

Palau Water Conservation Incentive Program (PWCIP)

RFP No NDBP 01-A/2014

Re-tender

Open Date September 15 2014

Closing Date October 15 2014

Terms of Reference for Consultancy on the Development of the Loan Program. The National Development Bank of Palau (NDBP) is soliciting individuals and or companies for **the development and implementation of a Palau Water Conservation Incentive Program**.

1. Background

The Secretariat of the Pacific Community (SPC) being the implementing agency for the European Union funded Global Climate Change Alliance: Pacific Small Island States (GCCA: PSIS) project is providing support to help the Republic of Palau in its prioritised water sector climate change adaptation actions. One element of this is the Palau Water Conservation Incentive Program.

The NDBP is already implementing a successful energy efficiency subsidy program (EESP) with support from the Government of Italy, Austria, and the Municipality of Milan , the Palau Energy Office, IUCN and the European Union funded North Pacific Africa-Caribbean-Pacific Renewable Energy and Energy Efficiency project (NorthREP). This provides property owners with a subsidy to install energy efficient measures and features to reduce the consumption of energy in new properties and to retrofit existing properties.

This model will be adapted for the PWCIP. A subsidy program will be integrated with existing housing and commercial loan programs to incorporate water catchment systems into new home/commercial building construction projects, as well as to existing home/business building renovation and improvement projects. The program will also look at incorporating a small energy efficient pumping and/or elevated water system that can be used to supply water from the tank into the building. This loan program with a subsidy mix will be available to all loan applicants meeting the Bank's lending criteria for approval.

The program under the NDBP will be extended to the Palau Housing Authority through their partnership established under a Memorandum of Understanding. Part of the loan program will incorporate continued maintenance service for at least 5 years from installation to address regular systems maintenance. As part of the proposed maintenance program a schedule of water quality testing will be conducted as part of the maintenance service being provided, together with the Environmental Quality Protection Board, or similar other third party partners .

The NDBP will also collaborate closely with the Palau Public Utilities Corporation (PPUC), SPC and the Palau Energy Office regarding the design and implementation of the program, and with the Office of Environmental Response and Coordination (OERC) for overall coordination with government. Local contractors, architects/engineering companies and property owners will be other key stakeholders.

The home owners and businesses will benefit from having a subsidised water catchment system in place which will provide a back-up water supply particularly during extreme events such as typhoons, droughts and utility service interruptions. Thus the program will contribute to building climate change resilience by developing alternative sustainable water sources. It is also anticipated that in the long term there may be financial savings as property owners begin using more rainwater to meet their everyday needs.

Objectives/Scope of work

- 2. Scope of Services (outputs)
- On signing contract prepare a schedule and work plan to be agreed to by NDBP in consultation with OERC, PPUC, SPC GCCA: PSIS Climate Change Coordinator, and SPC-GCCA: PSIS Climate Change Adviser based in Pohnpei <u>Deliverable 1</u>: Schedule and work plan
- Research similar subsidy programs in at least 3 other Pacific Island countries e.g. Cook Islands Rarotonga Water Tank Program <u>Deliverable 2:</u> Short (max 5-10 pages) assessment of other Pacific island water conservation incentive programs
- 3. Develop a framework for Water Conservation Incentive Loan Program with key elements or measures to be implemented by recipients with NDBP loan programs.
 - Identify basic requirements for systems water use efficiency including but not limited to:
 - metering to determine usage (from tank or from mains)
 - quality and capacity of available roof catchment for harvesting
 - land ownership
 - rainwater harvesting catchment system for either household or commercial building consisting of ,
 - tanks complete with insect and vermin screens
 - guttering, down pipes
 - first flush devices
 - outlets, overflow and drainage
 - water booster pump or pump to a roof elevated gravity tank
 - Tank bases/pads/stands
 - Retrofitting including but not limited to:
 - Water Use Efficiency Audits to identify leaks
 - Repair of leaks
 - Guttering, first flush devices
 - Prepare list of extra options including but not limited to:
 - Booster pumping or pumping to a roof elevated gravity tank using solar technology or energy efficient pumps
 - Filtration and treatment

- Water efficient appliances and fixtures
- Grey water reuse
- A product catalogue is attached for your reference. Similar or equivalent equipments/products may be considered.
- Rebate percentage (to rebate a percentage of water catchment system costs) and/or specific line item subsidy amount in a check list format.

