mitigation strategies are recommended to be incorporated into detailed design drawings, specifications and/or written instructions to bidders. A summary of clauses to be incorporated into the tender package is included in Section 9.3.

For Tables 4 - 8, the assumption is that LTA is responsible for site supervision during construction, as indicated in the "Monitoring" column by the requirement "Site Inspection by LTA". If a separate construction company or organisation will be performing contraction administration/site supervision instead of, or in addition to LTA, then the responsibility for site inspections in the "Monitoring" column should be assigned to said company.

Mitigation measures in the tables are qualified by one of the following:

a) D = include in drawings, meaning that the intent of the mitigation measure should be graphically shown in the tender drawings

b) C = add a clause, meaning that the intent of the mitigation measure should be described in text in the tender drawings and/or specifications, with suggested wording provided in Section 9.3.
## Mitigation Plan

### Table 4: Pre Construction – Preparatory /Mitigation Measures

<table>
<thead>
<tr>
<th>Issue (and applicable COEP &amp; guidelines)</th>
<th>Preparatory/Mitigation Measures</th>
<th>Responsibility</th>
<th>Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4.1 Land Acquisition and Resettlement</strong></td>
<td>• Implement LARP fully&lt;br&gt;• Prepare and submit LARP implementation report to WB for NOL&lt;br&gt;• Address grievances in accordance with GRM&lt;br&gt;• Disclose LARP Implementation Report</td>
<td>MNRE LTA</td>
<td>LARP Implementation Report&lt;br&gt;GRM Register of Complaints&lt;br&gt;WB InfoShop website&lt;br&gt;LTA Site Supervision</td>
</tr>
<tr>
<td><strong>4.2 Approvals</strong></td>
<td>• Prepare and submit Development Consent Application with relevant supporting documentation (EIA, ESMP, LARP Report, Consultation Report)&lt;br&gt;• Prepare and submit Application for material sources (including quarry, gravel pits, sand sources etc.) in accordance with applicable COEP in particular 8 – Quarry Development and Operations; COEP 9 – Gravel Extraction, COEP 13 – Earthworks. Also refer to Quarry Management Guidelines in Appendix D (D.1).&lt;br&gt;• Prepare and submit Contractor ESMP</td>
<td>LTA MNRE Contractor</td>
<td>Permits or DC CESMP and accompanying plans&lt;br&gt;LTA review process</td>
</tr>
<tr>
<td><strong>4.3 ESHS/OHS</strong></td>
<td>• Prepare OHS Plan as part of CESMP. Refer to Appendix D (D.1).&lt;br&gt;• Conduct Induction training for Contractor personnel&lt;br&gt;• Sign Code of Conduct (if instructed) for Contractor, Managers and other personnel&lt;br&gt;• Implement relevant pre-construction measures prescribed in OHS Plan</td>
<td>Contractor LTA</td>
<td>Contractors Training reports&lt;br&gt;Signed CoC&lt;br&gt;Contractors OHS monthly reports&lt;br&gt;LTA Site Inspections</td>
</tr>
</tbody>
</table>
### 4.4 Gender Based Violence (GBV) and Violence Against Children (VAC)

- Establish GBV and VAC Compliance Team (GCCT). Refer to Appendix D (D.2) for guidance.
- Prepare GBV and VAC Plans and seek Bank approval prior to project mobilization. Refer to Appendix D (D.2).
- Sign Codes of Conduct (if instructed) for Contractor, Managers and other personnel. Refer to Appendix D (D.2) for draft Codes of Conduct.
- Respond to GBV and VAC events as a matter of priority.

**Contractor**

- LTA (GCCT)
- GCCT Quarterly Reports
- LTA Progress Report
- LTA site inspections

### 4.5 Consultations

- Develop a consultation and communication plan to guide stakeholder consultations with the Contractor as required over the course of the Project. Key stakeholders are the village of Samalaeulu, LTA, MNRE, MWTI, MCIL and local environmental NGOs. Consult relevant sections of COEP 3 – Consultation, and WB requirements for consultation under OP/BO 4.01 Environmental Assessment and OP/BP 4.12 Involuntary Resettlement.
- Implement required pre-construction consultation in accordance with the approved CESMP Consultation and Communication Plan.

**Contractor with input from LTA**

- LTA site inspections
- Contractor’s Progress Reports

### 4.6 Loss of Livelihoods

- Ensure the full payment of compensation for lost crops and assets to rightful owners.
- Ensure full and timely delivery of other resettlement assistance for affected people identified in the LARP.

**Contractor**

- LTA
- LARP Implementation Report
- LTA Site inspections

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**MITIGATION DURING CONSTRUCTION**

Safeguards to protect the socio-cultural and environmental features in the construction zone and on adjacent lands are necessary to ensure the long-term sustainability of the environment and well-being of the village of Samalae‘ulu. These mitigation measures are designed to protect important features during construction by incorporating safeguards into construction practices, and are detailed in Tables 4 and 5.

Types of mitigation measures during construction include:

a) Safety features (eg. Fencing, warning signs) to be included in the tender package
b) Safety standards (eg. Setbacks, permissions / restrictions)
c) Required activities to achieve a performance standard (eg. Soil compaction, construction of drainage channels)
d) Conditional activities to be carried out if a benchmark is achieved (eg. Cover stockpiles with an erosion control blanket if slopes exceed 2:1)
e) Performance standards that must be achieved (eg. maximum and minimum slopes)
f) Approvals needed

Some of the mitigation measures can be easily achieved by incorporating site elements and construction methods into tender drawings, while others are better implemented by including clauses in the tender drawings, and have been marked as such in the Tables.
<table>
<thead>
<tr>
<th>Issue</th>
<th>Mitigating Measure</th>
<th>Responsibility</th>
<th>Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5.1 Environment, Social, Health and Safety (ESHS)</strong></td>
<td>• This should be in accordance with Occupational Health and Safety Act 2002 and OHS Regulation 2017. Also follow WB/IFC EHS Guidelines ([<a href="http://www.ifc.org/ifcext/sustainability.nsf/content/EHS">www.ifc.org/ifcext/sustainability.nsf/content/EHS</a> Guidelines Section 2](<a href="http://www.ifc.org/ifcext/sustainability.nsf/content/EHS">http://www.ifc.org/ifcext/sustainability.nsf/content/EHS</a> Guidelines Section 2) (Occupational Health and Safety) and Appendix D (D.1 and D.2)).</td>
<td>Contractor</td>
<td>LTA/MCIL site inspections Contractor Progress Reports</td>
</tr>
<tr>
<td><strong>5.2 Gender Based Violence (GBV) and Violence Against Children (VAC)</strong></td>
<td>• Prepare and implement approved GBV nd VAC Plans. Refer to requirements for GBV and VAC Plan Guidelines in Appendix D (D.2) for guidance. • If instructed by LTA, sign Codes of Conduct for contractors, managers and personnel in Appendix D (D.2). • Comply with monitoring and reporting requirements as per Codes of Conduct.</td>
<td>Contractor</td>
<td>LTA site inspections Contractor OHS monthly reports Contractor Progress Reports</td>
</tr>
<tr>
<td><strong>5.3 Physical Cultural Resources</strong></td>
<td>• Implement Chance Finds Procedures in the event of a chance find. Chance Finds Procedures are set out in the LARP.</td>
<td>Contractor</td>
<td>LTA/ Ministry of Education, Sports and Culture (MESC)</td>
</tr>
<tr>
<td><strong>5.4 Loss of Livelihoods</strong></td>
<td>• Give priority to the employment of Project Affected People when hiring local workers. (C) • Ensure the full restoration of affected lands before Contractors leave the site. (C) • Deliver fully any other delayed/outstanding resettlement assistance prescribed by the LARP before Contractors leave the site. (C)</td>
<td>Contractor</td>
<td>LTA Site inspections LARP implementation report</td>
</tr>
<tr>
<td><strong>5.5 Grievance Redress</strong></td>
<td>• Redress all received grievances in accordance with the approved Grievance Redress Mechanism (GRM) in the LARP, and the GBV/VAC GRM in Appendix D (D.2).</td>
<td>Contractor</td>
<td>Registers of Grievances GCCT Monitoring Reports</td>
</tr>
</tbody>
</table>
### Table 6: Environmental Mitigation Measures During Construction

(D = include in drawing; C = add a clause)

<table>
<thead>
<tr>
<th>Issue</th>
<th>Mitigating Measure</th>
<th>Responsibility</th>
<th>Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td><strong>Site Safety</strong>&lt;br&gt;COEP 12&lt;br&gt;ESH5/OHS Implementation Guidelines (Appendix D (D.1))</td>
<td>Contractor&lt;br&gt;LTA</td>
<td>• Appropriate safety precautions at entry points, excavations with steep slopes and the top of banks shown in tender drawings.&lt;br&gt;• Site inspections by LTA</td>
</tr>
<tr>
<td></td>
<td>• Restrict access to construction zone through warning signs, temporary gates, fencing or other construction zone demarcation at all entry points (D) and (C).&lt;br&gt;• Demarcate all excavations of 2.0m depth or greater and side slopes in excess of 2:1 (horizontal to vertical) through construction fence, rope or other means that clearly defines the hazard (D) or (C);&lt;br&gt;• Maintain and demarcate a 5.0m setback from top of bank using signs, construction flags, or other visual warning to prevent machinery, vehicles and people from accidentally falling into the river channel (D) and (C).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.2</td>
<td><strong>Natural Disasters - Cyclones</strong>&lt;br&gt;</td>
<td>Contractor / LTA</td>
<td>LTA to issue site instruction and communicate with Contractor to ensure safety measures are enacted.&lt;br&gt;Site inspections by LTA</td>
</tr>
<tr>
<td></td>
<td>• When a cyclone will strike within 24 hours, construction must cease, any loose boulders, construction materials secured or removed from the river channel, all stockpiles of loose aggregate or soil, and any potential contaminant must be covered and or removed, and any temporary fencing or safety equipment likely to be in the flooding zone of the river must be removed (C).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.3</td>
<td><strong>Natural Disasters - Earthquakes</strong>&lt;br&gt;</td>
<td>Contractor / LTA</td>
<td>Safety precautions for stockpiles and excavation pits shown in tender drawings;&lt;br&gt;Site inspections by LTA</td>
</tr>
<tr>
<td></td>
<td>• Compact and protect all stockpiles and excavation pits throughout the construction period.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.4</td>
<td><strong>Natural Disasters – Landslips</strong>&lt;br&gt;COEP 7&lt;br&gt;COEP 8&lt;br&gt;COEP 13</td>
<td>Contractor / LTA</td>
<td>Safety precautions for river channel works and slope stabilization shown in tender drawings;&lt;br&gt;Site inspections by LTA</td>
</tr>
<tr>
<td></td>
<td>• Stabilize any steep slope (greater that 2:1 horizontal to vertical) with erosion control measures.&lt;br&gt;• Carefully sequenced and excavation and construction in the river and secure steep slopes. (D) and (C).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 6: (Cont’d) Environmental Mitigation Measures During Construction

<table>
<thead>
<tr>
<th>Issue</th>
<th>Mitigating Measure</th>
<th>Responsibility</th>
<th>Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.5</td>
<td><strong>Earthworks – Site Clearance and Land Disturbance</strong>&lt;br&gt;COEP 13&lt;br&gt;COEP 11&lt;br&gt;COEP 6&lt;br&gt;COEP 7</td>
<td>• Prepare an Earthworks Plan that complies with COEP 13.2; must show construction phasing that reduces impacts on the environment and community.&lt;br&gt;• All topsoil (minimum 150mm depth) must be stripped and stockpiled, and re-applied to revegetated areas (C).&lt;br&gt;• Final grading must re-construct the original landscape shape and grade at edges of the construction zone (D) or (C).&lt;br&gt;• Trees and vegetation stockpiled for decomposition must be in appropriate locations that will not disrupt drainage patterns of the surrounding landscape, and or removed and disposed of at a PUMA approved site (D) or (C).&lt;br&gt;• Where logs and firewood are desired by villagers, contractors must remove branches and assist villages in transporting logs to appropriate locations (C).</td>
<td>Contractor&lt;br&gt;LTA&lt;br&gt;Design Consultant</td>
</tr>
<tr>
<td>6.6</td>
<td><strong>Earthworks – Soil Erosion and Sedimentation</strong>&lt;br&gt;COEP 6&lt;br&gt;COEP 5&lt;br&gt;COEP 8&lt;br&gt;COEP 12&lt;br&gt;COEP 13&lt;br&gt;Appendix D (D.3, D.4)</td>
<td>• All earthwork must be undertaken with the intent to reduce / prevent soil erosion of any exposed surface, and be constructed according to a phasing plan which requires re-vegetation before moving on to the next stage (C).&lt;br&gt;• Minimize number of stockpiles, area, and time stockpiles are exposed, place all minimum 30 m from areas prone to flooding, and construct a swale (minimum 450 x 450 mm) between stockpiles and adjacent properties to retain sediment in the construction zone (D) and (C).&lt;br&gt;• Slopes greater than 2:1 (stockpiles, excavation pits, temporary cut/fill, and final landscape form) must be fitted with appropriate erosion control measures as soon as possible according to the National Building Code Section B2 Siteworks and COEP 6 (C)&lt;br&gt;• All earthworks to be undertaken during the dry season or when the weather conditions are favourable.&lt;br&gt;• Install silt traps in all temporary and permanent drains where work is occurring in or within 30 meters of such drain.&lt;br&gt;• All run-off from the project shall be collected and diverted to facilities for removal of sediments i.e. silt ponds.&lt;br&gt;• Runoff from project area shall not be discharged into adjacent water bodies including the sea without effective means to prevent sedimentation.</td>
<td>Contractor&lt;br&gt;LTA&lt;br&gt;Design Consultant</td>
</tr>
<tr>
<td>Issue</td>
<td>Mitigating Measure</td>
<td>Responsibility</td>
<td>Monitoring</td>
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<tr>
<td>6.7</td>
<td><strong>Earthworks – Landscape Restoration</strong>  &lt;br&gt; COEP 13.5  &lt;br&gt; COEP 11</td>
<td>- Land disturbed during construction must be re-vegetated and graded/constructed as quickly as possible to prevent soil erosion. (C)  &lt;br&gt; - Any final steep slopes should be finished using bioengineering techniques shown in the National Building Code Section B2 Siteworks. (D)  &lt;br&gt; - Drainage patterns before construction must be restored – if modified, there must be no increase or decrease in drainage patterns that could negatively impact adjacent forested / farmed areas (D) and (C).  &lt;br&gt; - For rare plants, contact MNRE to determine course of action which may include – documentation and mapping of range, harvesting seed, transplanting to an MNRE plant nursery. (C).</td>
<td>Contractor  &lt;br&gt; LTA  &lt;br&gt; Design Consultant</td>
</tr>
<tr>
<td>6.8</td>
<td><strong>Air Quality / Dust</strong>  &lt;br&gt; COEP 2  &lt;br&gt; COEP 8</td>
<td>- Dust suppression measures should be in accordance with the requirements of COEP 2 and COEP 8  &lt;br&gt; - All construction areas and access roads will be sprinkled with water, on a regular basis, particularly during dry, windy conditions. Sources of water will be detailed in the CESMP.  &lt;br&gt; - Water soil stockpiles or otherwise cover them to limit spread of air-borne dust particles.  &lt;br&gt; - Minimize heavy machinery usage and idling (C).  &lt;br&gt; - Ensure vehicles and machinery are fitted with appropriate emission control equipment to avoid air pollution and release of toxic substances (C).</td>
<td>Contractor</td>
</tr>
<tr>
<td>6.9</td>
<td><strong>Noise and Vibration</strong>  &lt;br&gt; PUMA Noise Policy 2006</td>
<td>- The Contractor shall prepare a Noise Management Plan in accordance with the requirements of the PUMA Noise Policy 2006 as a key element of and annex to its CESMP. (C)  &lt;br&gt; - Project activities must be conducted during normal workings and working days. If activities must be conducted in the evening and/or weekend, the local community Council of Chiefs must be given at least one week notice of start and completion times. (C)  &lt;br&gt; - There shall be no working on Sunday. (C)  &lt;br&gt; - Maintain as much tree cover as possible between the construction zone and residential buildings (D)  &lt;br&gt; - Ensure activity in the northern end of the construction zone only occurs during daytime hours (C)  &lt;br&gt; - Operators of noisy equipment or other workers in the vicinity of excessively noisy equipment to be provided with ear protection equipment. (C)  &lt;br&gt; - Any construction equipment deemed too noisy by LTA shall be replaced. (C)</td>
<td>Contractor</td>
</tr>
<tr>
<td>Issue</td>
<td>Mitigating Measure</td>
<td>Responsibility</td>
<td>Monitoring</td>
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<tr>
<td>6.10</td>
<td><strong>Materials Extraction &amp; Supply (Gravel, Concrete Asphalt, etc)</strong>&lt;br&gt;COEP 8 COEP 9 Appendix D (D.3)</td>
<td>Contractor Design Review Consultant</td>
<td>Site inspections by LTA PUMA DCs</td>
</tr>
<tr>
<td></td>
<td>• Use only PUMA approved/licensed quarries. (C)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>• Comply with approved material source plans including Quarry sites and on-site gravel extraction Implementation Plans. These Plans must be in accordance with COEP 8 – Quarry Development and Operations and Quarry Implementation Plan Guidelines in Appendix D (D.3) of this ESMP. (D)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Material source plans (including quarry sites and on-site gravel extraction) must include procedures for health, safety and environmental impact reduction in accordance with COEP 8 and COEP 9 GravelExtraction. (D)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Use materials supply companies with valid operating licenses. (C)</td>
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<td></td>
<td>• All delivery trucks must be covered or water sprayed to prevent dust generation during transport.</td>
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<td></td>
<td>• Material should be delivered using routes and at hours prescribed by the LTA approved Traffic Management Plan.</td>
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<td></td>
<td>• No quarry or gravel extraction boundary should be located within 500 metres of the village, nor within 300 metres of any isolated dwelling, and should be screened from view by existing topography and trees (D) and (C)</td>
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<td></td>
<td>• Quarry pits for building materials must be backfilled with approved fill (soil, rock, felled trees, branches, etc.) to its original elevation and shape, and re-vegetated (D) or (C)</td>
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<td></td>
<td>• Blasting operations shall be conducted in a manner that will not cause danger to life or property according to provisions in COEP 9 (C)</td>
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<tr>
<td>6.11</td>
<td><strong>Management of Solid (non-hazardous) Waste</strong>&lt;br&gt;Appendix D (D.4)</td>
<td>Contractor</td>
<td>LTA/MNRE</td>
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<tr>
<td></td>
<td>• Prepare Waste Management Implementation Plan in accordance with Guidelines in Appendix D (D.4)</td>
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<td></td>
<td>• Construction waste (including scrap and packaging) that cannot be recycled or reused, and hazardous material must be collected and transported to a PUMA approved disposal site. (C)</td>
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<td></td>
<td>• Scrap metal that can be recycled are only to be provided to operators that are licensed by the appropriate Government agency to conduct recycling/recovery. (C)</td>
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<td></td>
<td>• Waste components that have remaining useful lives are to be stored and/or used at other project areas as the need arises. (C)</td>
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<td></td>
<td>• Hazardous material must be handled and transported separately from non-hazardous wastes and must be handled by trained persons only (C)</td>
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<td></td>
<td>• Any construction material deemed by LTA to be discharging emissions that are excessive, including smoke and foul odors shall be replaced. (C)</td>
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<tr>
<td>Issue</td>
<td>Mitigating Measure</td>
<td>Responsibility</td>
<td>Monitoring</td>
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</table>
| 6.12  | Management of Hazardous Materials and Substances - Soil Contamination NBC Appendix D (D.4) | • Minimize fuels and chemicals stored on site, and have a spill management plan that ensures the protection of groundwater and the river channel. (D) and (C)  
• Sites where pollutants or hazardous materials are stored or used must be confined to a designated area or protected according to the National Building Code of Samoa and COEP (C)  
• Adopt effective stormwater management techniques to ensure there is no possibility of groundwater or the river channel contamination. (D) and (C). | Contractor  
LTA  
Design Consultant | Hazardous material management shown in tender drawings or specifications.  
Site inspections by LTA |
| 6.13  | Traffic Management (equipment, materials deliveries, waste materials removal) COEP 12 Appendix D (D.4) | • Prepare a Traffic Management Plan to address traffic related issues related to the project. This TMP should be in accordance with COEP 12: Traffic Control During Construction and should form an annex to the Contractors ESMP. (D) and (C)  
• Implement the approved Traffic Management Plan. (D) and (C) | Contractor with inputs from LTA  
Contractor | LTA Approved TMP  
LTA site inspections |
| 6.14  | Construction Camps – Design COEP 5 | • Construction camps must be constructed on solid surface and located to not cause disturbance to adjacent land and landowners (D) or (C).  
• Construction camps must not be located with floodplains, coastal hazard, and landslip prone areas, and shall have minimal adverse environmental effect (C).  
• The minimum requirements of COEP 5 regarding facilities and maintenance (D) and (C). | Contractor  
LTA  
Design Consultant | Location and size of workers camp (on-site and off-site) shown in tender documents.  
LTA site inspections |
| 6.15  | Construction Camps - Management of Oil and Fuel for Construction Equipment COEP 5 | • All fuel and oil will be stored in bunded areas with impervious base. (C)  
• All fuel and oil transfers from storage to construction vehicles takes place from this area. (C) | Contractor | LTA site inspections |
<table>
<thead>
<tr>
<th>Issue</th>
<th>Mitigating Measure</th>
<th>Responsibility</th>
<th>Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.16</td>
<td><strong>Stormwater Management</strong>&lt;br&gt;COEP 2&lt;br&gt;COEP 6&lt;br&gt;COEP 11</td>
<td>• Grading plan / phasing plan must show all stormwater management and sedimentation control measures temporary catch drains, toe drains, retention ponds and silt traps) per phase (D)&lt;br&gt;• Site grading and stormwater management must reduce potential for run-off to the river (D)&lt;br&gt;• Create temporary catch drains at edges of the construction zone as part of a stormwater management strategy to reduce sedimentation of adjacent lands (D)&lt;br&gt;• Low points that will collect run-off and silt must be sufficiently sized so that sediment is retained in the construction zone (D).&lt;br&gt;• All permanent drainage channels, shall be re-vegetated and protected against scour from surface water runoff, and use gravel, rip rap, concrete or other hard surface where water velocity is likely to produce scour. (D).&lt;br&gt;• Channel discharge locations and culvert inlets and outlets must be protected from erosion by grassed swales, rip rap, gravel beds or other suitable means (D).&lt;br&gt;• Stormwater management must comply with the National Building Code Section B2 Siteworks an COEP 6. (D) and (C)</td>
<td>Contractor&lt;br&gt;LTA&lt;br&gt;Design/Review Consultant</td>
</tr>
<tr>
<td>6.17</td>
<td><strong>Groundwater</strong>&lt;br&gt;NBC</td>
<td>• Aquifers discovered during excavation must be suitably protected from contamination using erosion control and stormwater management techniques in the National Building Code and COEP . (C).&lt;br&gt;• Depth of soil over bedrock must be adequate to eliminate negative impacts on groundwater for road, bridge and slope stabilization construction. (D) or (C).</td>
<td>Contractor&lt;br&gt;LTA&lt;br&gt;Design Consultant</td>
</tr>
<tr>
<td>Issue</td>
<td>Mitigating Measure</td>
<td>Responsibility</td>
<td>Monitoring</td>
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</tbody>
</table>
| 6.18 River channel NBC COEP 7 | Setbacks from top of bank for construction equipment must comply with COEP (D).  
Silt traps must be installed along top of the bank on both sides to prevent sediment/water borne contaminants from entering river bed, and cleaned regularly. (D) and (C).  
No additional soil, stone, boulders, vegetation or waste is permitted to enter the riverbed. (C).  
Disturbed slopes must be stabilized using erosion control techniques in the NBC and COEP. (D) and (C).  
Construct and stabilize temporary safe river channel crossing for workers. Take appropriate measures to ensure the river is not contaminated. (D)  
Design river piers to minimize river bed scour. (D)  
Incorporate into the design of piers or abutments located on river banks erosion protection measures. (D) | Contractor  
LTA  
Design Consultant | Signs / markings that delineate the top of bank setback shown in tender drawings; Site inspections by LTA |
9.2 Environmental Mitigation Strategies Post-Construction

