

## TERMS OF REFERENCE (TOR)

### A. Project Title: *Pacific Resilience Programme*

**Activity Title: PREPSamoa/CON10B – Consultancy for the Design and Supervision of the Seismic Operation Centre (SOC).**

### B. Project Description

The Ministry of Natural Resources and Environment (MNRE), through the Samoa Meteorology Division (SMD) has the responsibility for providing quality data and warning information for earthquake, cyclones, tsunami, volcano, tides and oceans, climate and weather in Samoa. Recipients of such data and information are the general public, the Disaster Management Office, Disaster Advisory Committee, Media, private and other government sectors.

The existing National Data Centre (NDC) located on SMD premises in Mulinu'u is relatively small for operations and prone to flooding including during heavy rainfall, cyclones, storm surge and is also affected by sea level rise, king tides and risk of rust due to being closer to the sea. The NDC is the main operations centre which runs 24/7 and includes the seismic system for seismic analysis and the Seismic Operations Centre's (SOC's) core operations.

In efforts to ensure that the SOC is better placed to remain operational during extreme events, MNRE aims to construct a new SOC building in Tuanaimato (near the National Emergency Operations Centre (NEOC) building, see Appendix A) on a site that is less exposed to climate-related hazards.

The new SOC building will be used for routine day-to-day functions of the Geoscience Division currently responsible for the seismic and NDC operations. The building will be designed for phased future expansion, i.e., critical functions of the building will be constructed in the first phase (up to approximately 350 square metres (sqm) of floor space) and additional essential functions currently housed at the existing flood prone location at Mulinu'u may be constructed in future phases based on the availability of future funding.

The Government of Samoa will use a grant from IDA-World Bank under the Pacific Resilience Programme (PREP) for financing this consultancy for design, supervision for agreed critical building functions (up to 350 sqm).

### C. Objectives of Consultancy

This consultancy seeks a technical and financial proposal from the top ranked shortlisted firm or joint venture to design and supervise the construction of the new SOC building at Tuanaimato.

The selected firm (s) will:

- i) provide the required architectural and engineering designs and construction documentation (including drawings, specifications and schedules) for the new SOC building at Tuanaimato;
- ii) prepare the works bidding document including all relevant technical documents required to be included in the Bidding Documents package in conformity with laws and regulations of Samoa (including development control policies and the National Building Code) and the World Bank Procurement Guidelines;
- iii) prepare an Environmental & Social Impact Assessment (ESIA) Report – Preliminary Environmental Assessment Report (PEAR) or as otherwise required by the Planning Urban Management Agency (PUMA) – in conformity with the laws and regulations of Samoa, World Bank Guidelines, and the Environmental and Social Management Framework (ESMF) for PREP;
- iv) prepare and submit the Development Consent Application (DCA) to PUMA (based in Ministry of Works, Transport and Infrastructure, MWTI) for the development of the new SOC building including associated buildings and land development;

- v) prepare and submit the building permit application to MWTI for construction of new building;
- vi) provide technical advice as needed to the Samoa SOC Bid Evaluation Committee and PREP Project Implementation Unit (PIU) on the evaluation of the bids for the new SOC building;
- vii) supervise the construction of the new SOC building, including payments certification and quality assurance of all works;
- viii) design the SOC to maximise the current use of renewable sources of energy, mainly solar energy, to support the stand-by power generator and ensure the facility is energy efficient (considering also “passive” design opportunities such as window location and selection, passive cooling, optimal building orientation, building eave design), as well as seismic and flood resilience standards, and universal access design, per Samoa’s National Building Code 2017 (see link [www.mwti.gov.ws](http://www.mwti.gov.ws))
- ix) ensure the design of the new SOC building factors in landscaping and features to reflect and complement the nature of the site (based on site analysis findings); and
- x) include provision in the site plan for a) a cyclone shelter for staff; b) secured storage sheds; c) on-site back-up power soundproof shed; d) driveway, parking (including disability), and access ramps; as well as approximate costing for these.