Deliverable3: Framework description for the Water Incentive Loan Program

4. Develop design of a standard rainwater harvesting system for (i) household and (ii) commercial buildings based on a typical building catchment area, best average rainfall and set demand. Consult with private sector suppliers and tradesman and develop a typical bill of materials and contract templates for supply of materials and labour for installation of a standard rainwater harvesting system [Attached is a typical household rainwater harvesting system for your reference]

<u>Deliverable 4</u>: Develop and design standard rainwater harvesting systems complete with bill of materials and delivery contract template

5. Design a Marketing and Communications plan for the water conservation incentive program including the climate change context, and linking with other ongoing water conservation activities being conducted by partners

Deliverable 5: Marketing and communication plan

- 6. Develop and implement a training program for roll out of rainwater harvesting systems
 - small and large scale contractors
 - bank employees/inspectors
 - Training program materials i.e program folder contents to be made available in electronic and hard copy formats
 - Training report (5-10 pages) (Training to be co-ordinated with NDBP. NDBP can provide support with training venue at the Bank's training room located at the Bank's compound, NDBP may also provide for use, a projector and screen if needed.

<u>Deliverable 6:</u> Training program developed and implemented. Training materials and training report submitted

7. Develop guidelines for user maintenance using EQPB and Public Division of Environmental Health guidelines and standards.

Deliverable 7: User Maintenance Guidelines

A. Institutional arrangements

The consultancy will be managed by the CEO and/or their representative of the NDBP, in collaboration with partners in Palau including OERC, PPUC and the Project Manager and the Climate Change Adviser of the GCCA: PSIS project, within the SPC Programs Directorate.

B. Duration of the work

This consultancy will be delivered over the period October15 2014 – May 20 2015.

C. Qualifications of the successful contractor

NDBP seeks to engage a consultant or consultancy team with expertise in implementation of activities particularly as they relate to water conservation and climate change. Skills required are as follows:

- Degree or equivalent in a field related to natural resource management, engineering, or equivalent.
- At least 5 years' experience in the research, design, implementation, monitoring and evaluation of activities related to water conservation and climate change in the Pacific.
- Excellent command of written and spoken English, and written and spoken Palauan
- Experience and skills in liaison and balancing the requirements and needs of different groups including technical and communities, and in running community training and workshops.
- Ability to work independently and provide deliverables to schedule
- Computer literacy and demonstrated knowledge of software packages, particularly the Microsoft suite of programs

The consultant is expected to fulfil the competency requirements under the following table.

A two-stage procedure will be used in evaluating the proposals, with evaluation of the technical proposal being completed prior to any price proposal reviewed and compared. In the second stage, the financial proposal of all bidders will be assessed and compared [*The consultant is to submit the financial proposal in the Request for Proposal Form attached*]

Competency Requirements	Score Weight (%)	Total Obtainable Score
1. To what extent does the Consultant's overall proposal address the Scope of Work outlined in the Request for Proposals (RFP).	15%	15
2. To what extent does the Consultant's proposal demonstrate an understanding of the specific issues around the design of the Palau Water Conservation Incentive program (PWCIP)?	15%	15
3. To what extent does the Consultant's proposal demonstrate experience with (i) the design of a Loan Incentive Program and (ii) activities relating to water conservation and climate change in Pacific Small Island States	20%	20
4. To what extent is the Consultant's delivery schedule for the work comprehensive and realistic.	15%	15
5. Do the qualifications of the Consultant(s) meet the requirements for this consultancy for the Palau Water Conservation Incentive Program	20%	20
6. How would you assess the Consultant(s) analytical, project	15%	15

Competency Requirements	Score Weight (%)	Total Obtainable Score
management and reporting/delivery skills		
Total Score	100%	100

H. Scope of bid price and schedule of payments

This is an output based contract and will be paid in accordance with the payment schedule below:

<u>Milestones/Outputs</u>	<u>Deadline (Date)</u>	<u>% Payment</u>
Signed copy of the contract and Deliverable 1 – agreed work plan and schedule for conducting the consultancy	10/30/2014	20%
Deliverable 2: Short (max 5-10 pages) assessment of other Pacific island water conservation incentive programs	12/31/2014	10%
Deliverable 3: Framework description for the Water Incentive Loan Program	1/31/2015	10%
Deliverable 4 : Develop and Design standard rainwater harvesting systems complete with bill of materials and delivery contract template	2/15/2015	10%
Deliverable 5: Marketing and communication plan	3/1/2015	15%
Deliverable 6 : <u>Deliverable 6</u> : Training program materials and implementation reports	3/30/2015	15%
Deliverable 7: User Maintenance Guidelines	5/15/2015	20%

All activities to be conducted in close consultation with the NDBP Management, PPUC SPC GCCA:PSIS Project Officer, the Palau SPC GCCA: PSIS Climate Change Coordinator– Office of Environmental Response and Coordination, and the SPC-GCCA: PSIS Climate Change Adviser based in Pohnpei.