Safeguards to protect socio-cultural and environmental features in the construction zone and on adjacent lands after construction is completed are included in Tables 5 and 6 to ensure the long-term sustainability of the environment and well-being of the village of Samalae’ulu. These mitigation measures are designed to protect important features during the use of the bridge and road extension by incorporating safeguards into construction practices, and plans, and providing an on-going monitoring system to be enacted by LTA.

Types of mitigation measures post-construction include:

i. safety features, standards, activities and conditional activities to be included in tender drawings and specifications

ii. site inspections needed

iii. performance standards that must be achieved (e.g. maximum and minimum slopes)

Some of the mitigation measures can be easily achieved by incorporating site elements and construction methods into tender drawings, while others are better implemented by including clauses in the tender drawings, and have been marked as such in the Tables.

**Post Construction**

**Table 7: Socio-Cultural Mitigation Measures Post-Construction**

<table>
<thead>
<tr>
<th>Socio / Cultural Management Component</th>
<th>Mitigation Measures</th>
<th>Responsibility</th>
<th>Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1 Places of Cultural Significance</td>
<td>• none required, no places of cultural significance in construction zone;</td>
<td>• n.a.</td>
<td>• n.a.</td>
</tr>
<tr>
<td>7.2 Land Tenure</td>
<td>• none required,</td>
<td>• LTA</td>
<td>• n.a.</td>
</tr>
<tr>
<td>7.3 Land Acquisition and Compensation</td>
<td>• none required, unless Compensation Claims during construction have not been completed, see Table 4</td>
<td>• LTA</td>
<td>• LTA to monitor progress of land compensation</td>
</tr>
<tr>
<td>7.4 Loss of Livelihood / Use and Enjoyment of Land</td>
<td>• none required</td>
<td>• n.a.</td>
<td>• n.a.</td>
</tr>
<tr>
<td>7.5 Traffic / Circulation</td>
<td>• directional signage to Village must be installed at both ends of road extension (D)</td>
<td>• Contractor</td>
<td>• directional and speed limit signs shown in tender drawings</td>
</tr>
<tr>
<td></td>
<td>• speed limit signs must be installed (D)</td>
<td>• LTA</td>
<td>site inspections by LTA</td>
</tr>
<tr>
<td></td>
<td>• upgrade of mid-way path (used for construction access) so that it can be used by Villagers to access road extension (D) or (C)</td>
<td>• Design Review Consultant</td>
<td></td>
</tr>
<tr>
<td>7.6 Noise</td>
<td>• homes at the northern end of the construction zone will be impacted by construction, and several homes midway along the new road extension</td>
<td>• Contractor</td>
<td>• tree preservation to reduce noise shown in tender drawings</td>
</tr>
<tr>
<td></td>
<td>• maintain as much tree cover as possible between the construction zone and residential buildings (C)</td>
<td>• LTA</td>
<td>site inspections by LTA</td>
</tr>
</tbody>
</table>

D=include in drawing; C= add a clause
### Post Construction

#### Table 8: Environmental Mitigation Measures Post-Construction

<table>
<thead>
<tr>
<th>Environmental Management Component</th>
<th>Mitigation Measures</th>
<th>Responsibility</th>
<th>Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>8.1 Site Safety</strong></td>
<td>* Ensure highway markings, lanes, pedestrian-only, and any other pavement markings are visible (D)</td>
<td>* Contractor, LTA, Design Review Consultant</td>
<td>* Highway markings and accessibility, and all other items listed in Mitigation Measures column must be shown in tender drawings</td>
</tr>
<tr>
<td></td>
<td>* Ensure pedestrian separation from vehicles is clearly indicated along the bridge (D)</td>
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<td></td>
<td>* Ensure pedestrian areas are accessible (use ramps instead of curbs along pedestrian walkways) (D)</td>
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<td></td>
<td>* Any portion of the bridge intended for pedestrian use must consist of a non-slip surface (D)</td>
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<td></td>
<td>* Appropriate lighting / reflectors for user safety and security must be provided (D)</td>
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<tr>
<td></td>
<td>* Bridge design must not allow a situation where a person would be entrapped inside or under it (D)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>* Provision of security measures to restrict access to non-public or dangerous areas (D)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>8.2 Natural Disasters - Cyclones</strong></td>
<td>* Ensure road signs are securely installed to resist strong wind speeds Grade pavement crowned and adjacent land to reduce possibility of flooding of the road surface (D) * Incorporate design measures (e.g. erosion control techniques, protection of bridge abutments from debris), to prepare for, and deal with consequences of flash flooding, for all construction in the floodplain (D)</td>
<td>* Contractor, LTA, Design Review Consultant</td>
<td>* Safety precautions for road signs, pavement, and construction in the floodplain shown in tender drawings</td>
</tr>
<tr>
<td><strong>8.3 Natural Disasters - Earthquakes</strong></td>
<td>* Inspect road signs to ensure they are securely installed to resist strong wind speeds</td>
<td>* Contractor, LTA, Design Review Consultant</td>
<td>* Safety precautions for road signs shown in tender drawings (Soosung)</td>
</tr>
<tr>
<td><strong>8.4 Natural Disasters - Landslips</strong></td>
<td>* Inspect steep slopes 2:1 (horizontal to vertical) or greater to ensure erosion control techniques set out in the National Building Code and COEP are performing as expected</td>
<td>* Contractor, LTA, Design Review Consultant</td>
<td>* Slope stabilisation shown in tender drawings</td>
</tr>
<tr>
<td><strong>8.5 Site Clearance and Land Disturbance</strong></td>
<td>* N.A.</td>
<td>* N.A.</td>
<td>* N.A.</td>
</tr>
<tr>
<td><strong>8.6 Air Quality</strong></td>
<td>* N.A.</td>
<td>* N.A.</td>
<td>* N.A.</td>
</tr>
<tr>
<td><strong>8.7 Soil Erosion</strong></td>
<td>* Inspect steep slopes 2:1 (horizontal to vertical) or greater to ensure erosion control techniques set out in the National Building Code and COEP are performing as expected</td>
<td>* Contractor, LTA</td>
<td>* Slope stabilisation shown in tender drawings</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>* Site inspections by LTA</td>
</tr>
</tbody>
</table>
Table 8 (continued): Environmental Mitigation Measures Post-Construction

<table>
<thead>
<tr>
<th>Environmental Management Component</th>
<th>Mitigation Measures</th>
<th>Responsibility</th>
<th>Monitoring</th>
</tr>
</thead>
</table>
| 8.8 Soil Contamination              | • drainage works must not allow runoff from the road (that may be carrying pollutants) to enter aquifers (D)  
  • runoff from the bridge (that may be carrying pollutants) must be directed to appropriate discharge areas and not to the river bed or aquifers (D) | Contractor, LTA, Design Review Consultant      | • stormwater management shown in tender drawings or specifications  
  • site inspections by LTA                                                                 |
| 8.9 River channel                   | • runoff from the bridge (that may be carrying pollutants) must be directed to appropriate discharge areas and not to the river bed or aquifers (D)  
  • runoff from tableland must only be permitted to drain to the river bed if there is no possibility of it carrying pollutants (D) and (C) | Contractor, LTA, Design Review Consultant      | • stormwater management shown in tender drawings or specifications  
  • site inspections by LTA                                                                 |
| 8.10 Stormwater Management, Sediment Mitigation | • see River Channel requirements and Soil Contamination requirements  
  • ensure no ponding or flooding of stormwater along road extension through proper grading, ditches, culverts, catchment areas (D)  
  • ensure grading at edges of construction zone does not result in a significant change in drainage patterns for adjacent lands (D) and (C) | Contractor, LTA, Design Review Consultant      | • stormwater management techniques shown in tender drawings  
  • site inspections by LTA                                                                 |
| 8.11 Groundwater                    | • drainage works must not allow runoff from the road (that may be carrying pollutants) to enter aquifers (D) and (C) | Contractor, LTA, Design Review Consultant      | • stormwater management shown in tender drawings and/or specifications  
  • site inspections by LTA                                                                 |
| 8.12 Waste (solid)                  | • Warning signs advertising fines for littering and dumping placed in appropriate locations (D)  
  • Removal of trash and litter (LTA) | Contractor, LTA, Design Review Consultant      | • warning signs for trash/dumping included in tender drawings or specifications  
  • site inspections by LTA                                                                 |
| 8.13 Material Sourcing              | • n.a.                                                                               | • n.a.                                        | • n.a.                                                                                                               |
| 8.14 Landscape Restoration          | • vegetation must be removed / trimmed if it becomes hazardous to site lines (C)      | LTA                                           | • site inspections by LTA                                                                                           |
| 8.15 Construction Camp              | • Construction camps must be removed when construction is complete, and the land restored to its pre-construction condition, unless otherwise decided by LTA (C) | Contractor, LTA, Design Review Consultant      | • worker’s camp (onsite and off-site) removal / retention shown in tender drawings or specifications  
  • site inspections by LTA to confirm structural adequacy for continued use                                                                 |
| 8.16 Approvals                      | • n.a.                                                                               | • n.a.                                        | • n.a.                                                                                                               |
9.3 Construction Document Sample Clauses
Mitigation Measures listed in Sections 9.1 and 9.2 provide a summary of requirements to be included in tender drawings, specifications and/or as site instructions to reduce socio-cultural and environmental impacts. Some of these requirements can be graphically shown and included in tender drawings (D), while others will need specific clauses to be included in the tender package to legally bind the contractor to perform said works (C).

Below is a list of Sample Clauses that should be included in the tender drawings and specifications. They are intended to complement the mitigation measures listed in Tables 4 - 7, and will assist in giving direction to the preparation of the tender package, and instructions to the contractor to ensure environmental protection is part of the construction process. As part of the tender package, the clauses will be legally binding such that the contractor is obliged to enact them.

General Conditions
• Contractor must follow provisions in the Environmental Management Plan such that the conservation, protection and sustainability of environmental resources is maintained at all times during the construction period

• Construction must cease if an aquifer is encountered during excavation, and appropriate measures must be taken to protect the health of the aquifer to the satisfaction of the Government of Samoa.

• Contractor to ensure the existing mid-way access road is upgraded to a condition that provides a safe vehicular and pedestrian route after construction ceases

Site Safety
• A 5.0m setback from top of bank must be maintained and demarcated by signs, construction flags, or other visual warning mechanism to prevent machinery, vehicles and people from accidentally falling into the river channel

• In the event of a cyclone that will strike within 24 hours, construction must cease, any loose boulders, construction materials must be secured or removed from the river channel, all stockpiles of loose aggregate or soil, and any potential contaminant must be covered and/or removed, and any temporary fencing or safety equipment likely to be in the flooding zone of the river channel must be removed

• Warning signs and means to restrict access to the construction zone that comply with LTA standards must be installed and maintained at all possible entry points until road and bridge are opened for public use

• Excavations of 2.0m depth or greater with side slopes in excess of 2:1 (horizontal to vertical) must be demarcated through construction fence, rope or other means that clearly defines the hazard.

• Contractor must engage in traffic management (ie. people directing traffic, signage, temporary pavement markings, temporary diversions, etc.) that complies with LTA standards whenever the construction impacts the operation of existing roads

• Where the bridge, road and surrounding landscape have publicly accessible areas with a difference in elevation that exceeds 1.0m in height, fall protection must be provided (railing, berm, or other means that complies with the National Building Code Section D3.C Protection from Falling
Noise and Vibration

• Ensure construction activity in the northern end of the construction zone (in close proximity to existing homes) only occurs during daytime hours

Air Quality

• Limit spread of air-borne dust particles by watering soil stockpiles daily or as needed, and/or covering them

• Ensure vehicles and machinery are fitted with appropriate emission control equipment to avoid air pollution and release of toxic substances.

• Limit heavy machinery usage and idling to reduce air pollution

Hazardous Material

• Hazardous material must be handled and transported by trained persons only

• Construction waste and hazardous material must be collected and transported to a suitable dump site acceptable to the Government of Samoa

• Areas where hazardous materials are stored or handled must be graded so that runoff from the hazardous material handling area will not drain to aquifers, the river channel, or adjacent lands

• Contractor to minimise fuels and chemicals stored on site, and provide a spill management plan that ensures the protection of groundwater and the river channel satisfactory to the Government of Samoa prior to commencement of construction

• Use or storage of pollutants or hazardous materials must be confined to a designated area and protected according to the National Building Code of Samoa and COEP such that there is no possibility of groundwater or the river channel becoming contaminated

Construction Camps

• Contractor must plan for, obtain consent, install and remove any temporary construction camps needed for the project.

• Construction camps may not be located within flood plains, coastal hazard zones, and landslip prone areas, and must be constructed to have minimal adverse environmental effects and comply with COEP 5.3.3.

• Within 14 days of the commencement date, the contractor shall apply for Development Consent from PUMA for all temporary construction camps, submitting a detailed layout plan showing the relative locations of all temporary buildings and facilities to be constructed together with the location of site roads, storage areas and drainage facilities, in accordance with COEP 5.3.4.

• Within 14 days of the commencement date, the contractor shall submit to the LTA the signed authority of the landowner for the contractor to establish the construction camp, containing the following information:
  • details of compensation to be paid
  • agreed period of tenure
  • any specific requirements of the land owner
  • photographs of the site in its original condition
  • details of proposed and agreed site restoration after completion of the project works
At the completion of the construction work, the contractor shall dismantle and remove from site all facilities established within the construction camp including the perimeter fence and lockable gates. The whole of the construction campsite shall be grassed and if trees originally grew on the site they shall be replaced with similar tree species. All oil or fuel contaminated soil shall be carefully removed from the site and transported and buried in waste soil disposal areas. At the completion of restoration the site shall be in no way be inferior to the condition that pertained prior to commencement of the works.

At the completion of the above site restoration works, the contractor shall submit to the LTA a signed statement from the landowner(s) confirming that the landowner is satisfied with the restoration of the site. If such a statement is not submitted, LTA may withhold moneys owing to the contractor.

**Erosion Mitigation**
- All earthwork must be undertaken with the intent to reduce / prevent soil erosion of any exposed surface
- Any steep slope (greater than 2:1 horizontal to vertical), temporary or permanent, must be stabilised with erosion control measures acceptable to the Government of Samoa
- Contractor must minimise number of stockpiles, the area, and time stockpiles are exposed, place all minimum 30 m from areas prone to flooding, and construct a swale (minimum 450 x 450 mm) between stockpiles and adjacent properties to retain sediment in the construction zone
- Stockpiles and excavation pits must continually be compacted and protected throughout the construction period at regular intervals to mitigate soil erosion
- Temporary ditches at the edges of the construction zone must be constructed as part of a stormwater management strategy to reduce sedimentation of adjacent lands

**Phasing**
- Prior to construction, Contractor must provide step-by-step instructions (and/or shop drawings) illustrating the sequence of construction in the river channel so that slopes are protected and sedimentation is minimised to the satisfaction of the Government of Samoa.
- Each construction phase shown in the Phasing Plan must be re-vegetated before moving to the next phase.