#### D. Scope of Services

The Consultant shall provide the following services that consist of inter alia:

##### **Stage 1: Preliminary Design including Environmental & Social Impact Assessment**

The following main tasks are required for Stage 1:

**Task 1a: Development controls, Building codes, Surveys, Investigations and Tests:** The consultant shall:

- Review available data and reports and identify requirements of field surveys and other investigations for the identified site at Tuanaimato.
- Undertake initial assessments including site analysis (such as landscaping/vegetation, access and movement, urban design, traffic analysis, existing structures/infrastructure, stormwater/drainage, cultural heritage, etc.) to help determine the optimal building orientation and overall site/building design, as well as geotechnical, topographical, hydrological fieldwork, testing (if needed), investigations and analysis as required to determine depth and type of foundations, and flood-free ground floor levels.
- Advise which aspects of PUMA’s development control policies and other strategic planning documents are relevant to the project.
- Advise which aspects of Samoa’s National Building Code 2017 and other available and relevant national/regional documents are relevant to the project to ensure that the design is a seismic, fire, climate resilient and energy efficient design – among other building design aspects.
- Prepare a set of design criteria (reverse design brief) to meet the requirements of this brief (including as outlined in Appendix B) and the Samoa National Building Code 2017, including determination of appropriate design events and loading cases. If an alternative solution is used, it must be assessed for compliance with the performance requirements. This includes the nomination of any alternative International Design Standards (AS/NZ or similar).

**Task1b: Preliminary Design:** The preliminary design options (at least three different options) for the proposed building should be based on a single-story elevated floor construction and the key findings and recommendations of assessments per Task 1a including consideration of possible future phases. The preliminary design options will provide technical rationale of the proposed design option recommended after a cost benefit analysis, describe design criteria & parameters, proposed materials and finishes (external and internal), preliminary cost estimates, 3D visualizations of the concept design, additional survey and investigation requirements for detailed design, identify statutory requirements and proposed implementation procedures.

**Task 1c: Environmental & Social Impact Assessment:** The consultant shall appoint a suitably qualified individual to carry out an Environmental & Social Impact Assessment (ESIA) in conformity with the laws of

Samoa and in accordance with the Environmental and Social Management Framework (ESMF) carried out under the Pacific Resilience Program (PREP ESMF). The ESMF can be downloaded via the following link - <http://documents.worldbank.org/curated/en/2015/02/24096490/pacific-islands-pacific-resilience-program-prep-project-regional-environmental-social-management-framework>

The consultant shall ensure that the approved environmental & social management plan form part of the specifications of the bidding document.

***Task 1d: Application for Development Consent***

Upon the Government's approval of the preferred design option, the consultant shall prepare all the documentation, submission and payment of all necessary documents and plans to the relevant Samoan authorities for the Development Consent.

**Stage 2: Detailed Architectural Plans and Engineering Designs, Detailed Project Cost estimates and Technical Specifications and other relevant sections for the Bidding Documents**

***Task2a: Detailed Architectural and Engineering Drawings***

Once the agreed preliminary designs are approved by MNRE, the consultant will prepare the detailed architectural, engineering and building services documentation (including drawings, specifications, and schedules) taking into account the mitigation measures identified in the EIA report and the approved environmental management plan.

All the design should be in conformity with Samoan and/or applicable regional engineering standards. All necessary calculations will be prepared to determine and justify the engineering solution proposed for each component of the project, and will be incorporated into the design reports.

Detailed design documentation shall include a complete set of all drawings, specifications, schedules, construction details, bill of quantities, cost estimates, and other documentation needed to implement the project, including: geotechnical engineering design, architectural design, interior fitout design, structural design, building services (electrical, mechanical, fire protection and suppression, telecommunication and ICT networks, HVAC), utility services (potable water storage and distribution, sewage reticulation system, wastewater treatment and disposal system, standby power), site storm water collection and disposal and external works (such as landscaping, internal access, verandah, car parks, recreational space, fencing etc)

Architectural documentation shall include all dimensioned site plans, elevations, floor plans, sections and details, as well as door and window schedules, sanitary ware, fixtures and fittings, schedules of finishes etc. The design of the new SOC building should maximise the current use of renewable sources of energy to generate power and ensure the proposed facility is energy efficient – including “active” and “passive” design solutions. Provision of on-site back up power generator at least 100 meters from the building along with on-site secured storage space for Geoscience equipment, and fuel as needed for the generator plus hard stand should be included in design and bidding document.

Once all the detailed architectural and engineering designs are approved by MNRE, the consultant will lodge application for a building permit with MWTI, prepare all necessary works bidding document including Invitation to Bid (ITB), bid drawings, Specifications, Bill of Quantities (BOQ) (or Activity Schedules as agreed), implementation schedule, and quality control programs in conformity with the laws of Samoa and World Bank Procurement Guidelines and using standardised bidding documents (noting WB requirements take precedence should a conflict exist). The specifications will be detailed and should comply with the Samoa National Building Code and regional standards as applicable. The consultant will prepare a priced BOQ (or Activity Schedule) based on the market prices and prepare construction drawings with sufficient details to permit contractors to construct the works.

