



SUPPLY AND DELIVERY OF MATERIALS FOR THE UPGRADE RICE HULL CARBONIZER OF MinSU MAIN CAMPUS

Name of Project

**BAC Resolution Recommending Approval
Resolution No. 017, s. 2025**

WHEREAS, the Mindoro State University (MinSU), through Bids and Awards Committee (BAC) has advertised in the PhilGEPS and MinSU Website the **Request for Quotation (RFQ) No. 2025-10** for the project **"Supply and Delivery of Materials for the Upgrade Rice Hull Carbonizer of MinSU Main Campus"** with an Approved Budget for the Contract (ABC) amounting to **One Hundred Ninety-Nine Thousand Five Hundred Ninety Pesos (Php199,590.00)**;

WHEREAS, in response to the advertisement of the project, two (2) suppliers/bidders were found in the document request list, however only one (1) supplier/bidder in the name of **CONNORSTONE CONSTRUCTION DEVELOPMENT & SUPPLIES CORPORATION** submitted price quotation before the deadline;

WHEREAS, the detailed evaluation of price quotation resulted in the following:

Approved Budget for the Contract (ABC)	Name of Bidder	Price Quotation
Php199,590.00	Connorstone Construction Development & Supplies Corporation	Php199,333.73

WHEREAS, the BAC examined and verified the price quotation submitted by the abovementioned supplier and was found to be complying and responsive;

NOW, THEREFORE, BE IT RESOLVED that the BAC hereby recommends to the Head of Procuring Entity the approval of awarding the contract involving the project, **"Supply and Delivery of Materials for the Upgrade Rice Hull Carbonizer of MinSU Main Campus"** as follows:

- to Connorstone Construction Development & Supplies, Corporation for being the supplier/bidder with the Single Calculated Responsive Bid (SCRB);

RESOLVED, this 25th day of February, 2025 at MinSU-Main Campus, Alcate, Victoria, Oriental Mindoro.


CIEDELLE P. SALAZAR, J.D., Ph.D.
BAC Chairperson


Engr. MARK LESTER A. MAGPANTAY
BAC Vice-Chairperson


ATTY. SHERLYN A. LAYESA
BAC Member


FRANIE M. AFABLE, DBMHM
BAC Member


MELGAR G. FADRIQUELAN
BAC Member

Approved/Disapproved


ENYA MARIE D. APOSTOL, Ph.D.
SUC President III

Date: _____



PhilGEPS

Philippine Government Electronic Procurement System

Central Portal for
Philippine Government
Procurement Opportunities

Bid Notice Abstract

Request for Quotation (RFQ)

Reference Number 11730701
Procuring Entity MINDORO STATE UNIVERSITY
Title SUPPLY AND DELIVERY OF MATERIALS FOR THE UPGRADE RICE HULL CARBONIZER OF MinSU MAIN CAMPUS
Area of Delivery Oriental Mindoro

Solicitation Number:	RFQ No. 2025-010	Status	Closed
Trade Agreement:	Implementing Rules and Regulations		
Procurement Mode:	Negotiated Procurement - Small Value Procurement (Sec. 53.9)	Associated Components	1
Classification:	Goods	Bid Supplements	0
Category:	Industrial Machinery and Equipment		
Approved Budget for the Contract:	PHP 199,590.00	Document Request List	2
Delivery Period:	30 Day/s		
Client Agency:-		Date Published	07/02/2025
Contact Person:	Christian B. Apostol BAC Secretariat Head Alcate Victoria Oriental Mindoro Philippines 5205 63-43-2862368 cbapotel21@gmail.com	Last Updated / Time	07/02/2025 00:00 AM
		Closing Date / Time	10/02/2025 17:00 PM

Description

Please quote your lowest price on the items / listed below, subject to the General Condition on the last page, stating the shortest time of delivery and submit your quotation duly signed by your representative not later than _____ in the address stated in the last page.

CIEDELLE PIOL-SALAZAR, J.D., Ph.D.

BAC Chairperson

Note: 1. All entries must be typewritten.

2. Delivery Period within ____ calendar days.

3. Warranty shall be for a period of six (6) months for supplies and materials, one (1) year for Equipment, from date of acceptance by the procuring entity.

4. Price validity shall be a period of 30 calendar days.

5. G-EPS Registration Certificate shall be attached upon submission of the Quotation.

6. Bidders shall submit Original Brochures showing certification of the product being offered (optional).

7. Mode of delivery: [] Pick-up (Schedule) [] Door to Door Delivery

Item

No. Unit ITEM AND DESCRIPTION QTY. UNIT

PRICE TOTAL AMOUNT

1 unit Angle Bar or Sq Tube 40mmx40mmx5mm T GI 8

2 unit 1/4 x 1 1/2 95mm) white (3mm) yellow ss 2

3 unit Angel Bar 50mm x 50mm x 3mm THK BI 3

4 unit Angel Bar 50mm x 50mm x 5mm THK BI 3

5 unit Angel Bar 40mm x 40mm x 5mm THK BI 3

6 unit Chain Roller Belt (Standard Rollert Chain #60) ss 1

7 unit Flat Bar 25mm x 25mm x 3mm THK 1/4x1 (red) ss 2

8 unit MS Plate 8ft x 4ft x 3mm 3/16 9Yellow) ss 1

9 unit SS Sheet 8ft x 4ft x 1.2mm thk SS 1

[illegible]

Created by Annabelle Quinto Madrigal

Date Created 06/02/2025

The PhilGEPS team is not responsible for any typographical errors or misinformation presented in the system. PhilGEPS only displays information provided for by its clients, and any queries regarding the postings should be directed to the contact person/s of the concerned party.



ABSTRACT OF QUOTATION/S

I. Particulars
Project Name: Supply and Delivery of Materials for the Upgrade of Fire Hall Extension No. 1
Project Location: Marikina Main Camp
Implementing Office: BAW
Method of Procurement: RFQ
Approved Budget for the Contract (ABC): ₱ 199,500.00
Deadline of Submission of Quotation: _____

II. Abstract of Quotations / for SVP
Evaluation of Documents Required to be Submitted within the deadline specified in the RFQ

No	Participating Bidder/s	Date and Time of Receipt	Eligibility Requirements		Technical Requirements		Financial Requirements		Bid Amount	Rank	Remarks
			Pass	Fail	Pass	Fail	Pass	Fail			
	Concorstone Construction Dev't & Supplies, Corp		Pass	✓	Pass	✓	Pass	✓	199,333.73	1	least responsive bidder

III. Recommendation /Resolution
☒ Recommend to Award Contract

Date: 02-11-25

Lowest / Single Calculated and Responsive Quotation:	Contract Price Award (in words & figures):
Concorstone Construction Dev't and Supplies, Corp.	One hundred ninety nine thousand three hundred thirty three and 73/100 pesos only (₱ 199,333.73)

☐ Declaration of Failure under Section 35 of Revised IRR of RA 9184
☐ All prospective bidders are declared ineligible [Sec. 35.1(b)]
☐ All bids failed to comply with all the bid requirements or fail post-qualification [Sec. 35.1(c)]

Date: 02-11-25

LINA B. JAVIER
TWG Member

MAY C. BERON
TWG Member

FELIX A. MINESTERIO
TWG Member

MERVIN L. ICALLA
TWG Member

Engr. MARK KEYLORD S. ONAL
BAC-TWG Head

Proceed only if recommended for award of contract

12/04/05 - date completely signed by the TWGs

2025-09-27
AOQ

REQUEST FOR QUOTATION

SUPPLY AND DELIVERY OF MATERIALS FOR THE UPGRADE RICE HULL CARBONIZER OF MinSU MAIN CAMPUS

PR No.: PR25-0003

RFQ No. 2025-10

ABC Amount: Php199,590.00

Company Name : CONNORSTONE CONSTRUCTION DEVT & SUPPLIES CORP.

Address : LALUD, CALAPAN CITY, ORIENTAL MINDORO

Please quote your lowest price on the items / listed below, subject to the General Condition on the last page, stating the shortest time of delivery and submit your quotation duly signed by your representative not later than _____ in the address stated in the last page.

CIEDELLE PIOL-SALAZAR, J.D., Ph.D.

BAC Chairperson

- Note:**
1. All entries must be typewritten.
 2. Delivery Period within ____ calendar days.
 3. Warranty shall be for a period of six (6) months for supplies and materials, one (1) year for Equipment, from date of acceptance by the procuring entity.
 4. Price validity shall be a period of 30 calendar days.
 5. G-EPS Registration Certificate shall be attached upon submission of the Quotation.
 6. Bidders shall submit Original Brochures showing certification of the product being offered (optional).
 7. Mode of delivery: [☐] Pick-up (Schedule) [☐] Door to Door Delivery

Item No.	Unit	ITEM AND DESCRIPTION	QTY.	UNIT PRICE	TOTAL AMOUNT
1	unit	Angle Bar or Sq Tube 40mmx40mmx5mm T GI	8	1,163.64	9,309.09
2	unit	1/4 x 1 1/2 95mm) white (3mm) yellow ss	2	6,390.91	12,781.82
3	unit	Angel Bar 50mm x 50mm x 3mm THK BI	3	745.45	2,236.36
4	unit	Angel Bar 50mm x 50mm x 5mm THK BI	3	1,563.64	4,690.91
5	unit	Angel Bar 40mm x 40mm x 5mm THK BI	3	1,163.64	3,490.91
6	unit	Chain Roller Belt (Standard Rollert Chain #60) ss	1	114,061.00	114,061.00
7	unit	Flat Bar 25mm x 25mm x 3mm THK 1/4x1 (red) ss	2	3,090.91	6,181.82
8	unit	MS Plate 8ft x 4ft x 3mm 3/16 9Yellow) ss	1	363.64	363.64
9	unit	SS Sheet 8ft x 4ft x 1.2mm thk SS	1	12,181.82	12,181.82
10	unit	GI Sheet 8ft x 4ft x 1.5mm THK GI	3	2,872.73	8,618.18
11	unit	Sqr. Tube 2" x 3mm THK (2.0 Blue) BI	3	1,345.45	4,036.36
12	unit	Sqr. Tube 1" x 1.2mm THK (1.5 RED) SS	2	418.18	836.36
13	unit	Pipe 4" Sch. 40x6 meters Eagle GI	2	6,490.91	12,981.82
14	unit	Round Bar41" x 6meters GI	2	918.18	1,836.36
15	unit	Steel Matting 8ft x 4ft, 1x1 GI	1	1,090.91	1,090.91
16	unit	SS Welding Rod ER308L or E308L ø3.2mm (1/8")	50	63.64	3,181.82
17	kg	Welding Welding Rod E6013, ø3.2mm (1/8") Rod Ordinary	5	290.91	1,454.55
XX					
TOTAL					₱ 199,333.73

After having carefully read and accepted your General Condition, I / We quote you on the item at prices noted above

ENGR. IAN KAISSER C. BALLESTEROS

Supplier's Signature over Printed Name

639-681-037-00000

TIN No. of Establishment

0908-874-3789

Date _____

MSU-BAC-FR-05.01



Mindoro State University

Victoria, Oriental Mindoro 5205 Philippines

Email: universitypresident@minsu.edu.ph
Website: www.minsu.edu.ph
Mobile: +63 977 846 72 28



General Conditions

1. Quotations and other requirements stated below shall be submitted to the Bids and Awards Committee (BAC) Office, Mindoro State University -Main Campus, Alcate, Victoria, Oriental Mindoro, Philippines on the date and time stated in this RFP.
2. Supplier shall submit the following requirements:
 - a. Duly signed original copy of Request for Quotation (RFQ). Prices shall be quoted in Philippine Pesos.
 - b. PhilGEPS Registration
 - c. Valid Mayor's/Business Permit
 - d. Omnibus Sworn Statement
 - e. BIR Certificate of Registration
 - f. Latest Income/Business Tax Return
 - g. TAX Clearance
 - h. DTI Registration/SEC Certificate
 - i. Original Brochures or certificates of the items offered showing its performance characteristics or specifications, if applicable

Price validity shall be 30 calendar days from the deadline of submission of quotation.