**Landscape Restoration**
- If equipment is available, contractor must ensure felled trees and vegetation are mulched on site, and the mulch spread as the top layer on both sides of the road extension where it will be re-vegetated.
- Where logs are desired by villagers, contractor must remove branches and assist villagers in transporting logs to appropriate locations.
- Topsoil (minimum 150mm depth) must be stockpiled and re-used as the final treatment for re-vegetated areas.
• If rare plant species are discovered, MNRE must be contacted to determine a suitable course of action which may include: documentation and mapping of range, harvesting seed, transplanting to an MNRE plant nursery

• Final grading must re-construct the original landscape shape and grade at edges of construction zone

• Trees and vegetation stockpiled for decomposition must be in appropriate locations that will not disrupt drainage patterns of the surrounding landscape, and/or removed and disposed of at a suitable site

• If equipment is available, trees and vegetation should be mulched, and the mulch used for both sides of the road extension where it will be re-vegetated

• Where logs are desired by villagers, contractor must remove branches and assist villagers in transporting logs to appropriate locations

River Channel
• Silt traps must be installed along top of bank on both sides to prevent sediment/water-borne contaminants from entering river bed, and cleaned regularly.

• No additional soil, stone, boulders, vegetation or waste is permitted to enter the river bed unless otherwise indicated in the tender package

• Runoff from tableland must only be permitted to drain to the river bed if there is no possibility of it carrying pollutants

Hydrology, Drainage, Stormwater Management
• Contractor to ensure stormwater management techniques comply with the National Building Code Section B2 Siteworks and COEP 6

• Contractor to ensure the depth of soil over bedrock is adequate to eliminate negative impacts on groundwater at all times

• Drainage patterns that exist before construction commences must be restored to its original condition. If modified, there must be no increase or decrease in drainage patterns that could negatively impact adjacent forested / farmed areas

Material Extraction
• No quarry or gravel extraction boundary is permitted within 500 metres of the village, nor within 300 metres of any isolated dwelling, unless permission is granted by the Government of Samoa

• Contractor must provide shop drawings showing location of excavation pits for building materials, and intended end condition (fill, compaction, drainage, vegetation)

• Contractor to ensure gravel extraction pits are screened from view by existing topography and trees

• quarry pits for building materials must be backfilled with approved fill (soil, rock, felled trees, branches, etc.)
to its original elevation and shape, and re-vegetated;

- **Blasting operations shall be conducted in a manner that will not cause danger to life or property according to provisions in COEP 9**

### 9.4 Roles and Responsibilities

Successful implementation of the Mitigation Measures (Environmental Management Plan) depends on a coordinated effort between all participants in planning, design and construction of the project. Roles and responsibilities for each are described below.

#### 9.4.1 World Bank

**Funding Source and Commenting Agency**

The construction of the Maliolio bridge is funded by the World Bank as part of their efforts to assist Samoa to rebuild critical infrastructure following the devastation from Cyclone Evan in 2012. Not only is the World Bank a funding source, but they are also a commenting agency that reviews construction projects to ensure they comply with WB approved minimum standards and performance criteria. The World Bank has policies and plans that provide an accepted standard, and they assess development projects to ensure they comply with said policies and standards.

The World Bank also provides support to countries, such as Samoa, by assisting them to manage construction projects and ensure the country’s minimum performance standards and best practices are achieved.

To ensure that the Mitigation Measures are successfully integrated with the construction project, the World Bank will review the Tender Package prepared by Soosung/KEW, and provide comments so that the submission complies with all applicable documents. They will also assist LTA with project management during and after construction, the World Bank will again provide support to LTA and assist them with any issues that arise.

#### 9.4.2 LTA and Other Government Departments and Agencies

**Project Management, Commenting Agency and Site Supervision**

As the Samoan agency leading the project, LTA performs all roles of project management, including overseeing the production of the tender package, construction and post-construction.

For the design stage, LTA is the coordinating agency in Samoa, ensuring that all government departments and agencies are circulated and kept informed about the project. They also oversee the efforts of the Consultant (Soosung/KEW) and together with MNRE and other government departments and agencies, ensure compliance with policies and regulations. In this manner, the LTA and other agencies play an important role in ensuring that the mitigation measures are included in the tender package prepared by the Consultant.

During construction, LTA will be the lead agency doing Site Supervision, and through site inspections can evaluate the effectiveness of the implementation of the Mitigation Measures. If LTA decides to hire a separate company for Site Supervision, they will still be the lead agency to oversee construction.

#### 9.4.3 Design Consultant (Soosung/KEW)

As the authors of the Tender Package, the Consultant must ensure that the Mitigation Measures contained in this document are effectively illustrated and noted in the tender drawings / specifications. They will need to review the policies and regulations described in this document, and take appropriate actions to ensure they are included. During the construction phase, the Consultant must be available to clarify interpretation of the tender package, as needed.

The Consultant also must prepare all documentation required for Development Consent and Building Permit approvals, (see Section 9.5 below).

#### 9.4.4 Contractor
The Contractor hired by LTA/WB to install the bridge and road extension must ensure that the project is constructed according to the environmental standards in the tender package. Appropriate materials and methods must be used as specified. If the Site Supervisor (LTA) finds work to be unacceptable, the Contractor must take efforts to correct the problem so that it complies with the tender package.

9.4.5 Quarry Site Operator
The Contractor shall select the most cost effective and certified Quarry Site Operator from which to extract materials for construction works. PUMA has issued Development Consents to two companies that provide quarrying services in Savaii: a) Apia Lua operating in Salelologa and Avao, and b) Magele Osa operating in Tuasivi. The Agency has indicated that the Contractor needs to submit an application form for the use of a particular site prior to construction works commencement so that they can assess its condition accordingly. This will prevent any stop notices/orders from being issued if the Contractor uses a site without Development Consent. The Contractor will ensure, however, that the operation of the quarry activities within its control, including the safety of its personnel, is in accordance with the minimum requirements set forth in Appendix ___ and the OHS Plan.

9.5 Approvals
Before construction can commence, the following approvals from the Government of Samoa need to be attained:

<table>
<thead>
<tr>
<th>Implementing Agency</th>
<th>Approvals Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNRE</td>
<td>Development Consent for: construction camps, quarry pit, gravel extraction, drainage and earthworks</td>
</tr>
<tr>
<td>MWTI</td>
<td>Building Permit for: construction camps, earthworks, storm water management, bridge, erosion mitigation</td>
</tr>
</tbody>
</table>

The Consultant is advised to contact each of these agencies to determine requirements before preparing the tender package.
10.0 CONCLUSION

The environmental and socio-cultural impacts of the proposed bridge over the Maliolio River and road extension have been assessed and documented. Assuming that the Mitigation Measures listed in this document are fully implemented, the following conclusions can be made:

a) No significant species or habits will be impacted, and the landscape disturbed by construction will return to its previous condition in terms of ecological function, floral and faunal communities.

b) If the Mitigation Measures outlined in Section 9.0 are incorporated into the design, tender documents and construction activities, environmental impacts during construction and post-construction will be reduced to appropriate and acceptable levels.

c) Post-construction, the bridge will have a minimal environmental impact as the volume of the river bed will be marginally impacted by the construction of the bridge abutments, and the bridge will be set at an appropriate height above the projected high water line so that water flow following a storm event will not be impacted. Flora and fauna characteristics of the river will return to its pre-construction condition.

d) Post-construction, the road extension will have a low environmental impact as the adjacent land will naturally regenerate to its pre-construction condition, and stormwater management (culverts, ditches, etc.) will direct water to appropriate discharge areas.

e) Socio-cultural impacts are low. The village matais, untitled men and women representatives, have been fully consulted and their unanimous support for the Project is well informed. The bridge location and road alignment have been modified to avoid and or minimize the loss of homes and crops. Financial compensation for land taken and lost crops have been discussed with affected landowners and their families in a transparent and open manner. No cultural NN as the Villagers support the bridge and road extension in this location providing appropriate compensation is provided, and no significant cultural features will be impacted. Land taken for the bridge and road is minimal and will not deprive the village of available land for future settlement expansion and food security needs.

f) The greatest concern by the Villagers is flooding, which is not included in the scope of this project.

g) The Villagers' request to have adequate bus service post-construction is assured by LTA committing to maintaining bus service along the existing main road until future demands/conditions warrant a change.

A brief summary of the Mitigation Measures (contained in Sections 9.1 and 9.2) that the above conclusions are based on include the following:

1. Overall
   (i) development must proceed in appropriate phases to reduce environmental and socio-cultural impacts during construction
   (ii) construction details will ensure the bridge and road extension are sufficiently durable to protect against impacts of extreme weather and disasters
   (iii) best practices for construction safety used throughout construction period
   (iv) best practices to reduce amount of landscape disturbance and restore the landscape to its original condition within the study area and in the surrounding area used throughout construction period
   (v) efforts to reduce contamination of soil and water resources before and after construction will be implemented through effective stormwater management and erosion mitigation
   (vi) off-site elements - construction camps, quarries - will be designed and implemented according to the NBC and COEP
2 The bridge will be constructed with the following elements:
   (i) erosion control and stability of bridge abutments as per NBC and COEP
   (ii) runoff from bridge directed away from bridge to a suitable discharge area
   (iii) travelled portion of the bridge is located a sufficient height above expected high water levels from flooding
   (iv) slope stability measures for constructed slopes greater than 2:1 (horizontal to vertical)
   (v) re-vegetation of disturbed landscape
   (vi) appropriate compensation for landowners as per the LARP

3 The road extension will be constructed with the following elements:
   (i) effective stormwater management using culverts and swales constructed at all road curvatures and low points to prevent flooding of road
   (ii) protection of aquifers, if encountered, to remove potential for contamination by runoff
   (iii) slope stability measures for constructed slopes greater than 2:1 (horizontal to vertical)
   (iv) final grading and re-vegetation of disturbed landscape to mimic pre-construction conditions
   (v) upgrading of existing mid-way trail as an access route to the road extension for villagers
   (vi) construction of a T-intersection in northern portion to connect the existing Main Road to the road extension
   (vii) appropriate compensation for landowners as per the LARP

The Environmental Impact Assessment should be used as a reference material and checklist by all stakeholders to ensure that appropriate standards are used at the detailed design stage.
APPENDIX A – COEP and Corresponding Measures

Chart illustrating the applicable sections in the COEP, with a reference to the section in the Mitigation Measures (Environmental Management Plan) that addresses the COEP

<table>
<thead>
<tr>
<th>COEP 2 - Road Planning, Design and Construction</th>
<th>Description</th>
<th>Reference to Items in Tables 4 - 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>COEP 2 Section 2.2</td>
<td>• Incorporate design features for the general improvement of environmental quality</td>
<td>4 - 8 (all)</td>
</tr>
<tr>
<td></td>
<td>• Incorporate measures and design features for the mitigation of adverse environmental effects</td>
<td>4 - 8 (all)</td>
</tr>
<tr>
<td>COEP 2 Section 2.3</td>
<td>• Consider in the design, construction methods which will minimise environmental risk while taking into account the goals of sustainable development</td>
<td>4 - 8 (all)</td>
</tr>
<tr>
<td></td>
<td>• Specify that construction phases are sequenced, timed, and managed to minimise disturbance to the environment</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>• Specify that the programme of construction shall be prepared to show that areas to be re-vegetated are completed progressively as sections of the work are completed</td>
<td>57 5.14</td>
</tr>
<tr>
<td>COEP 2 Section 2.4</td>
<td>• Establish the mitigation and contingency measures for at least the following: oil spills, material loss, erosion control, failure of protection works or earthworks, litter control, dust control, water collection management, noise control, traffic management</td>
<td>4 - 8 (all)</td>
</tr>
<tr>
<td></td>
<td>• Specify the temporary stormwater treatment devices, their locations, and the maintenance programme for all such devices</td>
<td>5.10 5.14</td>
</tr>
<tr>
<td></td>
<td>• Specify and detail sedimentation control measures to be implemented</td>
<td>5.7 5.10 7.10</td>
</tr>
<tr>
<td>COEP 2 Section 2.4.1</td>
<td>• In consultation with the affected community, identify and implement the best practicable option for the disposal of excess cut and unsuitable materials</td>
<td></td>
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<td></td>
<td>• Specify that all excess cut disposal areas shall be subject to the same environmental controls and guidelines as the overall project, as set out in the relevant COEPs</td>
<td>54 55 57 59 5.14</td>
</tr>
<tr>
<td></td>
<td>• Specify that all excess cut disposal areas are designed to maximise embankment stability, minimise erosion, are shaped to conform with the general topography, and are vegetated appropriately</td>
<td>59 5.14</td>
</tr>
<tr>
<td></td>
<td>• Design water crossings to use low impact structures intended to minimise disturbance to the stream/river/estuarine environment, and shall incorporate construction sediment control and minimise clearance of vegetation</td>
<td>59 79</td>
</tr>
<tr>
<td>COEP 2 Section 2.4.1</td>
<td>• A clause must be included in all contract documentation which sets out the premise for environmental management as envisaged in these COEP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Road designs shall incorporate landscape aspects to fit the road shape into surrounding topography. Cut batters should be shaped or rounded to conform with adjacent landform</td>
<td>51 55 5.14 71 72</td>
</tr>
<tr>
<td>COEP 2</td>
<td>• All reasonable steps shall be taken to ensure minimum nuisance to adjacent land during construction</td>
<td></td>
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<td></td>
<td>• Plants, seedlings, and cutting used for revegetation should wherever possible be taken from the immediate area, and as close as possible to the restoration site</td>
<td></td>
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<tr>
<td>Section 2.4.2</td>
<td>• Minimise the extent of traffic and construction impacts on adjacent villages and other residential areas.</td>
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<td>• Dust control measures by dampening shall include description of where the water shall be collected from (i.e. whether from rain storage tanks or local watercourses), and number of watering trucks required. All care shall be taken to ensure excess water does not find its way to waterways. Hydrocarbons shall not be used as a method of dust control.</td>
<td></td>
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</tbody>
</table>
### COEP 5 - Construction Camps

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Reference to Items in Tables 4 - 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>COEP 5 Section 5.2</td>
<td>• Location of construction camps within flood plains, coastal hazard, and landslide prone areas shall be avoided. • Wherever possible construction camps shall be planned in areas that will have minimal adverse environmental effects</td>
<td>5.15</td>
</tr>
<tr>
<td>COEP 5 Section 5.3</td>
<td>• The consultant may specify the actual site of the construction camp or may specify the conditions that are to be met by the contractor in selecting, developing, maintaining and restoring such campsites.</td>
<td>5.15</td>
</tr>
<tr>
<td>COEP 5 Section 5.3.2</td>
<td>• If construction camps are to be located on private land, the contractor shall obtain the approval of the landowner to establish the campsite on such land and pay agreed compensation.</td>
<td>4.3</td>
</tr>
<tr>
<td>COEP 5 Section 5.3.3</td>
<td>• Construction camp shall be provided with the following minimal facilities:  o perimeter security fence  o canteen, dining hall, dormitories  o ablution block and sewage treatment / disposal  o sick bay and first aid station  o storage areas for fuel, materials, equipment  o stormwater management</td>
<td>5.15</td>
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</tbody>
</table>
## COEP 6 - Road Construction Erosion Control

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Reference to Items in Tables 4 - 8</th>
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<tbody>
<tr>
<td>COEP 6</td>
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<tr>
<td>Section</td>
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<tr>
<td>6.2.2</td>
<td>• Designer shall design and specify the construction of catch drains to provide erosion control, and must be appropriately lined to prevent scour.</td>
<td>5.10</td>
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<tr>
<td></td>
<td>• Catch drains shall be installed above cut batters where necessary to intercept overland flow of water, be located 2.0m from the edge of the batter.</td>
<td>5.11</td>
</tr>
<tr>
<td>6.2.4</td>
<td>• Toe drains shall be installed at the bottom of batters to prevent ponding, be designed with adequate capacity, and discharge to a grassed area.</td>
<td>5.10</td>
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<td>5.11</td>
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<tr>
<td>6.2.5</td>
<td>• Road side drains constructed to assist in stormwater management must be appropriately lined to prevent scour, have appropriately spaced turn outs that discharge to grassed areas (100 m maximum between turn outs), and have appropriately placed culverts to direct flow from one side of the road to the other</td>
<td>5.10</td>
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<td>5.11</td>
</tr>
<tr>
<td>6.2.6</td>
<td>• Batter protection shall be installed as soon as practical after the completion of any batter.</td>
<td>5.7</td>
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<td></td>
<td>5.9</td>
</tr>
<tr>
<td>6.2.7</td>
<td>• Designer shall detail and specify construction and maintenance of silt traps.</td>
<td>5.9</td>
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<td>5.10</td>
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<tr>
<td>6.2.8</td>
<td>• Road shoulders shall be surfaced with non-erodible material.</td>
<td>5.10</td>
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<td></td>
<td>• All shoulders should be grassed integral with the selected road side drain erosion protection system.</td>
<td>5.14</td>
</tr>
<tr>
<td>6.3.1</td>
<td>• All project work shall be undertaken with a conscious approach to the need for preventing or minimising erosion of any exposed earth surface.</td>
<td>5.14</td>
</tr>
<tr>
<td>6.3.2</td>
<td>• All batters in cut areas and all embankment batters shall be re-vegetated and protected against the effects of scour from surface water runoff.</td>
<td>5.14</td>
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<tr>
<td>6.3.7</td>
<td>• For Traps, Bench, Toe, and Roadside Drains - vegetation and the installation of erosion protection measures shall be established in the minimum possible time to mitigate against erosion from surface water run off</td>
<td>5.10</td>
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<td></td>
<td>• Outlets shall be discharged through silt traps or to silt retention ponds prior to prior to discharge to natural water courses.</td>
<td>5.14</td>
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<tr>
<td>6.3.8</td>
<td>• Silt fences shall be located in all temporary or permanent drains. They shall be maintained in sufficient operating condition throughout the construction and maintenance of the works.</td>
<td>5.10</td>
</tr>
<tr>
<td></td>
<td>• Wherever necessary and practicable, silt retention ponds shall be installed at the outlets to drainage systems constructed as a result of the works, and designed to have a retention volume of at least 1% of the contributing catchment area multiplied by a depth of 2 metres. The length to width ratio shall be 2:1. Ponds shall be cleaned out each time retained sediment reaches a depth of 1 metre.</td>
<td>5.10</td>
</tr>
<tr>
<td>6.3.9</td>
<td>• Discharges from silt retention ponds shall be preferably across grass swales and in any case shall be designed to avoid erosion of natural watercourses.</td>
<td>5.10</td>
</tr>
</tbody>
</table>
## COEP 7 - Slope Stability

