GOVERNMENT OF THE COOK ISLANDS

PROJECT IMPLEMENTATION DOCUMENT FOR THE AITUTAKI CYCLONE RECOVERY & RECONSTRUCTION PLAN PROGRAMME PHASE 2: CATEGORY 3 & 4 HOUSES

Version 4 –3rd June 2010

Prepared by the
MINISTRY OF INFRASTRUCTURE AND PLANNING

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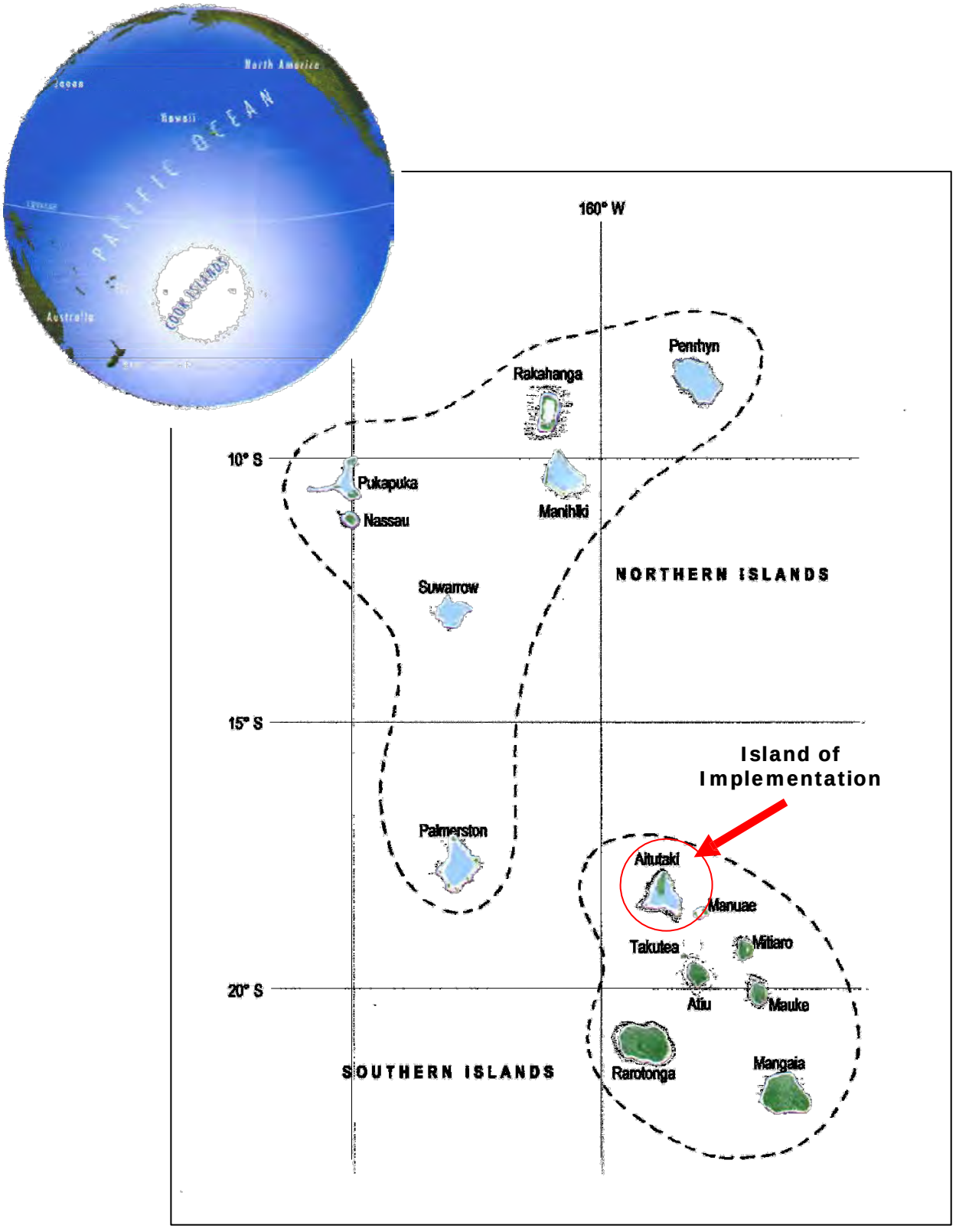
ACKNOWLEDGEMENTS

CYCLONE RECOVERY COMMITTEE
Cyclone Recovery and Reconstruction Plan 2010 - 2011

OFFICE OF THE PRIME MINISTER
National Policy & Planning

LOCALITY MAP



ACRONYMS

AMD	Aid Management Division
AMD-MFEM	Aid Management Division of the Ministry of Finance and Economic Management
ARC	Aitutaki Recovery Committee
CAPEX	Capital Expenditure
CIFPPM	Cook Islands Financial Policies and Procedures Manual
CIG	Cook Islands Government
CIIC	Cook Islands Investment Cooperation
CRC	Cyclone Recovery Committee
EIA	Environment Impact Assessment
ESBMP	Environmental Site Based Management Plan
FO	Finance Officer
HOM	Head of Ministry
MFAT	Ministry of Foreign Affairs and Trade (New Zealand)
MFEM	Ministry of Finance and Economic Management
MOIP	Ministry of Infrastructure and Planning
NES	National Environment Service
NZD	New Zealand Dollar ($NZ)
NZHC	New Zealand High Commission
NZS3910-2003	New Zealand Standard 3910 2003
PDD	
PE	Project Engineer
PM	Project Manager
PMG	Project Management Group
PID	Project Implementation Document
VAT	Value Added Tax

SECTION ONE: INTRODUCTION AND SUMMARY

Explanatory Note

This version of the PID (Version 4) has been developed from earlier drafts. There are still some unresolved issues, notably resolution of budget requirements and funding of Category 3 houses.

This will be subject to further analysis by ARC / MOIP and this PID will be revised further once more detail is available.

Introduction

Aitutaki is the northern most island of the southern group of the Cook Islands; it lies 277 km northeast of Rarotonga. The Aitutaki lagoon is of volcanic nature with the main island where all villages are located is standing at 88m high above sea level. The island has a distinctive tropical climate and beautiful scenery for which it has advanced well over the years in establishing its economic development on the tourism industry. Today, Aitutaki is next to Rarotonga in offering the best marketable destination for the tourism industry.

Tropical Cyclone Pat passed through the Southern Cook Islands in the early hours of 10 February 2010; the island of Aitutaki was seriously affected. At its peak Tropical Cyclone Pat was classified as a Category 3 cyclone bringing destructive wind gusts of over 100 knots. On 10 February the Prime Minister of the Cook Islands declared a 'State of Disaster' for Aitutaki. Given the scale of the resulting damage it was somewhat miraculous that there were limited casualties and no deaths reported, although the entire Aitutaki population was either directly or indirectly affected across all 8 villages. The most significant impact was on housing with approximately 78% of all homes being affected. Damage to livelihoods varies by sector although it is recognized that the local agriculture sector was completely destroyed. There was severe damage and destruction of the local food supply and food security will be affected for up to to 36 months.

Recovery Planning Process

The process for developing the plan was coordinated through a 'Recovery Committee' consisting of representatives from the Minister of Finance's Office, Office of the Prime Minister (OPM), Emergency Management Cook Islands (EMCI), Ministry of Finance and Economic Management (MFEM), Aid Management Division (AMD), Ministry for Internal Affairs (INTAFF), Ministry of Infrastructure and Planning (MOIP), Cook Islands Red Cross, UNDP and representatives of the Aitutaki Island Administration and Council. The Recovery Committee reports to the designated 'Recovery Coordinator' and designed and conducted a recovery needs assessment in Aitutaki. The main purpose of this assessment was to identify the key priority areas for recovery and reconstruction in Aitutaki, and would build on existing damage and humanitarian assessments. The Recovery Team worked with key line Ministries and partner agencies in developing strategies and specific activities for each of the priority areas identified in the assessment. As such the development of the plan is based on a multi-dimensional and multi-stakeholder process both at the Island

(Aitutaki) and national levels. The plan is a 'living' document and will be reviewed and updated by the recovery committee as further analysis is incorporated in to the plan.

Housing Infrastructure

It is estimated that almost three hundred occupied domestic homes were damaged at varying levels. The government's initial assessment on the full cost of repair and reconstruction of all domestic homes damaged by Tropical Cyclone Pat was estimated at $15 million (excluding labour costs) and up to $21 million (if labour costs are taken in to account). The comprehensive assessment undertaken by the Ministry of Infrastructure and Planning identified 110 homes with small scale damage (Category 1 and 2), 95 homes with significant damage (Category 3) and 72 that have been completely demolished or are condemned (Category 4). Note: There have been several revisions of these numbers as more detailed assessments have been carried out. Refer to comment below. There was also damage to other related infrastructure, such as power, water and public buildings. The most urgent need is to provide basic shelter to those people in domestic dwellings that were damaged as a result of Tropical Cyclone Pat. The views collected from the needs assessment identified differences in opinion on which homes should be repaired first: those totally destroyed and/or those partially. Generally it appears that all the homes need to be repaired and restored if they can, but the issue of protecting home assets and appliances suggests emphasis on repairing and restoring partially affected homes and dealing with the completed destroyed homes (that are occupied) in a coordinated manner.

Later revision of the estimated costs for repair and construction has reduced the expected cost as follows:

- Category 3 houses: 2,833,000 (ref comments in section 6)
- Category 4 houses: 2,070,000 (ref comments in section 6)

These estimates are for labour and materials and do not include design, contingency or project management costs. A separate allowance has been made for upgrade and repair of septic tank systems – refer Section 6.

Later revision of the number of damaged houses is included in the following table. It should be noted however that some category 3 houses may need to be reclassified to category 4 once detailed inspection has been carried out.

TABLE 1: Damaged Domestic Buildings[1]

Extent of Damage	Number of Houses
Category 1: Minor Damage (0-25%)	75
Category 2: Moderate Damage (26-50%)	35
Category 3: Major Damage (51-75%)	95
Category 4: Completely Demolished (76-100%)	60
TOTAL	265

Note: The above numbers of category 3 and 4 buildings are those agreed with MFAT (ref letter fom NZHC to the Minister of Finance dated 23 April 2010). The Aitutaki Island Council have identified further buildings bringing the number of those classified as Category 4 to 65. Funding for the construction of these

[1] Ministry of Infrastructure and Planning Detailed Damage Assessment March 2010

extra houses (5 x cat 4) will be allocated from the MFAT contingency sum. (ref letter NZHC to Minister Rasmussen 3 June 2010) Refer also to Section Six.

Management Arrangement

The Cyclone Pat Recovery and Reconstruction Plan for Phase 2 will be partially funded by the New Zealand Government under its MFAT budget allocation. It should be noted that the latest estimates of cost indicate a funding gap between the amount allocated by MFAT and the amount estimated to repair and rebuild category 3 and 4 houses. Refer also to Section Six.
The Ministry of Infrastructure and Planning (MOIP) will be responsible for coordinating the successful implementation of this Project.

For ensuring accountability and transparency Aitutaki Recovery Committee (ARC) comprising of representatives from the office of the Minister of Finance, the Office of the Prime Minister (OPM), Emergency Management Cook Islands (EMCI), Ministry of Finance and Economic Management (MFEM), Aid Management Division (AMD), Ministry for Internal Affairs (INTAFF), Ministry of Infrastructure and Planning (MOIP), Cook Islands Red Cross, UNDP and representatives of the Aitutaki Island Administration and Council. MOIP as the principal will also be responsible for any coordination with other parties that may be included in the execution of the works.

The NZ High Commission will be represented on the ARC.

The project will provide repairs to the Category 3 damage and construct new houses for Category 4 damage.

Project Goal

To provide safe and durable houses to withstand any future cyclones that may occur.

Description

The project includes repairing 95 Category 3 damaged houses and constructing 65 new houses for Category 4.

The Project Implementation Document has been put together to encourage the implementation of Phase 2 of this programme for the restoration of Aitutaki to prevent migration of the people to Rarotonga, New Zealand and Australia and also not to jeopardise the tourism industry on the island.

Project Management

The implementing agency will be the Ministry of Infrastructure and Planning (MOIP) who will appoint a Project Manager to the project. The Project Manager will initially be assisted by an advisor appointed by MFAT.

MFAT will appoint a Clerk of Works to assist with on site quality control and offer technical advice. Labour will be employed by MOIP on an hourly rate basis using predominantly Aitutakean workers under the supervision of MOIP tradesmen.

Materials will be procured in two stages. 20% of materials will be purchased by obtaining quotations from recognised suppliers with prices benchmarked against known costs.

The balance of materials will be procured using an open tender process as approved by the CIG and overseen by the Cook Islands Tender Committee.

Programme

Repair of Category 3 buildings will commence immediately on completion of Category 1 and 2 houses (estimate 7th June). Construction of Category 4 houses will commence on 1st July with an estimated target completion date of 31st December 2010.

Progress against this target completion date will be monitored as construction proceeds and will be affected by

- Availability of workforce
- Availability of key supervisory personnel
- Material delivery timelines.

SECTION TWO: PROJECT RATIONALE AND ASSESSMENT

Note: This section contains material uplifted from the overall recovery and reconstruction plan and is repeated here to provide contextual information.