The available budget for this consultancy is USD 40,000 \pm 18%.

This will be an output-based, lump sum contract and financial quotations should cover all costs including: professional fees, travel and per diem (if needed use SPC per diem rates for Palau, Koror State is USD 200 and elsewhere in Palau is USD 80), consultations, logistical arrangements and costs

relating to the delivery of the consultation and training activities (e.g. printing, broadcasting etc.). Coordinate with NDBP for training venue and logistics.

Terms and Conditions

The funding by the European Union through the Global Climate Change Alliance will be reflected as appropriate in the project activities, including the use of the following logos: EU flag accompanied by the text "Funded by the European Union" and the Global Climate Change Alliance logo



together with those of SPC and NDBP and other partners where applicable:



REQUEST FOR PROPOSAL SUBMISSION FORM

<u>Milestones/Outputs</u>	<u>Quantity</u>	<u>Cost (USD)</u>
Deliverable 1 – Agreed work plan and schedule for conducting the consultancy		
Deliverable 2: Short (max 5-10 pages) Assessment of other Pacific island Water Conservation Incentive Programs		
Deliverable 3: Framework Description for the Water Incentive Loan Program		
Deliverable 4: Development and Design of standard rainwater harvesting systems complete with bill of materials and delivery contract template		
Deliverable 5 : Marketing and communication plan		
Deliverable 6 : Training program development, implementation and submissions		
Deliverable 7: User Maintenance Guidelines		

Rain Harvesting Systems Safer solutions for rainwater collection



Rainwater Solutions



Marley Rain Harvesting Products; safer solutions for the collection, storage and distribution of rain water.

HOW SAFE IS THE WATER YOU ARE COLLECTING?

When collecting rainwater as a partial or total source for a water supply it is essential the design of the system meets the need for potable (safe drinking) water.

Water collected from a roof and stored and distributed from a water tank, can contain a nasty range of pollutants that can contaminate your water, for example bacteria from bird droppings, insects, rotting debris, airborne dusts (containing heavy metals).

The Marley Rain Harvesting System comprises of a number of unique and cost effective components that are designed to work with the Marley PVC range of spouting and downpipes to help make tank water as clean as possible. However, it is advisable to have your tank water analysed to check its potability.

7 STEPS TO RAIN HARVESTING POTABLE WATER;

- 1. Ensure the roof surface is suitable for collecting potable water
- Ensure spouting is installed according to Building Code, allowing for adequate fall and installing suitable expansion outlets or gutter outlets to make certain water does not pond in the gutter
- 3. Install debris diverter rainheads with screens to direct leaf litter and larger debris items out of the flow of the water
- 4. Fit an appropriate sized first flush diverter, to divert the first most contaminated rain water from entering the tank
- 5. Attach tank overflows and vent flaps to tanks to ensure the tank is vented properly allowing air to circulate
- 6. Attach insect screens to rainheads and tanks to prevent insects and vermin entering the tank
- To assist in cleaning the tank, install a tank vacuum kit to suck water from the bottom of the tank (anaerobic zone – dirty 'zone') when the tank is full to overflowing.