Ocular Inspection

Upon the decision of the End-User and BAC, the supplier and its concerned premises may be subjected to ocular inspection and approval by the End-User and/or TWG Inspections of the BAC prior to the award.

Award

The supplier that submitted the lowest calculated responsive quotation, and passed the inspection conducted by the End-User and BAC prior to the event, if any, shall be awarded the contract.

Evaluation of Quotations

Quotations shall be compared and evaluated on the basis of the following criteria:

1. Completeness of Submission
2. Compliance with Item & Description Requirements
3. Price

Instructions

1. Supplier shall be responsible for the source(s) of its goods/services/equipment, and which shall be in accordance with the schedule and specifications of the RFQ or contract. Failure of the supplier to comply with this provision shall be ground for cancellation of the award or purchase order issued to the supplier.
2. Supplier that accepted an award, purchase order, or contract but failed to deliver the required goods/services/equipment within the time called for in the award, purchase order, or contract shall be disqualified from participating in MinSU or any of MinSU campuses future procurement activities. This is without prejudice to the imposition of other sanctions prescribed under R.A. 9184 and its IRR-A against the supplier.
3. All duties, excise, and other taxes and revenue charges shall be paid by the supplier.
4. All transactions are subject to withholding of credible Government Taxes per revenue regulation(s) of the Bureau of Internal Revenue

Liquidation Damages

A penalty of one-tenth of one percent (0.001) of the total value of the undelivered goods/services/equipment shall be charged as liquidated damages for every day of delay of the delivery of the purchased goods/services/equipment.

Warranty

Supplier warrants that all goods/services/equipment to be provided are of acceptable industry standard.

Payment

Payment shall be made only upon a certification by the Head of the Procuring Entity to the effect that the GOODS have been rendered or delivered in accordance with the terms of this Contract and have been duly inspected and accepted.

MSU-BAC-FR-05.01





View Red Registration

[Back \(https://philgeps.gov.ph/SupDashboards/dashboard\)](https://philgeps.gov.ph/SupDashboards/dashboard)

My Contact Details

Salutation	Mr	First Name	Ian Kaiser
Middle Name	Castro	Last Name	Ballesteros
Gender	Male	Position	Projects and Engineering Head
Landline Area Code	043	Landline Number	2886742
Landline Extension Number			
Fax Area Code		Fax Number	
Fax Extension Number			
Country Code	63	Mobile Number	9127496851
Email Address	connorstonecorp.construct@gmail.com		

Organization Details

Organization Id	399254	Registration Date	19-Jul-2024 12:06 PM
Registration Status	active		
Organization Name	CONNORSTONE CONSTRUCTION DEVELOPMENT AND SUPPLIES CORP.	Form Of Organization	Corporation

**Business
Category**

Power sources,Batteries and generators and kinetic power transmission,Electrical wire and cable and harness,Power generation,Hand tools,Hydraulic machinery and equipment,Pneumatic machinery and equipment,Structural components and basic shapes,Concrete and cement and plaster,Roads and landscape,Structural building products,Insulation,Exterior finishing materials,Interior finishing materials,Doors and windows and glass,Plumbing fixtures,Construction and maintenance support equipment,Portable Structure Building Components,Structural materials,Castings and casting assemblies,Extrusions,Forgings,Moldings,Hardware,Packings glands boots and covers,Grinding and polishing and smoothing materials,Adhesives and sealants,Paints and primers and finishes,Pneumatic and hydraulic and electric control systems,Housings and cabinets and casings,Fabricated pipe assemblies,Fabricated bar stock assemblies,Fabricated structural assemblies,Fabricated sheet assemblies,Fabricated tube assemblies,Fabricated plate assemblies,Lamps and lightbulbs and lamp components,Lighting Fixtures and Accessories,Electrical equipment and components and supplies,Electrical wire management devices and accessories and supplies,Heating and ventilation and air circulation,Fluid and gas distribution,Industrial pumps and compressors,Industrial filtering and purification,Pipe piping and pipe fittings,Tubes tubing and tube fittings,Measuring and observing and testing instruments,Laboratory supplies and fixtures,Communications Devices and Accessories,Components for information technology or broadcasting or telecommunications,Computer Equipment and Accessories,Security surveillance and detection,Personal safety and protection,Fire protection,Workplace safety equipment and supplies and training materials,Floor coverings,Window treatments,Domestic appliances,Consumer electronics,Domestic wall treatments,Signage and accessories,Accommodation furniture,Commercial and industrial furniture,Classroom and instructional and institutional furniture and fixtures,Merchandising furniture and accessories,Decorative adornments,Classroom decoratives and supplies,Arts and crafts equipment and accessories and supplies,Land and soil preparation and management and protection,Well drilling and construction services,Building and facility maintenance and repair services,Residential building construction services,Nonresidential building construction services,Heavy construction services,Specialized trade construction and maintenance services,Plastic and chemical industries,Wood and paper industries,Environmental management,Storage,Transport services,Professional engineering services,Utilities,Permanent buildings and structures,Portable buildings and structures,Prefabricated buildings and structures

Location

local

**Organization
Type**Distributor,General
Merchandise,Services,Trading**Business Tax
Identification
Number**

639681037000

Capitalization

₱ 30,000,000.00

Corporation Details

SEC Certificate Number 202311012392702

SEC Registration Date 09-Nov-2023

Local Organization Address

Country Name	Philippines	Region	Region IV-B
Province	Oriental Mindoro	City/Municipality	Calapan City
Street Address	Atis Street	Zip Code	5200

Bank Account Details

Bank Name	Rizal Commercial Banking Corporation	Branch Code	6154
Bank Branch	Calapan	Account Name	Connorstone Construction Development and Supplies
Account Number	0000007591278240		

Uploaded Supporting Document

Uploaded	1721361981_Connorstone SEC Docs for Philgeps Red.pdf
Supporting Document	(https://philgeps.gov.ph/portal_documents/merchant_reg_documents/user_399254/documents/1721361981_Connorstone SEC Docs for Philgeps Red.pdf)

Status

Status

List of Active Users of the Merchant Organization

Last Name	First Name	Middle Name	Position	Status
No Records Found				



Republic of the Philippines
CITY OF CALAPAN
OFFICE OF THE CITY MAYOR

TAUMBAYAN ANG

BUSINESS PERMIT

2025

Pursuant to the provision of City Tax Ordinance Number 18, Series of 2011 as amended, otherwise known as the 2012 REVENUE CODE OF THE CITY OF CALAPAN, after payment of taxes and charges, etc. and compliance with existing requirements, permit is granted to herein taxpayer.

P 12,930.00

TAXPAYER'S NAME	BUSINESS I.D.	MODE OF PAYMENT	DATE BILLED	KIND OF BUSINESS	STATUS
ConnorstoneConstructionDev't.	0240000029	Annually	1/8/2025	Construction&Supplies	R
NAME OF BUSINESS		LOCATION OF BUSINESS			BUSINESS PLATE NUMBER
ConnorstoneConstructionDev't.andSuppliesCorp.		LALUD			
KIND OF FEE / TAX	TAX BASE	TAX AMOUNT	SUR/INT	TOTAL	PERIOD
BUSINESS TAX		4,950.00	0.00	4,950.00	
MAYOR'S PERMIT		5,750.00		5,750.00	
MAYORS PERMIT FEE		3,000.00			
EDUC'L SPECIAL PROGR		300.00			
DRAINAGE MAINTENANCE		300.00			
GARBAGE FEE		1,500.00			
FIRE AND SAFETY INSP		300.00			
SANITARY FEE		350.00			
MEDICAL FEE		500.00		500.00	
ANNUAL INSPECTION FEE		200.00		200.00	
BUSINESS STICKER		300.00		300.00	
SITE INSPECTION FEE		50.00		50.00	
OCCUPATIONAL FEE		1,100.00		1,100.00	
TAX CLEARANCE		30.00		30.00	
AAP.&RENEWAL OF BUS.FEE		50.00		50.00	
ENCODER		TOTALS	12,930.00		

Payment for 14

Notes:

1. This Permit will expire on

Dec. 31, 2025

2. This Mayor's Permit, together with the official receipt, shall at all times be displayed or posted for public view in a conspicuous place within the place of business or undertaking.

Check
Check number _____
Bank _____

Cash
O.R. Number 1444989
Date 1/8/2025

Payment received by:

RECOMMENDING APPROVAL:

APPROVED BY:

MARIA BENELYN JOY D. GARDOCE
Licensing Officer IV
Business Permits and Licensing Office

MARILOU F. MORILLO
City Mayor

Non-compliance with the applicable provisions of National Building Code of the Philippines (P.D. No. 1096), Code on Sanitation of the Philippines (P.D. No. 856), Revised Fire Code of the Philippines of 2008 (R.A. No. 9514), and other existing laws, issuances, regulations and ordinances shall be valid grounds for the immediate and automatic cancellation/revocation of this PERMIT.

ANY ERASURE AND/OR ALTERATION WILL AUTOMATICALLY INVALIDATE THIS PERMIT.



OMNIBUS SWORN STATEMENT

REPUBLIC OF THE PHILIPPINES)

CITY OF CALAPAN) S.S.

AFFIDAVIT

I, **ENGR. IAN KAISSER C. BALLESTEROS**, of legal age, Filipino, and residing at Brgy. Suqui, Calapan City Oriental Mindoro, after having been duly sworn in accordance with law, do hereby depose and state that:

1. I am the sole proprietor or authorized representative of **CONNORSTONE CONSTRUCTION DEVT & SUPPLIES CORP.**, with office address at Brgy. Sto. Niño, Calapan City, Oriental Mindoro;
2. As the owner and sole proprietor of **CONNORSTONE CONSTRUCTION DEVT & SUPPLIES CORP.**, I have the full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for **SUPPLY AND DELIVERY OF MATERIALS FOR THE UPGRADE RICE HULL CARBONIZER OF MinSU MAIN CAMPUS** with PR No.: **PR25-0003** and RFQ No. **2025-10**.
3. **CONNORSTONE CONSTRUCTION DEVT & SUPPLIES CORP.**, is not "blacklisted" or barred from bidding by the Government of the Philippines or any of its agencies, office, corporations, or Local Government Units, foreign government/ foreign or international financing institution whose blacklisting rules have been recognized by the Government Procurement Policy Board, **by itself or by relation, membership, association, affiliation, or controlling interest with another blacklisted person or entity as defined and provided for in the Uniform Guidelines on Blacklisting**;
4. Each of the documents submitted in satisfaction of the bidding requirements is an authentic copy of the original, complete, and all statements and information provided therein are true and correct;
5. **CONNORSTONE CONSTRUCTION DEVT & SUPPLIES CORP.**, is authorizing the Head of Procuring Entity or its duly authorized representative(s) to verify all the documents submitted;
6. The owner or sole proprietor is not related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;
7. **CONNORSTONE CONSTRUCTION DEVT & SUPPLIES CORP.**, complies with existing labour laws and standards; and

8. **CONNORSTONE CONSTRUCTION DEVT & SUPPLIES CORP.**, is aware of and has undertaken the following responsibilities as a Bidder:
- Carefully examine all of the Bidding Documents;
 - Acknowledge all conditions, local or otherwise, affecting the implementation of the contract;
 - Made an estimate of the facilities available and needed for the contract of the bid, if any, and
 - Inquire or secure Supplemental/Bid Bulletin(s) issued for the **SUPPLY AND DELIVERY OF MATERIALS FOR THE UPGRADE RICE HULL CARBONIZER OF MinSU MAIN CAMPUS with PR No.: PR25-0003 and RFQ No. 2025-10;**
9. **CONNORSTONE CONSTRUCTION DEVT & SUPPLIES CORP.**, did not give or pay directly, any commission, amount fee or any form of consideration, pecuniary of otherwise to any person of official, personnel or representative of the government in relation to any procurement project or activity;
10. **In case advance payment was made or given, failure to perform or deliver any of the obligations and undertakings in the contract shall be sufficient grounds to constitute criminal liability for Swindling (Estafa) or the commission of fraud with unfaithfulness or abuse of confidence through misappropriating or converting any payment received by a person or entity under an obligation involving the duty to deliver certain goods or services, to the prejudice of the public and the government of the Philippines pursuant to Article 315 of Act No. 3815 s. 1930, as amended, or the Revised Penal Code.**

IN WITNESS WHEREOF, I have hereunto set my hand this 10th day of February, 2025 at Calapan City, Oriental Mindoro, Philippines.