Development Rationale

The project is aligned to focus on recovery and reconstruction accordance with the Cyclone Pat Recovery and Reconstruction Plan (CPRRP).

Impact on Poverty

Economic development around Aitutaki has been restricted by a number of things such as; its remoteness, size and the aging and deterioration of the main infrastructure. The limited economic growth on the islands have resulted in many of the younger population leaving for better opportunities in Rarotonga, New Zealand and Australia. These factors contribute to long-term poverty and limited development on the island.

Therefore, the recovery and reconstruction programme will reinstate economic development on the island. A number of other factors will be required to ensure that businesses develop, such as ongoing commitment of the communities to work and develop appropriate business and revenue-creating ideas

The community on Aitutaki generally live a relatively traditional lifestyle and the roles of men and women are also quite traditional. While as small number of men work in the Administrations most of them tend to work mainly both as fishermen and farmers and provide food for the family.

Although opportunities for women are available in small resorts and tourist accommodations on the island but usually these are more limited. Many of them work and stay in the home. Increasingly, in other islands, the traditional roles are changing and women are also helping out in the fields and starting up small cottage industries.

Institutional Governance and Feasibility

The recovery and reconstruction programme will also include the development of a management plan which will enforce the Cook Islands Building Code to make sure houses are constructed in accordance with the Building Code. This is intended to incorporate Aitutaki with the other outer islands improving the institutional governance of domestic, commercial and institutional construction operations on the outer islands.

Development of a management plan and enforcement of the Building Code will streamline operation minimise associated costs. The effectiveness of such a systematic approach will be dependent on the practical experience gained throughout its application, and the commitment from MOIP to increase the capabilities on the island for successful application. MOIP is mandated to inspect all buildings during construction which will improve management systems.

Environmental Impact

The environmental impact of the recovery and reconstruction programme is likely to be minimal if there is a management strategy in place to ensure potential impacts are minimised. The reconstruction of Category 4 houses will include improvements to

sanitation systems that will be a positive environmental impact. Likewise, the improved structural strength of Category 3 and 4 houses will mean that the amount of debris will be reduced in the event of future cyclones.

Factors in the Design to Promote Sustainability

The detailed design of the recovery and reconstruction programme that will be developed and approved will based on the design criteria and implementation requirements outlined in this document and will focus on long-term sustainability as key design criteria. The new design is intended to be efficient and adaptable to ensure that there is value for money and meets its development goals. Therefore, the technical specification has specified technical instruction for the construction works that integrates construction materials and methods that will minimise maintenance cost.

Cost Benefit Analysis

While the recovery and reconstruction programme is not intended to be a revenue earning facility, its capital cost for completing the project is high in a relatively small dispersed community with low income. The locality of the island has also contributed to the high cost of construction. The economic analysis of the recovery and reconstruction programme has indicated little impact and returns.

In summary, it is envisaged that the project when completed will further attract economic development on the island that will continue to enhance the living standards of the local communities.

Technical Feasibility

The technical interventions proposed for the repair and construction works are relatively conventional and will be managed internally by MOIP personnel supplemented by a Clerk of Works funded by MFAT.

Community Support and Consultation

During the preliminary stage, consultations and discussions were held with community stakeholders and leaders and the Island Council to establish the following:

- Discuss the proposed new design
- Obtain agreement to the design
- Secure community support for the project
- Land dealing and related issues
- Supply of aggregate and sand for the project
- Considerations for community safety.

Social Recovery Programme

While a lot of focus has been placed on the physical reconstruction and establishing systems to return people to normalcy, there is a need to monitor and assess that the people affected by the disaster are also recovering. The needs assessment and focus group discussions identified that those affected by the cyclone were primarily concerned about their immediate needs rather than long term needs with some recommending that discussions on their future needs occur at a later stage. Some counselling services have been offered to those traumatized by the

event; however, follow up may be necessary, particularly for those people and families living in houses with Category 3 and 4 damage to ensure that they have not suffered any long term effects from the cyclone. Systems needs to be put in place to ensure that: those typically employed are able to retain employment and continue to be productive in the workplace (particularly essential services); maintains the family unit (including extended family) ensure that it is not weakened; school age children continue to attend school regularly and not be kept at home to assist with the repairs and recovery at home; prevent opportunities for gender-based violence due to depression or frustration caused by the loss and damage of the cyclone; the vulnerable members in society, such as the elderly and disabled, are not marginalized in the recovery efforts. There is a real risk that families will choose to leave Aitutaki rather than remain.

Local Recovery Programme

The total population of Aitutaki was directly or indirectly affected by Cyclone Pat. Damage to the local agriculture and livestock sector is extensive. The value in crop loss from Cyclone Pat is estimated at US $1.5 million. There was severe damage and destruction of the local food supply and food security will be affected for the next 3 to 36 months. The impact and strength of the cyclone caused 100% destruction of some of the food crops cultivated on the island, in particular, papaya and bananas. Most fruit and nut crops including coconuts, mango, chestnuts, and breadfruit will take many months to recover. Significant support will be needed to help agricultural livelihoods and ensure a reliable food supply to the local tourism industry. There are also reports of dead livestock, and there is a need for livestock feed, feed storage and foraging to assist small scale farming and livestock enterprise.

Cash assistance is desperately needed to procure housing materials, to purchase food in the market and for other essentials – particularly for the most vulnerable (e.g. women and elderly-led households). The expansion of social safety nets through the immediate injection of capital, taking into account gender disparity, to support livelihoods and to prevent a potentially large out-migration is a key strategy for early recovery. The importance of restoring small businesses, including shops, in order to stabilize the local economy is also widely recognized. Additionally, sustainable livelihood options that incorporate alternative income generating options linked to the tourism industry that take into account the respective skills sets of both men and women should be introduced. A strong element of sound planning with an emphasis on reducing the risks of future disasters is also recommended.

The Local Economic Recovery strategy aims to restore original sources of livelihood with the long-term intention of expanding traditional income generating activities and the possibility of introducing new alternative livelihoods options. This strategy hinges on:

- Immediately injecting capital into the local economy through an exchange for labour in the housing sector and cash transfers to most vulnerable
- Assisting small businesses in recovering and growing further
- Assisting local farmers in maximizing crop production, ensuring livestock populations are maintained, and
- Expanding alternative land and marine-based tourism options and develop local partnerships with Rarotonga-based tourism operators.

SECTION THREE: DAMAGE ASSESSMENT AND PROPOSED RECONSTRUCTION

Background

Tropical cyclone Pat hit Aitutaki Island around 2 a.m. on 10 February 2010 with category 3 wind force in the range of 176 to 208 km/hr. The cyclone left behind very devastating damages to the overall island of Aitutaki.

On 11 February 2010 a team of assessors from the Ministry of Infrastructure & Planning (MOIP) with the Cook Islands Red Cross (Rarotonga), Telecom (Rarotonga) and Public Health (Rarotonga), was mobilized to Aitutaki to begin a program of assessing damages caused by the cyclone Pat

This initial assessment report was broad in scope and focuses on a general overview of the type of building damage that have occurred, to assist in determining the relief and immediate response requirements.

On 22 February 2010 at the request of the Cyclone Recovery Committee, the MOIP team was deployed to Aitutaki for the second time to undertake a more detailed damage assessment of residential buildings only.

The task of the team was to undertake field assessment survey of all the residential buildings that had incurred damages by the cyclone. The assessment was very much guided by the initial damage assessment carried out previously, especially identifying the building locating and sites, and the names of occupiers before and during the cyclone period.

Scope

The assessment was based on a more detailed data acquisition of wind damage to only residential buildings on the Island. Significant wind damages to roof structures were observed for many of the buildings with each one of them recorded on templates with associated photographic identifications. The data was also mapped onto Geographic Information System (GIS) format. The report will have a study site map, satellite photos of sites, and brief damage description to the cause of structural failures.

Typical Building Structural Systems

In residential buildings, the primary structural systems are made up almost entirely by exterior load bearing walls and non-load bearing wall, roof structure and diaphragm and foundation. The overall building integrity depends not only on the strength of these components but also the adequacy of the connections between them. In the design of structures for wind loading, it is necessary to provide a continuous load path from the roof down into the (concrete) foundation. In a noticeable number of failed structures examined this continuous load path was not present.

From general observation, adequately constructed homes stood very well against Cyclone Pat wind forces. Where there was evidence of a breakdown in the load transfer path, the damage extent ranged from considerable to total, depending on the type of construction involved.

The roofing systems of all residential buildings investigated were predominantly constructed with light timber trusses or roof rafter system.

Roof Framing Systems

The roof trusses and rafter construction were found to be less than satisfactory under the wind forces, the connection between the purlin and the truss or rafter was inadequate. Substandard workmanship in the fixing of the purlin to trusses was evident (improper use of a single vertically driven nail as a tie-down) especially to newer constructed buildings. The much older housings with timber framed roof structure were found to have timber rots.

General Observed Performance of Buildings

In general, older housing performed poorly with the majority of structural damages occurring on the structural was associated with older construction (>25 years). The evidence after examining of the older structures have shown deterioration in the tie down components due to corrosion, rot, insect attack and leading to reduction in strength and/or non existence of tie downs along the critical load path.

The Cyclone Pat's wind force creating severe structural damages also caused the damaged structure components such as roofs being detached when wind driven forces threw debris on to other adjacent buildings thus instigating damages to that building. The duration of intense winds also maximized the potential for fatigue failure of roofing, claddings, fixings and generally roof structures of all buildings damaged.

In some cases of failure of older housing, it was apparent that the house had some upgrading undertaken. For example, a new roof was fitted with new roofing's but the roof failure occurred at the purlin to truss or rafter connection which still had only the original inadequate nail connection. For housing in flat exposed areas a 90 mm long Type 17 screw is required along with pre-drilling. Strapping of purlin to rafters would have been an alternative and secure connection. The roof structural connections have primarily contributed to failure of most of these structures. The poor construction practice was also evident in regards to inadequate tie down fixtures with only the use of nails without the use of cyclones ties or strapping. The lacks of maintenance by the occupants also lead to failure from corrosion of fixings and structural frame elements.

Impacts on Critical Infrastructure

Electricity transmission was cut to the entire island, except at the EOC base. Severe damage to poles (approximately 100 no.) and pole –mounted electrical distribution and communication networks was widespread. Power distribution affected other essential utilities such as the hospital, water supply.

The water supply relying on electricity to power the water pumps were also damaged. The village of Tautu would be greatly affected by the electricity being taking longer than anticipated and the water supply would require much needed emergency generators to power the water pumps at the water gallery.

Initially the access by roads was limited in some areas due to trees falling directly across the roads. However, this was cleared by Friday afternoon. However, the overall road infrastructure is unaffected by the cyclone.

Cyclone Wind Forces

Cyclone wind forces on a building acts predominantly upwards and horizontal. A building must have structural systems, which will remain intact under these loads and transmit the wind forces to the ground through its structural members, connections and claddings without failure of these elements.

According to the Cook Islands Building Code, the equivalent basic wind speed for permissible stress methods of design is 49 m/s. (approx. 180 km/hr) this corresponds to category 2 terrains and the value of the factor B1 is 1.5 and an upwind slope of 1:10 for escarpments.

As the cyclone was upgraded from a category 2 to a category 3 when it struck the island, with expected wind speeds in the range of 176 km/hr (49m/s) to 208 km/hr (57 m/s). This would be just beyond the Building Code design wind speed of 49m/s. The severity of the wind force intensity, say at 190 km/hr or 53m/s, beyond the Code design wind speed would definitely maximized the potential for fatigue failure of building structure fixings, including the undamaged buildings not assessed on the islands.

Therefore with the severity of the wind force greater than the Building Code wind force and as most buildings is not well maintained, it would not be a surprise to expect such devastating damages all throughout the villages – as indicated by the average 57% of the building populations being damaged to various degrees.

Damage to newer homes was also not immune to damages from the Cyclone Pat wind forces. It was very surprising to see a fair amount of newer buildings sustaining damages, particularly at the roof structures.

There may be a need to review the design wind speed forces, of the Building Code with the likelihood of newer buildings to be designed to higher wind speeds.

New category 4 homes have been designed in accordance with Australian standards to be capable of withstanding a Category 5 cyclone. However it should be noted that it is still possible that buildings can be damaged in such strong winds particularly if they are sustained for long periods.

Assessment Damage Criteria

The building damage assessment was based primarily on three damage criteria's such as; Building roof damage, building roof demolished and total building being demolished. Each criterion has assigned replacement rates of $200/m2, $400/m2 and $800/m2 respectively with various degree of damage expressed in percentage. The replacement cost is based on a value of rebuilding a damaged building structure.

Impacts on Buildings

The majority of structural damages assessed was as expected, associated with older constructions (>25 years). The older structures were primarily build of lower standard and are more likely to have deteriorated components (corrosions, rot, insect attack) leading to a reduction in strength at critical fixings (roofing/purlin, purlin/rafter and rafter/wall top plate etc).

With roof damages, the lost of flashings, basic guttering was also damaged, thus the delivering of rain water to water tanks (majority of the buildings have water tanks of varying sizes from 2000 litres to 10,000 litres) as a substitute for drinking water will be a major concern.

Some of the damages incur on buildings were caused by detached and flying building material debris from other damage buildings. The majority of homes with out-building such as make shift cooking/storage sheds were all destroyed.