	Leafslide Rainhead Code: RWLS	Ő	50mm diameter PVC Insect Proof Flap Valve Code: RH8118-4	O	90mm diameter, Female Gutter Outlet Code: RH8118-5		50mm diameter Vent Cowl PVC & S/Steel Insect Proof Screen Code: RH8119-9
	Leaf Beater Rain Head 80/90mm Dual Fit Code: RH8120	Ő	90mm diameter Insect Proof, Vented Flap Valve PVC/Stainless Steel Code: RH8119-3		100mm diameter Gutter Outlet Code: RH8118-6		100mm diameter Vent Cowl PVC & S/Steel Insect Proof Screen Code: RH8119-2
	Leaf Catcher Rain Head 90/100mm Dual Fit Code: RH8117		100mm diameter Insect Proof, Vented Flap Valve PVC/Stainless Steel Code: RH8119-3-100V		100 x 50mm rectangular Gutter Outlet Code: RH8153		90mm Tank Vacuum Kit - Poly/F-Glass/Flat wall Tank Code: RHFWTV90 Concrete Tanks Code: RHCONTV90
\checkmark	Leaf Eater Rain Head 80/90mm Code: RH8119		90mm Tank Corrugated Overflow Outlet Code: RH8123		90mm diameter Gutter Outlets for HALF ROUND Gutters Code: RH8118-9	X	Downpipe Diverter Code: RWDD
	90/100mm Dual Fit First Flush Water Diverter Post or Wall KIT (Kit only add 300 diam pipe to suit volume required) Code: RH8121-1		90mm 304 Stainless Steel M&F Insect Proof Screen (Fits RH8123, RH8124-1, RH 8124-2) Code: RH8116		Flanged Tank Overflow Outlet 90mm X 90 degree bend M&F Code: RH8124-1		100mm Roof Outlet Code: RV369 150mm Roof Outlet Code: RV482
	90mm First Flush Water Diverter - Downpipe Code: RH8119-5		90mm diameter, Male Gutter Outlet Code: RH8124		Plain Tank Overflow Outlet 90mm X 90 degree bend M&F Code: RH8124-2	\mathbb{M}	Outlet Strainer Code: RWST

RAIN HARVESTING SYSTEM COMPONENTS

Choosing the most suitable components for a rain harvesting system will be based upon whether the tank is set up as a wet or dry system.

A TYPICAL "WET" SYSTEM (syphonic system)

A "Wet" System is a system where the pipes are fitted in such a way that when the rain stops the pipes to the tank do not drain out. They hold water. With this type of system, the pipes must be fitted with screens at each end to ensure that insects cannot enter and breed in the system. A "wet" system needs to be fitted with a First Flush Water Diverter at the tank, with a capacity equal to that of the pipes plus whatever amount is to be diverted from the roof. To lessen the amount of water to be diverted at the tank, a Downpipe First Flush Water Diverter can be fitted on the building to take the required first flush from the roof.



A TYPICAL "DRY" SYSTEM

A "Dry" System is a system where the pipes drain out and dry out after rain. A system where pipes do not hold water after the rain stops. Large buildings normally make it near impossible to have "dry" systems. For slightly sloping sites an In-Ground First Flush Water Diverter will turn a "wet" system into a "dry" system.



A TYPICAL "WET" SYSTEM CONVERTED TO A "DRY" SYSTEM

For slightly sloping sites an In-Ground First Flush Water Diverter will turn a "wet" system into a "dry" system.



Regular maintenance is extremely important. Clean rainhead and filter screens. Check to ensure that all insect proofing is in place and is effective. Check that the roof is free from overhanging branches and that there are no snags in the roof gutter.

Rain Harvesting Systems safe solutions for the collection,

2

1 Spouting & Downpipes

Marley spouting systems and downpipes are key components in a Rain Harvesting System. Fit roof gutters and downpipes in compliance with Building Code E1 and Marley installation instructions. Ensure adequate fall is provided for and the correct number of downpipes are installed. Marley PVC spouting and downpipes do not rust, therefore metal contaminants from the gutter do not end up in water storage tank.

2 Leaf Diverters

Leaf and debris diversion rainheads should be fitted where water is captured for storage in tanks or as a debris removing device in urban areas. As the water flows from a gutter it brings the small pieces of debris with it. As water washes over the angle screen of the leaf diversion system the debris is forced away and the water continues through the screen.



Code: RH8121, RH8117, RH8119, RWLS

3 Downpipe Diverter

The Marley Downpipe Diverter can be installed easily to PVC downpipes allowing collection of fresh rainwater for tank filling, garden watering, aquariums etc. to reduce dependance on town supply. Code: RWDD

4 Floating Out-take Kit

This is connected to the tank outlet to the house and ensures you are drawing the cleanest water in the tank. The Floating out-take floats inside the tank, suspended just below the water surface where the cleanest water lies.

storage and distribution of rain water.



5 First Flush Diverter

The First Flush Diverter reduces pollution of tank water by diverting the first flush of contaminated water away from the tank. Code: RH8121-1, RH8119-5

6 Calmed Inlet

Provides a calmed inlet for rainwater enetering the storage tank. The calmed Inlet avoids distributing sediment in the bottom of the tank. Code: RH8119-9, RH8119-2

Vent Cowls, Flap Valves & Overflow

Vent Cowls reduce the possibility of pressurising inside the tank allowing a flow of fresh air into the tank, so the water can breathe. Fitting insect proof flap valves and tank overflows to a storage tank ensures the tank is vented allowing air to circulate while protecting it from insects.