ENGR. IAN KAISSER C. BALLESTEROS
Authorize Representative

SUBSCRIBED AND SWORN to before me, this 10th day of February, 2025 at Calapan City, Oriental Mindoro, Philippines.

NAME OF NOTARY PUBLIC

Serial No. of Commission _____

Notary Public for _____ until _____

Roll of Attorneys No. _____

PTR No. _____

IBP No. _____

Doc. No. _____

Page No. _____

Book No. _____

Series of _____

REVISED: APRIL 2019

REPUBLICA NG PILIPINAS
KAGAWARAN NG PANATILAP
KAWANIHAN NG RENTAS INTERNAS
REVENUE REGION NO. 09A - CAVITE-BATANGAS-MINDORO-ROMBLON
REVENUE DISTRICT OFFICE NO. 063 - CALAPAN, ORIENTAL MINDORO

OCN: 063RC20230000004447

Date OCN Generated: December 5, 2023

CERTIFICATE OF REGISTRATION

TIN & BRANCH CODE 639-681-037-00000	NAME OF TAXPAYER CONNORSTONE CONSTRUCTION DEVELOPMENT AND SUPPLIES CORP.	TIN ISSUANCE DATE December 5, 2023
REGISTERING OFFICE	<input checked="" type="checkbox"/> Head Office	<input type="checkbox"/> Branch
REGISTERED ADDRESS LALUD 5200 CITY OF CALAPAN (CAPITAL) ORIENTAL MINDORO PHILIPPINES		

TAX TYPES	FORM TYPES	FILING START DATE	FILING FREQUENCY	FILING DUE DATE
CORPORATE INCOME TAX	1702	January 1, 2024	ANNUALLY	On or before the 15th day of the 4th month following the close of the taxpayer's taxable year.
CORPORATE INCOME TAX	1702Q	April 1, 2024	QUARTERLY	Within sixty (60) days following the close of each of the first three (3) quarters of the taxable year.
VALUE ADDED TAX	2550Q	January 1, 2024	QUARTERLY	Not later than the 25th day following the close of each taxable quarter.
WITHHOLDING TAX - EXPANDED/OTHERS	0619E	January 1, 2024	MONTHLY	On or before the 10th day of the month following the month in which withholding was made.
WITHHOLDING TAX - EXPANDED/OTHERS	1601EQ	January 1, 2024	QUARTERLY	Not later than the last day of the month following the close of the quarter during which withholding was made.
WITHHOLDING TAX - EXPANDED/OTHERS	1604E	January 1, 2024	ANNUALLY	On or before March 1 of the year following the calendar year in which the income payments subject to expanded withholding taxes of exempt from withholding taxes were earned or accrued.
REGISTRATION FEE	0605	January 1, 2024	ANNUALLY	On or before the last day of January.

TAXPAYER TYPE: DOMESTIC CORPORATION

BUSINESS INFORMATION DETAILS

TRADE NAME 1	CONSTRUCTION OF BUILDINGS	REGISTRATION DATE
CONSTRUCTION OF BUILDINGS	December 5, 2023	
Line of Business (PSIC)	42100-CONSTRUCTION OF ROADS AND RAILWAYS	
Line of Business	CONSTRUCTION OF ROADS AND RAILWAYS	

REPUBLIKA NG PILIPINAS
KAGAWARAN NG PANANALAPI
KAWANIHAN NG RENTAS INTERNAS
REVENUE REGION NO. 09A - CABA MIRO (CAVITE-BATANGAS-MINDORO-ROMBLON)
REVENUE DISTRICT OFFICE NO. 063 - CALAPAN, ORIENTAL MINDORO

OCN: 063RC20230000004447
Date OCN Generated: December 5, 2023

CERTIFICATE OF REGISTRATION

TIN & BRANCH CODE 639-681-037-00000	NAME OF TAXPAYER CONNORSTONE CONSTRUCTION DEVELOPMENT AND SUPPLIES CORP.	TIN ISSUANCE DATE December 5, 2023
REGISTERING OFFICE	X Head Office	Branch
REGISTERED ADDRESS LALUD 5200 CITY OF CALAPAN (CAPITAL) ORIENTAL MINDORO PHILIPPINES		

(PSIC)	42200-CONSTRUCTION OF UTILITY PROJECTS	Secondary
Line of Business	CONSTRUCTION OF UTILITY PROJECTS	
(PSIC)	42900-CONSTRUCTION OF OTHER CIVIL ENGINEERING PROJECTS	Secondary
Line of Business	CONSTRUCTION OF OTHER CIVIL ENGINEERING PROJECTS	
(PSIC)	47529-RETAIL SALE OF CONSTRUCTION SUPPLIES, N.E.C.	Secondary
Line of Business	RETAIL SALE OF CONSTRUCTION SUPPLIES, N.E.C.	
(PSIC)	46639-WHOLESALE OF CONSTRUCTION MATERIALS AND SUPPLIES, N.E.C.	Secondary
Line of Business	WHOLESALE OF CONSTRUCTION MATERIALS AND SUPPLIES, N.E.C.	

REMINDERS:

1. An annual registration fee shall be paid upon registration and every year thereafter on or before the last day of January, using BIR Form No. 0605.
2. Filing of required tax return/s to conform with the above tax types, whether with or without business operation, to avoid penalties.
3. For new business registrants, application for registration of manual Books of Accounts (B/As) shall be before the deadline for filing of the initial quarterly income tax return or annual income tax return whichever comes earlier, from the date of registration. Registration of new set of manual B/As shall be before its use.
4. Immediately inform the district office in case of transfer/cessation of business and other changes in registration information by filing BIR Form No. 1905.
5. For Self-Employed Individuals (SEI) whose gross sales and/or receipts and other non-operating income does not exceed P3,000,000 and who opted to avail of the 8% Income tax rate, the tax type Percentage Tax (PT) shall not be reflected in the Certificate of Registration (COR). However, at the start of each taxable year, such SEI shall be automatically subjected to graduated income tax rates and required to file quarterly percentage tax return (BIR Form No. 2551Q) and option to replace the COR to reflect "PT", unless qualified and opted to avail of the 8% Income tax rate annually.

REPUBLICA NG PILIPINAS
KAGAWARAN NG PANANALAPI
KAWANIHAN NG RENTAS INTERNAS
REVENUE REGION NO. 09A - CAVAMIRO (CAVITE-BATANGAS-MINDORO-ROMBLON)
REVENUE DISTRICT OFFICE NO. 063 - CALAPAN, ORIENTAL MINDORO

OCN: 063RC20230000004447
Date OCN Generated: December 5, 2023

CERTIFICATE OF REGISTRATION

TIN & BRANCH CODE 639-681-037-00000	NAME OF TAXPAYER CONNORSTONE CONSTRUCTION DEVELOPMENT AND SUPPLIES CORP.	TIN ISSUANCE DATE December 5, 2023
REGISTERING OFFICE	X Head Office	Branch
REGISTERED ADDRESS LALUD 5200 CITY OF CALAPAN (CAPITAL) ORIENTAL MINDORO PHILIPPINES		

I hereby certify that the above named person is registered as indicated above, under the provision of the National Internal Revenue Code, as amended.



Regina P. Reforma
REGINA P. REFORMA
OIC-Asst. Revenue District Officer

EMELITA R. ABO
REVENUE DISTRICT OFFICER
(Signature over Printed Name)

THIS CERTIFICATE MUST BE EXHIBITED CONSPICUOUSLY IN THE PLACE OF BUSINESS.



Limuel Lopez <axie.gg94@gmail.com>

Tax Return Receipt Confirmation

ebirforms-noreply@bir.gov.ph <ebirforms-noreply@bir.gov.ph>
To: axie.gg94@gmail.com

Wed, Jan 22, 2025 at 9:31 AM

This confirms receipt of your submission with the following details subject to validation by BIR:

File name: 639681037000-1702RTv2018-122024.xml

Date received by BIR: 22 January 2025

Time received by BIR: 09:18 AM

Penalties may be imposed for any violation of the provisions of the NIRC and issuances thereof.

FOR RETURNS WITH TAX PAYABLE:

Please pay through any of the following ePayment Channels:

Land Bank of the Philippines Link.BizPortal

- LBP ATM Cards
- Bancnet ATM/Debit Cards
- PCHC PayGate or PESONeT (RCBC, Robinsons Bank, UnionBank, PSBank, BPI, Asia United Bank)

DBP PayTax Online

- Credit Cards (MasterCard/Visa)
- Bancnet ATM/Debit Cards

Unionbank of the Philippines

- Unionbank Online (for Unionbank Individual and Corporate Account Holders)
- UPAY via InstaPay (For Individual Non-Unionbank Account Holders)


Taxpayer Agent/ Tax Software Provider-TSP

- (Gcash/PayMaya/MyEG)

This is a system-generated email. Please do not reply.

Bureau of Internal Revenue

For BIR BCS/ Use Only Item:		Republic of the Philippines Department of Finance Bureau of Internal Revenue		1702-RT 01/18 ENCS P1	
BIR Form No. 1702-RT January 2018 (ENCS) Page 1		Annual Income Tax Return Corporation, Partnership and Other Non-Individual Taxpayer Subject Only to REGULAR Income Tax Rate <small>Enter all required information in CAPITAL LETTERS. Mark applicable boxes with an "X". Two copies MUST be filled with the BIR and one held by the taxpayers.</small>			
1 For <input checked="" type="radio"/> Calendar <input type="radio"/> Fiscal 2 Year Ended (MM/20YY) 12 - December 20 24		3 Amended Return? <input type="radio"/> Yes <input checked="" type="radio"/> No		4 Short Period Return <input type="radio"/> Yes <input checked="" type="radio"/> No	
		5 Alphanumeric Tax Code (ATC) IC 055 - Minimum Corporate Income Tax (MCIT) <input type="radio"/> IC019 - CORPORATION IN GENERAL - JAN 1, 2009 <input type="radio"/>			
Part I - Background Information					
6 Tax Identification Number (TIN) 639 - 681 - 037 - 00000					
7 RDO Code 063					
8 Registered Name (Enter only 1 letter per box using CAPITAL LETTERS) CONNORSTONE CONSTRUCTION DEVELOPMENT AND SUPPLIES					
9 Registered Address (Indicate complete address. If the registered address is different from the current address, go to the RDO to update registered address by using BIR Form No. 1905) CALAPAN CITY ORIENTAL MINDORO					
9A ZIP Code 5200					
10 Date of Incorporation/Organization (MM/DD/YYYY) 12/11/2023					
11 Contact Number 00					
12 Email Address axie.gg94@gmail.com					
13 Method of Deductions <input checked="" type="radio"/> Itemized Deductions [Section 34 (A-J), NIRC] <input type="radio"/> Optional Standard Deduction (OSD) - 40% of Gross Income [Section 34(L), NIRC as amended]					
Part II - Total Tax Payable (Do NOT enter Centavos; 49 Centavos or Less drop down; 50 or more round up)					
14 Tax Due 0					
15 Less: Total Tax Credits/Payments 0					
16 Net Tax Payable (Overpayment) (Item 14 Less Item 15) 0					
Add: Penalties					
17 Surcharge 0					
18 Interest 0					
19 Compromise 0					
20 Total Penalties (Sum of Items 17 to 19) 0					
21 TOTAL AMOUNT PAYABLE (Overpayment) (Sum of Items 16 and 20) 0					
If Overpayment, mark one(1) box only (Once the choice is made, the same is irrevocable) <input type="radio"/> To be refunded <input type="radio"/> To be issued a Tax Credit Certificate (TCC) <input type="radio"/> To be carried over as a tax credit for next year/quarter					
We declare under the penalties of perjury that this return, and all its attachments, have been made in good faith, verified by us, and to the best of our knowledge and belief, are true and correct, pursuant to the provisions of the National Internal Revenue Code, as amended, and the regulations issued under authority thereof. (If signed by an Authorized Representative, indicate TIN and attach authorization letter)					
Signature over Printed Name of President/Principal Officer/Authorized Representative					22 Number of Attachments 000
Signature over Printed Name of Treasurer/Assistant Treasurer					
Title of Signatory		TIN		Title of Signatory	
TIN		TIN			
Part III - Details of Payment					
Particulars		Drawee Bank/ Agency		Number	
Date (MM/DD/YYYY)		Amount			
23 Cash/Bank Debit Memo				0	
24 Check				0	
25 Tax Debit Memo				0	
26 Others (Specify Below)				0	
Machine Validation/Revenue Official Receipt Details [if not filed with an Authorized Agent Bank(AAB)]					
Stamp of Receiving Office/AAB and Date of Receipt (RO's Signature/Bank Teller's Initial)					

