

Section 5: Terms of Reference

GOVERNMENT OF SAMOA

INFRASTRUCTURE ASSET MANAGEMENT PROJECT IDA Credit Cr. 3193-WSO

TERMS OF REFERENCE FOR

Component C5: Land Administration and Survey

I. ABBREVIATIONS AND TERMS

CIM Plan	Coastal Infrastructure Management Plan
CIM Strategy	Coastal Infrastructure Management Strategy
COEP	Codes of Environmental Practice
EIA	Environmental Impact Assessment
GIS	Geographical Information System
GoS	Government of Samoa
IAM-1	Infrastructure Asset Management Project, Phase I
IDA	International Development Agency
MCDEM	New Zealand Ministry of Civil Defence and Emergency Management
MNRE	Ministry of Natural resources and Environment
MWTI	Ministry of Works, Transport and Infrastructure
PAD	Project Appraisal Document
PMU	Project Management Unit
PUMA	Planning and Urban Management Agency (a Division of MNRE)
SIAM-2	Infrastructure Asset Management Project, Phase II (previously called IAM-2)
SMP	Sustainable Management Plan under the PUMA Bill, 2003
<i>fono</i>	village council
<i>komiti</i>	committee
<i>matai</i>	chief
<i>pule</i>	customary authority
<i>pulenu'u</i>	government village representative

II. INTRODUCTION

- **Services Required:** The Government of Samoa (The Client) requires services for:

(a) *Survey and Geographic Information:* Although the GIS data produced under IAM-1 is based on a new national Samoa Integrated Grid (SIG), the Samoa survey control network is not sufficiently accurate to apply the grid to local engineering (especially with respect to level control) and cadastral survey around the country. It is proposed to upgrade the SIG control network to a standard suitable for cadastral survey, and to tie the currently used Lemuta cadastral datum¹ into the SIG². This is a

¹ The Lemuta datum was established in 1953 by traverse survey, and has an arbitrary origin located near the Observatory on Mulenu'u Peninsular. The Observatory datum, which also has its origin somewhere near the Observatory, is an even older datum that is sometimes used. It is proposed that this datum should be abandoned

prerequisite for the reform of the land administration system. This upgrade will allow all forms of information, whether GIS data collected from the aerial photographs, or detailed ground survey, to be accurately linked within databases for scientific, engineering, planning, management and policy development purposes. The associated survey regulations will also be upgraded to reflect to new survey standards³. At present, a number of agencies are collecting, using and storing geographic information based on different standards. It is proposed to develop technical standards that can be adopted by all relevant agencies to eliminate technical barriers to the exchange of information between agencies. These standards will be published by MNRE, probably through their webpage for convenient access⁴. This initiative is consistent with the GoS's draft policy on *Information and Communication Technologies* to ensure "cooperation between stakeholders."

(b) *Land Administration Reform*: The current system of land administration (registration and titling) is officially based on the Deeds system, although in practice aspects of the Torrens is also used. It is proposed to reform the land administration system to be based entirely on the Torrens system. Associated legislation and procedures will need to be developed, and extensive training and liaison provided for MNRE and industry stakeholders such as lawyers and surveying professionals). It is proposed to confine the land administration reforms to freehold and government land which is administered through MNRE. The system will be designed to allow *pule* (authority) over customary land to be recorded. Although it is not intended to incorporate the Lands and Titles Court in the reforms, relevant stakeholders will be consulted to see if there is any support for extending the reform initiative, perhaps under a separate project.

- **Project Description:** The Infrastructure Asset Management Programme (IAMP) is being funded under an International Development Assistance (IDA) Credit. The IAMP is an adaptable programme over an 8-year period. Phase 1 (IAM-1) has been completed on 31 March 2004. Phase 2 will start on April 19 2004 (SIAM-2). The overall goal of the IAMP is that "*Transport and coastal infrastructure assets are economically, environmentally and socially sustainable and managed by an effective partnership of all stakeholders*".

The Program will be implemented over a period of 8 years in two primary phases, as follows and meeting the targets shown in the table below:

IAM-1:	Meeting Vital Priorities and Strengthening Management (1999-2004)
SIAM-2:	Investing for Sustainable Growth and Protection (2004-2008).

- A summary of the Coastal, Environmental and Institutional Services under IAM-1, and the relationship to SIAM-2, is given in Annex A. A summary of the project design for the Sustainable Management Component of SIAM-2 is presented in Annex B. More complete details on the whole of IAM-1 and SIAM-2 can be found in PAD (1999, 2003).

III. OBJECTIVES AND SCOPE

altogether, and that in local areas where only Observatory datum benchmarks are available, survey lines will need to be extended on a case-by-case basis to tie into either the Lemuta or SIG marks.

² A preliminary attempt at this was done in 1995 by New Zealand resident surveyors without the benefit of high precision GPS to eliminate errors in the primary control. It is understood from anecdotal information that there may be differences in the Lemuta datum [*sic*] over different parts of the Islands.

³ MNRE propose to present draft Survey Regulations 2003 (originally prepared in 1995) to Cabinet later in 2003 for endorsement. These regulations cover technical standards, currently missing from the legislative portfolio, required for cadastral survey work. It is proposed that these regulations would be updated once the SIG is accurately established.

⁴ The standards will cover issues such as the precise definitions for geographical datums, projection standards, methods of datum conversion, topographical data dictionaries, and meta-data standards for layers and details used in geographical databases and drawing files.