***Task 2b: Design Completion Report including Confidential Cost Report:*** The consultant shall prepare a detailed design completion report setting out the design parameters, design standards used, design

decisions made, preliminary construction schedule, engineering design calculations etc, and including a confidential cost report / priced BOQ / Activity Schedule based on the market prices for the entire project.

**Task 2c: Works Bidding Document:** The consultant shall prepare the bidding document for the construction of the building, services and site infrastructure using the World Bank (WB) Standard Procurement Document for Small Works (<http://pubdocs.worldbank.org/en/887291616532109684/SBD-Small-Works-Disqualification-mechanism-not-applied-March-2021.docx> ). The bidding documents will include instruction to bidders, employer's requirements, general and special conditions of contract, technical specifications, bill of quantities or activity schedules, drawings, forms of contract agreement, etc. and technical assistance for the Evaluation Committee and generally any information required for successful bidding and contract implementation.

The applicable WB Procurement Guidelines (January 2011, revised July 2014) are available via the enclosed link: <http://pubdocs.worldbank.org/pubdocs/publicdoc/2016/3/492221459454433323/Procurement-GuidelinesEnglishJuly12014.pdf>

**Task 2d: Building Permit:** Upon the Government's approval of the detailed architectural plans and engineering designs, the consultant shall prepare all the documentation, submission and payment of all necessary documents and plans to the relevant Samoan authorities for the Building Permit.

### Stage 3: Procurement Assistance

**Task 3a: Evaluation of the Bids:** The consultant will assist the Samoa Evaluation Committee to analyse and evaluate the bids received and provide technical inputs as well as prepare the draft bid evaluation report for review and finalization by the Evaluation Committee.

### Stage 4: Construction Supervision and Contract Administration

The consultant will be fully responsible to MNRE for supervision of construction works and day-to-day contract administration of the Works Contract related to the construction of the new SOC building. The consultant shall provide a suitably-qualified and experienced building professional who is capable of carrying out the duties of "Project Manager" as defined in the World Bank Standard Procurement Document (WB SBD) for Procurement of Small Works (March 2021). The consultant will be required to monitor, audit and perform independent testing of materials and systems put in place by the works contractor to verify their compliance with the required standards in accordance with the specifications. The consultant will carry out the supervision of the construction of the new SOC building and associated services as well as site infrastructure, and administer the works contract as the Project Manager / PM's representative. The main supervision of the construction works on a day to day basis tasks shall include *inter alia*:

- Monitor overall construction works from the aspects of quality, quantity, health and safety and progress of the project;
- Approval of materials for construction, approval of material tests and assessment of results of material testing, approval and monitoring of contractors work plan and progress of works, generally ensuring that all works are carried out as per drawing and specifications.
- Monitor construction methods, quality controls and onsite healthy and safety;
- Certify the quality of works conformance with the specifications and drawings, including review of shop drawings submitted by the contractor, providing the contractor with instructions, supplementary details and clarification of the contract documents as needed;
- Regular assessment of adequacy of the contractor's input materials, labour, equipment, and construction methods;
- Scrutinize construction methods proposed by contractor including environmental, safety, personnel and public issues and as needed any COVID safety measures;
- Ensure that the works are carried out in accordance with the approved detailed design documentation, conditions of the approved Development Consent and Building Permit, OSH Regulations 2017, approved Environmental and monitoring plans as recommended in the EIA report, as well as the PREP ESMF;
- Record the work measurement and quantities and provide certification;

- Ensuring that the contractor is at all times in possession of all data required for it to meet the contractual works program, through the timely issuing of contract documents, initial, updated and revised construction drawings as required;
- Regular site visits and overview of progress, with particular attention to ensuring contractors' adherence to the design and construction drawings and specifications. Maintain daily records of the activities on the site, site conditions, environmental and social safeguards aspects, and contractor's resources;
- Regular reviews of the contractor's works program;
- Regular consultations with MNRE in regards to impacts and safety requirements of construction to daily work, operation, flow of data, equipment, effects and so on so that proper advice can be given to contractor for the smooth flow of SMD work.
- Random (but at least fortnightly), review of the contractors' daily records, material-testing results, batch records, set-out survey records etc. and report to the MNRE;
- Random independent sampling and testing of contractor's materials to ensure compliance with the specifications;
- Review and monitor contractor's adherence to the Environmental & Social Management Plan (ESMP);
- Advise the MNRE of any matters of concern and proposals for their resolution;
- Prepare monthly supervision reports with support photos for the MNRE;
- Review and make recommendations on any claims submitted by the contractor for additional payments and extensions of time;
- Conduct formal site meetings with the contractor and keep minutes of matters of concern;
- Measure the actual quantities of work carried out and agree these with the contractor; keep appropriate records of measured work;
- Receipt and checking of contractor's monthly statements, preparation of Interim payment certificates and forwarding to the MNRE in a timely manner for due payment etc.;
- Confirm that works completion has been reached (issue the Occupation Certificate, manage other approvals and monitoring inspections as required by PUMA's development consent and MWTI's building permit) and advise the MNRE in writing accordingly;
- Prepare a post-occupancy Building Manual including as-built drawings, compliance certificates, warranties, instruction manuals, and contractor/sub-contractor details; and
- To assess any Variation request (with Cost estimate), provide recommendations for approval/rejection, and ensure MNRE has cleared these before proceeding.