BIR Form No. 1702-RT January 2018(ENCS) Page 2	Annual Income Tax Return Corporation, Partnership and Other Non-Individual Taxpayer Subject Only to REGULAR Income Tax Rate	 1702-RT 01/18ENCS P2
Taxpayer Identification Number(TIN) <div style="display: flex; justify-content: space-between;"> 639 681 037 00000 </div>		Registered Name CONNORSTONE CONSTRUCTION DEVELOPMENT AND SUPPLIES


(DO NOT enter Centavos; 49 Centavos or Less drop down; 50 or more round up)


Part IV - Computation of Tax

27 Sales/Revenues/Receipts/Fees	599,995.00
28 Less: Sales Returns, Allowances and Discounts	530,140.00
29 Net Sales/Revenues/Receipts/Fees (Item 27 Less Item 28)	(30,145)
30 Less: Cost of Sales/Services	0
31 Gross Income from Operation (Item 29 less Item 30)	(30,145)
32 Add: Other Taxable Income Not Subjected to Final tax	0
33 Total Taxable Income (Sum of Items 31 and 32)	(30,145)
Less: Deductions Allowable under Existing Law	
34 Ordinary Allowable Itemized Deductions (From Part VI Schedule I Item 18)	0
35 Special Allowable Itemized Deductions (From Part VI Schedule II Item 5)	0
36 NOLCO (Only for those taxable under Sec. 27(A to C); Sec. 28(A)(1)(A)(6)(b) of Tax code, as amended) (From Part VI Schedule III Item 8)	0
37 Total Deductions (Sums of Items 34 to 36)	0
OR [in case taxable under Sec 27(A) & 28(A)(1)]	
38 Optional Standard Deduction (OSD) (40% of Item 33)	0
39 Net Taxable Income/(Loss) If itemized: Item 33 Less Item 37; If OSD: Item 33 Less Item 38	(30,145)
40 Applicable Income Tax Rate	30%
41 Income Tax Due other than Minimum Corporate Income Tax(MCIT) (Item 39 x Item 40)	0
42 MCIT Due (2% of Item 33)	0
43 Tax Due (Normal Income Tax Due in Item 41 OR the MCIT Due in Item 42, whichever is higher) (To Part II Item 14)	0
Less: Tax Credits/Payments(attach proof)	
44 Prior Year's Excess Credits Other Than MCIT	0
45 Income Tax Payment under MCIT from Previous Quarter/s	0
46 Income Tax Payment under Regular/Normal Rate from Previous Quarter/s	0
47 Excess MCIT Applied this Current Taxable Year (From Part VI Schedule IV Item 4)	0
48 Creditable Tax Withheld from Previous Quarter/s per BIR Form No. 2307	0
49 Creditable Tax Withheld per BIR Form No. 2307 for the 4th Quarter	0
50 Foreign Tax Credits, if applicable	0
51 Tax Paid in Return Previously Filed, if this is an Amended Return	0
52 Special Tax Credits (To Part V Item 58)	0
Other Credits/Payments (Specify)	
53	0
54	0
55 Total Tax Credits/Payments (Sum of Items 44 to 54) (To Part II Item 15)	0
56 Net Tax Payable (Overpayment) (Item 43 Less Item 55) (To Part II Item 16)	0

Part V - Tax Relief Availment

57 Special Allowable Itemized Deductions (Item 35 of Part IV x Applicable Income Tax Rate)	0
58 Add: Special Tax Credits (From Part IV Item 52)	0
59 Total Tax Relief Availment (Sum of Items 57 & 58)	0

BIR Form No. 1702-RT January 2018(ENCS) Page 3	Annual Income Tax Return Corporation, Partnership and Other Non-Individual Taxpayer Subject Only to REGULAR Income Tax Rate	 1702-RT 01/18ENCS P3
Taxpayer Identification Number(TIN)		Registered Name
639 681 037 00000		CONNORSTONE CONSTRUCTION DEVELOPMENT AND SUPPLIES
Part VI - Schedules <small>(DO NOT enter Centavos; 49 Centavos or Less drop down; 50 or more round up)</small>		
Schedule I - Ordinary Allowable Itemized Deductions <small>(Attach additional sheet/s if necessary)</small>		
1 Amortization		0
2 Bad Debts		0
3 Charitable and Other Contributions		0
4 Depletion		0
5 Depreciation		0
6 Entertainment, Amusement and Recreation		0
7 Fringe Benefits		0
8 Interest		0
9 Losses		0
10 Pension Trusts		0
11 Rental		0
12 Research and Development		0
13 Salaries, Wages and Allowances		0
14 SSS, GSIS, Philhealth, HDMF and Other Contributions		0
15 Taxes and Licenses		0
16 Transportation and Travel		0
17 Others(Deductions Subject to Withholding Tax and Other Expenses) <small>(Specify below; Add additional sheet(s), if necessary)</small>		
a Janitorial and Messengerial Services		0
b Professional Fees		0
c Security Services		0
d		0
e		0
f		0
g		0
h		0
i		0
18 Total Ordinary Allowable Itemized Deductions <small>(Sum of Items 1 to 17)</small>		0
Schedule II - Special Allowable Itemized Deductions <small>(Attach additional sheet/s, if necessary)</small>		
Description	Legal Basis	Amount
1		0
2		0
3		0
4		0
5 Total Special Allowable Itemized Deductions <small>(Sum of Items 1 to 4)</small>		0

BIR Form No. 1702-RT January 2018(ENCS) Page 4	Annual Income Tax Return Corporation, Partnership and Other Non-Individual Taxpayer Subject Only to REGULAR Income Tax Rate	 1702-RT 01/18ENCS P4	
Taxpayer Identification Number(TIN) Registered Name 639 681 037 00000 CONNORSTONE CONSTRUCTION DEVELOPMENT AND SUPPLIES			
Schedule III - Computation of Net Operating Loss Carry Over (NOLCO)			
1 Gross Income		(30,145)	
2 Less: Ordinary Allowable Itemized Deductions		0	
3 Net Operating Loss (Item 1 Less Item 2) (To Schedule IIIA, Item 7A)		(30,145)	
Schedule IIIA - Computation of Available Net Operating Loss Carry Over (NOLCO) <small>(DO NOT enter Centavos; 49 Centavos or Less drop down; 50 or more round up)</small>			
Year Incurred	Net Operating Loss A) Amount	B) NOLCO Applied Previous Year/s	
4 2024	30,145	0	
5	0	0	
6	0	0	
7	0	0	
Continuation of Schedule IIIA (Item numbers continue from table above)			
C) NOLCO Expired	D) NOLCO Applied Current Year	E) Net Operating Loss (Unapplied) [E = A Less (B + C + D)]	
4 0	0	30,145	
5 0	0	0	
6 0	0	0	
7 0	0	0	
8 Total NOLCO (Sum of Items 4D to 7D)	0		
Schedule IV - Computation of Minimum corporate income Tax(MCIT)			
Year	A) Normal Income Tax as Adjusted	B) MCIT	C) Excess MCIT over Normal Income Tax
1	0	0	0
2	0	0	0
3	0	0	0
Continuation of Schedule IV (Item numbers continue from table above)			
D) Excess MCIT Applied/Used in Previous Years	E) Expired Portion of Excess MCIT	F) Excess MCIT Applied this Current Taxable Year	G) Balance of Excess MCIT Allowable as Tax Credit for Succeeding Year/s [G = C Less (D + E + F)]
1 0	0	0	0
2 0	0	0	0
3 0	0	0	0
4 Total Excess MCIT Applied (Sum of Items 1F to 3F)		0	
Schedule V - Reconciliation of Net Income per Books Against Taxable Income <small>(Attach additional sheet/s, if necessary)</small>			
1 Net Income/(Loss) per Books		-30,145	
Add: Non-deductible Expenses/Taxable Other Income			
2		0	
3		0	
4 Total (Sum of Items 1 to 3)		-30,145	
Less: A) Non-Taxable Income and Income Subjected to Final Tax			
5		0	
6		0	
B) Special Deductions			
7		0	
8		0	
9 Total (Sum of Items 5 to 8)		0	
10 Net taxable Income (Loss) (Item 4 Less Item 9)		-30,145	



Bringing In Revenues
for Nation-building

Republic of the Philippines
Department of Finance
BUREAU OF INTERNAL REVENUE
Revenue District Office No. 063
QF-TCC-02-00-2024.01

ANNEX "K"

TCVC No. 09A-063-01-07-R0008-2025-M

TAX COMPLIANCE VERIFICATION CERTIFICATE

(For Tax Clearance-Bidding Purposes)

NAME OF TAXPAYER: CONNORSTONE CONSTRUCTION DEVELOPMENT AND SUPPLIES CORP.
TRADE NAME: CORNERSTONE CONSTRUCTION DEVELOPMENT AND SUPPLIES CORP.
REGISTERED ADDRESS: LALUD, CALAPAN CITY, ORIENTAL MINDORO
TIN: 639-681-037 BRANCH CODE: 00000 DATE OF REGISTRATION: December 05, 2023

This is to certify that the above mentioned taxpayer is eligible for issuance of this Tax Compliance Verification Certificate having satisfied all the criteria set forth by the BIR as of the date of this certification pursuant to Revenue Regulations No. 8-2016, as amended.

Tax liabilities recorded after the aforesaid dates or outside the jurisdiction of this Office are not covered by this Tax Compliance Verification Certificate.

Issued this *7th day of January, 2025.*

NOTE: THIS CERTIFICATE SHALL BE VALID AND EFFECTIVE FROM DATE OF ISSUE UNTIL APRIL 07, 2025 ONLY OR UNTIL REVOKED FOR VIOLATION OF THE CRITERIA SPECIFIED UNDER REVENUE REGULATIONS NO. 8-2016, AS AMENDED AND REVENUE MEMORANDUM ORDER NO. 46-2018, WHICHEVER COMES EARLIER. THIS SHALL NOT BE USED ON SALE/ TRANSFER OF REAL PROPERTIES. CERTIFICATION FEE OF P100 WAS PAID ON JANUARY 03, 2025. PAYMENT TRANSACTION NO. Z020250103142051284784. ANY ERASURE MADE ON THIS TCVC SHALL RENDER IT NULL AND VOID.