Flap Valved Code: RH8118-4, RH8119-3, RH8119-3100V, Corrugated Tank Overflow Code: RH8123.

8 Tank<u>Gauges</u>

Used to measure water levels in the tank.

9 Tank Vacuum Kit

By fitting a Tank Vacuum Kit, when the tank fills up the overflow will be sucked from the bottom of the tank (from the "Anaerobic Zone" - dirty zone). Code: RHFWTV90 (Poly/F-glass/Flat tanks), RHCONTV90 (Concrete tanks)

FIRST FLUSH DIVERTERS

Water diversion is a key component to water quality. The main function of the first flush diverter is to prevent the first flow of water from the roof from entering the water storage tank.

When it begins to rain, the first flow of contaminated water is diverted into the diverter chamber. Once the chamber is full, the fresh water automatically flows into the storage tank.

The type of first flush diverter to be fitted should be chosen by assessing the quantity of water to be diverted.

FIRST FLUSH DIVERTERS

90/100MM DUAL FIT FIRST FLUSH DIVERTER - WALL MOUNTED OR FITTED UNDERGROUND



Can be installed to a new or existing downpipe system.

Add the appropriate length of 300mm diameter pipe to suit the quantity of water you wish to divert (see table below).

Calculation Method: m^2 Roof Area x Pollution Factor x 1000 + (length of wet pipe m x pipe cross section factor) = litres to be diverted

Pipe Allowance

Pipe Size	Pipe Cross Section	Factor
RP65	3.30	
RP80	4.40	
90SW	5.75	

Pollution Factor 0.0005 Minimal Pollution; open field Pollution Factor 0.0020 Substantial Pollution; leaves, debris, bird droppings, various insect matter

PRODUCT CODE	DESCRIPTION	VOLUME IN LITRES
CHR.300.1	300mm x 1metre	80 Litres
CHR.300.1.5	300mm x 1.5metre	120 Litres
CHR.300.2	300mm x 2metre	160 Litres
CHR.300.3	300mm x 3metre	240 Litres

Installation instructions

Step 1 - Determine the length of the Diverter Chamber (see table above). Make sure the Screw Cap is at least 150mm from the ground to allow for cleaning.

Step 2 - Bevel both ends of the 300mm pipe with an angle grinder so that the pipe fits easily onto the end caps.

For Post/Wall mounting glue (Marley Gold) the caps on each of the chamber making sure the cap outlets are both at 12 o'clock.

For an underground unit (horizontal) glue one cap at 12 o'clock and the other at 6 o'clock.

First flush of contaminated water is diverted into chamber Once chamber is full fresh water flows to tank



Step 3 - Attach the wall/post bracket in position.

Place the diverter chamber into the bracket and secure the chamber to the wall at the top with a 100mm pipe bracket.

Step 4 - Connecting to the Chamber Inlet

If connecting to 90mm pipe; insert the ball seat with the small end (seat) down into the top of the chamber inlet and insert the infeed pipe directly hard down on the diverter seat.

If connecting to a 100mm pipe: Insert the ball seat with the small end (seat) down into the top of the chamber inlet and insert and glue the 20mm (long) 90mm spacer (provided) and push the spacer hard down on top of the seat to hold it in place. Attach the 100mm infeed pipe.

Step 5 - Connecting to the Chamber Outlet

Glue the 100mm long 90mm diameter pipe provided into the plain end of the 90mm threaded coupling From Roof Gutter



FIRST FLUSH DIVERTERS

Insert the Stainless Steel filter into the socket with the open end of the filter facing downwards, insert the 20mm (long) 90mm pipe (spacer) into the socket to hold the filter in place.

Fit the Screw cap to the socket making sure that the "O" Ring is in place in the cap. Insert the plastic screen into the cap, select the appropriate Flow Control Valve (rubber seal with holes) with the smallest hole giving slowest flow. Place Flow Control Valve in the Nut and Tail and screw the Nut and Tail into the cap.

To install the unit underground, ensure that before Chamber Inlets and Outlets are glued to the Chamber, the Chamber Inlet is at 12 O'clock and the Chamber Outlet at 6 O'clock to ensure water can drain out effectively.

Hint: Make sure diverter water flows away from house or tank. Use diverted water for gardens.

Maintenance

To ensure continuing function, unscrew the screw cap on a regular basis to allow debris to fall out. Hose or wash the filter screen if needed and check and clean the flow control valve.