The main works contract administration tasks shall include inter alia:

- Act as Project Manager's Representative
- Process the contractor's progress claims and validation of payment, issue interim payment certificates;
- Help to resolve all contractual issues and provide advice to MNRE on any dispute resolution issues;
- Carry out all revisions and detailed drawings as necessary during the contract implementation;
- Attend to third party inspections as necessary;
- Assess any contractor's claims for variations/extension, additional compensation, etc., and prepare recommendation for approval by MNRE;
- Prepare monthly progress reports;
- Prepare and certify as-built drawings for new building and sheds and services and the site infrastructure;
- Oversight of contractor's site management, safety and security plans to ensure visitors' and the general public around the area of work are safe, protected and secure from effects of dust, noise, ground vibrations, fumes etc during their working time.
- Record and issue notices of injuries/accidents or near misses in compliance with generally acceptable construction Occupational Safety and Health protocols;
- The consultant will be fully responsible to MNRE for supervision of construction works and administration of the Works Contract. The consultant will be required to monitor, audit and perform independent testing of materials and systems put in place by the works contractor to verify their compliance with the required standards in accordance with the specifications. The consultant's roles and responsibilities will include the following:
- The consultant has a specific responsibility to ensure that the engineered works are designed by engineer that is Samoan certified or registered with internationally recognized professional engineering institution, as applicable, and are constructed to the prescribed quality in accordance with the

specifications, bidding document and quality assurance systems. If an alternative solution is used, it must be assessed for compliance with the performance requirements of the Samoa Building Code. This includes the nomination of any alternative International Design Standards (AS/NZ, Eurocode or similar).

### Stage 5: Defects Liability Period

The Consultant must ensure to inspect the works at appropriate intervals during the Defects Liability Period (DLP) and issue confirmation of completed defects when the DLP ends. The Consultant must also ensure all tasks for this assignment will continue until the new SOC building construction is completed. It is expected that this assignment is for a total duration of sixteen months (plus a twelve (12) months Defects Liability Period). In the event the assignment goes beyond the project completion date, MNRE will fund the consultant's DLP inspection and final certificate production.

### E. Expected Outputs

The consultant shall deliver the following outputs:

| STAGE 1 OUTPUTS  |  |                            |
|--|--|----------------------------|
| Inception Report   | <p>Development Controls, National Building codes, Survey, Investigations and Tests:</p> <p>The consultant shall include:</p> <ul style="list-style-type: none"> <li>Carry out a review of Samoa's National Building Code 2017 and other available and relevant national/regional documents to ensure that the design is a seismic, fire, climate resilient and energy efficient design.</li> <li>Prepare a set of design criteria (reverse design brief) to meet the requirements of this brief and the Samoa National Building Code, International Design Standards (AS/NZ or similar) for MNRE endorsement.</li> <li>Detail any proposed changes to methodology, personnel, issues arising etc.</li> </ul> | 1 week after commencement  |
| Preliminary Design Report with cost benefit analysis and geotechnical report | <p>The preliminary designs will provide technical rationale of the proposed design options recommended after a cost benefit analysis, describe design criteria &amp; parameters, preliminary cost estimates, and identify statutory requirements and proposed implementation procedures.</p> <p>The report shall include a review of all activities in Stage 1, setting out possible design options, recommendations for preferred option based on a cost benefit analysis</p>   | 5 weeks after commencement |
| Environmental & Social Impact Assessment                                     | <p>Carry out an Environmental &amp; Social Impact Assessment (ESIA) as per the laws of Samoa and in accordance with the Environmental and Social Management Framework (ESMF) carried out under the Pacific Resilience Program. The ESMF can be downloaded via the following link - <a href="http://documents.worldbank.org/curated/en/2015/02/24096490/pacific-islands-pacific-resilience-program-prep-project-regional-environmental-social-management-framework">http://documents.worldbank.org/curated/en/2015/02/24096490/pacific-islands-pacific-resilience-program-prep-project-regional-environmental-social-management-framework</a></p>   | 6 weeks after commencement |