There has been witness by home owners seeing their roof structure partially being uplifted/heaving motions during the intense period of the cyclone. Therefore there is also a need during the recovery phase of the rehabilitation of buildings to inspect all buildings for structural soundness.

Not only older constructions incurred damages but some newer home also received damage more particularly at the roofing. There is concern that the building standards has not improved greatly, even with the appointment in 2008 of a building inspector on the island.

Building Design

Background

On 26 March 2010 MFAT engaged the services of an Emergency Architect to assess design options and in close cooperation with identified local and experienced builders and suppliers provide advice to the Aitutaki Recovery Committee and MFAT on options to ensure that the chosen design is:

- Appropriate for the climatic conditions on the island
- Able to withstand future cyclones
- In conformance with Cook Islands Building Code
- Cost effective, bearing in mind the level of available funding
- Fully-costed with a detailed materials list and bill of quantities
- Fully consulted and accepted by the Aitutaki community
- Culturally appropriate, acceptable to the longer term development pathways of people on Aitutaki, and consistent with principles of ensuring levels of dignity and decency in the delivery of the rebuilding and reconstruction programme
- Cost effective in terms of on-going maintenance by the home-owner
- Feasible in terms of the availability of materials and labour

The Technical Adviser from EAA:

- Provided the Cyclone Recovery Committee and MFAT with advice on alternative housing designs in line with the objectives outlined above
- Provided the Cyclone Recovery Committee and MFAT with any advice on how proposals/options could be improved including through amending any drawings or architectural plans
- Assessed the availability, quality and cost of local materials for the different designs, outlining any issues in relation to material supply and demand
- Advised the Cyclone Recovery Committee and MFAT on the optimal mix of local and overseas human resources and materials to implement the housing scheme of the Cyclone Pat Recovery and Reconstruction Plan in a way that is efficient, makes best use of local labour, provides an opportunity for local

people to gain useful employment skills, and does not crowd out Cook Islands private sector efforts to support the recovery of its economic development path and by doing so ensure the sustainability of recovery investments in Aitutaki for the longer term

- Advised the Cyclone Recovery Committee and MFAT on how to utilise offers of assistance from any other Non Governmental Organisation (NGO), and volunteer labour to best meet the objectives of the housing scheme
- Ensured that this advice included the principle of maximising the benefits of the housing reconstruction project to Cook Islands Government efforts to addressing and stabilising the impacts of the global economic recession on economic recovery and development in the Cook Islands

Proposed Work

Category 3 Buildings

A detailed assessment has been carried out of the damage to all the buildings on Aitutaki. Category 3 buildings have been assessed as having major, but repairable damage. MFAT has committed $950,000 towards the repair of these buildings. The assessment, appended to this document describes in each case the necessary repairs and the locations of these buildings are shown on the maps contained in Appendix 8.

It is possible that some Category 3 buildings, on closer inspection may not be feasible to repair and may be better to be demolished. The decision to demolish rather than repair a Category 3 building should be based on the following criteria.

- The structure is too weak to be adequately repaired to withstand future cyclones and/or
- The cost of undertaking repairs is substantially more than estimated.
- The decision to reclassify a Category 3 building to Category 4 shall be evidence based and be the subject of a recommendation to the Aitutaki Recovery Committee by the Project Manager with endorsement by the Clerk of Works.

Category 4 Buildings

These are new houses that will be constructed to replace homes that were either destroyed in the cyclone or were too badly damaged to be able to be repaired. The initial assessment carried out by MOIP immediately after the cyclone came up with a total of 60 houses in this category. This total has been subsequently revised to 65.
The reason for the revision was because some houses were over looked in the initial assessment by MOIP and only subsequently advised by the Island Council as a result of village meetings where residents advised that their properties had not been included in the assessment.
The current list of 65 houses appended to this document identifies each house along with the name of the householder/ resident family.

MFAT commissioned EAA of Australia to assist stakeholders to reach agreement on a preferred new design for new 1 and 2 bedroom houses. These designs, with minor modifications have been approved by the ARC and are included as an appendix to this document.

The Aitutaki Island Council have prepared a list of homeowners who will receive each type (1 or 2 bedroom) of house and that information is also appended.

The Category 4 houses will be constructed to a weathertight standard but final finishes such as painting, floor coverings, tiling and verandahs will remain the responsibility of the homeowner.

General

CIG Building Inspectors will inspect each house once completed and sign off conformity with the Cook Islands building code. Electrical safety will be signed off by the Electrician responsible for the work.

Any future structural work carried out by the building owner will be inspected for conformity with regulations.

Sewerage systems

It is anticipated that the new Category 4 houses will be connected to the existing septic tanks that were in existence prior to the cyclone. In some cases the condition of these tanks may be such that a new tank and dispersal system is required. There is a separate budget for this work (ref section six) and it may also be possible to link any upgrade of existing tanks to the NZ funded waste management project.

SECTION FOUR: PROJECT MANAGEMENT

Lead Agency - MOIP

The Ministry of Infrastructure and Planning (MOIP) is the lead agency for the implementation of this project. The Project will be managed by a Project Management Group (PMG) team that will also include the employment of a Project Manager (PM) working within and under the MOIP office. The PM will be directly responsible for the day to day project supervision and implementation of the works and will be based at the site on Aitutaki. He will be part of the PMG team which is made up off the Deputy Project Manager/ Engineer, the Finance Officer (reporting to the Secretary for MOIP) and the Clerk of Works appointed by MFAT (reporting to the NZHC). The Aitutaki Recovery Committee (ARC) will provide support throughout the project period of approximately twelve months of construction, up until the handover at completion.

The Cook Islands Government and the community have indicated their strong support for the project. MOIP are committed to providing appropriate personnel to implement this project. The office of MOIP will be used as the head office where the project business is conducted. Members of the ARC will be working together from time to time and be able to build effective working relationships with supporting agencies within the outer islands. Key personnel from MOIP will be committed to this project, which includes liaison with the respective ARC members for effective implementation of the project.

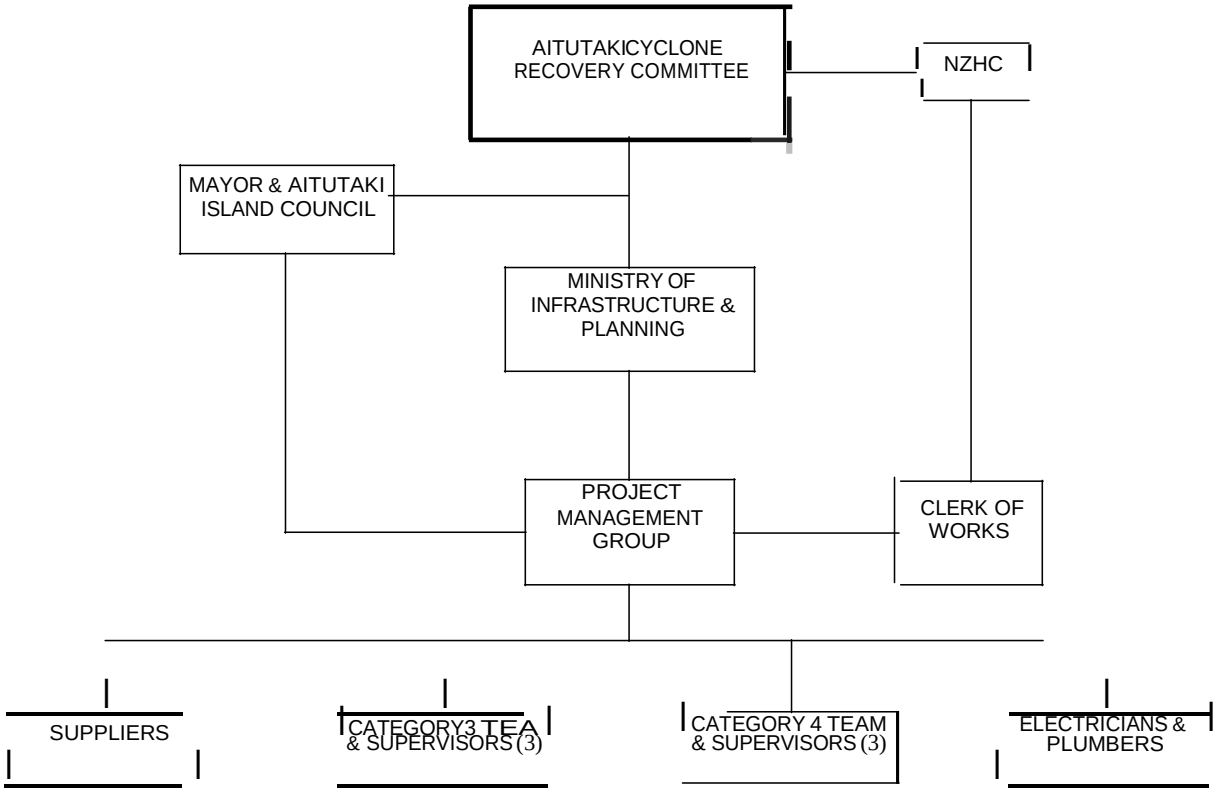
The ARC is represented by key stakeholders from within Government, island communities and the NZHC. A stakeholder analysis was drawn up by MOIP to identify key stakeholders that had a vested interest in the project. Out of the stakeholder analysis, resources were identified that were available from each agency that will be utilised to address unplanned issues arising with the project.

Aitutaki Recovery Committee

The Aitutaki Recovery Committee consists of representatives from the office of the Minister of Finance, the Office of the Prime Minister (OPM), Emergency Management Cook Islands (EMCI), Ministry of Finance and Economic Management (MFEM), Aid Management Division (AMD), Ministry for Internal Affairs (INTAFF), Ministry of Infrastructure and Planning (MOIP), Cook Islands Red Cross, UNDP and representatives of the Aitutaki Island Administration and Council and the NZ High Commission.

The PMG team (from MOIP staff and others) will report to the ARC, but may also attend meetings from time to time to provide technical and other relevant expertise required for the implementation of the project. The ARC is led by a Chairperson and is responsible for overall management and institutional arrangements of the project and continuously updating Cabinet. The Chairperson is responsible for ensuring the ARC terms of reference are adhered to and that the decisions of the committee correlate with Governments intention.

REPORTING & MANAGEMENT STRUCTURE



An overview of the PMG positions is provided below.

Roles and Responsibilities: Project Management Group

Project Manager- PM

The PM will be engaged prior to the project implementation being started. He will be responsible for supervising the project on a day-to-day basis and for monitoring the technical performance and progress of the project at the site. The PM will maintain open and effective communication with the workforce, the Island Secretary, the Mayor. He will lead the PMG team. The PM may have the authority from time to time to make decisions on the project site consistent with the Project Implementation Document and agreed work plan, without necessarily requiring referral to the ARC.

The PM will have demonstrated skills for project management, civil construction, administration, liaison with relevant stakeholders, and the ability to effectively meet engineering and management requirements of the project.

The PM is responsible to the ARC through the Secretary of MOIP. The PM will provide weekly progress reports to the ARC and liaise directly with the PDS team on technical matters regarding the project.

The PM is recruited by MOIP from its existing resource pool of skilled and experience list of people. The PM will be based on Aitutaki in a full time capacity and be responsible for coordinating construction activities on the island.

Refer to Appendix 4 for terms of reference that apply to this position.

Project Engineer / Deputy Project Manager

The Deputy Project Manager/ Engineer will be appointed by MOIP from within its own staff. This position will be part time. The role of this person is to act as deputy to the Project Manager and provide backup support as required. The Deputy PM/ Engineer will be fully conversant with the project and provide specialist technical input as required for the reconstruction of Category 3 housing.

The role will be a part time one largely based in Rarotonga but with travel to Aitutaki as necessary

Project Manager Advisor

Prior to works commencing on site MFAT will appoint an advisor to the Project Manager. The advisor will assist the PM and MOIP with preparation of the implementation document, procurement of materials and on site planning, co–ordination and quality assurance prior to the arrival of the Clerk of Works.

Clerk of Works

The Clerk of Works will be appointed by MFAT and will be based on Aitutaki and will form part of the PMG. He/she will provide technical expertise during reconstruction of Category 3 and construction of Category 4 houses and will work closely with the Project Manager and supervisors. In particular, he/she will fulfil a quality assurance role by ensuring that Category 4 houses are constructed in accordance with the design details provided by the architects and that work to Category 3 buildings follows

acceptable trade practice and fixings and details are appropriate for cyclone prone buildings. He/she will monitor the quality and supply of building materials to ensure that they meet the requirements of the specifications.

Finance Officer - MOIP

The Finance Officer will be provided by MOIP, and is responsible for the maintenance of administrative documents for the projects. The Finance Officer will keep records on all approved design documents and other amendments for the compilation of the as-built plans. In addition the Finance Officer will also be responsible for financial administration of the project. He/she will be responsible for keeping all financial records to produce financial reports; and will be responsible for all logistical planning, transportation and travel bookings, administration activities for the team working on the project.