90MM FIRST FLUSH DIVERTER – DOWNPIPE



A simple First Flush Diverter requiring minimal maintenance.

Can be installed to a new or existing downpipe system. Use a Marley adaptor to install with a 65mm or 80mm downpipe system (RA65.90 or

RA80.90).

Add the appropriate length of 90mm diameter pipe to suit the quantity of water you wish to divert.

Installation Instructions

Step 1 - Determine the length of the Diverter Chamber (cut 90mm pipe as long as possible) making sure the Screw Cap is at least 150mm from the ground to allow for removal and cleaning.



Step 2 - Place the Ball Seat into the Tee Junction and then fit the Diverter Chamber up against the Ball Seat and hold until the glue sets. Then fit the socket to the bottom end of the Diverter Chamber.

Step 3 - Fix the assembled chamber to the wall in the desired position using the steel Pipe Brackets.

Step 4 - For wall mounting, connect a M & F Elbow to the Diverter Chamber and connect the downpipe. Bracket if necessary. Fit an elbow to the Tee Junction inlet and connect to the bottom of the selected Leaf Diverter.

Step 5 - Place the Sealing Ball into the Diverter Chamber and attach the Screw Cap.

Step 6 - Select the appropriate Flow Control Valve and insert into the Nut and Tail. Insert plastic Filter Screen into Screw Cap and attach the Nut and Tail.

Maintenance

To ensure continuing function, unscrew the screw cap on a regular basis to allow debris to fall out. Hose or wash the filter screen if needed and check and clean the flow control valve.

DOWNPIPE DIVERTER



The Marley Downpipe Diverter can be installed easily to Marley PVC downpipes allowing collection of fresh rainwater for tank filling, garden watering, etc.

The Downpipe Diverter is especially useful for those wishing to reduce dependence on reticulated water.

The Downpipe Diverter should not be used in a 'wet system'.

Dimensions - 80mm pipe that can easily be adapted to fit all Marley downpipe profiles.

Installation Instructions

Cut a 320mm gap in the downpipe, join the Downpipe Diverter to the enclosed attachment.

Attach the Diverter to the downpipe, starting at the top with the diverter offset slightly, then push up and across.

Let the Diverter then slide down into the downpipe.

To Use - Simply lower the side arm and ensure it is clipped in and on a downwards slope.

LEAF DIVERTERS

Leaf and debris diversion rainheads should be fitted where water is captured for storage in tanks or as a debris removing device in areas on reticulated water.

As the water flows from the spouting it brings the small pieces of debris with it and as water washes over the angle screen of the leaf diversion system the debris is forced away and the water continues through the screen.

LEAF SLIDE



The leafslide has been designed for ease of installation. The filter box has anchor tabs provided for screwing or nailing it to the wall or fascia. The leafslide has a standard 90mm stormwater outlet which is easily adapted to fit Marley downpipe.

Best performance is achieved by using 65mm

diameter downpipe above the filter screen.

Dimensions - 280mm in length. The top of the Leafslide is 120mm by 100mm deep.

LEAF EATER - for high rainfall areas



The ultimate high performance rainhead for use in heavy rainfall areas. Primary screen of 6mm aperture and an insect proof secondary stainless steel screen of 0.995mm.

To install mount the main box evenly under the gutter outlet or expansion outlet by securing it

to the fascia with pop rivets or screws, making sure the backing plate fits snugly up to the bottom edge of the gutter but not between the fascia and back of the gutter.

Place the insect screen in the main box over the outlet ensuring that the screen clips into place. Replace the primary screen, making sure the screen fits inside the front lip of the Leaf Eater[®], and secure in place with the clips provided. The Leaf Eater[®] is now ready for connection to the downpipe. Do not glue the Leaf Eater[®] to the down pipe. Secure downpipe with a screw for easy replacement.

Dimensions - 290mm in length, 270 wide and 190mm in depth

LEAF BEATER - for low rainfall areas



A high performance rain head with a 4mm aperture adjustable elliptical primary screen. Sheds leaves from the gutter onto the ground. Comes complete with an integrated directional gutter outlet and an insect proof stainless steel low flow rate secondary screen. For midmounting

remove the top directional outlet. Bevel the entry downpipe at 60° and allow 50mm clearance between the pipe and screen.

Dimensions - 280mm in length, 210mm wide and 180mm in depth.

LEAF CATCHER - gutter or wall mounted



A budget leaf and debris catcher with two horizontal internal screens.