|   |   |   |
|---|---|---|
|   | The ESIA shall include an Environmental & Social Management Plan (ESMP).  |   |
| Application for Development Consent                             | The consultant shall prepare all the required documentation and submit applications to the relevant authorities for the Development Consent.  | 6 weeks after commencement  |
| <b>STAGE 2 OUTPUTS</b>  |   |   |
| Detailed Architectural and Engineering Drawings                 | Once the preliminary designs are approved by the MNRE, the consultant will prepare detailed architectural and engineering drawings taking into account the mitigation measures identified in the ESIA report and the approved Environmental & Social Management Plan.   | 3 months after commencement   |
| Design Completion Report  | On completion of detailed design, the consultant shall submit a detailed architectural and engineering design report setting out the design rationale, design parameters, design standards used, engineering design calculations, and a confidential cost report for the entire project.  | Draft: 3 months after commencement<br>Final: 1 month after draft  |
| Technical Specifications for all Works for the Bidding Document | The consultant shall prepare the Technical Specifications required for the bidding documents for the construction of the new building and sheds, services and site infrastructure. The documents to be submitted will include technical specifications for all works employer's requirements, detailed bill of quantities or activity schedules, drawings, etc. and generally any information required to complete Bidding Documents as per World Bank requirements and the laws of Samoa. The Consultant shall prepare the Works Bidding document including all the above information. | 1 month after MNRE approval is given for the detailed architectural and engineering drawings and design report. |
| Application for Building Permit                                 | The consultant shall prepare all the required documentation and submit applications to MWTI for the Building Permit.  | 1 week after MNRE approval is given for the detailed architectural and engineering drawings and design report.  |
| <b>STAGE 3 OUTPUTS</b>  |   |   |
| Draft Bid Evaluation Report                                     | The consultant shall prepare the evaluation report (in accordance with the Bank's Guidelines) to include clarifications and addendum/addenda issue to Bidders. Also document all activities leading up to the Final Bid Evaluation Report recommending the preferred Bidder. The consultant is also expected to provide technical assistance and advice to the Evaluation Committee when needed during evaluation of received bids.   | 2 weeks after Bid Evaluation Report is finalised  |

| <b>STAGE 4 OUTPUTS</b>        |  |  |
|-------------------------------|--|--|
| Monthly progress reports      | Concise review of construction progress and program, review of quality compliance, testing etc. Any physical, environmental, social, contractual issues arising and solutions proposed during the month. Should include minutes of all meetings, site instructions, photos etc   | 7 days after month end                                 |
| Payment Certificates          | All payment certificates in accordance with the conditions of works contract   | Monthly  |
| Certificate of Completion     | In accordance with the conditions of works contract  | When completed works are ready for taking over         |
| Contract Completion Report    | A Contract Completion Report will be submitted at the end of the assignment to serve as the final deliverable and trigger balance of payment. This report should include:<br><br>i) photos<br>ii) a full set of 'as built' plans including layout diagrams and text describing the finished products,<br>iii) commissioning and checks of all systems including water & sanitation, electrical, environmental, telecommunication etc; a detailed building maintenance schedule | At latest one (1) month after completion of all works. |
| <b>STAGE 5 OUTPUTS</b>        |  |  |
| Defects Liability Certificate | In accordance with the conditions of works contract  | On completion of all defects                           |
| Final Payment Certificate     | In accordance with the conditions of works contract  | On agreement of Final Account                          |

#### **F. Reporting Arrangement**

The consultant to undertake this work would work under the overall supervision of the ACEO, Acting ACEO or alternate of the SMD under the guidance of the CEO MNRE and, as directed report to the MNRE as required.

#### **G. Level of Effort and Duration of the Work**

It is estimated that the level of combined effort required to complete this assignment will be about 10 person-months of key experts. The selected consultant must ensure all tasks under Stages 1 and 2 of these terms of reference are completed within 4 months from the effective date of the contract. Stage 3 activities will continue until the SOC and sheds construction are completed. The schedule of tasks is presented in Section D of this Terms of Reference.

Also note that this assignment is in 4 stages whereby Stage 1 & 2 will be administered under a Lump Sum Contract and Stage 3 & 4 will be administered under a Time-based Contract.