Mayor

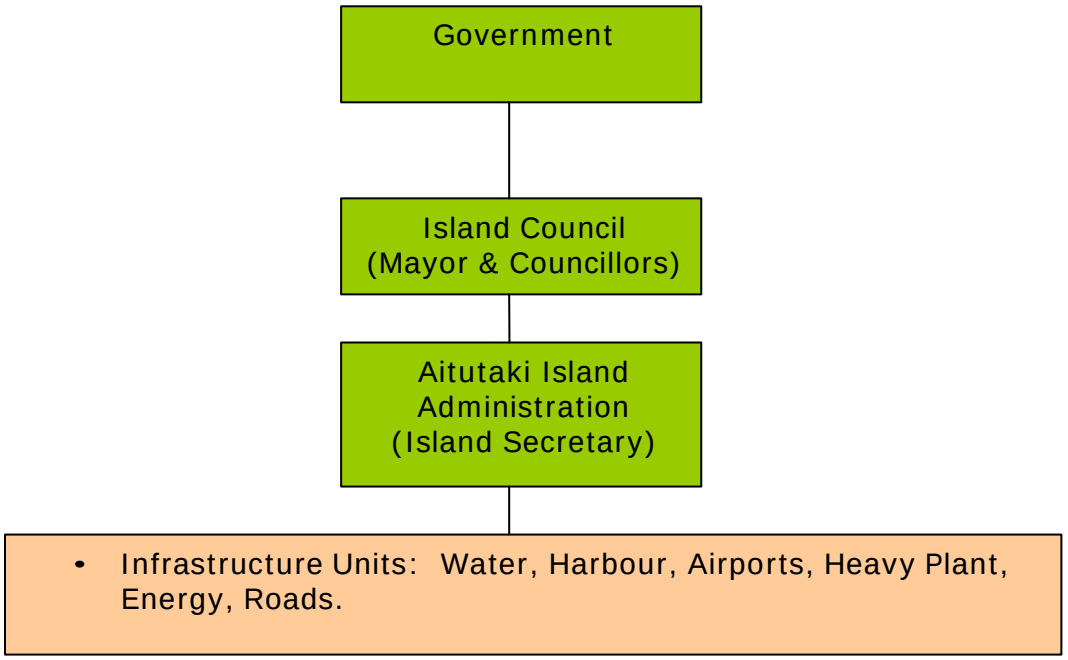
The role of the Mayor is to ensure the operations and management of the project are consistent with the island's expectations. As island liaison with the Construction project, the Mayor will facilitate access to resources from the island that is required for the construction works (e.g. Aggregates).). He will also

1. Ensure that good and fair work is carried out throughout the entire program
2. Work very closely with the ARC, MOIP, PM and the Clerk of works to ensure that good work plans are implemented.
3. Facilitate and ensure that access to any services required by the project from any Government Department like power supply, plant and machines, are provided.
4. Be the link between the PM with the Contractor and the island authorities.

The Mayor will make recommendations to the PM regarding workers with appropriate skills for the construction activities.

Institutional Context: The Island Council (IC) is illustrated below. The IC is the locally elected government and is directly responsible to the Minister of Infrastructure and Planning. They are responsible for running government affairs on the island. The IC is headed by the Mayor.

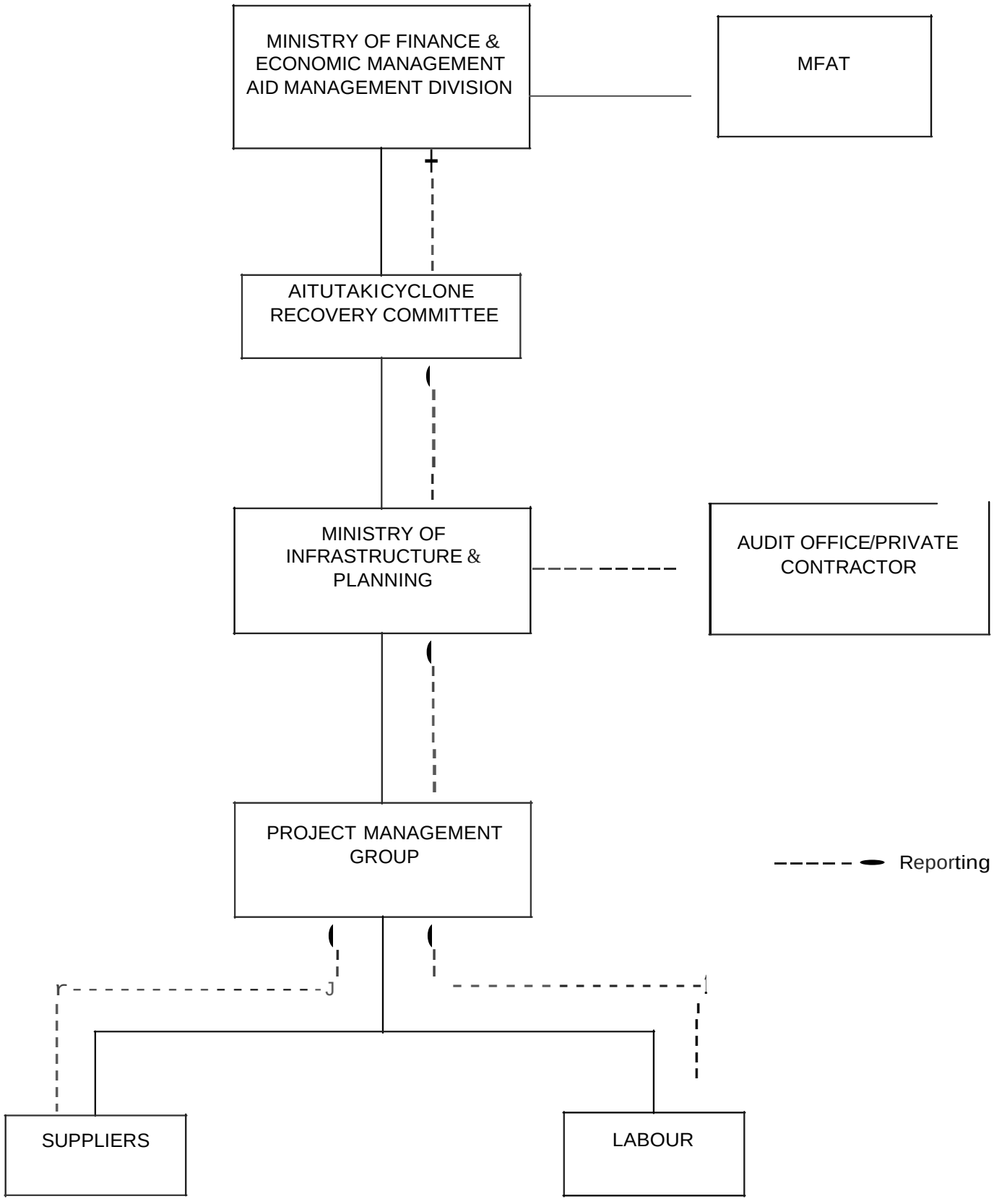
Institutional Structure



Inter-agency Coordination

Monitoring and coordination of the project between government agencies will be conducted by the ARC. The Chairperson of the ARC will ensure coordination required by the project, supported by the MOIP personnel working on the project (i.e. PM, Project Engineer, and Finance Officer) through ARC discussions, and through the cooperation of the various stakeholders represented on the ARC.

FINANCIAL FLOW CHART



Financial Management

The Finance Officer will work with PMG team to acquire all the necessary equipment prior to the implementation of the project on Aitutaki. The PM will provide the ARC with a weekly report, including actual expenditure and forecast expenditure. MOIP will provide monthly acquittals of expenditure to the ARC. Project funding will be managed by MOIP through AMD in accordance with the Cook Islands Government policies and procedures manual.

The ARC will approve the project budget, and requests for amendments to it, and monitor expenditure based on reports presented by the PM. The PM is required to maintain all financial records of payments being disbursed through MOIP on the site and be submitted to the PDS team at the end of the works or on demand. It is also expected that MOIP and the PM will regularly reconcile financial expenditures with MFAT before presenting progress reports to the ARC.

Reporting Requirements

The PMG will provide the ARC with following:

- Endorsement of the final assessment for Category 3 & 4 numbers and the final design and costs for the Category 4 house design in preparation for project implementation
- Progress and quality of the project including photographs
- Deviations from the cost plan with justification or proposals for corrective action
- Matters that may have a positive or adverse effect on the project and details of preventative and remedial action, or proposed action
- Summary of the milestones achieved during progress stages
- On completion of the project for a formal handover

The progress reports will be prepared on a weekly basis to show a full account of the status of the project and be submitted to the ARC. Should this be necessary, an inception report will be prepared by the PM and approved by the ARC within one month of mobilisation and will indicate any proposed changes to the project design or implementation strategy.

The PM will prepare a project completion report to detail the achievements of the project by component and output, identify constraints and strengths, and detail expenditures and inputs provided.

Monitoring and Evaluation

The ARC oversees the management of the project, with the assistance of the, the PM, and Technical Services Division of MOIP. Progress is monitored against the contract work plan, budget and PID, with payments dependent on the achievement of milestones by the Contractor. The PMG reports weekly to the ARC. The ARC shall prepare information papers to be presented to Cabinet so Cabinet is updated on the progress of the project.

SECTION FIVE: PROJECT IMPLEMENTATION

Introduction

The Ministry of Infrastructure and Planning commenced repairs of Category 1 and 2 buildings in March 2010 using funding from Cook Islands Government budgets. As of 10th May over 100 houses had been repaired with the balance expected to be complete by 7 June.

Expectations are that completion of the Category 1 and 2 repairs will be within the budget allocation for this work.

Shipping

Supply of materials to Aitutaki is constrained by shipping schedules. Supply vessels travel between Auckland, Rarotonga and Aitutaki every three weeks. There is a two week cut off prior to each sailing from Rarotonga for delivery of freight to the shipping company in Auckland. There may also be limited shipping on other vessels from Rarotonga to Aitutaki but details are not available as of the date of this report.

Upcoming shipping dates as at the date of this document are summarised below.

Freight Close Off Date Auckland	Depart Auckland	Depart Rarotonga	Arrive Aitutaki
24th May	31st May	6th June	9th June
14th June	21st June	30th June	2nd July
5th July	12th July	21st July	23rd July
26th July	2nd August	11 August	13th August

Local Supplies

Several suppliers of building materials are located on Aitutaki. These include:

- Ready mix concrete
  Contractor has two 5m² agitator trucks.

- Concrete Block
  A concrete block manufacturing plant (constructed in New Zealand) capable of producing well in excess of the number of blocks required.

- Timber
  Three timber suppliers carrying a range of commonly used timbers generally sourced from New Zealand. In general these are H3.2 treated No. 2 framing

grade. Also stocked and available are hardboard, plywood and fibre cement sheets.

- Roofing
  There is one roofing supplier on Aitutaki who can roll from coils of roofing material sourced from New Zealand steel. Only corrugated profile is available. Other profiles (e.g. 'Trimdek') have to be imported in cut sheets.

- Doors and Windows
  The roofing supplier also fabricates aluminium doors and windows using Rylock profiles sourced from Fletcher Aluminium in New Zealand.

- Aggregate
  The Aitutaki Island administration owns the local quarry. During April and May they have been stockpiling aggregate in anticipation of it being required for concrete foundations and floors and as at 13th May had approximately 90m³ out of a total estimated requirement of approximately 450m³.

Procurement Strategy (MFAT Funded Components)

The Cook Islands Government and ARC have a policy of maximising the economic benefits of the reconstruction effort. Implicit in this policy is the encouragement of local businesses (both Aitutaki and Rarotonga) to bid for supply of materials. In order to ensure value for money and best use of the budget, quotes and tenders for supply of materials from Cook Island companies will be assessed against quotations for direct supply of materials from New Zealand or Australia.

In addition, economic benefit for Aitutaki can be achieved by employment of local people for reconstruction where these skills are available. In addition, there is a significant element of upskilling and training for Aitutaki people if engaged in the reconstruction effort. Utilising local businesses, suppliers and Aitutaki workforce will help achieve the goals laid out in the overall cyclone recovery and reconstruction plan (ref section 2).

A variety of procurement strategies have been considered ranging from an international turn key contract to conventional construction contracts for identified components of the effort.

The preferred solution is to continue the strategy adopted for Category 1 and 2 repairs. It has the following features.

- Direct employment of Aitutaki workforce by MOIP as builders/labourers on an hourly / weekly basis.
- Labour to be formed into work gangs of 8–10 men each under the supervision of a MOIP staff member.
- The current workforce (approximately 27) can make a quick start on Category 3 buildings.
- Recruitment of an additional 25–30 men for Category 4 houses, specialist tradesmen (e.g. electricians) to be provided by MOIP.
- MOIP to tender supply packages for materials on a Cif Aitutaki basis.
- MFAT funded Clerk of Works to monitor quality for both categories of houses and advise on repairs to Category 3 houses.

- Weekly reporting by the Project Manager to MOIP and the ARC.

Adoption of this strategy will have the following benefits.

- It has been successfully proven during the repair of Category 1 and 2 houses.
- The workforce can make a start immediately once materials are available.
- There is a significant degree of upskilling and training available to local Aitutaki workers with input from MOIP staff and the Clerk of Works.
- It will contribute to the economic recovery of the island more than if an outside workforce was utilised.
- Risk (in terms of late delivery, cost overruns) is taken by MOIP. A private contractor would allow for this within their pricing structure along with a profit margin.