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Reference to Items in Tables 4 - 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>COEP 7 Section 7.3.2</td>
<td>• Investigations shall determine the depth of soils overlying rock where cut batters are likely to expose rock.</td>
<td>511</td>
</tr>
<tr>
<td></td>
<td>• The existing groundwater levels shall be determined in cut and fill locations.</td>
<td>511</td>
</tr>
<tr>
<td>Section</td>
<td>Description</td>
<td>Reference to Items in Tables 4 - 8</td>
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</table>
| COEP 8 Section 8.2 | • Potential quarry sites shall be identified and discussed during public consultations with the purchase or lease of land for quarry development undertaken in terms of the procedures defined in COEP 4 – Land Acquisition and Compensation.  
• No quarry boundary should be located within 500 metres of a public area or town or village nor within 300 metres of any isolated dwelling.                                                                 | 5.13                             |
| COEP 8 Section 8.3 | • The Quarry Plan should contain the following:  
  o extent of overburden stripping and the stockpiling of same for later site restoration.  
  o details and location of surface water drainage from the quarry site and any silt retention pond constructed prior to its discharge to a natural water course.  
  o details of pond maintenance and the method of loading and transporting settled material to a waste soil disposal site as per COEP 6.  
  o details of catch drains as in COEP 6.  
  o safety precautions to be implemented, guardhouse, amenities block and other facilities  
  o aggregate stockpiles  
  o plant and equipment to be used in the development and operation of the quarry.  
  o proposed magazine for the storage of explosives.                                                                                                                                                           | 5.13                             |
| COEP 8 Section 8.3.2 | • So far as is possible the quarry shall be screened from view by the use of existing topography and trees.                                                                                                                                                                           | 5.13                             |
| COEP 8 Section 8.3.3 to 8.3.6 | • Safety provisions during operation of the quarry, first aid, health, (sanitation) and quarry manager qualifications must be as per COEP 8.                                                                                                                                              | 5.13                             |
| COEP 8 Section 8.3.7 | • A vegetation survey shall be undertaken to determine the presence of any rare plant species and all necessary steps taken to save plants classified as important.                                                                                                                                 | 5.13                             |
| COEP 8 Section 8.3.7 | • Vegetation shall be stripped and on no account shall burning of vegetation be permitted.                                                                                                                                                                                              | 5.13                             |
| COEP 8 Section 8.3.8 | • Overburden stall be stripped and stockpiled to be reapplied for site restoration after quarry operations cease                                                                                                                                                                        | 5.13                             |
| COEP 8 Section 8.3.9 | • Blasting operations shall be conducted in a manner that will not cause danger to life or property.  
• A blasting operations manual shall be prepared as per requirements in COEP 8.3.9                                                                                                                                                                 | 5.13                             |
| COEP 8 Section 5.3.10 | • Dust generation during blasting operations shall be minimised. All haul roads shall be regularly dampened by spray bars fitted to water tankers or similar systems in order to minimise dust generation by traffic movements. Crushers, screens and stockpiles shall be dampened by appropriate water sprays to minimise dust generation. | 5.13                             |
| COEP 8 Section 8.3.11 | • Should any archaeological sites be discovered during any stage of quarry development or operation all work shall immediately cease and MWTI/PUMA be notified forthwith. On no account shall extraction work continue until authorised by MWTI/PUMA.                                                                                       | 5.16                             |
| COEP 8 Section 8.4 | • A Development Consent (consent) from PUMA must be obtained prior to the commencement of any quarry operation and comply with provisions in COEP 8.4                                                                                                                                 | 5.16                             |
## COEP 9 - Gravel Extraction

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Reference to Items in Tables 4 - 8</th>
</tr>
</thead>
</table>
| COEP 9 Section 9.2 | • the total quantity of gravel to be extracted shall be estimated and the length, breadth, and depth of river over which gravel extraction is likely to be undertaken  
• physical and/or chemical tests on representative samples of aggregate shall be undertaken to ascertain that gravel deposits will in fact yield gravel of sufficient quality for the proposed end use. | 5.13 |
| COEP 9 Section 9.3.2 | • A Gravel Extraction Management Plan should contain the following:  
  o extremity of the river over which extraction is to be undertaken  
  o depth of excavation and proximity to the banks of the river  
  o existing trees and vegetation within 10 m of the top of bank  
  o condition of all plant and machinery to be used in the extraction process  
  o short-term downstream effects including any effect on potable water supplies | 5.13 |
| COEP 9 Section 9.3.3 | • All vegetation within a band 10 metres wide measured from the river bank on each side of the river shall be carefully protected throughout gravel extraction activity. No trees shall be removed from such a band. | 5.13 |
| COEP 9 Section 9.3.4 | • No excavation of gravel material shall be undertaken in proximity to a riverbank such that instability of the bank will occur. | 5.13 |
| COEP 9 Section 9.3.6 | • All practicable steps shall be taken to prevent an increase in the level of turbidity downstream of the extraction works. Such steps may include the construction of diversion channels, ponds with upstream settling areas or other screening systems that will minimise increased downstream turbidity. | 5.13 |
| COEP 9 Section 9.3.7 | • No gravel extraction works shall be undertaken within a distance of 1000 metres upstream or 200 metres downstream of the village water supply intake system. | 5.7 5.13 |
| COEP 9 Section 9.3.8 | • No fuel storage area or refueling of plant, vehicles or machinery shall be located within or adjacent to any river or within any river flood plain. All fuel storage areas shall be sealed to prevent the escape of spilled fuel or lubricants. All oil traps, drains and site restoration procedures shall be as for COEP 5 - Construction Camps. | 5.13 |
| COEP 9 Section 9.3.9 | • Riverbed is to be restored to an appropriate profile.  
• All access ramps shall be demolished and the material spread evenly over the riverbed. | 5.6 5.13 |
| COEP 9 Section 9.4 | • A Development Consent (consent) from PUMA must be obtained prior to the commencement of any gravel extraction and comply with provisions in COEP 9.4 | 5.16 |
**COEP 11 - Drainage**

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Reference to Items in Tables 4 - 8</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COEP 11 Section 11.2.1</strong></td>
<td>• In the design of bridge waterways and major culverts, care shall be taken to assess appropriate overland flow paths for the discharge of flood flows arising from extreme rainfall in excess of the specified design rainfall.</td>
<td>5.10</td>
</tr>
<tr>
<td><strong>COEP 11 Section 11.2.2</strong></td>
<td>• All permanent drainage channels shall be re-vegetated and protected against scour from surface water runoff.</td>
<td>5.10</td>
</tr>
<tr>
<td><strong>COEP 11 Section 11.2.3</strong></td>
<td>• On steep gradients and elsewhere where expected flow velocity is likely to scour grassed surfaces, impervious lining such as concrete shall be used.</td>
<td>5.10</td>
</tr>
<tr>
<td><strong>COEP 11 Section 11.2.4</strong></td>
<td>• All channel discharge locations shall be protected against erosion by broad grassed swales up to 20 metres in length designed to reduce velocity of flow to less than scour velocity and to trap or settle out suspended sediment particles prior to discharge to natural water courses. Where the installation of grassed swales is impracticable, channel discharge locations shall be protected against scour by the installation of rock rip rap or energy dissipation structures or similar scour protection systems.</td>
<td>5.10</td>
</tr>
<tr>
<td><strong>COEP 11 Section 11.2.5</strong></td>
<td>• All culverts inlets and outlets shall be protected against erosion. This will normally be achieved through the design of appropriate aprons, wing walls and head walls.</td>
<td>5.10</td>
</tr>
<tr>
<td><strong>COEP 11 Section 11.2.6</strong></td>
<td>• Where necessary to minimise culvert exit velocities and minimise the risk of downstream erosion, outlet structures shall include appropriate energy dissipation measures such as “dragons teeth”, standing wave flumes, drop structures or similar devices.</td>
<td>5.10</td>
</tr>
<tr>
<td><strong>COEP 11 Section 11.2.7</strong></td>
<td>• Bridge piers shall be designed to minimise bed scour.</td>
<td>5.13, 5.14</td>
</tr>
<tr>
<td><strong>COEP 11 Section 11.2.8</strong></td>
<td>• Where piers or abutments are located on riverbanks, erosion protection measures shall be incorporated in the design.</td>
<td>5.14</td>
</tr>
<tr>
<td><strong>COEP 11 Section 11.3</strong></td>
<td>• Prior to commencing site clearance work, topsoil stripping or earthworks, the contractor shall install temporary or permanent drainage channels, silt fences and silt retention ponds as are necessary to minimise the discharge of surface water containing sediment particles to any natural watercourse or on to land adjacent to the site of the works.</td>
<td>5.7, 5.13</td>
</tr>
<tr>
<td><strong>COEP 11 Section 11.3.3</strong></td>
<td>• The clearance of existing vegetation from the invert or banks at any bridge site shall be limited to just that area required for the construction of the works.</td>
<td>5.13</td>
</tr>
<tr>
<td><strong>COEP 11 Section 11.4</strong></td>
<td>• Phasing for construction of the bridge shall demonstrate that detailed and specified erosion protection works are to be constructed at the earliest possible time.</td>
<td>5.13</td>
</tr>
<tr>
<td><strong>COEP 11 Section 11.5</strong></td>
<td>• Development Consent (consent) from PUMA must be obtained prior to the commencement of any drainage work and comply with provisions in COEP 11.</td>
<td>5.6, 5.13</td>
</tr>
<tr>
<td>Section</td>
<td>Description</td>
<td>Reference to Items in Tables 4 - 8</td>
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</tr>
<tr>
<td>COEP 13 Section 13.2.1</td>
<td>• An Earthworks Plan must indicate erosion and sedimentation control measures</td>
<td>55</td>
</tr>
</tbody>
</table>
| COEP 13 Section 13.2.3 | • The Earthworks Plan shall consider all factors that contribute to erosion and sedimentation, including, but not limited to, the following:  
  a. The topographic or hydrographic features, or both, of the project area;  
  b. The types, depth, slope and area of the soils, coral and reef of the affected area;  
  c. The original state of the area as to plant and animal life and ecosystem functioning;  
  d. Whether any living coral reef, seagrass bed, mangrove, freshwater lake, sandy beach, or other valuable ecosystem may be affected by the earthworks;  
  e. The proposed alteration to the area;  
  f. The amount of runoff from the project area;  
  g. The staging of earthwork activities;  
  h. Temporary control measures and facilities for use during earthwork activities;  
  i. Permanent control measures and facilities for long-term protection;  
  j. A maintenance programme for the control facilities including disposal of materials removed from the control facilities or project area;  
  k. Whether a Marine Reserve Area (MRA) or other designated coastal area of special concern is in the vicinity;  
  l. Whether archaeological sites or other cultural resources are in the vicinity;  
  m. Whether designated tourism or fishery resources are in the vicinity;  
  n. The presence and vulnerability of nearby beaches to erosion. | 55                                |
| COEP 13 Section 13.6.1 | • A Development Consent (consent) from PUMA must be obtained prior to the commencement of any earthworks and comply with provisions in COEP 13.6                                                                                               | 416                                |
APPENDIX B

Section K2 Major Infrastructure, and Section K2.A Bridge of the National Building Code of Samoa, 2017
Major Infrastructure projects are structures serving the public including, but not limited to, the following:

(a) bridge

(b) marine structures - port, wharf, harbour, jetty, and pier, see Figure K2.B.1

(c) boardwalk, see Figure K2.B.1

(d) SEAWALL (including a BUILDING sited adjacent to a waterbody that acts as a seawall), see Figure K2.C.3

(e) recreational activities such as a zipline, skyrail, amusement rides

(f) dam and river protection

(g) major slope retention

(h) underground tanks

Major Infrastructure projects must comply with the following provisions in the NBC to ensure stability, safety and environmental protection:

(a) Section B Stability

(b) Section C Fire Protection

(c) Section D Access

(d) Section E Hazardous Substances

(e) Section G Site Servicing and Waste

(f) Section H Climate Change Adaptation

(g) Section J Natural Disaster Resilience

Design and construction must be appropriate to the following site characteristics:

(a) geological structure

(b) hydrological resources

(c) soil profile

(d) potential for DISASTERS - cyclones, tsunamis, earthquakes, landslips, and bushfire

(e) ecology and natural features

Safety features that must be incorporated into Major Infrastructure projects include:

(a) appropriate size and placement of fencing, barriers, and/or HANDRAIL where the change in grade exceeds 1.0 m - see Section D3.C Protection from Falling

(b) provision of even, non-slip surfaces in publicly accessible areas
appropriate lighting for user safety and security

(d) avoidance of details that would entrap a person inside or under a structure

(e) warning signs that are easily visible and located appropriately

(f) safety equipment for first aid and rescue

(g) provision of security measures to restrict access to non-public or dangerous areas

.5 An Operations and Maintenance Manual that includes a monitoring program and inspection schedule must be provided as part of the BUILDING PERMIT application.

.6 Protection of a Major Infrastructure project sited in close proximity to a shoreline, cliff or area prone to landslips must comply with the approved government prescribed plans for shoreline protection and coastal management for the location. Priority must be given, to the degree possible, to any, some or all of the following natural shoreline protection methods:

(a) dune and cliff stabilisation (dewatering)

(b) beach replenishment

(c) protection and installation of mangroves and/or other natural shoreline vegetative solutions

(d) planting vegetation along area subject to erosion

(e) re-location of Major Infrastructure away from area vulnerable areas

.7 Design, construction, operation, alteration and demolition of Major Infrastructure must be administered according to the Government of Samoa Code of Environmental Practice and any other policies, guidelines or legislation of the Government of Samoa.

DEEMED-TO-SATISFY PROVISIONS

K2.A Bridge

.1 Bridges intended primarily for vehicular use must be constructed of reinforced concrete or galvanised steel, unless the size, scale and use justifies the use of an alternate material.

.2 Pedestrian bridges may be constructed of DURABLE and weather-resistant timber, hot-dip galvanised steel, concrete, stone or a combination thereof. Minor pedestrian structures of a temporary nature (design life up to 20 years) may utilise seasoned hardwood treated with preservative or other suitable material.

.3 Design and construction of a bridge must be appropriate to:

(a) DEAD LOAD

(b) LIVE LOAD including pedestrians, livestock, bicycles and vehicles (cars, trucks, trains, motorcycles)
(c) collision loads
(d) kerb and barrier design loads
(e) earth pressure and seismic
forces (f) forces from water flow
(g) wind loads
(h) thermal effects
(i) shrinkage, creep and pre-stress effects, and friction

.4 Design of the bridge and grading at stream crossings must ensure the following:
   (a) sufficient clearance is provided above expected FLOOD levels
   (b) fill of excavated area is of sufficient strength to withstand river flows and FLOODING
   (c) BUILDING MATERIAL and by-products of construction do not contaminate or affect sensitive habitats

.5 Kerbs on both sides of the bridge, where used, must be even in height unless site conditions warrant an alternative.

.6 Design of railing, cables and all other features must ensure that clear horizontal and vertical sight lines are provided.

.7 The design of safety barriers, their layout, extent and their interface with rigid barriers must be in accordance with AS / NS 3845 – Road Safety Barrier System and the Australian Bridge Design Code (SAA HB77).

.8 Abutments and piers must be smooth textured and protected with a sealant appropriate for the easy removal of graffiti.

.9 Bridge design must incorporate CONDUIT for piped utilities (water supply, sewage) and electrical CONDUCTORS crossing the span whether it will be installed at the time of the bridge construction or at a later date.

**K2.B Port, Wharf, Harbour, Jetty, Pier and Boardwalk**

.1 Site selection for a port, wharf, harbour, jetty pier or boardwalk (see description in Figure K2.B.1) must be appropriate to:
   (a) tidal and wave action
   (b) shoreline natural and synthetic features
   (c) DISASTER potential - cyclones, tsunamis, earthquakes, landslips, bushfire
   (d) anticipated capacity for storage and handling of cargo, passengers and pedestrians
   (e) type of ships and mooring depth
   (f) potential danger to adjacent properties due to operation and handling of HAZARDOUS SUBSTANCES
APPENDIX C

Excerpts from Rare Plants of Samoa, published by Conservation International Pacific Islands, showing the characteristics of three rare plants found in the study area.
**Geodorum densiflorum** (Lam.) Schltr.  
**Cymbidium pictum** R.Br.  
**Dendrobium furcatum sensu** Kraenzl. non Lindl.  
**Dendrobium pictum** Lindl. (not in the Samoan literature)  
**Dendrobium tricarinatum** Schltr.  
**Geodorum furcatum sensu** Kraenzl.; non Lindl.  
**Geodorum pictum** (R. Br.) Lindl.  
**Geodorum tricarinatum sensu** Schltr.; non Lindl.  
**Limodorum densiflorum** Lam.

**SAMOAN NAME:** none  
**ENGLISH NAME:** none  
**STATUS:** rare indigenous  
**REASON FOR LISTING:** rarity of collections  
**SUGGESTED ACTION:** Botanical survey of the fernlands at Luatuanu’u and Tiave’a. It is most frequently found in lowlands in sunny places, such as the fernland areas noted above.

Indigenous to Samoa, ranging from India to Niue. In Samoa it occurs in open areas on Savai’i and ‘Upolu, such as fernlands, reported from near sea level to ca. 100 m or more in elevation. It has been collected only once in Samoa in the last century. No Samoan names or uses have been reported.

**Small terrestrial herb** 20–50 cm in height, with clustered, subglobose pseudobulbs 1.3–2.6 cm in diameter covered by scarious sheaths when young. **Leaves** 2–5, simple, alternate; blade ovate to elliptic-ovate, 18–40 × 4.5–7 cm, long-attenuate at the base, acute or acuminate at the tip; surfaces glabrous; margins entire; petiole sheath-like, 6–18 cm long. **Inflorescence** a several-flowered, erect raceme more or less as long as the leaves, rachis recurved when young, bearing linear lanceolate bracts 1–1.3 cm long; flowers borne mostly on the top of the rachis, pale pinkish white to pale purple with reddish marks and yellow blotches on the lip, ovary 5–9 mm long. Sepals similar, oblong-obovate, abruptly acuminate at the tip, 10–12 × 3–3.5 mm. **Petals** oblong to oblong-elliptic, obtuse to subacute at the tip, 9.5–11 × 3.5–4.5 mm. Lip cymbiform, slightly constricted in middle, weakly bilobed at the tip, saccate at the base, 11–13 × 10–12 mm; callus with a small transverse ridge at the base and warts or keels in front; column ca. 3 mm long; foot ca. 3 mm long. **Fruit** an ovoid to fusiform capsule 2.8–3.5 cm long. **Flowering** and **fruiting** probably occur throughout the year.

**Distinguishable** by its medium-sized terrestrial orchid habit; large leaves 18–40 cm long; pink flowers clustered on the upper portion of a raceme as long as the leaves and recurved when young; and large capsule 2.8–2.5 cm long.

**SAVAII:**
Vaupel 285—(Specimen not at Bishop Museum—lost?).  
Whistler 11742—Roadside near the old timber mill at Āsau.

**UPOLU:**
Reinecke 187 (“lost”)—“Stubelberg,” fernlands above Vailele.
PORTULACACEAE

Portulaca quadrifida L.

*Portulaca* (No. 3) sensu Pickering

**SAMOAN NAME:** tamole?

**ENGLISH NAME:** none

**STATUS:** rare Polynesian adventive

**REASON FOR LISTING:** rarity of modern collections

**SUGGESTED ACTION:** There is not much that can be done for this aboriginal weed other than look for it in disturbed areas of coastal villages of all the main islands. Probably an unintentional Polynesian introduction to Samoa, pantropic in distribution. This species could be native, since some other members of the genus (e.g., *Portulaca lutea*) have seawater-dispersed seeds. Although it occurs in sunny littoral habitats, it is more commonly found as a rare weed in villages and along gravelly trails, reported only from coastal areas. It has no reported Samoan name (although *tamole* may refer to the whole genus) or uses.