## H. Duty Station

The consultant will be based at the current SMD, located at Mulinu'u, Samoa during Stage 1. The majority of Stage 2 work may be completed at the consultant's home base but a short visit to Samoa if it is an overseas firm, and will be required to submit designs to MNRE, obtain necessary approvals and prepare final documentation towards the end of Stage 2. Stage 3 will require the consultant to appoint an onsite supervision team to oversee day-to-day operation and for key members of the consultant team to make visits to Samoa if the firm is from overseas as and when necessary in order to satisfy the remit of this Terms of Reference. Stage 4 will require occasional visits to site.

## I. Qualifications of the Successful Consultant

Key and non-key experts needed to complete the scope of this assignment. Non-key experts other than those necessary to fulfil the Terms of Reference may also be proposed. Staff should have a minimum level of qualifications and experience as follows:

| KEY EXPERT  | EXPECTED TIME -<br>INPUTS (STAGE 1 &2) | MINIMUM QUALIFICATIONS & EXPERIENCE  |
|---|--|--|
| Project Director                                  | 0.5 month                              | Graduate architect or civil / structural engineer with ten years' experience in project management and design and construction supervision of large commercial, industrial or institutional buildings  |
| Design / Supervision Team Leader / Architect      | 4 months                               | Graduate architect with ten years' post-graduate experience, minimum 7 years design and construction supervision of institutional building works, including incorporation of resilience, energy efficiency, environmental sustainability, and universal access design standards                                      |
| Civil / Structural Engineer                       | 1.5 months                             | Professionally registered / certified graduate civil / structural engineer, with seven (7) years' experience of construction supervision including concrete, steelwork, timberwork, earthworks, paving, stormwater drainage, water supply & waste pipework   |
| Electrical / Mechanical Engineer                  | 0.5 month                              | Graduate in building / engineering related studies, with (7) seven years' experience of supervision of electrical and mechanical services installations  |
| Environmental / Social Safeguards Specialist      | 1 month                                | First Degree in environmental engineering or similar discipline + 10 years' with experience in drafting EIA Report and Development Consent applications;<br><br>Ten (10) years' of relevant work experiences, within the Pacific Region and abroad, also within the last 5years directly related recent experiences; |
| Clerk of Works / Site Inspector 3 (architectural) | 3 months                               | Diploma in building/engineering related studies, with 7 years' experience of supervision of building trades and architectural finishes.  |

| NON-KEY EXPERT        | EXPECTED INPUT (STAGE 1 & 2) | MINIMUM QUALIFICATIONS & EXPERIENCE  |
|-----------------------|------------------------------|--|
| Geotechnical Engineer | 0.5 months                   | Experienced and professionally qualified geotechnical engineer with minimum seven (7) years' experience in geotechnical investigation, assessments, analysis and reporting. Geotechnical engineer's specific experience should include (but not be limited to), the following:<br><br>field/site investigations; soil investigations; analysis; geotechnical engineering calculations; and making technical recommendations for building foundations; structural design considerations; and appropriate site preparation procedures. |
| Quantity Surveyor     | 0.75 months                  | Experienced and professionally qualified quantity surveyor with minimum seven (7) years' experience in quantity surveying including preparing cost estimates and plans, preparing material estimates, management costs and contracts, and assessing cost impacts to design options/changes.  |

#### J. Schedule of Payments Stages 1& 2

The schedule of payments against key milestones is indicated in the table below:

| Deliverable/Outputs   | Deadline (Date)   | % Payment Subject to Acceptance by MNRE |
|---|---|---|
| Inception Report  | 1 week after commencement   | 10%                                     |
| Design criteria and Preliminary Design Report with cost benefit analysis  | 5 weeks after commencement  | 15%                                     |
| ESIA including Environmental & Social Management Plan; Detailed Architectural Plans and Engineering Drawings; Cost Estimate Report; | 3 months after commencement   | 25%                                     |
| Technical Specifications for all Works for the Bidding Document and prepare Bidding Document for all works                          | 1 month after MNRE approval of detailed architectural plans, engineering drawings & cost report.<br><br>Successful submission of the Development Consent and Building Permit. | 10%                                     |
| Final Bid Evaluation Report completed and approved by Client  | 2 weeks after Bid Evaluation cleared by WB  | 10%                                     |

| Deliverable/Outputs                              | Deadline (Date)                         | % Payment Subject to Acceptance by MNRE |
|--|---|---|
|  |   |   |
| Construction Supervision and Contract Monitoring | Quarterly based on payment certificates | 30%                                     |

The payments will be made upon submission of the deliverable/outputs and approval by the Client for stage 1 and stage 2.