Screen one: 6mm aperture screen Screen two: 0.955mm stainless steel insect proof screen.

Cleaning - Simply lift the screen out and empty and replace when cleaned. Perfect for low rain fall, low leaf areas where tank water is required. Fits both 90 and 100mm PVC pipe.

Dimensions - 210mm in length, 290mm wide and 190 mm in depth.

TANK VACUUM KIT



Fine sediment, which can contain harmful bacteria and heavy metals, eventually builds up in the bottom of the tank and some can find its way out the outtake pipe and into the home and can be ingested. This can be removed by using a tank vacuum kit.

How the Tank Vacuum System Works

Water flows into the tank through your existing pipework. The 90mm diameter Tank Vacuum Kit becomes charged with water and a suction action starts as the excess water exits the tank. This exiting water sucks the sediment/waste from the bottom of the tank (from the "Anaerobic Zone" - dirty zone) up the syphon pipe and out the tank. Position the tank vacuum kit directly over the outtake. Cut the vacuum pipe so that the serrated pick up rests on the bottom of the tank. The anti syphon feature prevents all the water in the tank from syphoning.

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Mahia Road, Manurewa, Private Bag 802 Manurewa Sales Department: Telephone 09 279 2777 Direct Fax 09 279 2778 Freefax 0800 652 621 Head Office: Telephone 09 279 2799 Fax 09 279 2798 **Contact Centre:** 0800 222 922

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Rainwater Solutions



RFP No NDBP 01/2014

PALAU WATER CONSERVATION INCENTIVE PROGRAM (PWCIP)

TYPICAL RAINWATER HARVESTING HOUSEHOLD INSTALLATION

Schematic of household installation

The following Drawing A1 is a standard drawing of an installation using Marley products. The full Marley product catalogue for "Rain Harvesting Systems" is included as part of this RFP and can be used for guidance.

For larger commercial buildings the same system can be used with the First Flush Diverter (FFD) sized accordingly.

The sizing of the tanks can be based on either a "rule of thumb" analysis based on average annual rainfall or more preferably, time based modelling using prolonged rainfall data and household or building demand. The sizing of the FFD chamber will be based on the roof catchment area and cut to length as required.

Other proprietary products are available and as long and as they meet best practice requirements they can be considered. Other products are available for consideration from the website **www.http://rainharvesting.com.au/.**



Drawing A1

The following Drawing A2 shows a typical installation on a Pacific Island, utilising products from the catalogue mentioned above with a tank manufactured to suit house specifications.

Leaf-Eater attached to the fascia with stainless steel screws – details in Drawing A5

Downspout (in this case 90mm)

FFD - in this case the chamber is 300mm (12") stormwater pipe. 90mm is used for smaller roof catchments)



Flanged tap outlet – see details in Drawing A4

Drawing A2



Screened overflow outlet

Drawing A3

Flanged tap outlet with 1" brass ball valve, reduced to a ³/₄ " hosetap (the Galvanised Tee has been provided for the connection of a pressure / booster pump).



Drawing A4

Leaf Eater connected to the gutter outlet

FFD Tee piece connected using stainless steel screws for ease of removal for tank maintenance



Drawing A5

.EnergyEfficient

cal power in your new home. by including features and measures which are electric bills. You may be able to participate in proven to reduce the consumption of electrithis limited-term program offered by NDBP (NDBP) Energy Efficiency Subsidy Program National Development Bank of Palau's (EESP) wants to help you save money on your

energy saving features that will provide If selected, you will be asked to choose measures you select, your home loan will be you with a rebate or subsidy on your home borrower. This is a voluntary effort. discounted at a favor-able rate to you, the loan. Depending on the type and number of

Measures

EAST-WEST ORIENTATION OF LONG AXIS OF HOUSE **REQUIRED FOR PARTICIPATION IN PROGRAM** SURGE PROTECTOR STRIPS ON APPLIANCES ATTIC VENTILATION AT SOFFIT AND RIDGE RADIANT BARRIER INSULATION IN ROOF COMPACT FLUORESCENT LAMPS ENERGY STAR APPLIANCES WIDE ROOF OVERHANGS WHITE ROOF COATING LIGHT WALL COLORS

Options

OPTIONAL FOR ADDITIONAL CREDIT

FULLY OPENABLE WINDOWS WATER HEATER EITHER SOLAR WATER HEATER OR INSTANT (DEMAND) EXTERIOR WINDOW SHADING OR AWNINGS TINTED OR HIGH-PERFORMANCE GLASS WATER HEATER TIMER/ACCESSIBLE SHUT OFF SWITCH HOT WATER PIPING INSULATION