In a very few cases, homeowners of Category 3 houses have undertaken repairs using their own resources. In these instances, reimbursement of actual costs will be made by MOIP after verification of invoices and inspection of work by the Project Manager

The issue of material supply has been discussed and agreed with MOIP, ARC and the Ministry of Finance and Economic Management. Unlike a conventional construction contract where the responsibility of providing the construction materials lies with the contractor, the proposed strategy relies on procurement of construction materials by MOIP.

The Cook Islands has stringent tender requirements for procurement of publically funded goods. This includes oversight of the process by the CIG Tenders Committee and public notification of the opportunity to bid. It has been agreed by the ARC that this process should apply for the majority (80%) of all materials funded by MFAT however this process – even in a streamlined form will take several weeks to run its course. Thus, if adopted for all material procurement, the time frame plus shipping constraints would prevent a start date on site until mid August (ref Aitutaki Work Programme).

Accordingly, it is proposed to procure 20% of the materials for both Category 3 and 4 houses by way of seeking quotations from known suppliers both in Rarotonga and Aitutaki. Quotations will be evaluated by the PMG including the Project Manager Advisor.

Prices obtained by this means will be benchmarked against known costs in New Zealand, Aitutaki and Rarotonga to ensure prices are reasonable. Direct purchase of materials from New Zealand will remain an option if savings can be achieved in this manner.

The budget requirement for this exercise can be displayed as follows.

	MFAT Funded Houses	**MFAT Budget Allocation (Total)**	**Open Tender Budget Allocation**	**Direct Procurement (Fast track)**
Category 3	95	950,000	830,000	120,000
Category 4	60	1,900,000	1,520,000	380,000
TOTALS	**155**	**$2,850,000**	**$2,350,000**	**$500,000**

This approach has been endorsed by the ARC and MOIP. A letter seeking an exemption to the CIG tender process was sent by the Ministry of Finance to the Chairman of the Tender Committee on Friday 14th May and is appended to this document.

Tender Packages

It is intended that MOIP will obtain prices for construction materials from a range of suppliers for the following packages of materials.

- Timber
- Roofing
- Concrete Blockwork
- Ready Mix Concrete
- Reinforcing Steel
- Sheet Materials (Plywood, Fibre Cement, Hardboard)
- Fixings (bolts, nailplates, nails, screws, brackets etc)
- Doors and Windows – including glazing and hardware
- Electrical fittings
- Flashings and ridging
- Plumbing fittings
- Joinery (sink bench)
- Damp Proofing
- Sisalation
- Sand / Cement

Note:

1. Some packages may be combined for efficiency.
2. In the case of concrete supply there is only one supplier on Aitutaki and a supply contract will be negotiated directly.

Bills of quantities will be prepared by MOIP for each tender package using data already prepared during the detailed assessment of damage in the case of Category 3 houses and the drawings prepared by EAA in the case of Category 4 houses.

It is noted that it is not possible to accurately schedule all materials as at the date of this report and that some flexibility in the procurement arrangements shall be maintained to allow for the purchase of small numbers of individual items that may be required. Such items might include one off brackets or fastenings (particularly for the cat 3 houses), sealants, misc plumber's supplies (eg adhesives) etc
It is proposed that purchases of such items will be authorised by the PM in conjunction with the Clerk of Works.

As outlined above, it is proposed that 80% of materials will be subject to the Open Tender Process approved by the CIG. It is anticipated that this will result in cost savings due to the bulk of materials required. Tenders for this component will be publicly advertised in the Cook Islands and in New Zealand and documentation will be in accordance with the standard MOIP templates.

Suppliers will be required to include freight costs within their price with MOIP taking delivery at the Aitutaki wharf.

The tender documents will allow for staggered delivery dates if requested by suppliers.

Tenders received will be evaluated by the PMG including the Project Manager Advisor and subsequently the Clerk of Works before a recommendation for approval is made to the ARC and the CIG Tenders Committee.

Material Storage

MOIP will take delivery of a considerable quantity of materials on Aitutaki and proper and secure storage will be essential. The community hall in the Vaipae village lost a considerable portion of its roof during the cyclone and it has been agreed with the hall owners that MOIP will have use of the hall for material storage in return for repairing the roof. This hall is centrally located in an area where a considerable number of Category 3 and 4 houses are situated.

MOIP / ARC shall arrange for insurance to cover materials while in storage.

Programme Procurement

Refer to the Aitutaki Work Programme which outlines the proposed procurement programme as already described. It can be summarises as follows.

Stage 1

Complete Category 1 and 2 repairs and repair the Vaipae Hall.

Approval of PID and complete contractual documentation between MFAT and CIG. Target completion date – 7th June.

Stage 2

Complete 'fast track' procurement of materials using a portion of MFAT funds ($500k) to allow initial shipping deadlines to be met.

Continue with existing workforce on Category 3 houses. Recruit extra labour and commence Category 4 construction.

Target date for material delivery – 28th June.

(Note: if rapid agreement can be achieved and if funds are available then an earlier start may be possible on Category 4 foundations using materials already available on Aitutaki).

Stage 3

Conduct open tender process using established CIG procedures that are streamlined as much as possible.

Delivery of materials to site on 13th August.

Construction Programme Strategy

As described it is intended to continue to utilise the existing workforce that has completed the repairs to Category 1 and 2 houses to continue on with Category 3 houses.

Each of these houses will pose different challenges with no two houses being the same. While all Category 3 houses will require substantial roof repairs there is other damage that will need repaired to a greater or lesser extent in each Category 3 house.

It is proposed that 3 teams of workers each comprising 8–10 men and lead by a MOIP supervisor will undertake this work.

It is proposed to commence with three pilot houses representing three typical types of construction (limestone/ timber/ concrete). This will be done to refine construction techniques and test the validity of estimates both for materials and labour costs.

It is currently estimated that each team will repair – on average 1½ homes per week. Thus, it is estimated it will take the three teams 26 – 30 weeks to complete the 95 Category 3 houses.

Construction of the new Category 4 houses will take place in a different manner. In this case a 'production line' approach will be taken. Separate teams of workers – similar in size to the existing teams will be recruited and will be lead by MOIP supervisors.

Each team will specialise in a different aspect of construction:

Team 1 : Footings, foundations and floor slab
Team 2 : Concrete masonry columns and walls
Team 3 : Carpentry, roofing and finishing work

Specialist input from electricians will supplement these teams as required.

Based on the experience obtained during the construction of the prototype house it is estimated that once established it may be possible to complete two to three houses per week.
Allowing for time taken to establish suitable work patterns and for the teams to get up to speed it is estimated that construction of Category 4 houses will take approximately 30 weeks.

If a start date of 1st July can be achieved then the target date for completion of Category 4 housing will be at the end of December 2010.

Environmental Risk Management Plan

If required, the PMG will be responsible for putting together an Environmental Site Based Management Plan that meets the requirements of the CI government..

The PMG will be responsible overall for monitoring activities and for ensuring that all new works are executed within acceptable boundaries. The PM is responsible for the day-to-day site supervision and control of works on the island. The purpose of the plan is to ensure that measures are put in place to minimise any drastic environmental impact during construction.

Health and Safety

The PMG will prepare and implement a health and safety plan. Work place accidents shall be monitored and reported back to MOIP and the ARC. The PM and workplace supervisors shall ensure that suitable safety equipment and on site training is available and also to ensure that Health and Safety Regulations are adhered to during the works.

Project Implementation Risk Management

Generally the risks are institutional, socio-economic, financial and environmental. A preliminary risk assessment was carried out to identify risks that could affect the management of the project.

These issues can be managed by sound project management to effectively mitigate the impact of the following risks:

- Delays in commencing the works
- Availability of the right plants & equipment
- Shipping delays and loss of materials and equipment during shipping
- Extreme weather conditions during construction
- Unexpected site condition (geological strata harder than expected)
- Mechanical breakdowns and limited available equipments for continuity
- Communication breakdowns
- Availability of sufficient workforce

Risks associated with the quality of the completed works include:

- Poor workmanship in project works resulting in low grade quality
- Lack of experience with specialised materials and technique
- Undersized machineries and plants resulting in double handling and delays

The above risks can be reduced by:

- Careful design of the works
- Forward logistical planning requirements for materials and transportation of plants and equipments
- Good project management and coordination with all parties involved
- Avoiding construction during cyclone seasons
- Proper storage of materials on the site
- Close supervision of construction works
- Ensuring special tasks are executed by a qualified and skilful workforce
- Ensuring the right size of heavy plant and machineries are used on the site for efficiency and delivery.

Pre-Project Preparation

In addition to the initial assessments have been carried out by MOIP and the following has been completed by MOIP for Phase 1 of the project (Category 1 and 2 repairs):

- Discussions with Island Council
- Actual designs and implementation criteria
- Preparation of logistic planning and approach methods
- Identification of engineering and project implementation risks
- Establishment of project management structure, including identification of key MOIP personnel to manage, administer and construct the project (i.e. project engineer, finance officer – management & administration and PM.

Project Outcomes

Successful implementation of the project includes the establishment of management systems and operation plan for the Island Administration and the Island Council to ensure that:

- New housing are safe and durable and achieving its design capability.

- Routine inspections are carried out during specific times of the construction phase
- The Cook Islands Building Code is enforced
- All building permits are to be approved by the Building Control office of MOIP
- The construction of the building is in accordance with the design specifications approved by the Building Control office of MOIP
- Encouraging local awareness and participation in the management of projects by introducing usage control measures.
- Contributing to the improvement of socio-economic and living standards on the island.

Collectively these results will lead to a more effective management and operation system for the building industry on Aitutaki.

Project Completion

Inspection and Handover

On completion the Cook Islands Government Building Inspector will inspect the site, certifying completion in accordance with the approved design and in line with the Cook Islands Building Code, and good practice.

Operation and Management

One of the key results of the project is the good management and effective ongoing operations for monitoring of the construction industry on the island. The post-completion goal is to ensure that the buildings being constructed meet the requirements of the Cook Islands Building Code.

An Operational and Maintenance Plan shall be developed as part of the project. The Cook Islands Government agrees to provide budget, labour and other resource inputs for monitoring of the construction industry to be enforced.

Evaluation

An evaluation will be carried out after one year of completion of the Project. The Project will be independently evaluated at the direction of the ARC in order to assess lessons learned and to ensure that the use of the infrastructure is meeting the expected outcomes on Aitutaki in general.

SECTION SIX: FINANCE AND BUDGET

MFAT Funding

The New Zealand Government has allocated funding to the Aitutaki Recovery and Plan totalling $5.5 million. Of this amount funding has been directed towards reconstruction and repair of Category 3 housing and construction of Category 4 housing as follows.

Allocation	Activity
$1.0 million	Provision of services to the agreed number (currently 60) of Category 4 houses – concrete foundation, plumbing and electricity.
$900,000	Contribution towards actual and reasonable costs of building materials for Category 4 homes. $15,000 x 60 homes = $900,000
$950,000	Contribution to the repairs of 95 Category 3 homes (materials / labour) $10,000 x 95 homes = $950,000
$2,850,000	**SUBTOTAL**
$200,000	Quality Assurance, Full time project inspector based in Aitutaki for up to one year – fees, accommodation, travel
$300,000	Sanitation – through the waste management initiative manage installation, repair or upgrade of sanitation system in all four Category 4 homes $5,000 x 60 = $300,000
$514,850	Unallocated Contingency

It has been noted that:

"Estimates are likely to change as damage assessments and costings are finalised during April. Some costs will be determined through a competitive tendering process. The current draft of the Aitutaki Recovery and Reconstruction Plan identified 72 homes needing reconstruction but further assessment against eligibility criteria has reduced this to 60. Further changes likely as repair work gets started on Category 3 homes as some may be condemned and require reconstruction rather than repair".

Cook Island Government Funding

The CIG has allocated $250,000 towards project management of the Category 3 and 4 housing. This budget figure will cover project manager costs and MOIP staffing costs.

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Budget Figures – Category 4 Houses

MFAT commissioned Emergency Architects Australia to prepare plans and outline specifications for 1 and 2 bedroom Category 4 homes. Based on plans prepared by them, their estimates of cost are summarised below. They comment that these are estimates only and need to be considered as 'broad' cost outline. Estimates include labour and a 5% contingency.

1 Bedroom House

Structural Frame	13,587
Infill Walls and Fitout	14,863
	$28,470

2 Bedroom House

Structural Frame	19,949
Infill Walls and Fitout	16,962
	$36,911

Extra costs if required (per house)

Septic tank	2,911
Rainwater tank	4,005
Verandah	2,650

Budget Figures – Category 3 Houses

The Cook Islands Government originally estimated an average cost of $15,000 for repairs to Category 3 homes. This figure was included in the Aitutaki Recovery Plan. MFAT offered $950,000 towards this amount based on an allocation of $10,000 per house (95 houses).

On 26 May, MOIP completed a more detailed estimate of costs for category 3 houses (ref appendix 9) that increased the total estimated cost of materials to $2,373,000. Within this figure, costs per house vary considerably. On top of this amount, is added the estimated cost of labour being $460,000 bringing the total estimated cost of category 3 repairs to $2,833,000.

This equates to an average cost per house (95 houses) of $29,800 (materials and labour)

Funding Gap – Category 3 Houses

The ARC recognises there is a gap between the funds committed to repair of Category 3 houses and the estimated costs. This can be expressed as follows.