Appendix A – Aerial View of the New Location for the New Seismic Operations Centre



## Appendix B: Requirements of the Seismic Operation Center (SOC) Building

The SOC works will comprise the construction of:

- a new SOC building with a suitable finished floor level height in relation to flood level and universal access design.
- a small shed for storage space (storage for spares of geo-science equipment and parts)

During the initial phase, the PREP project will finance the critical building functions up to 350 m<sup>2</sup> of total floor space to be constructed, while additional spaces may be constructed in future phase(s). The building should provide a safe working environment for staff members of all genders, e.g., through adequate lighting and building entrance design.

### National Data Centre

- Main operations centre to include seismic system for seismic analysis and core operations: 6 hot desks to fit 6 shift workers working 24/7.

### Staff Offices

- 1 separate executive room for ACEO, 1 separate standard office for Principal Officer
- 5 general offices with work stations for the rest of the staff.

### Facilities Rooms

- A Server room (Visual/Audio recording/storage)
- Entry and Reception Area (with public display walls etc. for school educational tours).
- Filing and storage room
- Bathroom - vanity and shower (females/males/disability) and First Aid Room
- 2 Conference rooms with TV/Video for training and multipurpose use (accessible to kitchen area (fit max 20 people)
- Kitchen
- 2 Meeting Rooms accessible to kitchen area.

### Others

- Furnitures, AV, solar/battery back-up generator, standard water tank, carpark, outdoor verandah/porch, security guard booth and security fence and gate.

Further details for the floor plan are listed in Appendix C – Schedule of Accommodation and Appendix D – Design Brief.

The new SOC building will need to comply with the Samoa National Building Code 2017 and reference standards to withstand the potential impacts of natural hazards such as cyclones, floods, fires, earthquakes, and tsunami. A site analysis and cost benefit analysis should be undertaken to determine the configuration of the proposed structure. The new SOC building must be energy efficient and as much as possible use natural light and ventilation, and should be nominally designed to remain functional during and after natural hazard events in accordance with “Importance level 4” in terms of AS/NZS 1170.0 2002.

### Appendix C – Schedule of Accommodation

|                                | +OFFICES & SERVICES   | STAFF | FUNCTION                   | REQUIREMENTS | AREA M <sup>2</sup>      | FURNITURE & EQUIPMENT  |
|--------------------------------|---|-------|----------------------------|--------------|--------------------------|--|
|                                | <b>TOTAL FLOOR SPACE</b>  |       |                            |              | <b>350 m<sup>2</sup></b> |  |
| <b>A) NATIONAL DATA CENTRE</b> |   |       |                            |              | <b>50 m<sup>2</sup></b>  |  |
|                                | Main Operations   | 6     | Shift workers (24/7 shift) |              |                          | Work Stations and monitoring screens. Limited access and out of bound (signage for awareness during earthquakes, tsunami)              |
| <b>B) STAFF OFFICES</b>        |   |       |                            |              | <b>110 m<sup>2</sup></b> |  |
|                                | ACEO Geoscience   | 1     | Executive Office           |              | 16 m <sup>2</sup>        | Executive desk & chair, 1 executive lounge set, filing cabinets  |
|                                | Principal Officer   | 1     | Standard Office            |              | 14 m <sup>2</sup>        | Desk and chair, filing cabinets  |
|                                | General Office Comprising   | 5     | General Office space       |              | 50 m <sup>2</sup>        | Work stations  |
|                                |   |       | Filing and storage room    |              | 30 m <sup>2</sup>        | Filing and storage shelves.  |
| <b>C) FACILITIES</b>           |   |       |                            |              | <b>120 m<sup>2</sup></b> |  |
|                                | Server Room (Visual / Audio recording/ storage)                                 |       |                            |              |                          | server cabinets, visual and recording storage equipment  |
|                                | Entry and Reception Area (include public display for schools educational tours) |       |                            |              |                          | Display boards or equivalent, viewing window of the operations centre during tours from outside given restrictions and limited access. |

|                             |   |                           |                  |  |                         |                                     |
|-----------------------------|---|---------------------------|------------------|--|-------------------------|-------------------------------------|
|                             | Bathroom vanity and shower (Separate female and male toilet block)<br><br>& First Aid Room  | Female /males/ disability |                  |  |                         |                                     |
|                             | 2 Conference Rooms (multipurpose use – TV /video room – capacity max 20 people)   |                           | Conference rooms |  |                         | Desk & chairs<br>TV/Video equipment |
|                             | Kitchen   |                           |                  |  |                         | sink, cupboards, fridge, boiler     |
|                             | 2 Meeting rooms (1 of the meeting rooms will have multipurpose use including use as lounge or waiting area for staff waiting for their shift)                           |                           |                  |  |                         | desk, chairs, lounge set            |
| <b>D) CIRCULATION SPACE</b> | 70 m <sup>2</sup> for circulation space<br><br>(about 20% of total floor space for circulation space)   |                           |                  |  | <b>70 m<sup>2</sup></b> |                                     |
| <b>E) OTHERS</b>            | Furnitures, AV<br><br>Outdoor Verandah/Porch.<br><br>Solar/Battery Backup Generator<br><br>Standard Water Tank<br><br>Car park, Security Guard booth and Security Fence |                           |                  |  |                         |                                     |