HEAT TRAPS ON WATER HEATER PIPING

CEILING FANS

.GreenPalau

Another purpose of the EESP is to help reproduced by fossil fuel of oil and gas. nations of the world in conserving energy duce Palau's carbon footprint and join other

a healthy environment and the EESP houscerns and policies. ing loan effort will continue to advance the Palau is a recognized leader in supporting Republic's role of sound environmental con-

.ForExample



trim is permitted) for your wall. (Colored Select light colors



appliances strips with all of your Use surge protector



enough to shade walls. overhangs that are wide

dimming fixtures. lamps in all nonUse compact fluorescent

Construct roof

A GREEN PALAU SAVES YOU MONEY

emissions are now rising. ronment and healthy people. Air pollution and harmful fossil fuel cost helps Palau to maintain its healthy envi-Reducing individual and community expenditures on

ELP)?

NDBP-ENERGY LOAN PROGRAMS (NDBP-WHERE CAN I FIND OUT MORE ABOUT THE

awareness and action towards lower these efforts. EESP loans to home buyers will do much to support consumption of electrical power. The through individual and community However, these can be lowered



at Ngetkib Village, Airai State. you can visit the NDBP branch You can also call the dedicated

NDBP-Energy Loan Programs, To find out more about the

to 3:00 pm. You can also visit the NDBP website at programs at 587-2577, Mondays to Fridays 9:00 am NDBP-ELP query hotline to find out more about the three

ABOUT THE NDBP LOAN www.ndbp.com.

SUBSIDIES

BANK OF PALAU NATIONAL

only contribute to a "greener into your new home, you not approved features and measures When you as a borrower install



community" but save money in the short, medium and long term. The program is designed to reduce energy consumption.

consumption for home buyers building their houses measures and features proven to reduce electrical Bank to be used to off-set the cost of including certain funds to the Republic of Palau's National Development The Government of Italy generously provided seed

greater the savings for you in the long run. more energy efficient is your home and therefore, the tional installation. The more features you choose the These are listed under the required to install and op-



any items which require Bank approval.

Please consult with your Loan Officer before ordering

of the EESP effort. Your Loan Officer will inform you of

those items.

fore installation to ensure that they meet the standards Certain measures must be approved by the Bank beor blue prints for your house.

and features to choose from which you will then instruct

be provided with a breakdown of the various measures begin your application for a NDBP housing loan. You will

Your Loan Officer will advise you on the EESP when you

HOW DO I APPLY?

your designer or contractor to include in the drawings

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NATIONAL DEVELOPMENT BANK OF PALAU

OWI	NDBP ENERGY EFFICIENCY SUBSIDY PROGRAM	M: CRE	EDIT CALC DATE:	ULATI	ONS	
<u>REQ</u>	UIRED MEASURES INCORPORATED					
	EAST-WEST ORIENTATION (IF LONG TO SHORT WALL RATIO) IS GI	REATER TI	HAN 1.	.5 TO 1	
	LIGHT WALL COLORS					
	WHITE OR LIGHT COLOR ROOF COATING					
	CONTINUOUS SOFFIT VENTILATION (NOT FOR CONCRETE S	SLAB)				
	RADIANT BARRIER INSULATION (NOT FOR CONCRETE SLAB	5)				
	COMPACT FLUORESCENT LAMPS					
	SUBTOTAL CREDIT FOR REQUIRED MEASURES			\$	3,000	
<u>OPT</u>	ONAL MEASURES INCORPORATED					
	FULLY OPENABLE WINDOWS	\$	600.00			
	TINTED OR HIGH PERFORMANCE GLASS	\$	200.00			
	EXTERIOR WINDOW SHADING DEVICES	\$	200.00			
	CEILING FANS WITH SPEED CONTROLS	\$	200.00			
	SOLAR WATER HEATING SYSTEM					
	OR INSTANT (DEMAND) WATER HEATERS					
	OR PREP FOR INSTANT (DEMAND) WATER HEATERS					
	OR HOT WATER PIPING INSULATION					
	AND TANK TYPE WATER HEATER TIMER OR SHUTOFF SWITCH					
	AND HEAT TRAPS ON WATER HEATER TANK	\$	1,800			
	SUBTOTAL MAXIMUM CREDIT FOR OPTIONAL MEASURES			\$	3,000	
	TOTAL CREDIT FOR PROGRAM					\$ 6,000