Prostrate succulent herb with stems up to 10 cm or more in length, rooting at the nodes, with conspicuous axillary hairs ca. 5 mm long around the node. **Leaves** simple, opposite; blade succulent, often somewhat reddish, ovate to oblong, 3–10 mm long, rounded at the base, acute at the tip; surfaces glabrous; margins entire; subsessile. **Inflorescence** of solitary terminal flowers, surrounded by an involucre of 4 leaf-like bracts. **Calyx** of 2 ovate sepals ca. 3 mm long, united at the base. **Corolla** of 4 obovate, yellow petals 4–5 mm long mostly rounded at the tip. **Ovary** superior, with free-central placentation; style 4-branched (3–5–). **Stamens** usually 8 (12), free. **Fruit** an obovate, circumscissile capsule 2–3.5 mm long, containing many tiny black seeds. **Flowering** and fruiting occur continuously.

**Distinguishable** by its tiny prostrate herb habit; conspicuously hairy leaf axils; tiny, opposite, succulent leaves; small yellow, 4-merous flowers; and many-seeded capsule opening by the top splitting off. It can be distinguished from the similar and more common, native *Portulaca samoensis*, which has 5-merous flowers, many of its leaves spirally arranged rather than opposite, and hairs only in the axils.

**SAVAII:**

USEE s.n.—Without further locality. Reinecke
428—Matāutu.

Rechinger 9—Gravelly volcanic soil in disturbed places in the Sātāua. Christophersen
704—Gravelly road at Sāmalae‘ulu.

**MANONO:**

Rechinger 524—Without further locality.
**Sida samoensis** Rechinger

_Sida parvifolia_ sensu auct. non DC.
_Sida retusa_ sensu auct. non L.
_Sida_ (No. 4) sensu Pickering

**SAMOAN NAME:** mautofu?

**ENGLISH NAME:** none

**STATUS:** rare Polynesian adventive

**REASON FOR LISTING:** rarity of modern collections

**SUGGESTED ACTION:** Botanical survey of the west side of Nu’utele Island and Manono to see if this species is still found in this disturbed habitat.

Possibly an unintentional Polynesian introduction to Samoa, native to Fiji and western Polynesia (despite the fact that it was named from Samoa). It would seem to be native since it has restricted regional distribution, but collections indicate that it does not occur in native habits. Instead, it is a minor weed in coastal villages and sunny disturbed places, reported only near the coast. It was probably much more common prior the European era, but has declined in frequency probably because of the competition with more aggressive weeds introduced during the last two centuries. No uses or Samoan names have been reported, unless people called it _mautofu_ (or some variation of this), which is applied to the larger, more common, and more conspicuous _Sida rhombifolia_.

Prostrate subshrub, much-branched, with finely stellate-pubescent stems up to 35 cm long, and equal, filiform, stipules 1–3 mm long. **Leaves** simple, alternate; blade orbicular to broadly ovate, 0.5–2.5 cm long, cuneate to rounded at the base, acute to obtuse at the tip; lower surface densely stellate-pubescent; margins serrate; petiole 3–5 mm long. **Inflorescence** of solitary, axillary and subterminal flowers. **Calyx** cup-shaped, 3.5–5 mm long, deeply divided into 5 broadly ovate, apiculate, strongly ribbed lobes, on thin pedicel 1–2 cm long. **Corolla** rotate, with 5 free, pale orange, obovate, unequally bilobed petals ca. 7–9 mm long. **Ovary** superior, usually 1-celled; stigma 5-lobed. **Stamens** many, monadelphous. **Fruit** a flattened-globose schizocarp 3–4.5 mm in diameter, breaking up at maturity into 5 mericarps, each with a pair of terminal awns ca. 1.5 mm long. **Flowering** and fruiting occur continuously.

**Distinguishable** by its prostrate, somewhat woody herb habit; small, alternate leaves with toothed margins; pale orange, 5-parted, monadelphous flowers lacking bracts below the calyx; and a rotate schizocarp that splits into 5 segments (mericarps), each bearing a pair of awns.

**SAVAI**:

USEE s.n.—“Growing near the coast,” without further locality. Vaupel 249—Matāutu (Bishop Museum, 26 October 1906).
Rechinger 1444—sandy beach area at Sāsina, near sea level.
Rechinger 1640—Dry soil at Āsau.
Rechinger 1719—Matāutu.
APPENDIX D: ESMP IMPLEMENTATION PLANS GUIDELINES

D.1. OHS Implementation Plans Guidelines
D.2 Codes of Conduct and Plans for ESHS, OHS, GBV and VAC Standards
D.3 Quarry Implementation Plan Guidelines
D.4 Waste Management Implementation Plan Guidelines
D.1: OHS IMPLEMENTATION PLAN GUIDELINES

1. Objective
The objective of this Code of Practice is to provide guidance on the:
- key principles involved in ensuring the health and safety of workers is protected;
- preparation of Health and Safety Code of Practices and associated Job Safety Analyses (JSA); and
- implementation of Health and Safety Code of Practices during project implementation.


2. Requirements
For the purposes of the project, in addition to the national OHS standards the Employer is adopting a code of practice for occupational health and safety based on good international industry practice.

The Employer’s Engineer is required to monitor OHS guidance during their regular duties. There will be monthly/bi-monthly independent OHS audits by a certified auditor as part of the consultant’s supervision team. The Contractor will be required to report monthly on their performance with the above indicators supplied during bidding, as well as:
- Number of alcohol tests
- Proportion of positive alcohol tests
- Number of site health and safety audits conducted by contractor
- Number of safety briefings
- Number of near misses
- Number of traffic management inspections
- Number of sub-contractor reviews
- Number of stop work actions
- Number of positive reinforcements

3. Principles
Employers must take all reasonable practicable steps to protect the health and safety of workers and provide and maintain a safe and healthy working environment.

The application of prevention and control measures to occupational hazards should be based on comprehensive job safety analyses (JSA). The results of these analyses should be prioritized as part of an action plan based on the likelihood and severity of the consequence of exposure to the identified hazards.

The following key principles are relevant to maintaining worker health and safety:

3.1 Identification and assessment of hazards
Each employer must establish and maintain effective methods for:
- Systematically identifying existing and potential hazards to employees;
- Systematically identifying, at the earliest practicable time, new hazards to employees;
- Regularly assessing the extent to which a hazard poses a risk to employees.

3.2 Management of identified hazards
Each employer must apply prevention and control measures to control hazards which are identified and assessed as posing a threat to the safety, health or welfare of employees, and where practicable, the hazard shall be eliminated. The following preventive and protective measures must be implemented order of priority:
• Eliminating the hazard by removing the activity from the work process;
• Controlling the hazard at its source through engineering controls;
• Minimizing the hazard through design of safe work systems;
• Providing appropriate personal protective equipment (PPE).

The application of prevention and control measures to occupational hazards should be based on comprehensive job safety analyses (JSA). The results of these analyses should be prioritized as part of an action plan based on the likelihood and severity of the consequence of exposure to the identified hazards.

3.3 Training and supervision

Each employer must take all reasonable practicable steps to provide to employees (in appropriate languages) the necessary information, instruction, training and supervision to protect each employee's health and to manage emergencies that might reasonably be expected to arise in the course of work. Training and supervision extends to the correct use of PPE and providing employees with appropriate incentives to use PPE.

To that end, all safety officers, supervisors and managers for the contractor and Employer's Engineer must have an appropriate level of OHS competency for the role they are fulfilling.

3.4 General duty of employees

Each employee shall:
• take all reasonable care to protect their own and fellow workers health and safety at the workplace and, as appropriate, other persons in the vicinity of the workplace;
• use PPE and other safety equipment supplied as required; and
• not use PPE or other safety equipment for any purpose not directly related to the work for which it is provided.

3.5 Protective clothing and equipment

Each employer shall:
• provide, maintain and make accessible to employees the PPE necessary to avoid injury and damage to their health;
• take all reasonably practicable steps to ensure that employees use that PPE in the circumstances for which it is provided; and
• make provision at the workplace for PPE to be cleaned and securely stored without risk of damage when not required.

4. Design

Effective management of health and safety issues requires the inclusion of health and safety considerations during design processes in an organized, hierarchical manner that includes the following steps:
• identifying project health and safety hazards and associated risks as early as possible in the project cycle including the incorporation of health and safety considerations into the worksite selection process and construction methodologies;
• involving health and safety professionals who have the experience, competence, and training necessary to assess and manage health and safety risks;
• understanding the likelihood and magnitude of health and safety risks, based on:
  o the nature of the project activities, such as whether the project will involve hazardous materials or processes;
  o The potential consequences to workers if hazards are not adequately managed;
• designing and implementing risk management strategies with the objective of reducing the risk to human health;
• prioritising strategies that eliminate the cause of the hazard at its source by selecting less hazardous materials or processes that avoid the need for health and safety controls;
• when impact avoidance is not feasible, incorporating engineering and management controls to reduce or minimize the possibility and magnitude of undesired consequences;
• preparing workers and nearby communities to respond to accidents, including providing technical resources to effectively and safely control such events;
• Improving health and safety performance through a combination of ongoing monitoring of facility performance and effective accountability.

For further information on safety in design see: http://tinyurl.com/ohs-safety-in-design.

5. Job Safety Analysis

The job safety analysis (JSA) is a process involving the identification of potential health and safety hazards from a particular work activity and designing risk control measures to eliminate the hazards or reduce the risk to an acceptable level. JSAs must be undertaken for discrete project activities such that the risks can be readily identified and appropriate risk management measures designed.

The annex to this Code of Practice includes a template for a JSA that must be completed and included as an attachment to the Health and Safety Code of Practice.

6. Implementation

6.1 Documentation

An OHS Management Plan must be prepared and approved and submitted as part of the CESMP prior to any works commencing on site.

The OHS Management Plan must demonstrate the Contractor’s understanding of how to manage safety and a commitment to providing a workplace that enables all work activities to be carried out safely. The OHS Management Plan must detail reasonably practicable measures to eliminate or minimise risks to the health, safety and welfare of workers, contractors, visitors, and anyone else who may be affected by the operations. The OHS Management Plan must be prepared in accordance with the World Bank’s EHS Guidelines, Samoa’s health and safety legislation, and industry best practices as appropriate.

6.2 Training and Awareness

Provisions should be made to provide health and safety orientation training to all new employees to ensure they are apprised of the basic site rules of work at/on the site and of personal protection and preventing injury to fellow employees. Training should consist of basic hazard awareness, site-specific hazards, safe work practices, and emergency procedures for fire, evacuation, and natural disaster, as appropriate.

Visitors to worksites must be provided with a site induction prior to entering and must be escorted at all times while on site. This induction must include details of site hazards, provision of necessary PPE and emergency procedures. Visitors are not permitted to access to areas where hazardous conditions or substances may be present, unless appropriately inducted.

6.3 Personal Protective Equipment (PPE)

Personal Protective Equipment (PPE) provides additional protection to workers exposed to workplace hazards in conjunction with other facility controls and safety systems.

The PPE requirements shall be clearly defined in the CESMP and be based on the New Zealand Transport Agency’s ZeroHarm approach (http://tinyurl.com/ohs-ppe-requirements). It should be noted that these PPE requirements also apply to site visitors, based on the assessed risk.

PPE is considered to be a last resort that is above and beyond the other facility controls and provides the worker with an extra level of personal protection. The table below presents general examples of occupational hazards and types of PPE available for different purposes. Recommended measures for use of PPE in the workplace include:
• active use of PPE if alternative technologies, work plans or procedures cannot eliminate, or sufficiently reduce, a hazard or exposure;
• identification and provision of appropriate PPE that offers adequate protection to the worker, co-workers, and occasional visitors, without incurring unnecessary inconvenience to the individual;
• proper maintenance of PPE, including cleaning when dirty and replacement when damaged or worn out. Proper use of PPE should be part of the recurrent training programs for Employees
- The selection of PPE should be based on the hazard and risk ranking described earlier in this section, and selected according to criteria on performance and testing established.

<table>
<thead>
<tr>
<th>Objective</th>
<th>Workplace Hazards</th>
<th>Suggested PPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye and face protection</td>
<td>Flying particles, molten metal, liquid chemicals, gases or vapors, light radiation.</td>
<td>Safety Glasses with side-shields, protective shades, etc.</td>
</tr>
<tr>
<td>Head protection</td>
<td>Falling objects, inadequate height clearance, and overhead power cords.</td>
<td>Plastic Helmets with top and side impact protection.</td>
</tr>
<tr>
<td>Hearing protection</td>
<td>Noise, ultra-sound.</td>
<td>Hearing protectors (ear plugs or ear muffs).</td>
</tr>
<tr>
<td>Foot protection</td>
<td>Falling or rolling objects, pointed objects. Corrosive or hot liquids.</td>
<td>Safety shoes and boots for protection against moving &amp; falling objects, liquids and chemicals.</td>
</tr>
<tr>
<td>Hand protection</td>
<td>Hazardous materials, cuts or lacerations, vibrations, extreme temperatures.</td>
<td>Gloves made of rubber or synthetic materials (Neoprene), leather, steel, insulating materials, etc.</td>
</tr>
<tr>
<td>Respiratory protection</td>
<td>Dust, fogs, fumes, mists, gases, smokes, vapors.</td>
<td>Facemasks with appropriate filters for dust removal and air purification (chemicals, mists, vapors and gases). Single or multi-gas personal monitors, if available.</td>
</tr>
<tr>
<td></td>
<td>Oxygen deficiency</td>
<td>Portable or supplied air (fixed lines). On-site rescue equipment.</td>
</tr>
<tr>
<td>Body/leg protection</td>
<td>Extreme temperatures, hazardous materials, biological agents, cutting and laceration.</td>
<td>Insulating clothing, body suits aprons etc. of appropriate materials.</td>
</tr>
</tbody>
</table>

7. Monitoring

Occupational health and safety monitoring programs should verify the effectiveness of prevention and control strategies. The selected indicators should be representative of the most significant occupational, health, and safety hazards, and the implementation of prevention and control strategies. The occupational health and safety monitoring program should include:

- **Safety inspection, testing and calibration**: This should include regular inspection and testing of all safety features and hazard control measures focusing on engineering and personal protective features, work procedures, places of work, installations, equipment, and tools used. The inspection should verify that issued PPE continues to provide adequate protection and is being worn as required.

- **Surveillance of the working environment**: Employers should document compliance using an appropriate combination of portable and stationary sampling and monitoring instruments. Monitoring and analyses should be conducted according to internationally recognized methods and standards.

- **Surveillance of workers health**: When extraordinary protective measures are required (for example, against hazardous compounds), workers should be provided appropriate and relevant health surveillance prior to first exposure, and at regular intervals thereafter.

- **Training**: Training activities for employees and visitors should be adequately monitored and documented (curriculum, duration, and participants). Emergency exercises, including fire drills, should be documented adequately.

- **Accidents and Diseases monitoring**: The employer should establish procedures and systems for reporting and recording:
  - Occupational accidents and diseases
  - Dangerous occurrences and incidents
These systems should enable workers to report immediately to their immediate supervisor any situation they believe presents a serious danger to life or health. Each month, the contractor shall supply the following data to the Employer’s Engineer for reporting to the client. These data are to also include incidents related to any sub-contractors working directly, or indirectly, for the Contractor.

### Lead Indicators vs. Lag Indicators

<table>
<thead>
<tr>
<th>Lead Indicators</th>
<th>Lag Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of drug and alcohol tests</td>
<td>Number of Fatal injuries</td>
</tr>
<tr>
<td>Proportion of positive drug and alcohol tests</td>
<td>Number of Notifiable Injuries</td>
</tr>
<tr>
<td>Number of site health and safety audits</td>
<td>Number of Lost Time Injuries (LTI)</td>
</tr>
<tr>
<td>Number of safety briefings</td>
<td>Number of Medical Treatment Injuries (MTI)</td>
</tr>
<tr>
<td>Number of near misses</td>
<td>Number of First Aid Injuries (FAI)</td>
</tr>
<tr>
<td>Number of traffic management inspections</td>
<td>Total Recordable Injuries</td>
</tr>
<tr>
<td>Number of Safety in Design workshops (Designers only)</td>
<td>Number of serious environmental incidents</td>
</tr>
<tr>
<td>Number of Safety in Design issues eliminated (Designers only)</td>
<td>Number of service strikes</td>
</tr>
<tr>
<td>Number of sub-contractor reviews</td>
<td>Number of property damage incidents</td>
</tr>
<tr>
<td>Number of stop work actions</td>
<td>Number of staff on reduced/alternate duties</td>
</tr>
<tr>
<td>Number of positive reinforcements</td>
<td>Lost Time Injury Frequency Rate (LTIFR)</td>
</tr>
<tr>
<td></td>
<td>Total Recordable Frequency Rate (TRFR)</td>
</tr>
</tbody>
</table>

Definitions of the above are to be in accordance with those used by the New Zealand Transport Agency [here](http://tinyurl.com/nzta-ohs-reporting).

The Employer’s Engineer shall be notified of any incident in accordance with the standards below:

<table>
<thead>
<tr>
<th>Incident Severity Class</th>
<th>Incident Classification</th>
<th>Notification timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 1</td>
<td>Fatality</td>
<td>As soon as possible</td>
</tr>
<tr>
<td></td>
<td>Notifiable Injury, Illness or Incident</td>
<td>As soon as possible</td>
</tr>
<tr>
<td>Class 2</td>
<td>Lost Time Injury</td>
<td>As soon as practicable but within 48 hours</td>
</tr>
<tr>
<td></td>
<td>Medical Treatment</td>
<td>Within 72 hours</td>
</tr>
</tbody>
</table>

All Class 1 and Class 2 health and safety incidents must be formally investigated and reported to the Employer’s Engineer through an investigation report. This report shall be based on a sufficient level of investigation by the Contractor so that all the essential factors are recorded. Lessons learnt must be identified and communicated promptly. All findings must have substantive documentation. As a minimum the investigation report must include:

- Date and location of incident
• Summary of events
• Immediate cause of incident
• Underlying cause of incident
• Root cause of incident
• Immediate action taken
• Human factors
• Outcome of incident, e.g. severity of harm caused, injury, damage
• Corrective actions with clearly defined timelines and people responsible for implementation
• Recommendations for further improvement
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<tr>
<td>Contact position:</td>
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<td>Contact phone number</td>
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<tr>
<td>Who are involved in the activity:</td>
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<td>Maintenance checks required:</td>
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<td>Personal protective equipment:</td>
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<tr>
<td>Certificates, permits and/approvals required</td>
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<tr>
<td>Relevant legislation, codes, standard MSDSs etc applicable to this activity</td>
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This job analysis has been authorised by:

Name: ........................................................................................................

Position: ....................................................................................................

Signature: ....................................................................................................

Date: .........................................................................................................
Risk assessment

**Use the risk rating table to assess the level of risk for each job step.**

<table>
<thead>
<tr>
<th>Consequence</th>
<th>Likelihood</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tbody>
<tr>
<td><strong>1</strong> Insufficient</td>
<td>Rare</td>
<td>LOW</td>
<td>LOW</td>
<td>LOW</td>
<td>LOW</td>
<td>MODERATE</td>
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<tr>
<td>No injuries or health issues</td>
<td>Unlikely</td>
<td>The event may occur in exceptional circumstances</td>
<td>LOW</td>
<td>LOW</td>
<td>MODERATE</td>
<td>MODERATE</td>
</tr>
<tr>
<td><strong>2</strong> Minor</td>
<td>Medical treatment, potential LTI</td>
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<td>HIGH</td>
<td>HIGH</td>
<td>CRITICAL</td>
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<tr>
<td>First aid treatment</td>
<td><strong>3</strong> Moderate</td>
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<td>MODERATE</td>
<td>HIGH</td>
<td>HIGH</td>
<td>CRITICAL</td>
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<tr>
<td><strong>4</strong> Major</td>
<td>Permanent disability or disease</td>
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<td>MODERATE</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>CATASTROPHIC</td>
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<tr>
<td><strong>5</strong> Extreme</td>
<td>Death</td>
<td>MODERATE</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>CATASTROPHIC</td>
<td>CATASTROPHIC</td>
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</tbody>
</table>

**Risk rating:**

Low risk: Acceptable risk and no further action required as long as risk has been minimised as possible. Risk needs to be reviewed periodically.