Funds Committed: (MFAT) **$950,000**

Estimated cost: (MOIP 26 May) **$2,883,000**

Funding Gap: **$1,833,000**

No solution has been confirmed as at the date of this report as to how this funding gap can be eliminated. In the interim, tendering of materials will proceed with as tight cost control as possible consistent with the overall requirement to report houses to a cyclone resistant standard and using quality materials and work practices appropriate to the location.

Funding Gap – Category 4 Houses

MFAT have committed funding of $1.9 million towards Category 4 homes (excluding septic tanks). The funding was based on 60 houses.

The Aitutaki Island Council has determined that there should be 65 houses constructed. (39 x 1 bedroom houses and 26 x 2 bedroom hoses) A breakdown of this information is given in Appendix 10. The ARC has endorsed these numbers based on a reassessment of numbers as previously described

Cost :	1 bedroom homes 39 x 28,470 =	$1,110,000	approx
	2 bedroom homes 26 x 36,911 =	960,000	approx
Total Estimated Cost		**$2,070,000**	**approx**

Note: Excludes verandah, rainwater tank and septic tank connection.

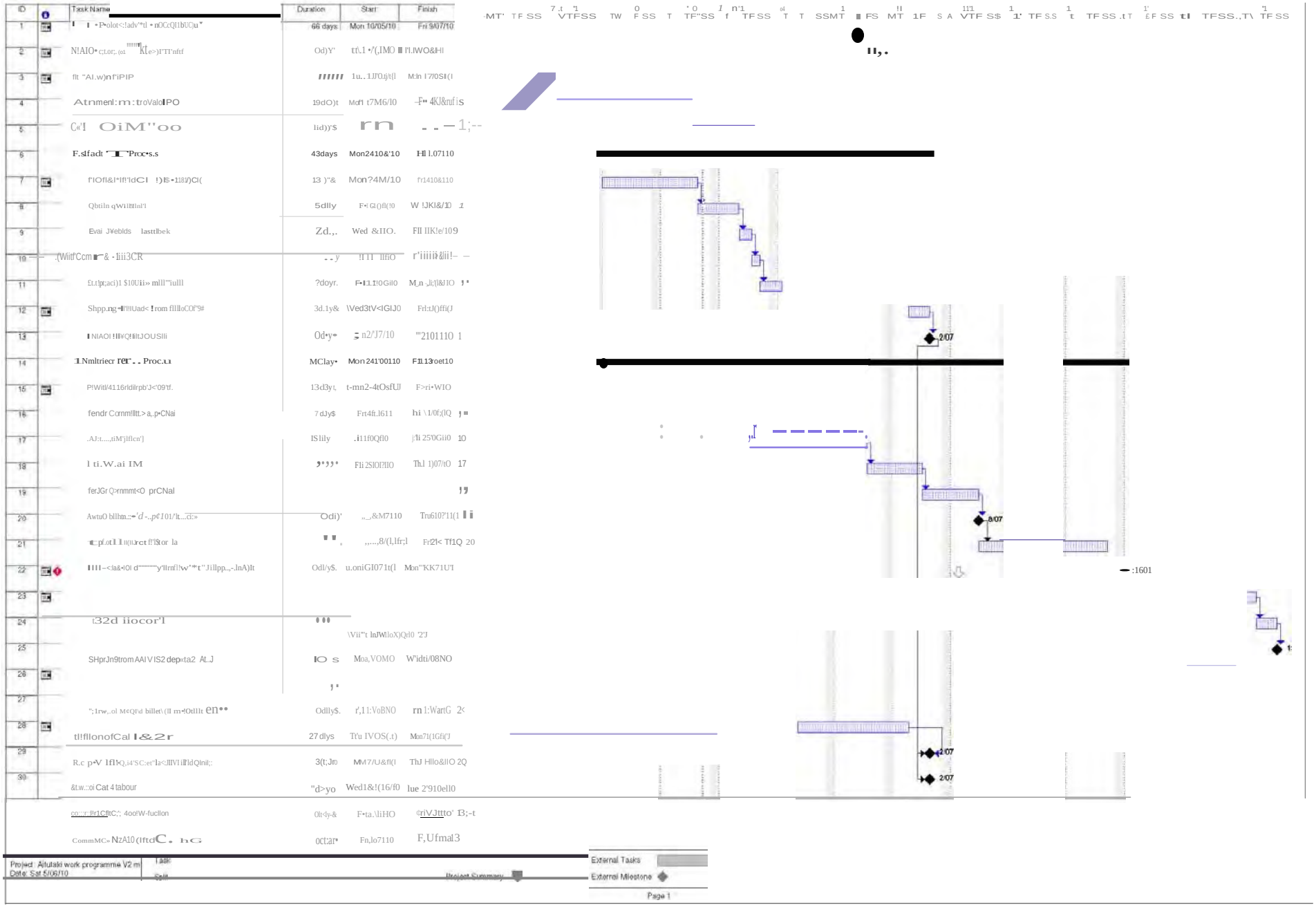
Funding Available	$1,900,000
Difference (estimated)	**$170,000**

The difference will be covered from the MFAT contingency sum to enable construction of the extra five houses. (ref letter NZHC to Minister Rasmussen dated 3 June).

As for Category 3 houses, tight cost control will be necessary and measures put in place to monitor progress and actual expenditure against budget.

APPENDICES

Appendix 1: Aitutaki Work Programme


Task Name
Duration
Start
Finish
Project: Afiutaki work programme V2 m
Date: Sat 5/06/10
Task
Split
Project Summary
External Tasks
External Milestone
Page 1
Summary

Appendix 2: Project Management Group Terms of Reference

Introduction:

The Project Management Group (PMG) team shall comprise of the Project Manager, Project Engineer, Clerk of Works & Finance Officer. This is an in-house design and administration team of the project. All matters regarding the initiation, design and implementation of the project shall be directed to this PMG team which is based at the Technical Services Division of MOIP.

The team will finalise all the documentation and purchase of all materials and transportation to Aitutaki.

The Role of the PDS

The PMG team will therefore be the one to undertake administration and manage the overall project. Their functions also include:

- To inform the Secretary of MOIP of any progress and any issues relating to the works.
- Discuss with the MSC of any variation to the project. Before any decision is made with any variation the Secretary must sanction it.
- Any decisions made by the Secretary MOIP will be actioned by the PMG
- As technical adviser and representative of the Principal, MOIP.
- Supervising Construction on behalf of the Principal, MOIP
- Certifying of payments

Appendix 3: Project Manager Terms of Reference

Purpose of the Position:

The Aitutaki Cyclone Recovery Committee wishes to engage the services of a Project Manager (PM) to implement the Cyclone Recovery Housing project for Categories 3 & 4. The PM has overall project management responsibility on site in Aitutaki. The PM is responsible for the overall administration, timely completion and reporting of the project.

Reports to:

The PM will report to the Aitutaki Cyclone Recovery Committee on a daily basis on the implementation of activities relating to the Cyclone Recovery Housing project.

Key Responsibilities and Tasks

The key responsibilities of the Project Manager are:

- To supervise the execution of the construction works
- To ensure that the approved work plans progresses in accordance with agreed timelines
- To ensure that all works comply with approved design and standards.
- To coordinate with other stakeholders with matters relating to the project
- To oversee the delivery of the project.

The Project Manager:

The Project Manager will lead and manage the project on site. It is preferred that the person has the required project management experience on the outer islands and can communicate effectively with the communities on Aitutaki on issues relating to the project. The PM's main roles are:

1. Pre-project Work Requirements;

Familiarise himself with the project requirement and providing the leadership in undertaking of the key pre-project activities. The PM will work with MOIP in undertaking the following;

- Organising meetings, consultations with stakeholders as required to allow the project preparatory works to start and be completed on time
- Coordination of tasks related to the issue of procurement of materials and the organisation of each Contractor with stakeholders.
- Liaise with the Project Manager Advisor (appointed by MFAT) regarding procurement and planning issues.

2. Project Management

Provide the expected project management oversight and leadership in the implementation of the project towards a successful end through:

- Meet and work closely with the workforce supervisors, Clerk of Works, stakeholders, Island Administration and the Island Council to ensure that all

phases of the works are properly planned and that key project milestones are achieved
- Provide on a daily basis and in conjunction and co–operation with the Clerk of Works, on-site supervision and inspection on the technical aspects relating to the construction components of the project.
- Cooperate closely with the workforce supervisors on matters of workers safety.
- To keep a site diary constituting a detailed history of the work done and all happening on the site

3. Reporting

- Provide advice and detailed written report to the Aitutaki Cyclone Recovery Committee
- To record the progress of work in comparison with the work program
- Provide reports on any major variations that may occur on the project
- Provide project Completion Report

4. Works Management

- To measure in agreement with the workforce supervisors the quantities of work executed
- To verify in agreement with the Clerk of Works the quantities of work executed and completed so that interim and final payments due to the workers and suppliers may be certified by the PM.
- To ensure that any additional/variation works are initially documented before certification by the PM.

5. Communications

- Active liaison with key partners in this case with the Project Manager Advisor, Supervisors, Clerk of Works, Island Administration, the Island Council and inspectors
- Effective oral and written communications between the varying audience including being understanding and sensitive to cultural issues
- Collaboration with the Clerk of Works and Supervisors regarding consideration of changes to the construction works
- To ensure there is a good working relationship with all involved with the project which include key stakeholders, Supervisors, Clerk of Works and suppliers

6. Performance Management

In conjunction and in co–operation with the Clerk of Works ensure that:

- Project and product qualities are monitored and evaluated against set standards
- To check the works to ensure that they are executed to correct line and levels
- To check that the materials and workmanship comply with the specifications.
- To examine the methods of executing the works to ensure that the safe and satisfactory execution of the permanent works
- To inspect materials on site.

- To demonstrate strong leadership, confidence, commonsense and professional judgement throughout the execution of the project.
- To check the credibility of the local builders that are part of the team.
- To ensure that all matters affecting other stakeholders on site as a result of the project are resolved in a proper manner.

7. Qualifications, Experience and Personal Qualities

Minimum academic qualification is a Bachelor's Degree in Civil Engineering but other related qualifications will be considered:

- Minimum of 5 years professional experience;
- Extensive experience in all aspects of infrastructure development
- Experience in tropical environment (marine, coastal)
- Excellent cross cultural communication skills (wide and varied target audience)
- Demonstrated technology transfer skills
- Ability to work in a multi sector/discipline team
- Good programme design skills (include ability to make both technical and policy recommendations)

8. Term of Assignment

The assignment is for term of the project

9. Motivation, Commitment and Networking Ability

Requires a person who is highly motivated, a self starter and can work with or draw and engage information/support from any person(s) who may have knowledge/information/resources crucial to project completion. Must be innovative, able to forecast and anticipate likely problems and also make arrangement, strategies to minimise impact on the project.

10. Completing Tasks

Requires an energetic person with the proven ability to complete tasks on time, at an acceptable level and standard.

11. Honesty and Integrity

Requires a person that is honest who will work to complete projects with high respect for other staff members and peers.

Appendix 4: Finance Officer Terms of Reference

Purpose of the Position:

The Aitutaki Cyclone Recovery Committee wishes to engage the services of a Finance Officer (FO) to manage the finances of the Cyclone Recovery Housing project for Categories 3 & 4. The FO is responsible for maintaining the projects financial obligations and services within the requirements of the Ministry of Finance and Economic Management (MFEM) Act and the Cook Islands Government Financial Policies and Procedures Manual.

Reports to:

The FO will report to the Project Manager (PM) of the Aitutaki Cyclone Recovery Housing project on a daily basis and shall provide weekly financial reports relating to the project.

Key Responsibilities and Tasks

The key responsibilities of the Financial Officer are:

- Process payments for goods and services requested by the PM
- Preparing payment vouchers for purchases of goods and services for approval and signing for processing by MFEM
- Prepare loose vouchers (overtime, wages, salaries and payroll allowances) for processing by MFEM
- Data entry of appropriation, receipts, payments, automatic transfers and general journals into accounting software
- Reconcile the project account, accounts payables, accounts receivables, VAT account and all other subsidiary accounts
- Communicate with the banks to clarify issues identified in the bank statements
- Complete weekly variance reports

The Finance Officer:

The Finance Officer shall be responsible for the processing of both payments and receipts for goods, supplies and services received or rendered to maintain good rapport with suppliers and customers. Accurate and efficient data entry of financial information to ensure rework is minimized and all deadlines for report submissions are met.

Reporting

- Provide weekly financial reports
- Provide completed financial report upon completion of project.

Communications

- Active liaison with key partners in this case with the Contractors, Island Administrations, the Island Council and inspectors
- Consultation on position of payment processes, supplier accounts, charges, payments, delivery of goods and services

- To ensure there is a good working relationship with suppliers

Qualifications, Experience and Personal Qualities

- Minimum of 5 years professional experience in the area of finance
- Excellent cross cultural communication skills (wide and varied target audience)
- Ability to work in a multi sector/discipline team

Term of Assignment

The assignment is for term of the project

Motivation, Commitment and Networking Ability

Requires a person who is highly motivated, a self starter and can work with or draw and engage information/support from any person(s) who may have knowledge/information/resources crucial to managing finances. Must be innovative, able to forecast and anticipate likely problems and also make arrangement, strategies to minimise impact on the project.