Regina P. Reforma
REGINA P. REFORMA
Asst. Revenue District Officer
Officer-In-Charge



NOTE: This certification was issued as a requirement for the issuance of a Tax Clearance for Bidding Purposes.



REPUBLIC OF THE PHILIPPINES
SECURITIES AND EXCHANGE COMMISSION
The SEC Headquarters
7907 Makati Avenue, Salcedo Village,
Barangay Bel-Air, Makati City, 1209, Metro Manila



COMPANY REG. NO.: 2023110123927-02

CERTIFICATE OF INCORPORATION

KNOW ALL PERSONS BY THESE PRESENTS:

This is to certify that the Articles of Incorporation and By Laws of:

Connorstone Construction Development and Supplies Corp.

were duly approved by the Commission on this date upon the issuance of this Certificate of Incorporation in accordance with the Revised Corporation Code of the Philippines (Republic Act No. 11232), which took effect on February 23, 2019 and copies of said Articles of Incorporation and By Laws are hereto attached.

This Certificate grants juridical personality to the corporation but does not authorize it to issue, sell or offer for sale to the public, securities such as but not limited to, shares of stock, investment contracts, debt instruments and virtual currencies without prior Registration Statement approved by the Securities and Exchange Commission; nor to undertake business activities requiring a Secondary License from this Commission such as, but not limited to acting as: broker or dealer in securities, government securities eligible dealer (GSED), investment adviser of an investment company, close-end or open-end investment company, investment house, transfer agent, commodity/financial futures exchange/broker/merchant, financing/lending company, and time shares/club shares/membership certificate issuers or selling agents thereof; nor to operate a fiat money to virtual currency exchange. Neither does this Certificate constitute a permit to undertake activities for which other government agencies require a license or permit.

This Certificate DOES NOT AUTHORIZE INVESTMENT SOLICITATION AND INVESTMENT-TAKING WITHOUT A SECONDARY LICENSE FROM THIS COMMISSION.

As a registered corporation, it shall submit annually to this Commission the reports indicated at the back of this certificate.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the seal of this Commission to be affixed to this Certificate at The SEC Headquarters 7907 Makati Avenue, Salcedo Village, Barangay Bel-Air, Makati City, 1209, Metro Manila, Philippines, this day of 08 November Two Thousand Twenty Three.

GERARDO F. DEL ROSARIO

Director

Company Registration and Monitoring Department

For SEC use only
F439 (PSIC as reserved)
Stock Corporation
Regular

*This is a computer generated certificate,
signature is not required.*

DOCUMENTARY STAMP TAX PAID

Standard Form Number: SF-GOOD-01
Revised on: May 24, 2004

APPROVED BUDGET FOR THE CONTRACT (ABC)
SUPPLY AND DELIVERY OF MATERIALS FOR THE UPGRADE RICE HULL CARBONIZER OF MINSU MAIN CAMPUS
Alcate, Victoria, Oriental Mindoro

Project Name and Location

Stations: Mindoro State University


Length:

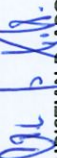
ITEM NO.	DESCRIPTION	QUANTITY	UNIT	CURRENT MARKET PRICE	TOTAL COST	VAT, OTHER TAXES AND/OR DUTIES APPLICABLE	FREIGHT & INSURANCE	OTHER INDIRECT COSTS	OTHER COST FACTORS				TOTAL COST	UNIT COST
									INFLATION, CURRENCY		VALUE			
									%					
									INFLATION, CURRENCY					
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)		


Prepared by


Recommending Approval

Approved


MARYNEL A. HERMOSA
Member, BAC Secretariat


CHRISTIAN B. APOSTOL, Ph.D.
Head, BAC Secretariat


CIEDELLE PIOL-SALAZAR, Ph.D.
Chairperson, BAC


ENYA MARIE D. APOSTOL, Ph.D.
SUC President III

2025-057

PURCHASE REQUEST

Fund Cluster:[illegible]

DEPARTMENT OF SCIENCE AND TECHNOLOGY
Project Line-Item Budget
CY 2023

Program Title : **ACCELERATED R&D PROGRAM FOR CAPACITY BUILDING OF RESEARCH AND DEVELOPMENT INSTITUTIONS AND INDUSTRIAL COMPETITIVENESS: COLLABORATIVE RESEARCH AND DEVELOPMENT TO LEVERAGE PHILIPPINE ECONOMY (CRADLE) PROGRAM**
 Project Title : Development of Automated Banana Leaf Singeing Technology Using Rice Hull Gasifier
 Total Duration : One (1) Year and Six (6) Months (1.5 Years)
 Current Duration : 01 November 2023 - 31 October 2024 (Year 1 of 1.5 Years)
 Implementing Agency : Mindoro State University (MinSU) - Institute of Agricultural and Biosystems Engineering
 Project Leader : Engr. Mark Keylord S. Onal
 Cooperating Agency : Merl's Native Delicacies
 Monitoring Agency : PCAARRD

	Counterpart Funding		
	MinSU	Merl's Native Delicacies	DOST-GIA
I. PERSONNEL SERVICES (PS)			
<u>Direct Cost</u>			
Salaries	₱ 274,788.00	₱ 120,000.00	₱ ---
Two (2) Project Technical Specialist I @ ₱47,606.00/mo. x 12 mos.	---	---	1,142,544.00
One (1) Project Technical Assistant I @ ₱27,811.00/mo. x 12 mos.	---	---	333,732.00
One (1) Project Laborer II @ ₱17,614.00/mo. x 12 mos.	---	---	211,368.00
Honoraria			
One (1) Project Leader @ ₱8,800.00/mo. x 12 mos.	---	---	105,600.00
Four (4) Project Staff Level 2 @ ₱6,000.00/mo. x 12 mos.	---	---	288,000.00
<u>Indirect Cost</u>			
<u>PCAARRD</u>			
Honoraria			
One (1) Project Coordinator @ ₱4,400.00/qtr. x 4 qtrs.	---	---	17,600.00
Two (2) Project Support Staff Level 2 @ ₱1,500.00/qtr. x 4 qtrs.	---	---	12,000.00
TOTAL FOR PS	₱ 274,788.00	₱ 120,000.00	₱ 2,110,844.00
II. MAINTENANCE AND OTHER OPERATING EXPENSES (MOOE)			
<u>Direct Cost</u>			
Traveling Expenses (local)	₱ 30,000.00	₱ ---	₱ 170,000.00
Communication Expenses (postage and deliveries, telephone, interne	---	---	20,000.00
Transportation and Delivery Expenses	---	---	20,000.00
Supplies and Materials Expenses			
1. Office Supplies	---	---	50,000.00
2. Field Supplies	12,000.00	748,853.33	50,000.00
Utilities	140,000.00	---	50,000.00
Representation Expenses	---	---	80,000.00
Professional Services (other professional services - contract labor)	---	---	105,684.00
Other MOOE:			
1. Fabrication of Gasifier	---	---	232,652.00
2. Fabrication of Conveyor System	---	---	90,000.00
3. Paper Registration, Publication, etc.	20,000.00	---	50,000.00
<u>Indirect Cost</u>			
<u>MinSU</u>			
Supplies and Materials Expenses (office supplies)	30,000.00	---	59,000.00
Printing and Binding Expenses	20,000.00	---	50,000.00
Utilities	44,000.00	---	115,968.00
<u>PCAARRD</u>			
Travelling Expenses	---	---	50,000.00
Communication Expenses	---	---	10,000.00
Representation Expenses	---	---	10,000.00
Supplies and Materials Expenses	---	---	45,368.00
TOTAL FOR MOOE	₱ 296,000.00	₱ 748,853.33	₱ 1,258,672.00

III. CAPITAL OUTLAY (CO)

Direct Cost

One (1) Sensor and Control System for Conveyor and Gasifier	₱ ---	₱ ---	₱ 243,000.00
One (1) unit Laptop (with license software and accessories)	---	---	100,000.00

DEPARTMENT OF SCIENCE AND TECHNOLOGY
Project Line-Item Budget
CY 2023

Program Title : **ACCELERATED R&D PROGRAM FOR CAPACITY BUILDING OF RESEARCH AND DEVELOPMENT INSTITUTIONS AND INDUSTRIAL COMPETITIVENESS: COLLABORATIVE RESEARCH AND DEVELOPMENT TO LEVERAGE PHILIPPINE ECONOMY (CRADLE) PROGRAM**

Project Title : Development of Automated Banana Leaf Singeing Technology Using Rice Hull Gasifier

Total Duration : One (1) Year and Six (6) Months (1.5 Years)

Current Duration : 01 November 2023 - 31 October 2024 (Year 1 of 1.5 Years)

Implementing Agency : Mindoro State University (MinSU) - Institute of Agricultural and Biosystems Engineering

Project Leader : Engr. Mark Keylord S. Onal

Cooperating Agency : Merl's Native Delicacies

Monitoring Agency : PCAARRD

Indirect Cost
PCAARRD

One (1) unit Laptop (with license software and accessories)

TOTAL FOR CO

GRAND TOTAL

Counterpart Funding		
MinSU	Merl's Native Delicacies	DOST-GIA
---	---	80,000.00
P ---	P ---	P 423,000.00
P 570,788.00	P 868,853.33	P 3,792,516.00 *


* Chargeable against the following:
 CY 2023 DOST-GIA A.IIIb.1 (a)

MinSU	PCAARRD	TOTAL
P 3,567,548.00	P 224,968.00	P 3,792,516.00

Certified Correct:

Approved for DOST-GIA EXECOM:


ARMELA K. RAZO
 Chief, Special Projects Division


LEAH J. BUENDIA
 Undersecretary for Research and Development

Date of Approval: 25 September 2023



DOST Form 2 (for Basic/Applied Research)
DETAILED RESEARCH & DEVELOPMENT PROJECT PROPOSAL

(1) PROJECT PROFILE

Program Title:

Accelerated R&D Program for Capacity Building of Research and Development Institutions and Industrial Competitiveness: Collaborative Research and Development to Leverage Philippine Economy (CRADLE) Program

Project Title:

DEVELOPMENT OF AUTOMATED BANANA LEAF SINGEING TECHNOLOGY USING CONTINUOUS-TYPE RICE HULL (CtRH) CARBONIZER

Project Leader/Sex:

ENGR. MARK KEYLORD S. ONAL/MALE

Project Duration (number of months): 18 months

Project Start Date:

Project End Date:

Implementing Agency (Name of University-College-Institute, Department/Organization or Company):

MINDORO STATE UNIVERSITY – INSTITUTE OF AGRICULTURAL & BIOSYSTEMS ENGINEERING

Alcate, Victoria, Oriental Mindoro 5205

Address/Telephone/Fax/Email (Barangay, Municipality, District, Province, Region):

Co-implementing Agency

DOST – Metals Industry Research and Development Center (MIRDC)

General Santos Avenue, Bicutan, Taguig City, 4th District, NCR

DOST – MIMAROPA

General Santos Avenue, Bicutan, Taguig City, 4th District, NCR

(2) COOPERATING AGENCY/IES

Merl's Native Delicacies – Industry partner

Merlita Bolus, 09177074803

Panikian, Naujan, Oriental Mindoro

(3) SITE(S) OF IMPLEMENTATION

IMPLEMEN TATION SITES NO.	COUNTRY	REGION	PROVINCE	DISTRICT	MUNICIPALITY	BARANGA Y
1.	Philippines	MIMAROPA	Oriental Mindoro	1st	Naujan	Panikian
2.						
3.						
4.						
5.						