Moderate risk: Tolerable with further action required to minimise risk. Risk needs to be reviewed periodically.

High risk: Tolerable with further action required to minimise risk. Risk needs to be reviewed continuously.

Critical risk: Unacceptable risk and further action required immediately to minimise risk.

Catastrophic: Unacceptable risk and urgent action required to minimise risk.
Risk controls
The hierarchy of control can be used as an effective tool to deal with health and safety issues at work. Use the type of control suggested as measures to deal with the hazard. Aim to use control measures from as high on the hierarchy of control list as possible. If that is not possible the next option down the list or a combination of the measures should be implemented. The least effective control measure is the use of personal protective equipment (PPE) and it should be used as a last resort or a support to other control measures. Information and training should be integrated with all levels of control to explain how controls work.

1. **Eliminate** – if it is possible, the hazard should be removed completely. For example, get rid of dangerous machines.

2. **Substitute** – replace something that produces the hazard with something that does not produce a hazard. For example, replacing solvent based paint with water based paint. Risk assessment on the substitution must be conducted to ensure that it will not pose another hazard.

3. **Engineering control** – isolate a person from the hazard by creating physical barrier or making changes to process, equipment or plant to reduce the hazard. For example, install ventilation systems.

4. **Administrative control** – change the way a person works by establishing policies and procedures to minimise the risks. For example, job scheduling to limit exposure and posting hazard signs.

5. Use **personal protective equipment** (PPE) – protect a person from the hazard by wearing PPE. For example, wearing gloves, safety glasses, hard hats and high-visibility clothing. PPE must be correctly fitted, used and maintained to provide protection.
# JSA – Action steps

<table>
<thead>
<tr>
<th>Step No</th>
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<th>Potential hazards</th>
<th>Risk rating**</th>
<th>How to control risks***</th>
<th>Name of persons responsible for work</th>
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This job safety analysis has been developed through consultation with our employees and has been read, understood and signed by all employees undertaking the works:

Print Names:  
Signatures:  
Dates:  

<table>
<thead>
<tr>
<th>Review No</th>
<th>01</th>
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D.2: CODES OF CONDUCT AND ACTION PLAN FOR IMPLEMENTING ESHS AND OHS STANDARDS, AND PREVENTING GENDER BASED VIOLENCE AND VIOLENCE AGAINST CHILDREN

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1. Background

The purpose of these Codes of Conduct and Action Plan for Implementing ESHS and OHS Standards, and Preventing Gender Based Violence (GBV) and Violence Against Children (VAC) is to introduce a set of key definitions, core Codes of Conduct, and guidelines that:

i. clearly define obligations on all project staff (including sub-contractors and day workers) with regard to implementing the project’s environmental, social, health and safety (ESHS) and occupational health and safety (OHS) requirements, and;

ii. prevent, report and address GBV and VAC within the work site and in its immediate surrounding communities.

The application of these Codes of Conduct will help ensure the project meets its ESHS and OHS objectives, as well as preventing and/or mitigating the risks of GBV and VAC on the project.

Mutual respect and fair treatment between those working on the project and local communities is critical to a safe, respectful, and productive workplace and operating environment. GBV and VAC can be one of the most serious violations of respect and fair treatment which can harm the local community, and significantly damage trust and cooperation between parties.

These Codes of Conduct are to be adopted by those working on the project and are meant to:

i. create awareness of the ESHS and OHS expectations on the project;

ii. create common awareness about GBV and VAC and:
   a. ensure a shared understanding that they have no place in the project; and,
   b. create a clear system for identifying, responding to, and sanctioning GBV and VAC incidents.

Ensuring that all project staff understand the values of the project, understand expectations for all employees, and acknowledge the consequences for violations of these values, will help to create a smoother, more respectful and productive project implementation thereby helping ensure that the project’s objectives will be achieved.

2. Definitions

The following definitions apply:

- **Environmental, Social, Health and Safety (ESHS):** an umbrella term covering issues related to the impact of the project on the environment, communities and workers.
- **Occupational Health and Safety (OHS):** Occupational health and safety is concerned with protecting the safety, health and welfare of people engaged in work or employment. The enjoyment of these standards at the highest levels is a basic human right that should be accessible by each and every worker.
- **Gender-Based Violence (GBV):** is an umbrella term for any harmful act that inflicts physical, sexual, emotional or psychological harm or suffering to a person, threats of such acts, coercion, and other deprivations of liberty, which is based on power inequalities that are based on gender roles in which a perpetrator gains power and exerts control over the other person. These acts can occur in public or in private. GBV is abuses of power perpetrated against any persons because of their gender.
- **Violence against Women and Girls (VAWG):** is an umbrella term for any harmful act that is perpetrated against girls and women, expressly because she is a girl or woman, and that is based on socially ascribed (i.e. gender) differences between men and women. It includes acts that inflict physical, sexual, emotional or psychological harm or suffering, threats of such acts, coercion, and other deprivations of liberty and can occur in public or in private. Since women and children are most vulnerable to violence, VAWG specifically speaks to the power dynamics between men and women in which women are perceived to have less power than men.1

---

1 It is important to note that although disproportionately perpetrated against women and girls, violence can also be perpetrated against men and boys. While VAWG specifically relates to violence against women and girls, GBV relates to violence against persons of any gender, including men, boys, and transgender.
• **Violence Against Children (VAC):** is defined as physical, sexual, emotional and/or psychological harm, neglect or negligent treatment of minor children (i.e. under the age of 18), including exposure to such harm,\(^2\) that results in actual or potential harm to the child’s health, survival, development or dignity in the context of a relationship of responsibility, trust or power. This includes using children for profit, labor, sexual gratification, or some other personal or financial advantage. This also includes other activities such as using computers, mobile phones, or video and digital cameras appropriately, and never to exploit or harass children or to access child pornography through any mediums.

• **Sexual Harassment:** is unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature. Sexual harassment is not always explicit or obvious, it can include implicit and subtle acts but always involves a power and gender dynamic in which a person in power uses their position to harass another based on their gender. Sexual conduct is unwelcome whenever the person subjected to it considers it unwelcome. Ex. Looking somebody up and down; kissing, howling or smacking sounds; hanging around somebody; whistling and catcalls; giving personal gifts.

• **Accountability Measures:** are the measures put in place to ensure the confidentiality of survivors and to hold contractors, consultants and the client responsible for instituting a fair system of addressing cases of GBV and VAC.

• **Contractors Environmental and Social Management Plan (CESMP):** The plan prepared by the contractor as to how they will implement the works activities in accordance with the project’s environmental and social management plan (ESMP).

• **Child:** is used interchangeably with the term ‘minor’ and refers to a person under the age of 18.\(^3\) This is in accordance with Article 1 of the United Nations Convention on the Rights of the Child.

• **Child Protection (CP):** is an activity or initiative designed to protect children from any form of harm, particularly arising from VAC.

• **Consent:** is the informed choice underlying an individual’s free and voluntary intention, acceptance or agreement to do something. No consent can be found when such acceptance or agreement is obtained through the use of threats, force or other forms of coercion, abduction, fraud, deception, or misrepresentation. In accordance with the United Nations Convention on the Rights of the Child, the World Bank considers that consent cannot be given by children under the age of 18, even in the event that national legislation of the country into which the Code of Conduct is introduced has a lower age\(^4\). Mistaken belief regarding the age of the child and consent from the child is not a defense.

• **Consultant:** is any firm, company, organization or other institution that has been awarded a contract to provide consulting services in the context of the ERAP, to the project, and has hired managers and/or employees to conduct this work.

• **Contractor:** is any firm, company, organization or other institution that has been awarded a contract to conduct infrastructure development works in the context of the ERAP project and has hired managers and/or employees to conduct this work. This also includes sub-contractors hired to undertake activities on behalf of the contractor.

• **Employee:** is any individual offering labor to the contractor or consultant within country on or off the work site, under a formal or informal employment contract or arrangement, typically but not necessarily in exchange for a salary (e.g. including unpaid interns and volunteers), with no responsibility to manage or supervise other employees.

• **GBV and VAC Allegation Procedure:** is the prescribed procedure to be followed when reporting incidents of GBV or VAC.

• **GBV and VAC Codes of Conduct:** The Codes of Conduct adopted for the project covering the commitment of the company, and the responsibilities of managers and individuals with regards to GBV and VAC.

• **GBV and VAC Compliance Team (GCCT):** a team established by the project to address GBV and VAC issues.

• **Grievance Redress Mechanism (GRM):** is the process established by the VAIP project to receive and address complaints (see [www.vaip.vu](http://www.vaip.vu)).

• **Grooming:** are behaviors that make it easier for a perpetrator to procure a child for sexual activity. For example, an offender might build a relationship of trust with the child, and then seek to sexualize that relationship (for example by encouraging romantic feelings or exposing the child to sexual concepts through pornography).

---

\(^2\) Exposure to domestic violence is also considered VAC.

\(^3\) Samoa is party to this convention. [http://www.pseataskforce.org/uploads/tools/1478613357.pdf](http://www.pseataskforce.org/uploads/tools/1478613357.pdf)

\(^4\) The World Bank follows the United Nations for the age of consent (18 years) so this applies on World Bank financed projects.
Manager: is any individual offering labor to the contractor or consultant, on or off the work site, under a formal employment contract and in exchange for a salary, with responsibility to control or direct the activities of a contractor’s or consultant’s team, unit, division or similar, and to supervise and manage a pre-defined number of employees.

Online Grooming: is the act of sending an electronic message with indecent content to a recipient who the sender believes to be a minor, with the intention of procuring the recipient to engage in or submit to sexual activity with another person, including but not necessarily the sender.

Perpetrator: is the person(s) who commit(s) or threaten(s) to commit an act or acts of GBV or VAC.

Response Protocol: is the mechanisms set in place to respond to cases of GBV and VAC.

Sexual Favors: is a form of sexual harassment and includes making promises of favorable treatment (ie. promotion) or threats of unfavorable treatment (ie. loss of job) dependent on sexual acts—or other forms of humiliating, degrading or exploitative behavior.

Survivor/Survivors: is the person(s) adversely affected by GBV or VAC. Women, men and children can be survivors of GBV; children can be survivors of VAC.

Work Site: is the area in which infrastructure development works are being conducted, as part of the project.

Work Site Surroundings: is the ‘Project Area of Influence’ which are any area, urban or rural, directly affected by the project, including all human settlements found on it.

3. Codes of Conduct

This chapter presents three Codes of Conduct for use:

- **Company Code of Conduct**: Commits the company to addressing GBV and VAC issues;
- **Manager’s Code of Conduct**: Commits managers to implementing the Company Code of Conduct, as well as those signed by individuals; and,
- **Individual Code of Conduct**: Code of Conduct for everyone working on the project, including managers.
3.1 Company Code of Conduct

Company Code of Conduct
Implementing ESHS and OHS Standards
Preventing Gender Based Violence and Violence Against Children

The company is committed to ensuring that the project is implemented in such a way which minimizes any negative impacts on the local environment, communities, and its workers. This will be done by respecting the environmental, social, health and safety (ESHS) standards, and ensuring appropriate occupational health and safety (OHS) standards are met. The company is also committed to creating and maintaining an environment in which gender based violence (GBV) and violence against children (VAC) have no place, and where they will not be tolerated by any employee, associate, or representative of the company.

Therefore, in order to ensure that all those engaged in the project are aware of this commitment, the company commits to the following core principles and minimum standards of behavior that will apply to all company employees, associates, and representatives including sub-contractors, without exception:

General

1. The company—and therefore all employees, associates, and representatives—commits to complying with all relevant national laws, rules and regulations.
2. The company commits to full implementing its ‘Contractors Environmental and Social Management Plan’ (CESMP).
3. The company commits to treating women, children (persons under the age of 18), and men with respect regardless of race, color, language, religion, political or other opinion, national, ethnic or social origin, property, disability, birth or other status. Acts of GBV and VAC are in violation of this commitment.
4. The company shall ensure that interactions with local community members are done with respect and non-discrimination.
5. Demeaning, threatening, harassing, abusive, culturally inappropriate, or sexually provocative language and behavior are prohibited among all company employees, associates, and its representatives.
6. Respect reasonable work instructions (including regarding environmental and social norms)
7. Protect and ensure proper use of property (for example, to prohibit theft, carelessness or waste)

Health and Safety

8. The company will ensure that the project’s occupational health and safety (OHS) management plan is effectively implemented, including wearing prescribed personal protective equipment, preventing avoidable accidents and reporting conditions or practices that pose a safety hazard or threaten the environment.
9. The company will:
   a. prohibit the use of alcohol during work activities.
   b. The company will prohibit the use of illegal substances at all times.
10. The company will ensure that adequate sanitation facilities are available on site and at any worker accommodations provided by the contractor.

Gender Based Violence and Violence Against Children

11. Acts of GBV or VAC constitute gross misconduct and are therefore grounds for sanctions, which may include penalties and/or termination of employment. All forms of GBV and VAC, including grooming are unacceptable, regardless of whether they take place on the work site, the work site surroundings, at worker’s camps or at worker’s homes.
12. In addition to company sanctions, legal prosecution of those who commit acts of GBV or VAC will be pursued if appropriate.
13. Sexual contact or activity with children under 18—including through digital media—is prohibited. Mistaken belief regarding the age of a child is not a defense. Consent from the child is also not a defense or excuse.
14. **Sexual Harassment**—for instance, making unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct, of a sexual nature, including subtle acts of such behavior, is prohibited. Ex. Looking somebody up and down; kissing, howling or smacking sounds; hanging around somebody; whistling and catcalls; giving personal gifts; making comments about somebody’s sex life; etc. is prohibited.

15. **Sexual favors**—for instance, making promises or favorable treatment dependent on sexual acts—or other forms of humiliating, degrading or exploitative behavior are prohibited.

16. Unless there is full consent by all parties involved in the sexual act, sexual interactions between the company’s employees (at any level) and members of the communities surrounding the work place are prohibited. This includes relationships involving the withholding/promise of actual provision of benefit (monetary or non-monetary) to community members in exchange for sex—such sexual activity is considered “non-consensual” within the scope of this Code.

17. All employees, including volunteers and sub-contractors are highly encouraged to report suspected or actual acts of GBV and/or VAC by a fellow worker, whether in the same company or not. Reports must be made in accordance with GBV and VAC Allegation Procedures.

18. Managers are required to report suspected or actual acts of GBV and/or VAC as they have a responsibility to uphold company commitments and hold their direct reports responsible.

**Implementation**

To ensure that the above principles are implemented effectively the company commits to ensuring that:

19. All managers sign the ‘Manager’s Code of Conduct’ detailing their responsibilities for implementing the company’s commitments and enforcing the responsibilities in the ‘Individual Code of Conduct’.

20. All employees sign the project’s ‘Individual Code of Conduct’ confirming their agreement to comply with ESHS and OHS standards, and not to engage in activities resulting in GBV or VAC.

21. Displaying the Company and Individual Codes of Conduct prominently and in clear view at workers’ camps, offices, and in public areas of the work space. Examples of areas include waiting, rest and lobby areas of sites, canteen areas, health clinics.

22. Ensure that posted and distributed copies of the Company and Individual Codes of Conduct are translated into the appropriate language of use in the work site areas as well as for any international staff in their native language.

23. An appropriate person is nominated as the company’s ‘Focal Point’ for addressing GBV and VAC issues, including representing the company on the GBV and VAC Compliance Team (GCCT) which is comprised of representatives from the client, contractor(s), the supervision consultant, and local service provider(s).

24. Ensuring that an effective GBV and VAC Action Plan is developed in consultation with the GCCT which includes as a minimum:

   a. **GBV and VAC Allegation Procedure** to report GBV and VAC issues through the project Grievance Redress Mechanism (GRM);
   b. **Accountability Measures** to protect confidentiality of all involved; and,
   c. **Response Protocol** applicable to GBV and VAC survivors and perpetrators.

25. That the company effectively implements the GBV and VAC Action Plan, providing feedback to the GCCT for improvements and updates as appropriate.

26. All employees attend an induction training course prior to commencing work on site to ensure they are familiar with the company’s commitments to ESHS and OHS standards, and the project’s GBV and VAC Codes of Conduct.

27. All employees attend a mandatory training course once a month for the duration of the contract starting from the first induction training prior to commencement of work to reinforce the understanding of the project’s ESHS and OHS standards and the GBV and VAC Code of Conduct.

---

5 **Consent** is defined as the informed choice underlying an individual’s free and voluntary intention, acceptance or agreement to do something. No consent can be found when such acceptance or agreement is obtained through the use of threats, force or other forms of coercion, abduction, fraud, deception, or misrepresentation. In accordance with the United Nations Convention on the Rights of the Child, the World Bank considers that consent cannot be given by children under the age of 18, even in the event that national legislation of the country into which the Code of Conduct is introduced has a lower age. Mistaken belief regarding the age of the child and consent from the child is not a defense.
I do hereby acknowledge that I have read the foregoing Company Code of Conduct, and on behalf of the company agree to comply with the standards contained therein. I understand my role and responsibilities to support the project’s OHS and ESHS standards, and to prevent and respond to GBV and VAC. I understand that any action inconsistent with this Company Code of Conduct or failure to take action mandated by this Company Code of Conduct may result in disciplinary action.

Company name: _________________________
Signature: ___________________________
Printed Name: _______________________
Title: _______________________________
Date: _______________________________
3.2. Manager’s Code of Conduct

**Manager’s Code of Conduct**

**Implementing ESHS and OHS Standards**

**Preventing Gender Based Violence and Violence Against Children**

Managers at all levels have a responsibility to uphold the company’s commitment to implementing the ESHS and OHS standards, and preventing and addressing GBV and VAC. This means that managers have an acute responsibility to create and maintain an environment that respects these standards, and prevents GBV and VAC. Managers need to support and promote the implementation of the Company Code of Conduct. To that end, managers must adhere this Manager’s Code of Conduct and also sign the Individual Code of Conduct. This commits them to supporting the implementation of the CESMP and the OHS Management Plan, and developing systems that facilitate the implementation of the GBV and VAC Action Plan. They need to maintain a safe workplace, as well as a GBV-free and VAC-free environment at the workplace and in the local community. These responsibilities include but are not limited to:

**Implementation**

1. To ensure maximum effectiveness of the Company and Individual Codes of Conduct:
   a. Prominently displaying the Company and Individual Codes of Conduct in clear view at workers’ camps, offices, and in public areas of the work space. Examples of areas include waiting, rest and lobby areas of sites, canteen areas, health clinics.
   b. Ensuring all posted and distributed copies of the Company and Individual Codes of Conduct are translated into the appropriate language of use in the work site areas as well as for any international staff in their native language.
2. Verbally and in writing explain the Company and Individual Codes of Conduct to all staff.
3. Ensure that:
   a. All direct reports sign the ‘Individual Code of Conduct’, including acknowledgment that they have read and agree with the Code of Conduct.
   b. Staff lists and signed copies of the Individual Code of Conduct are provided to the OHS Manager, the GCCT, and the client.
   c. Participate in training and ensure that staff also participate as outlined below.
   d. Put in place a mechanism for staff to:
      i. report concerns on ESHS or OHS compliance; and,
      ii. confidentially report GBV or VAC incidents to the the Grievance Redress Mechanism (GRM)
   e. Staff are encouraged to report suspected or actual ESHS, OHS, GBV or VAC issues, emphasizing the staff’s responsibility to the Company and the country hosting their employment, and emphasizing the respect for confidentiality.
4. In compliance with applicable laws and to the best of your abilities, prevent perpetrators of sexual exploitation and abuse from being hired, re-hired or deployed. Use background and criminal reference checks for all employees.
5. Ensure that when engaging in partnership, sub-contractor or similar agreements, these agreements:
   a. Incorporate the ESHS, OHS, GBV and VAC Codes of Conduct as an attachment.
   b. Include the appropriate language requiring such contracting entities and individuals, and their employees and volunteers, to comply with the Individual Codes of Conduct.
   c. expressly state that the failure of those entities or individuals, as appropriate, to ensure compliance with the ESHS and OHS standards, take preventive measures against GBV and VAC, to investigate allegations thereof, or to take corrective actions when GBV or VAC has occurred, shall constitute grounds for sanctions and penalties in accordance with the Individual Codes of Conduct.
6. Provide support and resources to the GCCT to create and disseminate internal sensitization initiatives through the awareness-raising strategy under the GBV and VAC Action Plan.
7. Ensure that any GBV or VAC issue warranting police action is reported to the client and the World Bank immediately.
8. Ensure that any major ESHS or OHS incidents are reported to the client and the supervision engineer immediately.
Training

9. The managers are responsible to:
   a. Ensure that the OHS Management Plan is implemented, with suitable training required for all staff, including sub-contractors and suppliers; and,
   b. Ensure that staff have a suitable understanding of the CESMP and are trained as appropriate to implement the CESMP requirements.