Completing Tasks

Requires an energetic person with the proven ability to complete tasks on time, at an acceptable level and standard.

Honesty and Integrity

Requires a person that is honest who will work to complete projects with high respect for other staff members and peers.

Appendix 5: Risk Management Matrix

Source of Risk	Risk Event	Impact on Project	L	C	R	Risk Treatment	Responsibility
Management Risks							
Aitutaki Island Administration	Lack of support for the resources required for maintaining the operation.	Reduce sustainability of the project through lack of institutional support.	2	4	2	Ensure that the Island administration is well informed about the project.	MOIP
	Lack of skill and knowledge within Island Administration.	Increase the degree of capacity building required.	3	4	3	Provide capacity building within the project and develop training programs to improve skill and knowledge.	MOIP
	Island Administration loses skilled personnel during or after the project.	Reduce sustainability of the project through reduction of skilled personnel to manage operation.	3	3	2	Ensure that more than one person is trained in one skilled area.	MOIP
	Lack of funds for operations and management.	Reduce sustainability of the Project through inadequate operations and maintenance.	4	3	3	Regular meetings with Island Council and MOIP to maintain their support.	MOIP
Equipment Failure	Major equipment on the project failed or breakdown.	Reduce credibility of the Project Team.	3	3	2	Incorporate backup plant services schedules in the construction management plan. Ensure that spare parts are purchased and shipped with the implementation team.	MOIP
Transportation	Shipping to Aitutaki irregular.	Reduce sustainability of the Project through inadequate operations and	3	3	3	Ensure that equipment, spare parts and dried goods are purchased and shipped with the	MOIP

Source of Risk	Risk Event	Impact on Project	L	C	R	Risk Treatment	Responsibility
		maintenance.				implementation team	
Environmental Risks							
Heavier cargo deliveries	Lack of harbour facilities to meet demand.	Reduced capacity of types of cargos delivered. Ensure supplier awareness	2	3	2	Minimise opportunities for developments and enhancing living standards on islands.	MOIP
Contractor	Damage to environment during construction works.	Community backlash at environmental damage.	2	3	2	ESBMP to be prepared by MOIP.	MOIP
Social and Gender							
Traditional Leaders	Traditional leaders do not provide necessary land approvals.	Cause delays and may lead to incomplete works. Project may not fulfil its objective.	3	3	2	Conduct regular meetings with Island Council and traditional leaders on the impact and status of the project.	MOIP
Community	Lack of support from community regarding operations and management.	Reduce sustainability of the project by inviting unwarranted damages to the facilities.	3	3	2	Conduct community consultation.	MOIP
	Community ignorance of improved construction measures and Building Code.	Reduce sustainability and efficiency of the project. Increase opportunities for high maintenance and operation costs.	3	3	2	Conduct community awareness meetings and underline the importance enforcing the Building Code.	MOIP

L = Likelihood
C = Consequences
R = Risk
Scale of 1-5 with 1 equal to low risk and 5 equal to high risk

Appendix 6: Environmental Site Based Management Plan

- MOIP as the Implementing Agency are committed to comply fully with the environmental protection legislation and development consent conditions
- Identify and manage all on-site environmental issues in order to minimise all environmental impacts caused by our activities and
- Train all our on-site staff for responsible environment management relevant to their daily task and ensure they follow environmental work instruction.

ESBMP - Environmental Issues and Impact Checklist

Construction Site - Aitutaki						
Is the Environmental Issue Applicable to the Site?	**Key Environmental Issues**	**Environmental Issues**	**Maximum Consequence Score**	**Probability**	**Risk Rating**	**Mitigation Actions**
9	Community Relations & Amenity	Excessive noise, overtimes and night works, dust and traffic congestion.	3	B	Medium	Inform the local communities of the type of operation and provide contact details of any concern. Adhere to Contract specifications on times of operation
9	Air Quality	Photochemical smog, ground level ozone resulting from vehicle emissions and explosion fumes. Can	4	C	Medium	Service and maintain all machineries in good order. Avoid exposing diesel fumes.

		adverse affects on human health.				
		Impacts of dust (coarse particles) are generally local and more of a nuisance especially on sensitive vegetation through surface coating.	4	B	Medium	Use water sprays to control dust. Stop work if dust cannot be controlled.
9	Noise	Annoyance reaction, sleep disturbance, interference with communication and hearing loss.	4	B	Medium	Maintain all equipments in good working order. Comply with Contract conditions.
9	Waste & excavated materials	Mass volume of excavated materials for reuse by the local community. Damaged parts and machines will be left behind after the construction	4	A	Medium	Implement source separation of construction waste and arrange for better use of materials. Stockpile excavated material properly for reuse by local community.
9	Soil Contamination	Contamination of good vegetable soils	2	D	Medium	Provide drainage on site. Ensure all soil excavated on cut is utilised on

		as a result of mass stockpiling of excavated soil materials and excess clearing				embankment and compacted thoroughly. Mark out clearly the extent of clearing line and trees to be cut down
9	Hazardous Materials	Loose or mishandling of hazardous materials, exposed diesel fuels can result in explosion, fire, loss and damage of life and property.	3	D	Low	Store all materials in proper place. Fuelling of machineries in bunded area with appropriate signage. Handling of heavy goods by authorised people

Note 1: Consequence score based on AS4360 – table 1
Note 2: Probability score based on AS4360 – table 2

ESBMP - Duties & Responsibilities

Project Management Group (PMG) Team

- Responsible for the overall project delivery

Project Manager (PM)

- Responsible for meeting MOIP project outcomes and delivery (employed for the on-site management of the project)
- Ensure all requirements for site establishment (land permits and boundaries etc.) are met before commencing construction.
- Ensure compliance with all requirements such as community access and land boundaries

MOIP Representatives

- Ensure the safe handling and storage of project materials
- Ensure site boundaries are established before commencing of works
- Ensure that all works are executed within the boundaries and adhering to safety on site
- Ensure the trench and clearing line is established clearly on site before any excavation begins.
- Ensure all requirements for site establishment (site entry, setting out boundary lines etc.) are met before commencing construction as per approved Environmental Site Based Management Plan and relevant conditions of the contract and specification
- Ensure all site personnel are adequately trained to carry out their environmental responsibilities
- Training needs for site personnel
- Day to day implementation of all site environmental requirements.
- Keep daily diary of all events and actions relevant to environmental management as set out in this EMP
- Briefing with local community and site staffs on specific environmental aspects relevant to their tasks (e.g. pre-warnings and public awareness during site clearing days)
- Maintaining records of all induction and training
- Maintenance of site records to include; Site diary, relevant environmentally related actions, a monitoring record card, any complains and remedial actions

Individual Machine Operator

- regularly maintain machinery in good working order particularly silencers and reversing alarms

ESBMP - Community Relations & Amenity

PLANNING		IMPLEMENTATION	
Environmental Issues	***Compliance & Best Practice Requirements***	***Work Instructions***	***Responsibility***
• Noise	• All machinery exhaust mufflers and reversing alarms in good working conditions, engine servicing • Compliance with approved working hours	• Daily and weekly check of all machineries • Time restrictions - Sunday: no construction works	PM Supervisors
• Traffic Management	• Supervise delivery of plants & heavy machineries on site to minimise damages, accidents & losses. • Manage parking & servicing yard safely away from community access	• Ensure dump trucks & machineries use designated access routes • Trucks and Machinery hazard lights and warnings are in good order for night works • Advise the local community of any unusual activity that might affect access to their properties	PM
• Dust	• Minimise dust generation from site access and stockpiles	• See instructions for dust suppression under “Air Quality” above	PM
• Community liaison	• Keep community awareness and fully informed of proposed works and any activity that would impact amenity (e.g. tree cutting)	• Keep a register of names of all property owners closely related to the new sites and area of work • Advanced consultation with the local communities and prior warning on actual blasting dates • Consult community on the extent of large volumes of excavated materials for stockpiling • Develop a traffic user methods and	PM

		road repairs format for road accessibility	
• Complaints	• Ensure all issues and complaints from the local community are reordered and addressed promptly	• Record all details of issues and complaints (person, date, time and nature of the complaint) • Promptly carry out any necessary corrective action. If necessary change work practices to prevent reoccurring of circumstances	PM

ESBMP - Noise

PLANNING		IMPLEMENTATION	
Environmental Issues	***Compliance & Best Practice Requirements***	***Work Instructions***	***Responsibility***
• Noise emission from site activities	• Development consent and Conditions of Contract and specification	• Time Restrictions • All possible steps can be taken to minimise noise from the site • Maintain records of any noise complaints and corrective actions	Supervisors

ESBMP - Waste & Discarded Machineries

PLANNING		IMPLEMENTATION	
Environmental Issues	***Compliance & Best Practice Requirements***	***Work Instructions***	***Responsibility***
• Mass volume of excavated materials for reuse by the local community. • Damaged parts and old machines	• Development consent and Conditions of Contract and specification	• Locate the damping site away from good vegetable land and without danger to nearby properties • Stockpile the excavated loose material carefully and be contained within designated boundary • Advice community on better re-	PM Supervisors

and excess material will be left behind after the construction		use of the materials. • Record all damaged mechanical parts, machineries that will be discarded and burry away on damping site. • Inform community on upkeep of machineries and materials that will be left behind on their care and responsibilities after completion of works	

ESBMP - Soil Contamination

PLANNING		**IMPLEMENTATION**	
Environmental Issues	***Compliance & Best Practice Requirements***	***Work Instructions***	***Responsibility***
• Stockpiling of excavated materials	• Conditions as specified by the Development agreement and Technical specification	• Stockpile all excavated material carefully on damping site only	Supervisors

Appendix 7: Maps Showing Locations of Category 1 and 2 Houses

Appendix 8: Maps Showing Locations of Category 3 and 4 Houses

Appendix 9: Detailed Assessment of Category 3 Houses

Survey No.	BLDG ID	Owner Name	Category	Village	Wall Type	Roof Type	Village No.	Floor Area Area - m2	Remedial Cost Cost - $	Total Cost - $
1	1165	Lucy Marsters	3	Amuri	Concrete	Gable	1	224	$ 38,341.12	
2	1326	Paoro Teiti (Hse 1)	3	Amuri	Timber	Gable/Lean-To	2	287	$ 34,131.52	
3	1181	Mikaera Tumu	3	Amuri	Concrete	Gable	3	246	$ 34,323.20	
4	1183	Paora Teiti (Hse 2)	3	Amuri	Concrete	Lean-To	4	219	$ 35,838.40	
5	1182	Kiria Kiria	3	Amuri	Concrete	Gable	5	301	$ 21,256.00	
6	1218	Camp Henry	3	Amuri	Conc/Timber	Hip	6	141	$ 26,254.40	
7	1223	Ahiao Paniani	3	Amuri	Conc/Timber	Gable	7	251	$ 17,108.64	
8	1225	Okiroa Reese	3	Amuri	Concrete	Lean-To	8	201	$ 22,256.96	
9	1230	Charlie Lockington	3	Amuri	Timber	Gable/Lean-To	9	210	$ 20,354.40	
10	1229	Meteka Meteka (Tumu)	3	Amuri	Timber	Gable/Lean-To	10	177	$ 23,337.12	
11	1232	Tamarua Kiria	3	Amuri	Conc/Timber	Gable/Lean-To	11	235	$ 33,914.56	
12	1233	Tapita William	3	Amuri	Limestone	Hip	12	120	$ 25,518.08	
13	1244	Joe Meti	3	Amuri	Limestone	Gable/Lean-To	13	177	$ 33,594.40	
14	1268	Ioane Taua	3	Amuri	Conc/Timber	Gable/Lean-To	14	108	$ 24,797.12	
15	1261	Umaki John	3	Amuri	Concrete	Gable/Lean-To	15	195	$ 23,737.60	
16	1277	Toa Isamaela	3	Amuri	Limestone	Gable	16	216	$ 25,342.08	
17	830	Tiamana Tuakana	3	Amuri	Timber	Gable	17	104	$ 16,340.80	
18	749	Riro & Tutai Teuru	3	Amuri	Concrete	Gable/Lean-to	18	243	$ 16,445.92	
19	752	Apera Teuru	3	Amuri	Concrete	Gable	19	149	$ 15,509.60	
20	738	Teiti Teiti	3	Amuri	Concrete	Gable	20	220	$ 22,482.24	
21	736	Okiroa Rakitu	3	Amuri	Concrete	Gable/Lean-To	21	129	$ 27,548.48	
22	114	Teinakore Katu	3	Amuri	Timber	Gable/Lean-To	22	295	$ 34,084.80	
23	775	Teteva Ua	3	Amuri	Concrete	Gable/Lean-To	23	335	$ 37,302.72	
24	866	Tukua Upokomanu	3	Amuri	Concrete	Gable	24	189	$ 20,089.86	
25	1317	Takapuna Vakai	3	Amuri	Limestone	Gable	25	278	$ 35,534.40	
26	1335	Roi Steven	3	Amuri	Timber	Gable/Lean-To	26	89	$ 21,977.28	
27	1164	Mary Strickland	3	Amuri	Timber	Gable	27	79	$ 20,871.04	
										$ 708,292.74
28	1172	Hosea Drollet	3	Ureia	Conc/Timber/Lime	Gable/Lean-To	1	217	$ 34,399.81	
29	1152	Rino George	3	Ureia	Conc/Timber	Gable	2	131	$ 16,298.88	
30	1142	Teina George	3	Ureia	Concrete	Gable	3	250	$ 27,202.88	
31	1138	Teremoana Nooroa	3	Ureia	Conc/Timber/Lime	Gable/Lean-To	4	217	$ 35,520.96	
32	1143	Josie Sadaraka	3	Ureia	Conc/Timber	Gable/Lean-To	5	229	$ 25,129.60	
33	1133	Ashin Ashin	3	Ureia	Timber	Lean-To	6	343	$ 34,274.88	