(4) TYPE OF RESEARCH

☐ Basic
☒ Applied

(5) R&D PRIORITY AREA & PROGRAM (based on HNRDA 2017-2022)

☐ Agriculture, Aquatic and Natural Resources

	Commodity: _____ Health _____ Priority Topic: _____ _X_ Industry, Energy and Emerging Technology Sector: _____ Disaster Risk Reduction and Climate Change Adaptation _____ Basic Research _____ Sector: _____
Sustainable Development Goal (SDG) Addressed	1. Good Health and Well Being 2. Affordable and Clean Energy 3. Industry, Innovation and Infrastructure

(6) EXECUTIVE SUMMARY (not to exceed 200 words)

This project aims to develop a banana leaf singeing equipment. This technology will be used by food processor engaged in developing banana leaves as packaging material. This would be implemented by the Prototyping Division in partnership with Merl's Native Delicacies and in collaboration with Mindoro State University. The project duration will be 18 months and would cost ₱ 5.0 M.

Banana Leaf is one of the most common and effective natural Food Contact Materials (FCM) used in the Philippines due to its pliability, hydrophobic, antimicrobial, antiulcerogenic, and antioxidant properties. Banana Leaf is used by Merl's Native Delicacy as its primary materials for their "*Suman sa Lihya*". But the process of its preparation as packaging material poses safety and health hazards among its workers as they are using traditional method of singeing using charcoal-powered burner. Singeing is the process of slightly scorching, burning or treatment of materials with flame.

This addresses the needs of MSMEs particularly food processors engaged in natural packaging operation to provide safer, reliable, and cost-efficient banana leaf singeing technology for Food Contact Materials (FCM). When adjusted/reconfigured, the technology can also be used by local weavers for singeing natural fibers for them to provide safer and better alternatives for dangerous, costly, and labor-intensive traditional methods. The project will be developed in partnership with the Mindoro State University (MinSU) and Metals Industry Research and Development Center (MIRDC) as the designer, primarily responsible for the design and automation of the technology in cooperation with Merl's Native Delicacy as the primary beneficiary.

(7) INTRODUCTION

Banana leaves are widely used as a food contact material in the Philippine food service industry. The leaf is traditionally used as a liner or wrapper for various food during cooking and packaging. Its functionality in food service and processing industries may be attributed to its availability, fast regeneration, and biodegradability. Also, its inherent chemical components and structure contribute to its suitability as a packaging material, enhancing the sensory properties and shelf life of the food it encloses [1]. The inexhaustible leaves are water and leak proof; free from detergent residues, provide specific flavor and aroma, and act as antioxidants and help in digestion of the food by emanating its ingredients such as vitamin C and potassium during hot food serving [2].

Filipino native delicacies are usually made from glutinous rice (also called sticky rice and locally called *malagkit na bigas*), coconut milk, sugar, cassava, and young coconut meat [2]. These food products are commonly packed using banana leaves and similar materials when

distributed and sold to the market. With the availability of technologies, such as vacuum packaging and water retort, to increase shelf life, the production of these delicacies has increased, the same with the demand for packaging materials like banana leaves.

Tropical countries like the Philippines have diverse vegetation in which various plants and different kinds of leaves can be easily gathered, produced and be used as natural food contact materials (FCM). Leaves commonly found and used as food wrappers in the Philippines are banana leaves, coconut leaves. Leaves packaging is unique, artistic, and add flavor to the product [4]. Banana leaves are commonly used as the packaging material for local delicacies and other food products such as *suman*, *tupig*, and many others. In practice, mainly in a small production volume, banana leaves are manually heated or singed in an open fire (LPG or charcoal stove) to become pliable and can be formed into the required packaging shape. Singeing is the process of lightly heating or burning the banana leaves. However, when the demand and production are high, a more efficient, faster, cheaper, and safer method of heating the banana leaves is needed.

Presently, the Merl's Native Delicacy employs "*maglalaib*" who are responsible for manual singeing of banana leaves using traditional charcoal-fueled stove. Merl's singe workers experience discomfort by being exposed to the smoke. No specific health problems have been reported but the exposure to smoke could lead to health problems. Since the polycyclic aromatic hydrocarbons are carcinogenic, lung cancer could be a potential health hazard to grill workers.

The current situation of Merl's uses manual singeing of the banana leaves using coconut charcoal. Through the utilization of the much cheaper rice hull, the monthly operating cost will be lessened and the health hazard to the manual singeing workers of the banana leaves will also be eliminated. This method not only poses great risk to workers from burning but also incurs additional cost to the company as coconut charcoal is more expensive and harder to acquire. Merl's Native Delicacies currently use 64 sacks of charcoal a month which cost around ₱37,000. The projected monthly cost of using the rice hull carbonizer is only around ₱21,000.

Rice producers could also benefit by selling their waste rice hull from milling their palay. Banana farmers could also earn by supplying banana leaves to the food processors that will use the technology. Food processors that use banana leaves as food contact materials for delicacies such as *tupig*, *bibingka*, *puto* and other food products could benefit from the technology. Restaurants which use singe banana leaf as lining to their plate or as wrapper of rice are also potential users of this technology. Metal fabricators that could fabricate the whole set of technology and integrators that could integrate automation technologies to the rice hull carbonizer and conveyor system will also benefit and will help the sustainability of the technology.

This project offers a value-addition in the production aspect where in there is an improved quality or evenly singed banana leaves, a higher margin of safety for the laborers and a more efficient singeing process resulting to lower production cost. Singeing banana leaves will enhance its natural waxy coating that provides better insulation for hot food. Another positive attribute in using singed banana leaves is the aroma produced when food is wrapped in it. Singeing banana leaves will also make it soft and pliable, making the packaging process more manageable.

(7.1) RATIONALE/SIGNIFICANCE (not to exceed 300 words)

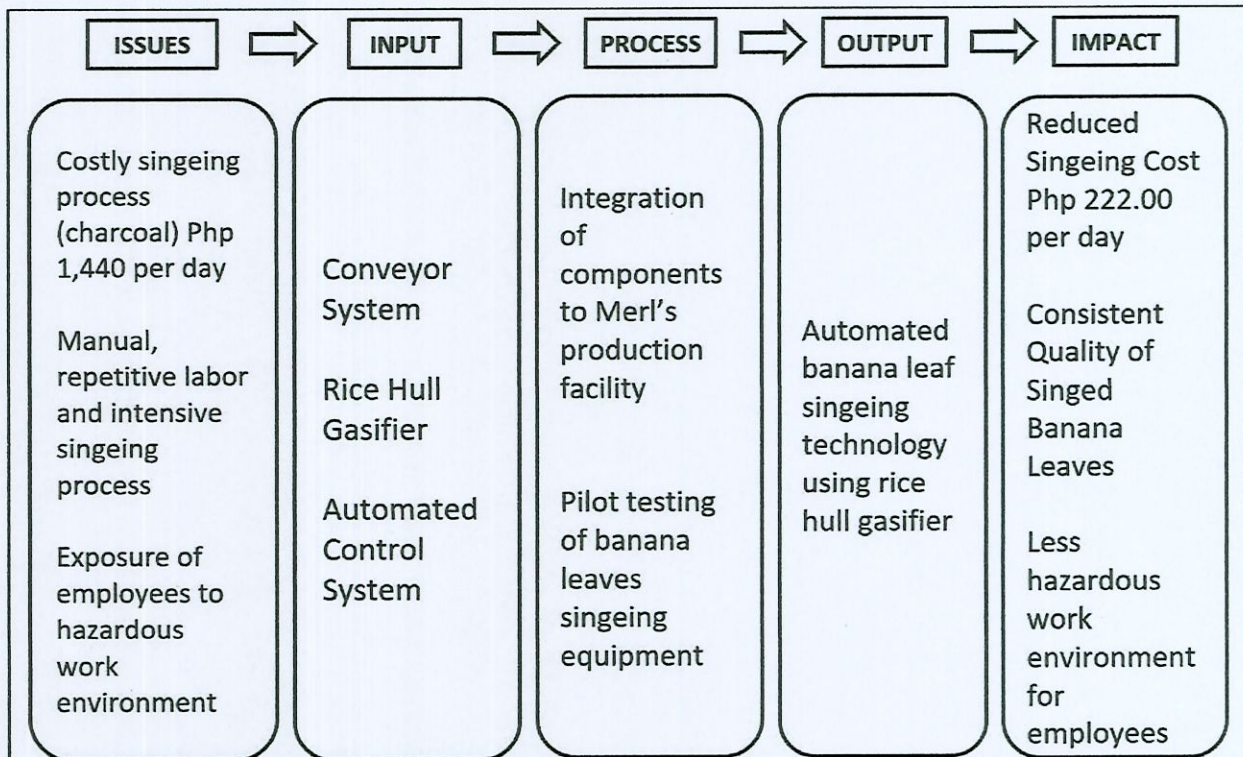
Merl's Native Delicacies is a food processing company located in Calapan, Oriental Mindoro, that ventures into the supply and distribution of pasalubong products. They are known for their best-seller *Suman sa Lihya*, a native delicacy made of sticky rice. The company produces about 300,000 pieces of *suman* per month and is expanding their market reach abroad.

Currently, the company uses charcoal as the fuel source to singe banana leaves. The workers in charge have separate charcoal stoves that are used to singe the banana leaves by manually. This process is labor-intensive, repetitive, and hazardous to workers' health due to lengthy exposure to charcoal combustion by-products such as dust, particulates, and other harmful fumes and chemicals produced.

The company owner wants to modify their singeing process to be more efficient, faster, and safer for the health of their employees. The solution is to develop an automated banana leaf singeing technology that utilizes rice husk as fuel. A conveyor system will be used to control the contact time of banana leaves with the flame produced in the rice husk carbonizer. This proposed system will reduce the manual and repetitive process of singeing thousands of banana leaves daily and reduce workers' exposure to a hazardous work environment. Also, the cost of rice hull is cheaper, and is abundant in the province, therefore, it will be economical.

Other food processors will use the technology developed in this research, particularly those engaged in the mass production of native delicacies, pasalubong items, and other food products packed in banana leaves. The metal fabricators can acquire a license for the equipment design and manufacture for the companies in need of the equipment. Mindoro State University will also be part of the project, particularly in the testing phase, boosting its R&D capabilities. The banana leaf singeing technology aligns with sustainable development goals 3, 7 and 9, and supports the transition towards circular economy, where resources are used efficiently, and waste is minimized.

(7.2) SCIENTIFIC BASIS/THEORETICAL FRAMEWORK



(7.3) OBJECTIVES

a. General: This project aims to address the needs of MSMEs (Merl's Native Delicacy) to provide safer, reliable, and cost-efficient banana leaf singeing technology for Food Contact Materials (FCM).

b. Specific:

1. To design and install a banana leaves singeing equipment in Merl's Native Delicacies production plant;
2. To come up with an optimum singeing temperature, rice hull feed rate, and exposure time to maximize the use of rice hull as fuel source;
3. To determine the economic viability of the banana leaves singeing technology.

(8) REVIEW OF LITERATURE

Potential Health Risks of Workers Exposed to Charcoal Grilling

The combustion of charcoal reacts with oxygen in the air to form colorless carbon monoxide (among other gases). According to the Food and Agriculture Organization (FAO), unburned carbon monoxide gas can be emitted by burning charcoal which is very poisonous [3]. In a study made by Madani et al., charcoal meat grilling workers exceeded the 5% COHb limit set by the World Health Organization and the National Institute for Occupational Safety Health [4]. COHb is the measurement of carboxyhemoglobin in the blood, which is how exposure to carbon monoxide is estimated.