10. All managers are required to attend an induction manager training course prior to commencing work on site to ensure that they are familiar with their roles and responsibilities in upholding the GBV and VAC elements of these Codes of Conduct. This training will be separate from the induction training course required of all employees and will provide managers with the necessary understanding and technical support needed to begin to develop the GBV and VAC Action Plan for addressing GBV and VAC issues.

11. Managers are required to attend and assist with the project facilitated monthly training courses for all employees. Managers will be required to introduce the trainings and announce the self-evaluations, including collecting satisfaction surveys to evaluate training experiences and provide advice on improving the effectiveness of training.

12. Ensure that time is provided during work hours and that staff prior to commencing work on site attend the mandatory project facilitated induction training on:
   a. OHS and ESHS; and,
   b. GBV and VAC required of all employees.

13. During civil works, ensure that staff attend ongoing OHS and ESHS training, as well as the monthly mandatory refresher training course required of all employees to combat increased risk of GBV and VAC.

Response

14. Managers will be required to take appropriate actions to address any ESHS or OHS incidents.

15. With regard to GBV and VAC:
   a. Provide input to the GBV and VAC Allegation Procedures and Response Protocol developed by the GCCT as part of the final cleared GBV and VAC Action Plan,
   b. Once adopted by the Company, managers will uphold the Accountability Measures set forth in the GBV and VAC Action Plan to maintain the confidentiality of all employees who report or (allegedly) perpetrate incidences of GBV and VAC (unless a breach of confidentiality is required to protect persons or property from serious harm or where required by law).
   c. If a manager develops concerns or suspicions regarding any form of GBV or VAC by one of his/her direct reports, or by an employee working for another contractor on the same work site, s/he is required to report the case using the GRM.
   d. Once a sanction has been determined, the relevant manager(s) is/are expected to be personally responsible for ensuring that the measure is effectively enforced, within a maximum timeframe of 14 days from the date on which the decision to sanction was made.
   e. If a Manager has a conflict of interest due to personal or familial relationships with the survivor and/or perpetrator, he/she must notify the respective company and the GCCT. The Company will be required to appoint another manager without a conflict of interest to respond to complaints.

16. Managers failing address ESHS or OHS incidents, or failing to report or comply with the GBV and VAC provisions may be subject to disciplinary measures, to be determined and enacted by the company’s CEO, Managing Director or equivalent highest-ranking manager. Those measures may include:
   f. Informal warning,
   g. Formal warning,
   h. Additional Training,
   i. Loss of up to one week’s salary.
   j. Suspension of employment (without payment of salary), for a minimum period of 1 month up to a maximum of 6 months.
   k. Termination of employment.

17. Ultimately, failure to effectively respond to ESHS, OHS GBV and VAC cases on the work site by the company’s managers or CEO may provide grounds for legal actions by authorities.

I do hereby acknowledge that I have read the foregoing Manager’s Code of Conduct, do agree to comply with the standards contained therein and understand my roles and responsibilities to prevent and respond to ESHS, OHS GBV
and VAC requirements. I understand that any action inconsistent with this Manager’s Code of Conduct or failure to take action mandated by this Manager’s Code of Conduct may result in disciplinary action.

Signature: ______________________

Printed Name: ______________________

Title: ______________________

Date: ______________________
3.3 Individual Code of Conduct

Individual Code of Conduct

Implementing ESHS and OHS Standards

Preventing Gender Based Violence and Violence Against Children

I, ______________________________, acknowledge that adhering to environmental, social health and safety (ESHS) standards, following the project’s occupational health and safety (OHS) requirements, and preventing gender based violence (GBV) and violence against children (VAC) is important. All forms of GBV or VAC are unacceptable be it on the work site, the work site surroundings, at worker’s camps, or the surrounding communities.

The company considers that failure to follow ESHS and OHS standards, or to partake in GBV or VAC activities, constitute acts of gross misconduct and are therefore grounds for sanctions, penalties or potential termination of employment. Prosecution of those who commit GBV or VAC may be pursued if appropriate.

I agree that while working on the project I will:

• Attend and actively partake in training courses related to ESHS, OHS, HIV/AIDS, GBV and VAC as requested by my employer.
• Will wear my personal protective equipment (PPE) at all times when at the work site or engaged in project related activities.
• Take all practical steps to implement the contractor’s environmental and social management plan (CESMP).
• Implement the OHS Management Plan.
• Adhere to a zero alcohol policy during work activities, and refrain from the use of illegal substances at all times.
• Consent to police background check.
• Treat women, children (persons under the age of 18), and men with respect regardless of race, color, language, religion, political or other opinion, national, ethnic or social origin, property, disability, birth or other status.
• Not use language or behavior towards women, children or men that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate.
• Not participate in sexual contact or activity with children—including grooming, or contact through digital media. Mistaken belief regarding the age of a child is not a defense. Consent from the child is also not a defense or excuse.
• Not engage in sexual harassment—for instance, making unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct, of a sexual nature, including subtle acts of such behavior. Ex. Looking somebody up and down; kissing, howling or smacking sounds; hanging around somebody; whistling and catcalls; giving personal gifts; making comments about somebody’s sex life; etc.
• Not engage in sexual favors—for instance, making promises or favorable treatment dependent on sexual acts—or other forms of humiliating, degrading or exploitative behavior.
• Unless there is the full consent6 by all parties involved, I will not have sexual interactions with members of the surrounding communities. This includes relationships involving the withholding or promise of actual provision of benefit (monetary or non-monetary) to community members in exchange for sex—such sexual activity is considered “non-consensual” within the scope of this Code.
• Consider reporting through the GRM or to my manager any suspected or actual GBV or VAC by a fellow worker, whether employed by my company or not, or any breaches of this Code of Conduct.

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6 Consent is defined as the informed choice underlying an individual’s free and voluntary intention, acceptance or agreement to do something. No consent can be found when such acceptance or agreement is obtained through the use of threats, force or other forms of coercion, abduction, fraud, deception, or misrepresentation. In accordance with the United Nations Convention on the Rights of the Child, the World Bank considers that consent cannot be given by children under the age of 18, even in the event that national legislation of the country into which the Code of Conduct is introduced has a lower age. Mistaken belief regarding the age of the child and consent from the child is not a defense.
With regard to children under the age of 18:

- Wherever possible, ensure that another adult is present when working in the proximity of children.
- Not invite unaccompanied children unrelated to my family into my home, unless they are at immediate risk of injury or in physical danger.
- Not sleep close to unsupervised children unless absolutely necessary, in which case I must obtain my supervisor’s permission, and ensure that another adult is present if possible.
- Use any computers, mobile phones, or video and digital cameras appropriately, and never to exploit or harass children or to access child pornography through any medium (see also “Use of children’s images for work related purposes” below).
- Refrain from physical punishment or discipline of children.
- Refrain from hiring children for domestic or other labor which is inappropriate given their age or developmental stage, which interferes with their time available for education and recreational activities, or which places them at significant risk of injury.
- Comply with all relevant local legislation, including labor laws in relation to child labor.

Use of children’s images for work related purposes
When photographing or filming a child for work related purposes, I must:

- Before photographing or filming a child, assess and endeavor to comply with local traditions or restrictions for reproducing personal images.
- Before photographing or filming a child, obtain informed consent from the child and a parent or guardian of the child. As part of this I must explain how the photograph or film will be used.
- Ensure photographs, films, videos and DVDs present children in a dignified and respectful manner and not in a vulnerable or submissive manner. Children should be adequately clothed and not in poses that could be seen as sexually suggestive.
- Ensure images are honest representations of the context and the facts.
- Ensure file labels do not reveal identifying information about a child when sending images electronically.

Sanctions
I understand that if I breach this Individual Code of Conduct, my employer will take disciplinary action which could include:

- Informal warning.
- Formal warning.
- Additional Training.
- Loss of up to one week’s salary.
- Suspension of employment (without payment of salary), for a minimum period of 1 month up to a maximum of 6 months.
- Termination of employment.
- Report to the police if warranted.

I understand that it is my responsibility to ensure that the environmental, social, health and safety standards are met. That I will adhere to the occupational health and safety management plan. That I will avoid actions or behaviors that could be construed as GBV or VAC. Any such actions will be a breach this Individual Code of Conduct. I do hereby acknowledge that I have read the foregoing Individual Code of Conduct, do agree to comply with the standards contained therein and understand my roles and responsibilities to prevent and respond to ESHS, OHS GBV and VAC issues. I understand that any action inconsistent with this Individual Code of Conduct or failure to take action mandated by this Individual Code of Conduct may result in disciplinary action and may affect my ongoing employment.

Signature: __________________________
Printed Name: __________________________
Title: __________________________
Date: __________________________
4. GBV AND VAC ACTION PLAN

GBV and VAC Action Plan

4.1 The GBV and VAC Compliance Team

The project shall establish a ‘GBV and VAC Compliance Team’ (GCCT). The GCCT will include, as appropriate to the project, at least four representatives (‘Focal Points’) as follows:

a. A safeguards specialist from the client;
b. The occupational health and safety manager from the contractor, or someone else tasked with the responsibility for addressing GBV and VAC with the time and seniority to devote to the position;
c. The supervision consultant; and,
d. A representative from a local service provider with experience in GBV and VAC (the ‘Service Provider’).

It will be the duty of the GCCT with support from the management to inform workers about the activities and responsibilities of the GCCT. To effectively serve on the GCCT, members must undergo training by the local service provider prior to the commencement of their assignment to ensure that they are sensitized on GBV and Child Protection.

The GCCT will be required to:

a. Approve any changes to the GBV and VAC Codes of Conduct contained in this document, with clearances from the World Bank for any such changes.
b. Prepare the GBV and VAC Action Plan reflecting the Codes of Conduct which includes:
   i. GBV and VAC Allegation Procedures (See 4.3)
   ii. Accountability Measures (See 4.4)
   iii. An Awareness raising Strategy (See 4.5)
   iv. A Response Protocol (See 4.6)
c. Obtain approval of the GBV and VAC Action Plan by company management;
d. Obtain client and World Bank clearances for the GBV and VAC Action Plan prior to full mobilization;
e. Receive and monitor resolutions and sanctions with regard to complaints received related to GBV and VAC associated with the project; and,
f. Ensure that GBV and VAC statistics in the GRM are up to date and included in the regular project reports.

The GCCT shall hold quarterly update meetings to discuss ways to strengthen resources and GBV and VAC support for employees and community members.

4.2 Making Complaints: GBV and VAC Allegation Procedures

All staff, volunteers, consultants and sub-contractors are encouraged to report suspected or actual GBV or VAC cases. Managers are required to report suspected or actual GBV and/or VAC cases as they have responsibilities to uphold company commitments and they hold their direct reports accountable for complying with the Individual Code of Conduct.

The project will provide information to employees and the community on how to report cases of GBV and VAC Code of Conduct breaches through the Grievance Redress Mechanism (GRM). The GCCT will follow up on cases of GBV, VAC and Code of Conduct breaches reported through the GRM.

4.3 Addressing Complaints about GBV or VAC

The figure below shows the process for addressing complaints.

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7 Where there are multiple contractors working on the project each shall nominate a representative as appropriate.
4.4 Grievance Redress Mechanism (GRM) for GBV and VAC

The project operates a grievance redress mechanism (GRM). Reports of GBV or VAC, other complaints, or other concerns may be submitted online, via telephone or mail, or in person.

All complaints regarding GBV and VAC for international consultants and foreign workers must immediately be reported to the World Bank task team. The GRM Manager will refer complaints related to GBV or VAC to the GCCT to resolve them. In accordance with the GBV and VAC Action Plan, the GCCT through the Service Provider and Focal Point(s) will investigate the complaint and ultimately provide the GRM Manager with a resolution to the complaint, or the police if necessary. The GRM operator will, upon resolution, advise the complainant of the outcome, unless it was made anonymously. Complaints made to managers or the Service Provider will be referred by them to the GRM for processing.

If the complaint to the GRM is made by a survivor or on behalf of a survivor, the complainant will be directly referred to the service provider to receive support services while the GCCT investigates the complaint in parallel.

4.5 Service Provider

The Service Provider is a local organization which has the experience and ability to support survivors of GBV or VAC. The client, the contractor(s) and consultant must establish a working relationship with the Service Provider, so that GBV and VAC cases can safely be referred to them. The Service Provider will also provide support and guidance to the GBV and VAC Focal Points as necessary. The Service Provider will have a representative on the GCCT and be involved in resolving complaints related to GBV or VAC.

4.6 GBV and VAC Focal Point

The GCCT will refer the complaint to the appropriate Focal Points for resolution (i.e. issues with contractor’s staff will be for the contractor to resolve; consultant’s staff the consultant; and client staff the client) and will advise the GCCT on potential resolutions, including referral to the police if necessary. They will be assisted by the Service Provider as appropriate.
All the Focal Points on the GCCT must be trained and empowered to resolve GBV and VAC issues. It is essential that all staff of the GRM and GCCT understand the guiding principles and ethical requirement of dealing with survivors of GBV and VAC. All reports should be kept confidential and referred immediately to the Service Provider represented on the GCCT. In GBV and VAC cases warranting police action, the Focal Points must appropriately refer the complaint to: (i) the authorities; (ii) the Service Provider; and, (iii) management for further action. The client and the World Bank are to be immediately notified.

4.7 Accountability Measures
All reports of GBV or VAC shall be handled in a confidential manner in order to protect the rights of all involved. The client, contractor and consultant must maintain the confidentiality of employees who notify any acts or threats of violence, and of any employees accused of engaging in any acts or threats of violence (unless a breach of confidentiality is required to protect persons or property from serious harm or where required by law). The contractor and consultant must prohibit discrimination or adverse action against an employee on the basis of survivor’s disclosure, experience or perceived experience of GBV or VAC (see Annex 1 for examples of actions to maintain accountability).

To ensure that survivors feel confident to disclose their experience of GBV or VAC, they can report cases of GBV or VAC through multiple channels a) online, b) phone, c) in-person, c) the local service provider, b) the manager(s), c) village councils, d) police. To ensure confidentiality, only the service provider will be privy to information regarding the survivor and only the GCCT will be privy to information regarding the perpetrator.

4.8 Monitoring and Evaluation
The GCCT must monitor the follow up of cases that have been reported and maintain all reported cases in a confidential and secure location. Monitoring must collect the number of cases that have been reported and the share of them that are being managed by police, NGOs etc.

These statistics shall be reported to the GRM and the Supervision Engineer for inclusion in their reporting.

In GBV and VAC cases warranting police action, the client and the World Bank are to be immediately notified.

4.9 Awareness-raising Strategy
It is important to create an Awareness-raising Strategy with activities aimed to sensitize employees on GBV and VAC on the work site and its related risks, provisions of the GBV and VAC Codes of Conduct, GBV and VAC Allegation Procedures, Accountability Measures and Response Protocol. The strategy will be accompanied by a timeline, indicating the various sensitization activities through which the strategy will be implemented and also the related (expected) delivery dates. Awareness-raising activities may be linked with trainings provided by the Service Provider.

4.10 Response Protocol
The GCCT will be responsible for developing a written response protocol to meet the project requirements, in accordance to national laws and protocols. The response protocol must include mechanisms to notify and respond to perpetrators in the workplace (See 4.8 for Perpetrator Policy and Response). The response protocol will include the GRM process to ensure competent and confidential response to disclosures of GBV and VAC. An employee who discloses a case of GBV or VAC in the workplace shall be referred to the GRM for further action.

4.11 Survivor Support Measures
Appropriately respond to the survivor’s complaint by respecting the survivor’s choices to minimize the potential for re-traumatization and further violence against the survivor. Refer the survivor to the Service Provider to obtain appropriate support services in the community—including medical and psychosocial support, emergency accommodation, security including police protection and livelihood support—by facilitating contact and coordination

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8 Survivors of GBV and VAC may need access to police, justice, health, psychosocial, safe shelter and livelihood services to begin on a path of healing from their experience of violence.

9 Develop appropriate protocol for written recording of GBV issues and VAC raised in case the notes are subpoenaed. Develop processes for record keeping including activities undertaken by the GCCT.
with these services. The client, contractor or consultant may, where feasible, provide financial and other supports to survivors of GBV or VAC for these services (see Annex 1 for examples of financial support).

If the survivor is an employee, in order to ensure the safety of the survivor and the workplace in general, the client, contractor or consultant, in consultation with the survivor, will assess the risk of ongoing abuse, to the survivor and to the workplace, and make reasonable adjustments to the work schedule and work environment as deemed necessary (see Annex 1 for examples of safety measures). The employer will provide adequate leave to survivors seeking services after experiencing violence (see Annex 1 for details).

4.12 Perpetrator Policy and Response
Encourage and accept notification through the GRM from employees and community members about perpetrators in the workplace. Through the GCCT and/or the Service Provider, oversee the investigation of these grievances, ensuring procedural fairness for the accused, and within the local laws. If an employee has breached the Code of Conduct, the employer will take action which could include:

a. Undertake disciplinary action up in accordance with sanctions in the GBV and VAC Codes of Conduct;
b. Report the perpetrator to the Police as per local legal paradigms; and/or
c. If feasible, provide or facilitate counselling for the perpetrator.

4.13 Sanctions
In accordance with the Code of Conduct, any employee identified as a potential GBV or VAC perpetrator shall be considered for disciplinary measures in line with sanctions and practices as agreed in the Individual Code of Conduct (see Annex 1 for examples of sanctions). It is important to note that, for each case, disciplinary sanctions are intended to be part of a process that is entirely internal to the employer, is placed under the full control and responsibility of its managers, and is conducted in accordance with the applicable national labor legislation.

Such process is expected to be fully independent from any official investigation that competent authorities (e.g. Police) may decide to conduct in relationship to the same case, and in accordance with the applicable national law. Similarly, internal disciplinary measures that the employer’s managers may decide to enact are meant to be separate from any charges or sanctions that the official investigation may result into (e.g. monetary fines, detention etc.).