## Appendix D: Design Brief – Samoa New Seismic Operations Centre Building

The MNRE has the following expectations of the proposed SOC building and its functions:

- Safe working environment for staff of all genders.
- Universal access for people of all abilities.
- Withstand impacts of natural hazards (comply with National Building Code; AS/NZS 1170 – Importance Level 4).
- Design to consider future phases of expansion by the government subject to availability of funding (ie. if remaining units of SMD relocate from Mulinu’u – an area prone to flooding including during heavy rainfall, cyclones, storm surge and is also affected by sea level rise, king tides and risk of rust due to location being closer to the sea).
- Energy efficient using natural light and ventilation (cost saving encouraged).
- Reception and display area open to the public with limited access to the national operation centre.
- Main operations centre to include seismic system for seismic analysis and core operations: 6 hot desks to fit 6 shift workers working 24/7.
- Design aesthetic to be different from NEOC.
- Building facades, entrances and landscapes to promote culture and identify of Samoa, public art to promote disaster awareness, education and learning.
  
- The staff will be working 24/7 in the SOC to do the following:
  - Monitor and report on earthquake and tsunami activity through network of seismographs
  - Provide early warning information and alerts on earthquake and tsunami activity
  - Prepare geo-science products such as tidal information
  - Operate the National Tsunami Warning Centre
  - Remote-based working technologies.
  
- Site layout and coverage based on the following site analysis findings:
  - SOC will be constructed on the existing open space on green grass at Tuanaimato, adjacent to the NEOC building.
  - Position critical equipment (back-up generators, fire control devices) above flood lines – solar/battery powered generators.
  - Face building entrance to primary street frontage.
  - Permeable spaces to minimize “hard” surfaces
  - Front and side setbacks
  - Designated access (entry and exit) and security fence given existing land use which includes a bar.
  - Solar farm in vicinity and impact of future expansion.
  - More trees/shades and outdoor recreational spaces (including volleyball space) for staff.
  - Future expansion potential subject to Government of Samoa securing more funding.
  
- Access and car parking
  - Provide clear, safe and accessible pedestrian access.
  - Driveways and parking design must permit vehicles to enter and exit safely in a forward direction.
  - Vehicular access must be provided through the site safely – consider turning circles of larger vehicles needed to access SOC building.
  - Parking design must be safe, accessible and adequate – PUMA parking policy (1 space per 60m<sup>2</sup> =6 spaces plus accessible parking).
  - Parking design should have minimal visual impact – bigger with landscaping and shade trees etc.
  - Good balance of shaded areas and use of permeable spaces.
  - Parking should be easily accessible (with adequate lighting) by shift workers especially female.
  
- Site lighting and landscaping
  - Enhance sense of security – especially for shift workers– use pedestrian scale lighting.
  - Use low energy (LED) fittings or solar –powered lights (but with adequate lighting for shift staff on shift work).

- Site utilities such as waste disposal areas, service entrances, should be designed to allow ease of access for service personnel and maintain public safety.
- Fencing design should complement street character.
- Safe landscape design (anti-slip paving, traffic safety) the blends with surroundings.
- More plant shade trees (limited vegetation on site), non-invasive species.
- Storm-water management
  - Design effective storm-water management system with properly sized gutters and downpipes.
  - Connect all impermeable surfaces (building roofs, driveways, parking areas) to proper SW system and onsite drainage system (absorption trenches, storage tanks).
  - How to manage/recycle storm-water on site.
  - Minimize localized flooding – grade site away from building entrances, design rain gardens, permeable surfaces – site is relatively flat.
- Building external design
  - Façade materials – durable, cyclone and flood resistant, complement streetscape, doors and windows. complement, use low-maintenance and light-coloured materials.
  - Use light-colored roofs, rooftop drainage, multi-functional roof space.
  - Building identification signage (PUMA signage policy).
  - Sustainable design technologies – passive design is key, solar panels.
  - Parking design should have minimal visual impact – bigger with landscaping and shade trees etc.