- **Objectives:** The output goal for the Sustainable Management component of the IAMP is: “*infrastructure assets in coastal and other hazard zones, natural resources, land and national emergency systems are environmentally and socially sustainable*”. More detailed goals are:

1. *Sustainable management of coastal infrastructure is continued (from IAM-1) and extended to infrastructure in other hazard zones.*
2. *Restructured management of the use of land and natural resources and registration of land.*
3. *National emergency management systems are strengthened to achieve improved reduction, readiness, response and recovery.*

- The scope of this contract covers the goals defined in the second bullet points. The goals under the first and third bullet points will be addressed through a separate contract.

IV. IMPLEMENTING AGENCY

- The implementing agency for Task C5 is the Ministry of Natural Resources and Environment (MNRE). The MNRE is responsible for:

4. The administration, management, development, alienation, settlement, protection and care of Government land;
5. Government land negotiations and administration for registration/sale/purchase of Government Land;
6. Administration and commercial management of certain government properties;
7. Maintenance of trigonometrical and geodetic networks, benchmarks and the like, for the production and sale of land maps;
8. Establishment of standards and specifications for land spatial data, and the archiving and maintenance of resulting records;
9. Registration and valuation of lands;
10. Provision of advice, policy development, administration, regulation and maintenance of reserves for the management of natural resources and the environment;
11. Public education and awareness raising on environmental issues;
12. Provision of effective solid waste management and disposal for the Apia urban area; and
13. Urban development and planning;

- MNRE operates under MNRE Principal Act 2003, which incorporates the Lands Surveys and Environments Act, 1989. A Chief Executive Officer (CEO) heads the Ministry, overseeing and manages its full operation. There are six Divisions in the ministry, namely Corporate Services, Technical Services, Environment & Conservation, Land Management; Planning and Urban Management; Legal Division. An Assistant CEO heads each Division.

- The Consultant will report to the MNRE Project Component Manager. On this contract, the Consultants will also work closely with the Deputy CEO, Technical Services, the Chief Surveyor, and the Deputy CEO, Land Management, and their staff.

V. DESCRIPTION OF SERVICES REQUIRED

Inception Review

- Within one (1) month of commencement of the contract, complete an inception country visit to carrying out interviews with all relevant agencies and stakeholders, review facilities, assess existing institutional and individual capabilities, review records and data, and confirm (or recommend any changes to) the methodology, timetable, counterpart arrangements, sub-consultant and partner arrangements and activities, and proposed procurement arrangements, for completion of the project. Findings and detailed implementation plan are to be presented in an inception report outlining, in detail, the detailed described above. The consultant shall also develop and describe key performance and

progress indicators, and a risk management plan for the project (based on AS/NZS 4360 [*Risk Management*]), against which the project progress is to be assessed and risks are to be managed.

Survey and Geographic Information

- **Initial Review and Options:** Review the existing primary and secondary geodetic control networks, assess the accuracy and condition of existing survey marks, and identify upgrade requirements to ensure that the control network is suitable for future cadastral survey and ground control for aerial survey. As part of this review, the consultant shall, in consultation with MNRE, define and recommend appropriate standards for the network control. If appropriate, these standards may be based on standards already developed and applied in New Zealand or Australia. Recommendations for upgrade will cover, *inter alia*, requirements for establishment of new or additional survey marks, beacons and monuments, repair and maintenance of existing marks, re-survey of existing marks and survey of new marks to determine their precise coordinates under the geodetic new datum.
- The consultant shall prepare and submit a report of all work required to upgrade the geodetic control networks, including activities required, and detailed programme.
- **Upgrade Geodetic Datum:** In consultation with MNRE staff (survey and mapping), develop and prepare a complete definition and specification of, a geocentric datum for Samoa, and a complete definition for the Samoa Integrated Grid (SIG), that can be applied using modern GPS systems. At present, subject to the conclusions of the initial review, it is expected that:
 - a) The geodetic datum will continue to be based on the WGS72 ellipsoid, but with a locally assessed specific seven-point transformation (tied into the regional GPS base stations) to allow conversion from the WGS84/ITRF2000 geodetic reference frame to the WGS72 geodetic reference frames at a defined epoch.
 - SIG will continue to be based on a Transverse Mercator projection centred on meridian 172° W and the equator with a local scale factor of 1.000 000.
 - Mean sea level will be tied into the results of the work undertaken through Flinders University under the South Pacific Sea Level and Climate Monitoring Project (<http://www.pacificsealevel.org>) and data collected from the SEAFRAME [Sea level Fine Resolution Acoustic Measuring Equipment] network.
 - Corrections for plate movement will be based on the results of regional GPS programmes such as those published by Beavan *et al.* (2002) and the continuous GPS Station Network data collected by Geoscience Australia (<http://www.ga.gov.au/nmd/geodesy/spslcmp/samoa.htm>).
- **Geodetic Network Upgrade:** Implement all work required to establish or upgrade the survey marks, monuments, etc., undertaking all field survey, analysis and documentation to upgrade the network to the agreed standard. Note that permission for access onto other than government land will need to be arranged through MNRE.
- **Transformation Formulae:** Develop and specify transformation formulae (and embedded code spreadsheets, custom code, or definition files that can operate with industry standard geodetic analysis packages or accepted Internet downloadable products such as SNAP2/CONCORD2 [<http://www.linz.govt.nz>]) for the existing Lemuta survey circuits throughout Samoa to the new Samoa Integrated Grid. This is to allow existing surveys to be transformed to the new grid as necessary. Details of the transformations are to be incorporated in the Survey Manual.
- **Revise Survey Ordinances:** Review the Survey Ordinance and [draft] Survey Regulations 2003, recommend and draft changes required to incorporate the new geodetic standards. It is anticipated that the Survey Regulations may require only small modifications, but that the Ordinance may require a substantial overhaul and redrafting.