4.14 Potential Procedures for Addressing GBV and VAC
Accountability Measures to maintain confidentiality can be achieved through the following actions:

1. Inform all employees that confidentiality of GBV/VAC survivors’ personal information is of utmost importance.
2. Provide the GCCT with training on empathetic and non-judgmental listening.
3. Take disciplinary action, including and up to dismissal, against those who breach survivor’s confidentiality (this is unless a breach of confidentiality is necessary to protect the survivor or another person from serious harm, or where required by law).

GBV and VAC Allegation Procedures should specify:

1. Who survivors can seek information and assistance from.
2. The process for community members and employees to lodge a complaint through the GRM should there be alleged GBV or VAC.
3. The mechanism for how community members and employees can escalate a request for support or notification of violence if the process for reporting is ineffective due to unavailability or non-responsiveness, or if the employee’s concern in not resolved.

Financial and Other Supports to survivors can include:

1. No/low interest loans.
2. Salary advances.
3. Direct payment of medical costs.
4. Coverage of all medical costs related specifically to the case. Coverage of physical costs until the survivor has physically recuperated. Coverage of emotional and psychological costs for at least 12 sessions for mental
recuperation or until resolution of the trauma.

5. Upfront payments for medical costs to be recouped from the employee’s health insurance.
6. Providing or facilitating access to childcare.
7. Providing security upgrades to the employee’s home.
8. Providing safe transportation to access support services or to and from accommodation.

Based on the rights, needs and wishes of the survivor, survivor support measures to ensure the safety of the survivor who is an employee can include:

1. Changing the perpetrator or survivor’s span of hours or pattern of hours and/or shift patterns.
2. Redesigning or changing the perpetrator or survivor’s duties.
3. Changing the survivor’s telephone number or email address to avoid harassing contact.
4. Relocating the survivor or perpetrator to another work site/alternative premises.
5. Providing safe transportation to and from work for a specified period.
6. Supporting the survivor to apply for an Interim Protection Order or referring them to appropriate support.
7. Taking any other appropriate measures including those available under existing provisions for family friendly and flexible work arrangements.

Leave options for survivors that are employees can include:

1. An employee experiencing GBV should be able to request paid special leave to attend medical or psychosocial appointments, legal proceedings, relocation to safe accommodation and other activities related to GBV.
2. An employee who supports a person experiencing GBV or VAC may take carer’s leave, including but not limited to accompanying them to court or hospital, or to take care of children.
3. Employees who are employed in a casual capacity may request unpaid special leave or unpaid carer’s leave to undertake the activities described above.
4. The amount of leave provided will be determine by the individual’s situation through consultations with the employee, the management and the GCCT where appropriate.

Potential Sanctions to employees who are perpetrators of GBV and VAC include:

- Informal warning
- Formal warning
- Additional Training
- Loss of up to one week’s salary.
- Suspension of employment (without payment of salary), for a minimum period of 1 month up to a maximum of 6 months.
- Termination of employment.

Referral to the Police or other authorities as warranted.

D.3. QUARRY MANAGEMENT PLAN GUIDELINES

1. Objective
This Guideline is based on COEP 8 and is to cross referenced with this COEP as it provides WB EHS requirements in addition to the government requirement set out in the COEP. The objective of this Guideline is to prescribe the safety requirements for the development and operation of quarries as well as to define procedures and works that shall be used to mitigate against adverse environmental effects. The quarry operations shall follow the principles of WorkSafe New Zealand’s guidance on health and safety good practice at opencast mines, alluvial mines and quarries (http://tinyurl.com/quarry-guide). It is recommended that all workers be provided with the associated pocket guide (http://tinyurl.com/quarry-pocket-guide).

Only in the case when extraction of material from the existing quarries is uneconomical or unsuitable, or alternative material sources are not available, then only the Contractor should establish a new quarry with prior environmental, social and legal approval.

2. Planning and Design

2.1 Quarry Sites

During the planning of a development project which will involve earthworks, potential quarry sites shall be identified. The potential sites shall be discussed during public consultations in regard to the project. Such potential sites shall be identified on plans drawn to an appropriate scale and the plans shall be displayed and discussed during public consultations.

It is the contractor’s responsibility to identify the specific sites to be used during construction in order to meet the project specifications.

2.2 Land Acquisition

The purchase or lease of land for quarry development shall be undertaken in terms of the procedures defined in the Land Acquisition and Resettlement Policy Framework (LARF or RPF). No quarrying is to be undertaken prior to the execution of a Land Use Agreement with the owners.

2.3 Site Plans

It is desirable that no quarry boundary is located within 500 metres of a public area or town or village nor within 300 metres of any isolated dwelling. The designer shall provide site plans of potential quarry sites in the tender documents. Such plans shall show existing level contours, access road, natural watercourses and other relevant topographical features.

The area defined for quarry operation shall be based on the volume of aggregate to be quarried and hence the extent of quarry operation. It shall also provide the area necessary for stockpiling stripped overburden, the establishment of a crusher and screening plant, the stockpiling of crushed aggregate and the installation of stormwater cut off drains, silt retention ponds and staff amenities.

3. Construction

3.1 Quarry Management Plan

All quarry operation shall be the entire responsibility of the contractor and shall be carried out in terms of the agreed management plan.

Prior to commencing any physical works on site, a quarry development plan shall be prepared and approved by the Employer’s Engineer and PUMA. The quarry management plan shall satisfy all DGMRW permit application requirement and ensuring due regard for the following:

- All operations shall comply with the laws of Samoa and the CRWCR PESMP.
- Show the extent of overburden stripping and the stockpiling of same for later site restoration.
- Document the methods of vegetation clearance, including the results of plant / habitat surveys and / or the plan to carry out such surveys.
- Show the details and location of surface water drainage from the quarry site and the silt retention pond that will be constructed to settle silt and soil contaminated water prior to its discharge to ground or a natural water course.
- Show details of catch drains installed to intercept overland flow of surface water to prevent its discharge into the quarry area.
- State safety precautions to be implemented.
- Show facilities such as guardhouse, amenities block and other facilities to be constructed.
• Show location of aggregate stockpiles.
• List plant and equipment to be used in the development and operation of the quarry.
• Show the site of the proposed magazine for the storage of explosives.
• Show sensitive environmental receptors (vegetation, waterways, neighbouring land uses)
• Community engagement strategy – how the community will be consulted, warned of blasting, traffic will be controlled, site safety maintained etc.
• Other relevant environmental controls based on an environmental impact assessment
• Basic rehabilitation plan
• Copies of all relevant licences (environmental permits, mining licences etc.)

On no account shall physical works be commenced for development of the quarry until an agreed Quarry Management Plan has been approved by the Supervision Engineer and cleared by the World Bank as compliant with the PESMP.

3.2 Safety Provisions

The following provisions shall be made in the operation of any quarry opened and/or operated by the Contractor for the safety of all employees or persons on site:
• All operations for quarries must comply with the OHS requirements of the PESMP.
• A daily register is to be maintained identifying all personnel who are engaged in or about the quarry.
• All persons engaged in the operation of the quarry shall be trained and have sufficient knowledge and experience in the type of operation in which they are engaged.
• All persons engaged in the operation of the quarry shall be adequately supervised.
• Approved lighting shall be provided in inside working places where natural lighting is inadequate to provide safe working conditions.
• All personnel engaged in quarry operations shall wear appropriate PPE at all times when on the quarry site.
• All employees engaged in operations on a quarry face at a height greater than 1.5 metres above the level of the quarry floor or bench floor shall be attached at all times to a properly secured safety rope by means of a safety harness.
• All persons whose duty it is to attend to moving machinery in or about any quarry shall wear close fitting and close fastened garments. Their hair shall be cut short or securely fixed and confined close to their head.
• All boilers, compressors, engines, gears, crushing and screening equipment and all moving parts of machinery shall be kept in a safe condition. Every flywheel and exposed moving parts of machinery shall be fitted with safety screens or safety fenced as appropriate.
• All elevated platforms, walkways and ladders shall be provided with adequate hand or safety rails or cages.
• Machinery shall not be cleaned manually while it is in motion nor oiled or greased while in motion.

Should any of the above safety measures be ignored or inoperative at any time then the Supervision Engineer shall direct that quarry operations cease until all safety measures are provided and are in operating order.

3.3 Provision of First Aid

At every quarry there shall be provided the following first aid equipment:
• A suitably constructed stretcher with a warm, dry blanket.
• A well equipped first-aid box.

The quarry manager shall at least once every working week personally inspect the first-aid equipment to ensure that it complies with the requirements of this specification. Any supplies used from the first-aid box shall be replaced forthwith. A person trained in first aid to the injured shall be available at the quarry during all operational periods of whatever nature.

3.4 Health Provisions

At every quarry a sufficient number of toilets and urinals shall be provided for the use of employees and shall be properly maintained and kept in a clean condition.

At every quarry a supply of potable water, sufficient for the needs of the persons employed, shall be provided. If persons are employed in places remote from the source of water supply, suitable clean containers of potable water shall be provided for their use.
Suitable facilities for washing shall be provided and maintained in a clean and tidy condition to the satisfaction of the employer, and those facilities shall be conveniently accessible for the use of persons employed in or about the quarry.

3.5 Quarry Manager

A manager who is experienced in all aspects of quarry operation and in particular safety procedures shall control every quarry. The manager shall be personally responsible for ensuring that all safety facilities are available and that safety procedures are followed.

The quarry manager shall have appropriate qualifications as recognised and required by GoV

When requesting the Supervision Engineer’s approval to operate the quarry, the contractor shall ensure that the credentials include certified true copies of the following documents:

- Grade quarry manager’s surface certificate
- Quarry shot firer’s certificate
- References from previous clients or employers demonstrating experience in:
  - The design and layout of quarries including the layout of benches, faces, access roads, drainage and crushing plant.
  - The methods of working quarry faces with particular reference to face stability and the safety of persons employed in or about the quarry
  - The safety of the public at large
  - The provision for and application of first aid.

The quarry manager’s duties shall include as a minimum:

- daily, within two hours immediately before the commencement of the first working shift of the day in any part of the quarry, inspect every working place and travelling road, and all adjacent places from which danger might arise, and shall forthwith make a true report of the inspection in a record book kept for the purpose at the quarry. The record book shall be accessible to the Supervision Engineer and the persons employed in or about the quarry.
- at least once in every 24 hours examine the state of the safety appliances or gear connected with quarrying operations in the quarry, and shall record the examination in the record book.
- once in each week carefully examine the buildings, machinery, faces, benches, and all working places used in the quarrying operations, and shall forthwith after every such examination record in writing in the record book his opinion as to their condition and safety and as to any alterations or repairs required to ensure greater safety of the persons employed in the working of the quarry. The manager shall then ensure that any such alterations or repairs are carried out.

3.6 Vegetation

Vegetation shall be stripped from the proposed quarry development area. Before stripping any vegetation a survey shall be undertaken to determine the presence of any threatened plant species or habitats of threatened animal species. All necessary steps shall be taken to save plants classified as important. Care shall be taken to avoid damage to any vegetation outside the defined quarry area. On no account shall burning of vegetation be permitted.

3.7 Overburden Stripping

Overburden stripped from any proposed quarry area shall be stockpiled clear of the quarry operation to be used for site restoration at the completion of operations. Stockpiles shall be shaped and smoothed to minimise ingress of rainwater. Surface water run off from stockpiles shall be intercepted by perimeter drains which shall be discharged to silt retention ponds.

Batters in overburden excavation shall be sloped to ensure they are safe and stable against failure. The maximum height of any batter in overburden shall be 3 metres. Any higher batter in overburden shall have an intermediate bench at least 3.5 metres in width. Such benches shall be shaped and drained.

3.8 Blasting Operations

Blasting operations shall be conducted in a manner that will not cause danger to life or property. All explosives shall be stored in purpose built locked magazines on a site within the quarry boundary but remote from blasting operations. Detonators shall be stored in a separate locked magazine but similarly sited.
A blasting operations manual shall be prepared for any quarry and such manual, which shall be maintained by the quarry manager, shall stipulate procedures for at least the following:

- Operation of magazines for the storage of explosives and for the storage of detonators.
- The quantity of explosive that may be removed from a magazine at any one time.
- The procedure for quarry explosive cases.
- Persons allowed to fire shots.
- Explosives to be carried in securely covered containers.
- Tamping of explosives.
- Diameter of drill holes.
- Time when charges are to be fired.
- Detonation delay.
- Firing warnings.
- Blasting shelters.
- Treatment of misfired charges
- Inspection of work site after each detonation by the quarry manager or an approved person appointed in writing by the quarry manager.

A person specially appointed in writing by the quarry manager for the purpose shall be in charge of every magazine, and shall have keys to one of the locks. That person shall be responsible for the safe storage of explosives contained therein, for the distribution of explosives therefrom, and for the keeping of accurate records of stocks and issues in a book provided for the purpose. A second person, appointed by the employer shall have keys to the second lock. Both persons shall be present to unlock the magazine, and note the removal of stock and ensure both locks are subsequently secured.

- Explosives shall be used in the same order as that in which they were received into the magazine.
- Naked lights shall not be introduced into a magazine or into any working place in a quarry where explosives are temporarily stored.
- Explosives shall not be taken from a magazine in quantities exceeding that required for use during one shift, and any surplus explosives shall be returned to the magazine at the end of that shift.
- No case or carton containing explosives shall be opened in the storage area of any magazine.
- Instruments made solely of wood, brass, or copper shall be used in opening cases or cartons of explosives, and the contractor shall provide and keep suitable instruments for that purpose.
- The preparation of charges and the charging, tamping, and firing of all explosive charges in or about a quarry shall be carried out under the personal supervision of the quarry manager.

### 3.9 Access/Haul Roads

- Access to a new quarry site may require construction of a new road or rehabilitation of an existing road. Construction of a new road, in a rural environment is may be permitted where it does not impact natural habitats or require resettlement. The rehabilitation / strengthening of an existing road is a preferred alternative and may involve widening of the road, replacement and /or strengthening of road pavement, improvements in drainage and side slopes, and repairs of culverts and bridges. It may also include realignment of a short stretch of the road.
- As part of the rehabilitation plan the Contractor may be required to restore roads to their condition prior to commencing quarrying works.

### 3.10 Workers Accommodation

Any accommodation provided by the Contractor for workers must comply with the worker’s accommodation requirements in the PESMP and CESMP.

### 3.11 Dust Suppression

Operation of any quarry shall incorporate dust suppression measures. Dust generation during blasting operations shall be minimised. All haul roads shall be regularly dampened by spray bars fitted to water tankers or similar systems in order to minimise dust generation by traffic movements. Crushers, screens and stockpiles shall be dampened by appropriate water sprays to minimise dust generation.
4. **Rehabilitation**

- Quarry rehabilitation shall be done in accordance with the principles of the CSI Guidelines on Quarry Rehabilitation (http://tinyurl.com/quarry-rehabilitation).
- A realistic Rehabilitation Plan will be developed and rehabilitation planning shall begin as early as possible in the quarry life cycle in order to be fully effective. Once objectives are set, rehabilitation activities should be defined and performed in order to achieve these goals.
- The objectives of a rehabilitation plan should be based upon the specific characteristics of the extraction site and should reflect:
  - Legislative requirements
  - Health and safety considerations
  - Environmental and social characteristics of the quarry and surrounding area
  - Biodiversity of area
  - Ecosystem services provided within the sites ecological boundaries
  - Operating plan for the quarry – technical feasibility of the rehabilitation objectives will be affected by the manner in which the quarry operates
  - Status of the quarrying area of existing operating site
  - Characteristics of the deposit (geology and hydrology)
  - Impacts arising from operation of the site
  - Post closure land use plan

Rehabilitation plans should adopt the following structure:

a. Context
b. Objectives
c. Action plans
d. Prioritised actions and schedule
e. Monitoring and evaluation
f. Rehabilitation and post-closure costs
g. Roles and responsibilities
h. Compatibility with biodiversity

5. **Consent**

5.1 **Consent Required**

In accordance with the Mines and Minerals Act, Quarry Permit Regulation Order No. 8 (2005) and any other relevant legislation, any person who engages in quarry development or operations shall first obtain Quarry Permit from DGMRW for the proposed activity.

5.2 **Application for Consent**

- Permit applications shall be on an approved form and shall be submitted by to the Commissioner. Applications shall be accompanied by such other documents as DGMRW may require. The Commissioner must not issue or renew any permit unless a copy of the application has been exhibited for a period of not less than 30 days at the headquarters of the area council of the local government council responsible for the land which is the subject of the application.

5.3 **Special Conditions**

- The Commissioner may, by notice served on the applicant, require further information in respect of the application as the Commissioner considers relevant or necessary. The applicant must comply with the notice.
D.4 WASTE MANAGEMENT IMPLEMENTATION PLAN GUIDELINES

1. **Objective**

The objective of this Sub-plan is to prescribe the requirements for the development of waste management sub-plans.

2. **Planning and Design**

As part of the Contractors ESMP (CESMP) prepared by the contractor waste management measures will be included in a waste management plan (WMP) to cover all matters related to solid and liquid waste disposal arising from construction related activities (including storage, disposal and accidental spills).

The Contractors will prepare a WMP based on national legislation and detailed prescriptions of the PESMP which will cover the following:

i. Assign responsibility of implementing the waste management plan to one designated person;

ii. Forecast the types and percentage of waste that will be produced by the contract:
   - Divide the listed waste streams into recyclable, reusable and refuse

iii. Describe recycling/reuse methods. Identify the possibilities for reuse and recycling for each type of waste that is created and describe these – where, how, and when to handle materials. The following must be considered:
   - Agreed reuse and recycling options and locations for disposal/endorsement from PUMA;
   - Recyclables to be recovered and sold to recognized recyclers;

iv. Identify waste destinations. Only existing consented disposal sites will be used. This section should consider:
   - Methods for treatment and disposal of all solid and liquid wastes;
   - Designation of waste disposal areas agreed with local authorities;
   - Residual waste to be disposed of in disposal sites approved by local authorities and not located within 500 m of rivers or streams;
   - Disposal of solid wastes into drainage ditches, rivers, other watercourses, agricultural fields and public areas shall be prohibited; and
   - All solid waste will be collected and removed from work camps and disposed in designated local waste disposal sites.

v. Material use and handling: Use this section to describe how waste will be sorted and stored on site before collection. This section should consider:
   - Provide details of how the various waste streams will be stored and labelled in the construction camp;
   - Provide instructions for the handling of all types of waste including detailed instructions for equipment needed when managing waste, as well as any safety procedures for waste crew;
   - Identification of licensed service providers for waste collection;
   - Establishment of regular disposal schedule and constraints for hazardous waste;
   - Program for disposal of general waste / chain of custody for hazardous waste;
- Segregation of wastes to be observed. Organic (biodegradable - such as tree trimmings) shall be collected, stockpiled and given to the local community (no burning is allowed on site);
- Camp, construction offices/facilities and work’s yard to be provided with garbage bins;
- Burning of construction and domestic wastes to be prohibited;

vi. Monitoring: The relevant monitoring requirements of the PESMP will be incorporated into the WMP and a designated person will be listed as being responsible for monitoring.

vii. Communication and training: Explain what will be done to educate and inform all project employees about the waste management system that has been established.
APPENDIX F

Printed References

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   Enhancement Road Access Project, Government of Samoa / AusAid, 2013
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http://www.worldwildlife.org/ecoregions/oc0112