Aside from carbon monoxide, grill workers are also exposed to the emissions of polycyclic aromatic hydrocarbons (PAHs), which are among the most health-relevant compounds. PAHs are known for being toxic, mutagenic, and have carcinogenic properties [5, 6]. In a study by Oliveira et al., even with a mechanical ventilation system, workers were exposed to PAHs at levels that ranged between 56.2 and 261 ng/m³, with 7.8% of PAHs being

carcinogenic compounds [7]. 200 µg/m³ is the occupational threshold limit proposed by the American Conference of Governmental Industrial Hygienists for an 8-hour exposure to coal tar pitch volatiles.

In another study by Dyremark et al., charcoal grilling poses a potential health hazard to the people performing the grilling because of the PAHs emitted [8]. PAHs were also emitted during the combustion of coconut shells, as shown in the study of Gurlutyu [9].

Banana Leaves Preparation

In the study of Luna et al., the most commonly used method of preparation of banana leaves is wiping, washing, and heating or singeing. Convenience and service speed are the primary reasons cited for wiping leaves. However, *suman sa lihiya* production includes the heating process, incurring additional overhead and labor costs [1].

Singeing and oven heating are also implemented by food service establishments in Columbia and Mexico. Heating is done to soften the banana leaves, making them more pliant to facilitate handling when used as a food contact material. According to the respondents in the study of Luna et al., heating is done to kill pathogens that may harm consumers; however, there is no empirical evidence that heating ensures the safety of leaves. For heated banana leaves used as packaging material, food safety and quality breaches are less likely to occur. Heating during cooking may potentially kill spoilage and pathogenic microorganisms. It is also crucial that the food cooked in banana leaves should be served or packed immediately after proper cooling to reduce microbial recontamination [1].

In the singeing process reported by Luna et al., the banana leaves are passed over the flame for ≤ 20 seconds allowing it to change color from light to dark green without burning. On the other hand, in oven-heating, pre-cut leaves are exposed to hot air for 20-30 seconds. Singeing can potentially generate soot that may contaminate food. Uneven heating of banana leaves occurs due to the manual singeing process. Although these are not observed in oven heating, the oven size is a limitation because it dictates the length of banana leaves to be accommodated. Both heating methods are tedious; thus, designing new mechanical heating equipment suitable for banana leaves could be explored. The prototype design may consider a thermally controlled metal plate device where the leaf can be pressed between plates [1].

Drying and Heating Methods

In the paper of Erbay Z. et al., a pilot-scale heat pump conveyor dryer was used to dry olive leaves. The drying system consisted of two main parts: a heat pump and a drying chamber. The air was heated by a heat pump system, including a scroll compressor, two condensers (internal and external), the expansion valve, an evaporator, and a heat recovery unit. R407C was used as a refrigerant in the heat pump system. The drying air was regulated by a fan and its speed control unit, and the drying air was recycled. Drying compartment dimensions were 3.0 x 1.0 x 1.0 m. Drying experiments were carried out at a drying air temperature range of 45–55 °C with a drying air velocity range of 0.5–1.5 m/s for a time range of 270–390 min. Olive leaves were moved by a conveyor band system driven by a motor. The heat pump was used in drying because of the low operating cost [10].

Akpınar developed a solar dryer with forced convection which was used to investigate the drying of parsley. The setup mainly consists of an indirect, forced convection solar dryer with a solar air collector, a circulating fan, and a drying cabinet. The solar air collector was constructed from stainless steel sheets, and the outer surface was painted black. The solar

air heater was covered with a copper sheet. Fins were also installed in the flow area to increase the heat transfer coefficient and output of temperature air. Glass is used to cover the air heater to prevent top heat loss. The drying cabinet was made from wood, forming a rectangular tunnel. Dry and hot air is blown into the top side of the cabinet. A centrifugal fan is installed in the drying cabinet to provide an air velocity of 0.4 m/s. The temperature of drying air at the inlet of the drying cabinet ranged from 50.5 to 64.3 °C and the temperature of drying air at the outlet of the drying cabinet ranged from 43 to 60.4 °C [11].

In the study of Alit et al., a dryer was designed to use two rice husk-fueled furnaces in which heat exchanger pipes are added. The distribution of heat through the heat exchanger pipes and conduction from the furnace attached to the wall of the drying chamber was investigated. The test results show that the average ambient air temperature of 32.14 °C can be increased to 92.10 °C, 93.27 °C, and 94.96 °C in the drying chamber for variations in the diameter of the furnace wall holes of 8 mm, 10 mm, and 12 mm, respectively. Sequentially, the temperature in the drying chamber reaches a maximum of 119.13 °C, 127.98 °C, and 140.89 °C [12].

The dryer system includes a rice husks furnace, stainless steel pipes, iron plates, aluminum plates, solar panels, batteries, exhaust fans, type K thermocouples, and data loggers. Rice husk is the primary energy source in the drying test process. A stainless-steel pipe with a diameter of 1 inch is used as a heat exchanger. Steel plates are considered in the design of the rice husk burning furnace with dimensions of 40 cm × 50 cm × 60 cm. The dimensions of the drying chamber are 50 cm × 50 cm × 140 cm, which is made of an aluminum sheet. A solar panel is used as an energy source to drive the exhaust fan, with batteries as energy storage.

In a separate research article of Alit et al., the heat exchanger is placed at the bottom of the furnace. The furnace and drying chamber are in separate positions. The furnace has dimensions of 800 mm × 500 mm × 500 mm, the stand is 400 mm high and it is made of steel sheet plates. The furnace wall consists of 468 holes. The diameter and the distance between the holes are 1 cm and 5 cm, respectively. Furthermore, the diameter of the furnace ash hole is 12 mm and the heat exchanger pipes are stainless steel pipe.

The drying chamber is made of aluminum with 4 shelves. The insulation is made of rubber with a thickness of 3 mm. The dimensions of the drying chamber are 600 mm × 536 mm × 536 mm, with 400 mm footrest. The hot air is circulating with a forced convection system by means of an exhaust-fan. Exhaust-fan is placed in the chimney of the drying chamber with a constant air velocity of 2 m/s. The study uses measuring devices such as data loggers, K type thermocouples, digital scales, anemometers, and moisture meters [13].

Biomass Fuel for Dryers and Heaters

Bello et al. investigated the thermal properties of three biofuels: charcoal, sawdust, and rice husk. The biomass fuels were burned in a furnace-dryer where the air was supplied through natural convection using air ducts. In order to prevent heat loss, the drying chamber was insulated by a 25.4 mm air space between the inner wall and the outer casing. It was found that charcoal exhibits the highest thermal power (4.08 kW) expressed by temperature increase. The burning of sawdust was slower, and the thermal energy was 3.56 kW. Rice husk has the least thermal power of 2.93 kW due to slight temperature increases and emitting dark exhaust gases. The observed temperature rise and characteristic temperature curves in the drying chamber indicated that charcoal attained a very high drying temperature and increased within a short period than other fuels. The sawdust and rice husk have much lower heat buildup and longer temperature rise response time. Also, charcoal's total energy/heat transfer by conduction per hour is the highest at 1.47 kW per hour, while rice husk is the least with 0.98 kW per hour, though rice husk retains its heat over a long period.

It was observed that charcoal completely burns away at shorter durations than sawdust and rice hull [14].

Charcoal is suitable for short time heating processes such as baking and roasting. Rice husk could be ideal for milk and fruit juice pasteurization, which requires heat processing conditions of between 63-85° C for about 15 to 30 minutes. Sawdust can be used to sterilize meat, fish, soup, etc. Charcoal is more environmentally friendly than other products because of the smokeless burning process, thus suitable for indoor cooking [14]. However, rice hull is cheap and lowers drying cost, thus making mechanical drying competitive. As a waste of the rice milling process, the cost of acquiring rice husk is practically its transportation cost to the dryer [15].

Rice Hull Carbonizer

Philippine Rice Research Institute (PhilRice) had developed its continuous type rice hull carbonizer. It processes rice hull into biochar. It has an input capacity of 20-60 kg/h of rice hull and has a yield of 35 – 42 % charcoal. Its operation is continuous operation, and safe to operate during windy season. Presented in Figure 1 is the PhilRice Continuous Rice hull Carbonizer that the project proposed to utilize.



Figure 1. PhilRice continuous rice hull carbonizer.

PhilRice had developed some attachments for their continuous rice hull carbonizer to utilize the heat it produce. Among the applications were cooking attachment and pasteurization chamber, oven attachment, multi-purpose attachment (roaster), and heat recovery attachment. These attachments are presented in Figure 2.



Figure 2. PhilRice developed attachment to recover heat from the carbonizer.

Carbonization process utilizes higher operating temperatures (>300°C) and longer residence times (>2 hours). Carbonization aims to produce a highly carbonaceous product [16]. The product is called charcoal which refers to the highly carbonaceous product that is intended to be used as a fuel. Furthermore, charcoal can be used in the smelting and sintering processes as a reductant in the metallurgical industry [17]. Carbonization is the oldest known thermochemical process that allowed humans to convert wood into charcoal.

Carbonization was performed in the early ages by gathering the wood into a cone-shaped pile, covering it with earth, slowly combusting the wood, and allowing for the water content and volatile substances to exit from a central chimney, turning the wood into coal.

There is a considerable demand for banana leaves in the cooking and packaging of food products, particularly the local delicacies. However, the manual singeing or heating of banana leaves is a tedious process and affects workers' health due to exposure to hot and dusty environments. There is also no existing equipment that can accommodate the heating of a large volume of banana leaves. This study aims to develop a banana leaves heating machine that can process faster and more efficiently but at the same time cheaper using rice hull as fuel.

(9) METHODOLOGY

Existing Practice

Currently, the company produces 14,640 pieces of banana leaves that are ready for suman packaging every day. Eighty-three (83) kilograms of coconut shell charcoal are used to singe the banana leaves to become pliable and suitable for wrapping. Three employees are involved in this process, working 4 hours a day, five days a week.

I. System Design and Development

Proposed System Design

The two main components of the banana leaf singeing technology are the conveyor system and the rice hull carbonizer. The conveyor system will be designed according to the production capacity while the rice hull carbonizer system will be adopted from existing design of PhilRice. The system's capacity will be based on the theoretical calculations of heat energy produced by the carbonizer and the conveyor speed to come up with an optimum exposure time, heating temperature, and rice hull feed rate. Dimensions of the conveyor will be sized according to the required average size of banana leaves, and the speed will be controlled using a variable frequency drive (VFD).

The heating value of the coconut charcoal is 7,200 kcal/kg, while the rice hull is 3,000 kcal/kg. Equations 1 and 2 are used to determine the required energy from the rice hull carbonizer to produce the same capacity or pieces of banana leaves heated by the coconut shell charcoal. In this study, the target production capacity of the proposed heating equipment is 14,640 pcs per day or 50% of the company's total daily capacity. Table 1 shows the summary of the calculation.

$$\dot{Q}_{COAL} = \dot{m}_{COAL} \cdot HHV_{COAL} \cdot \eta_{COAL} \quad (\text{Eq. 1})$$

where, \dot{m}_{COAL} is the consumption of the coconut shell coal, HHV_{COAL} is the heating value of the coconut shell coal and η_{COAL} is the thermal efficiency of the system.

$$\dot{m}_{ricehull} = \frac{\dot{Q}}{HHV_{ricehull} \cdot \eta_{ricehull}} \quad (\text{Eq. 2})$$

Where, $HHV_{ricehull}$ is the heating value of the rice hull and $\eta_{ricehull}$ is the thermal efficiency of a rice hull carbonizer.

The thermal efficiency of burning coal in the open atmosphere is 10% [24] while typical rice hull carbonizer efficiency ranges from 60-80% [21, 22, 23].

Table 1: Comparison of coconut charcoal and rice hull as fuel for banana leaves heating

Fuel	Heating Value (kcal/kg)	Overall Efficiency (%)	Consumption (kg/day)	Operating Cost (Pesos per month)	Production Rate (pcs/day)
Coconut Shell Charcoal (Stove)	7200	10	41.6	37,200	14,460
Rice Hull (Carbonizer)	3000	60	166.4	15,846	14,460

Assembly and Integration

The fabrication and assembly of the conveyor and the rice hull carbonizer will be done independently. These components will be integrated at the test site. Figure 3 shows the concept design of the proposed banana leaves heating equipment.