Survey No.	BLDG ID	Owner Name	Category	Village	Wall Type	Roof Type	Village No.	Floor Area Area - m2	Remedial Cost Cost - $	Total Cost - $
34	1119	Kairangi Paora	3	Ureia	Timber	Lean-To	7	155	$ 22,097.60	
35	1118	Enua Manavakai	3	Ureia	Limestone	Gable/Lean-To	8	218	$ 39,574.08	
36	1097	Ngatuakana Ngatua	3	Ureia	Timber	Gable	9	152	$ 17,608.00	
37	1021	Ngataua Puapii	3	Ureia	Concrete	Gable	10	125	$ 13,504.32	
38	1013	Tere Raea	3	Ureia	Timber	Gable/Lean-To	11	254	$ 26,579.84	
39	1110	Matakeu Tetera	3	Ureia	Concrete	Lean-To	12	152	$ 20,245.76	
40	1106	Anna Nicholls	3	Ureia	Limestone	Gable	13	171	$ 34,412.48	
41	1139	Tangi Ngaro	3	Ureia	Timber	Gable	14	276	$ 25,825.60	
42	1095	Bob Maoate	3	Ureia	Limestone	Hip	15	177	$ 40,260.48	
43	1020	George Titi	3	Ureia	Timber	Gable	16	142	$ 20,226.56	
										$ 433,161.73
44	1025	Jessie Jessie	3	Arutanga	Conc/Timber	Gable/Lean-To	1	261	$ 26,436.32	
45	1011	Arona Tinirau	3	Arutanga	Timber	Gable	2	105	$ 16,934.08	
46	1035	Maea Maea	3	Arutanga	Timber	Lean-To	3	164	$ 21,877.76	
47	956	Kaora Kaora	3	Arutanga	Conc/Timber	Gable	4	297	$ 37,693.12	
48	939	Paiti Tamu	3	Arutanga	Timber	Gable	5	103	$ 18,386.88	
49	1004	Nga Upu	3	Arutanga	Limestone	Gable	6	317	$ 41,224.64	
50	919	Plumber Nicholas	3	Arutanga	Concrete	Gable	7	225	$ 21,012.80	
51	1315	Teva Simiona	3	Arutanga	Timber	Lean-To	8	186	$ 22,180.80	
52	920	Tatira Tatira	3	Arutanga	Concrete	Lean-To	9	226	$ 15,683.52	
53	916	Deborah Arama	3	Arutanga	Limestone	Gable	10	231	$ 38,769.60	
54	913	Tuaine Tetevano	3	Arutanga	Lime/Timber	Gable/Lean-To	11	249	$ 31,401.60	
55	1005	Enua Tuatini	3	Arutanga	Conc/Timber	Lean-To	12	208	$ 23,028.16	
										$ 314,629.28
56	696	Tu Bishop	3	Reureu	Timber	Gable/Lean-To	1	261	$ 22,886.72	
57	672	Teaukura Ariki	3	Reureu	Concrete	Gable	2	237	$ 23,654.72	
58	673	John Jessie	3	Reureu	Limestone	Lean-To	3	188	$ 29,188.80	
59	1308	Maki Teave	3	Reureu	Timber	Gable	4	131	$ 17,232.00	
60	680	Hosea Tauraki	3	Reureu	Timber	Gable	5	81	$ 15,998.08	
61	1304	Metuatai Cummings	3	Reureu	Concrete	Gable	6	230	$ 23,127.68	
62	687	Janet Pumati	3	Reureu	Timber	Gable	7	73	$ 14,638.40	
63	529	Meau Tane	3	Reureu	Limestone	Gable/Lean-To	8	206	$ 31,473.92	
64	954	Ruta Tare (House 1)	3	Reureu	Lime/Timber	Gable	9	58	$ 16,057.92	

Survey No.	BLDG ID	Owner Name	Category	Village	Wall Type	Roof Type	Village No.	Floor Area Area - m2	Remedial Cost Cost - $	Total Cost - $
65	588	George Ngati	3	Reureu	Concrete	Gable	10	151	$ 27,841.92	
										$ 222,100.16
66	644	Kupa Teao	3	Nikaupara	Conc/Timber/Lime	Gable	1	147	$ 29,786.88	
67	645	John Tearetoa	3	Nikaupara	Limestone	Gable	2	177	$ 32,655.68	
68	1305	Mii Makimare nee Jacob	3	Nikaupara	Conc/Timber/Lime	Gable/Lean-To	3	272	$ 28,776.00	
69	654	Lucy Tuarai	3	Nikaupara	Limestone	Gable/Lean-To	4	209	$ 20,358.40	
70	632	Metuakore Strickland	3	Nikaupara	Limestone	Gable	5	150	$ 25,789.44	
71	633	Tania Mataiti	3	Nikaupara	Limestone	Gable	6	234	$ 34,275.20	
72	669	Kaungake Taia	3	Nikaupara	Conc/Timber	Gable/Lean-To	7	195	$ 21,665.28	
73	648	Maitoe Maitoe	3	Nikaupara	Limestone	Gable	8	150	$ 26,209.28	
										$ 219,516.16
74	389	Panapa Tekopua	3	Tautu	Timber	Gable	1	170	$ 12,068.16	
75	386	Kairangi Henry	3	Tautu	Concrete	Hip	2	178	$ 18,759.04	
76	462	Apii Tepaki	3	Tautu	Limestone	Lean-To	3	203	$ 33,364.48	
77	372	Pakeu William	3	Tautu	Conc/Lime	Gable	4	126	$ 26,661.76	
78	444	Matai Simiona	3	Tautu	Conc/Lime	Gable/Lean-To	5	257	$ 35,026.24	
79	363	Teariki Vairua	3	Tautu	Concrete	Gable	6	179	$ 16,443.52	
80	383	Tai Reva	3	Tautu	Concrete	Gable	7	152	$ 17,370.88	
81	442	Tapu Manapori	3	Tautu	Concrete	Gable	8	131	$ 27,477.12	
82	447	Temata Tupakea	3	Tautu	Conc/Lime	Gable/Lean-To	9	247	$ 29,832.64	
83	440	Akateni Ioane	3	Tautu	Conc/Lime	Gable/Lean-To	10	201	$ 36,491.52	
84	471	Kairangi Ratai	3	Tautu	Conc/Lime	Gable	11	126	$ 18,003.20	
85	432	Rangatira Tuare	3	Tautu	Concrete	Gable	12	167	$ 16,728.00	
										$ 288,226.56
86	278	Taa Rere	3	Vaipae	Concrete	Gable	1	219	$ 25,083.52	
87	291	Rangi Ngatokoa	3	Vaipae	Timber	Lean-To	2	134	$ 14,373.12	
88	282	Pukenga Varu	3	Vaipae	Concrete	Lean-To	3	382	$ 16,526.08	
89	225	Ta Maetu	3	Vaipae	Concrete	Gable	4	126	$ 17,200.32	
90	183	Tuau Tuau	3	Vaipae	Concrete	Lean-To	5	47	$ 29,765.44	
91	252	Eikura Terepai	3	Vaipae	Limestone	Lean-To	6	176	$ 29,471.04	
92	262	Ngatapati Iro	3	Vaipae	Limestone	Gable	7	114	$ 6,593.39	
										$ 139,012.91

Survey No.	BLDG ID	Owner Name	Category	Village	Wall Type	Roof Type	Village No.	Floor Area Area - m2	Remedial Cost Cost - $	Total Cost - $
93	153	Mama Lani Carl	3	Vaipeka	Timber	Gable	1	112	$ 11,669.44	
94	121	Kitai Tapora	3	Vaipeka	Conc/Timber	Gable/Lean-To	2	257	$ 15,177.28	
95	144	Nooroa Aue (Kids)	3	Vaipeka	Timber	Gable/Lean-To	3	72	$ 20,943.04	
										$ 47,789.76

No. of Buildings 95

Total $ 2,372,729.30

Appendix 10: Island Council List of Category 4 Allocations (1 or 2 Bedroom Houses)

BLDG ID	Owner Name	Category	Village	Village No.	Survey No.	Building Size	
						1 Bedroom	2 Bedroom
715	Alister Webb	4	Amuri	1	1	1	
714	Ioane Vaevae	4	Amuri	2	2	1	
713	Kopu Vaevae	4	Amuri	3	3	1	
710	Metuatini Vaevae	4	Amuri	4	4	1	
709	Tau Vaevae	4	Amuri	5	5	1	
1322	Tuaine Samuel	4	Amuri	6	6	1	
748	Ngatuaine Hosking	4	Amuri	7	7	1	
800	Vaerurangi Teaukura Snr	4	Amuri	8	8	1	
1320	Plumber Teotu	4	Amuri	9	9	1	
1319	Terekino Tuare	4	Amuri	10	10		2
1318	Clyde Rima	4	Amuri	11	11	1	
1202	Kimiora Mataiti (Pene)	4	Amuri	12	12	1	
1237	Tiopu Henry	4	Amuri	13	13	1	
1245	Taromi Vaikai	4	Amuri	14	14		2
116	Tupai Vahua & Mamia Teinakore	4	Amuri	15	15	1	
1128	Takake Ngatuakana	4	Ureia	1	16		2
1079	Pani Ngatoe	4	Ureia	2	17		2
1024	Arani Henry	4	Ureia	3	18		2
1381	Mira Kurariki	4	Arutanga	1	19	1	
917	Teetu Jessie (4 Square Church)	4	Arutanga	2	20	1	
914	Tutai Taai	4	Arutanga	3	21	1	
1030	Tamatoa Ariki	4	Arutanga	4	22		2
942	Tuakeu Paulo	4	Arutanga	5	23		2
690	Mama Noo Unuka	4	Reureu	1	24	1	
1307	Teokotai Monga	4	Reureu	2	25		2
1324	Nga Rota	4	Reureu	3	26	1	
647	Arama Joseph	4	Nikaupara	1	27	1	
634	Tukumate Ben	4	Nikaupara	2	28	1	
651	Titoru Tekeu	4	Nikaupara	3	29	1	
605	Ioane Purua	4	Nikaupara	4	30		2
514	Tiki Maruaau	4	Nikaupara	5	31	1	
505	Taringi Nelio	4	Nikaupara	6	32	1	
1300	Makirai Samuel	4	Tautu	1	33	1	
1287	Noo Reinoa	4	Tautu	2	34		2
375	Tuvaine Paerau	4	Tautu	3	35		2
385	Puia Mauri	4	Tautu	4	36	1	
365	Natua Ruarangi	4	Tautu	5	37	1	
463	Piakura Messine	4	Tautu	6	38	1	
451	Zekari William	4	Tautu	7	39		2
433	Arerau Mao	4	Tautu	8	40		2
472	Ruau Teinangaro	4	Tautu	9	41		2
479	Pookotai Tepaki	4	Tautu	10	42		2
475	Paraia Pita	4	Tautu	11	43		2
466	Peka Pareanga	4	Tautu	12	44	1	
318	Pilato Mahitu	4	Vaipae	1	45		2
302	Teinakore Manuela	4	Vaipae	2	46	1	
296	Tuakura Tuakura	4	Vaipae	3	47	1	
286	Temata Ua	4	Vaipae	4	48		2
243	Arii Williams	4	Vaipae	5	49		2
238	Arere Tara	4	Vaipae	6	50	1	
1285	Metua Terei	4	Vaipae	7	51		2

BLDG ID	Owner Name	Category	Village	Village No.	Survey No.	Building Size	
						1 Bedroom	2 Bedroom
218	Terei George	4	Vaipae	8	52		2
220	Tutai George	4	Vaipae	9	53	1	
200	Ioane Uri	4	Vaipae	10	54		2
169	Rakau Teopu	4	Vaipae	11	55		2
540	Enuake Tare	4	Vaipae	12	56		2
237	Ngapoko Tiurai	4	Vaipae	13	57		2
246	Marako Paoo	4	Vaipae	14	58	1	
547	Matamaru Nanai	4	Vaipae	15	59	1	
556	Tu Arona	4	Vaipae	16	60	1	
553	Sara Daniel	4	Vaipae	17	61	1	
221	Noble John Pakoti	4	Vaipae	18	62	1	
140	Tupuna Kamoe Metuatini	4	Vaipeka	1	63		2
126	Kamoe Tupoa	4	Vaipeka	2	64	1	
1368	Katherine Henry	4	Vaipeka	3	65	1	
				total	**65**	**39**	**26**

Appendix 11: Floor Plan Category 4 – 1 Bedroom House

Appendix 12: Floor Plan Category 4 – 2 Bedroom House