Figure 3 Concept Design Setup

Temperature sensors will be installed in the heating chamber and the carbonizer air inlet. A VFD will also be connected to the motor of the conveyor to adjust the linear speed. Another VFD will be installed in the feeder system of the carbonizer to regulate the feed rate of the rice hull. An extra pipeline will be installed to the burner. This would be used for LPG fuel once there will be a technical problem with the equipment and the operation of the company would not be hampered. These instrumentations will help the researchers determine the system's optimum heating temperature, exposure time, and feed rate to produce the required quality of heated banana leaves.

II. Testing

Functional Testing

These are the criteria that must be satisfied to consider the equipment as fully functional.

Table 2: Functional Test Checklist

Criteria	Yes	No
All motors are functional.		
All blowers are functional.		
The conveyor is functional.		
All VFDs are functional.		
All light indicators are functional.		
All temperature sensors are functional, and the readings are correct.		
Flame is produced from the rice hull carbonizer.		

Testing Protocol

The banana leaves that will be tested in the heating equipment will be prepared according to the company's existing procedure. The rice hull will be weighed before transferring into the hopper.

For a three different constant rice hull feed rate (20.8 kg/h, 5.6 kg/h, 10.4 kg/h), the conveyor will run at different speed settings using the VFD. These feed rates correspond to 100%, 75% and 50% capacity of the rice hull carbonizer. The average length of one piece of banana leaf is 150 mm. The following linear speed will be used (see Table 3).

Table 3: Linear speed with corresponding exposure time and production rate

Conveyor Linear Speed (mm/s)	Leaf Exposure Time (seconds)	Calculated Production Rate (pieces of leaves per day)	Actual Production Rate (pieces of leaves per day)
113.1	1.3	21,714	
94.2	1.6	18,095	
75.4	1.9	14,476	
56.5	2.6	10,857	
37.7	3.9	7,238	

The quality of the singed banana leaves will be inspected, and the optimum linear speed of the conveyor will be determined. If the banana leaves are of below standard quality, the testing will proceed to the next linear speed parameter and exposure time.

For constant linear speed of conveyor, the rice hull feed rate will be varied. The optimum exposure time will be determined and will have a corresponding production rate.

Table 4: Optimum exposure time for different capacity of the rice hull carbonizer.

Carbonizer Capacity (%)	Rice Hull Feed Rate (kg/h)	Optimum Exposure Time (seconds)	Production Rate (pieces per day)
100	20.8		
75	15.6		
50	10.4		

The prototype testing will continue for two months to test the equipment for consistency and reliability. The following parameters shall be taken daily and the average value will be

computed:

Table 5: Average rice hull carbonizer capacity for specific production rate

Optimum Carbonizer Capacity	Rice Hull Feed Rate (kg/h)	Optimum Exposure Time (seconds)

These are the performance parameters of the system that will be taken during the testing.

The following data will be noted during the test:

- System downtime, errors occurred – determine the cause of errors
- Troubleshooting and repair – determine the parts that are usually repaired
- User experience (ergonomics, usability)

Banana Leaves Parameters

Aside from the parameters stated above (production rate, optimum carbonizer capacity, rice hull feed rate), banana leaves parameters will also be observed. Several parameters of banana leaves will be benchmarked according to the preference of the company. Color chart will be established based from their existing process. The moisture content of the banana leaves will also be monitored during performance testing. The pliability of the banana leaves will be observed.

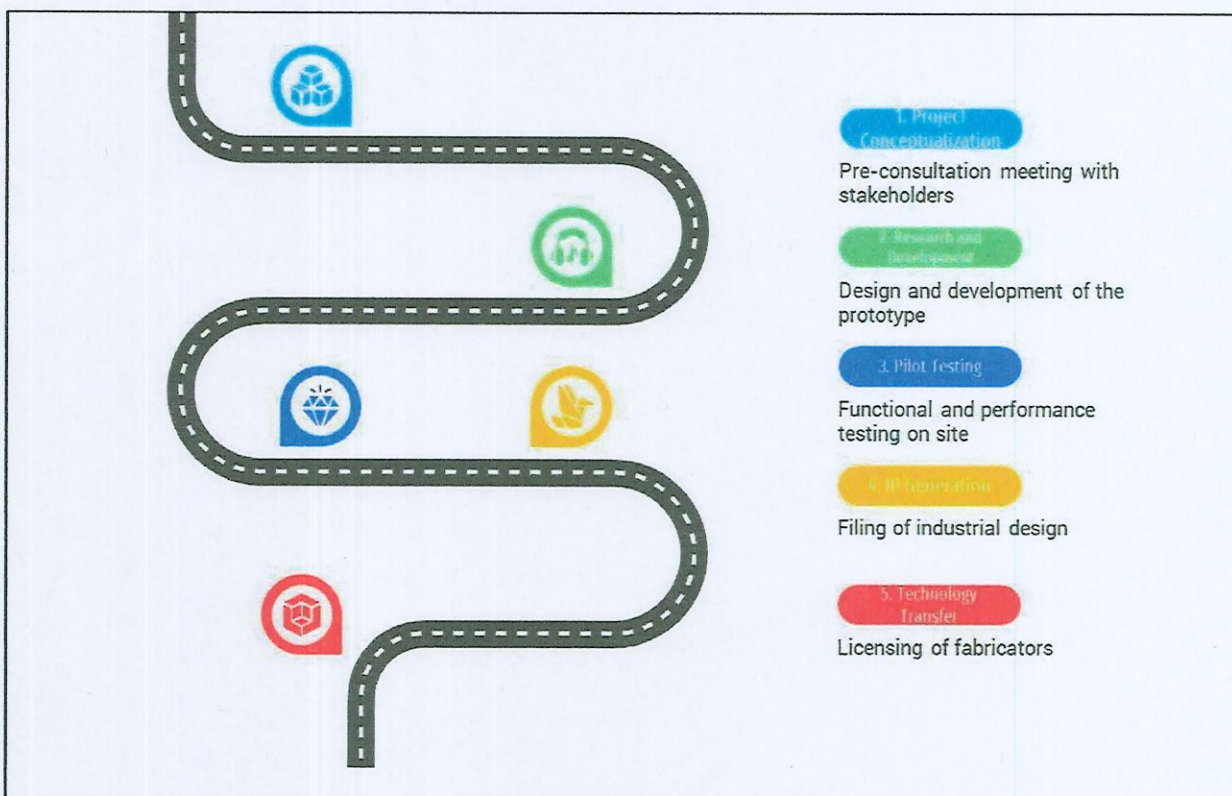
Operation Manual

Manual of operation will be generated after the functional and performance testing of the equipment. The operation manual will be based on the final design of the equipment and will include the drawings of the major parts of the equipment. All the buttons, indicators and controls in the panel will be included. General troubleshooting and repairs will also be included.

III. Economic Viability

The actual rice hull consumption and the number of banana leaves it can singe will be determined during the testing. The actual electric consumption will also be measured. Aside from these parameters, the cost of the rice hull and the worker's wage will dictate the operation's cost. The actual cost of the equipment will be determined. The VFDs and sensors used during the testing will not be included in the cost of the equipment. The monthly savings from using the equipment will determine the return on investment (ROI) from the commercial cost of the equipment.

(10) TECHNOLOGY ROADMAP (if applicable) (use the attached sheet)



(11) EXPECTED OUTPUTS (6Ps)

Publication – At least One (1) scientific paper for conference/publication

- One (1) operation manual
- One (1) audio visual presentation

Patent/Intellectual Property

- One (1) IP applied (rights will be shared by MinSU and DOST-MIRDC)

Product – One (1) unit of automated banana leaf singeing technology

People Services

- Three (3) persons trained for end users,
- One (1) technology training

Partnership – Two (2) partnership with a private company and a local fabricator

Policy – One (1) Draft Method of Test will be endorsed to AMTEC

(12) POTENTIAL OUTCOMES

1. Safe working environment for the workers performing the singeing of banana leaves
2. Productivity of the beneficiary will be increased

(13) POTENTIAL IMPACTS (2Is)

1. Social Impact – Reduction of health hazard for industry workers
2. Economic Impact – New product developed for metal industry; generation of income for beneficiary

(14) TARGET BENEFICIARIES

Merl's Native Delicacies, other businesses using banana leaf as packaging material, and other restaurants using banana leaf as lining in the plates and as wrapper for rice

(15) SUSTAINABILITY PLAN (if applicable)

The output of this project would enable MSME's and farmers to benefit from the developed technology and sustainable practices. The developed system minimizes health impact on the workers and support long-term production by using automation. This system could also benefit MSME's that use heated banana leaves as food contact material such as *tupig*, *bibingka*, and *puto* or other food products.

Farmers could benefit from the supply of banana leaves. According to the Philippine Statistics

Authority, Oriental Mindoro has increased its banana production by 68% in 2021. 3,000 pieces of Pakil leaves per day are used. Pakil leaves are different from the variety of leaves used by other MSME's and is abundant in the area.

MIMAROPA is also 7th largest producer of palay in the Philippines and Oriental Mindoro supplies more than half of the palay produced in the region. Rice producers could also benefit by selling their waste rice hull from milling their palay.

Other MSME's that could benefit the technology is the metal fabricators that could fabricate the whole set of technology. Integrators that could integrate automation technologies to the system will also benefit.

A DOST-assisted local fabricators in the province will be tapped to spearhead the commercialization of the banana leaf singeing technology.

(16) GENDER AND DEVELOPMENT (GAD) SCORE (refer to the attached GAD checklist)

(17) LIMITATIONS OF THE PROJECT

The project will be limited to design, development and testing of the equipment.

(18) LIST OF RISKS AND ASSUMPTIONS RISK MANAGEMENT PLAN (List possible risks and assumptions in attaining target outputs or objectives.)

Risks	Assumptions
Delayed acquisition of necessary equipment	Proceed with other activities such as fabrication of available parts, programming of the programmable logic controller and programming of variable frequency drive. Prioritize assembly of available off-the-shelf components, integration and programming Revisit workplan, fast track other activities
Disruption of scheduled activities due to weather disturbances	Make necessary adjustments in the work plan

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(20) PERSONNEL REQUIREMENT

Position	Percent Time Devoted to the Project	Responsibilities
Project Leader (Agricultural and Biosystems Engineer, Renewable Energy)	20%	Responsible to the overall technical and administrative management of the project to attain its' objectives Approves all the required documents such as Monitoring Reports, Progress Reports, Performance Evaluation Reports, etc.
Project Staff (Mechanical Engineer)	20%	Assist the project leader in overseeing project deliverables Responsible for the conceptualization and design of the equipment and automation system Assist in the programming of the PLC
Project Staff (Background in Economics)	20%	Assist the project leader in overseeing project deliverables Assist in the preparation of TORs for

		bidding Responsible for the implementation of the objective of attaining economic viability of the equipment
Project Staff (Agricultural and Biosystems Engineer, Crop Process Engineering)	20%	Assist the project leader in overseeing project deliverables Responsible for the testing and data gathering Assist in the documentation
Project Staff	20%	Assist the project leader in overseeing project deliverables Responsible for the preparation of TOR and bidding process Responsible for the monitoring and procurement of necessary fabrication materials
Project Technical Specialist I (CoS), (Automation)	100%	Responsible for the integration of the controls, sensors and plc program
Project Technical Specialist I (CoS) (Agricultural and Biosystems Engineer)	100%	Responsible for the system design requirements
Project Technical Assistant I (CoS)	100%	Liaison and clerical requirements of the project
Project Laborer II (CoS)	100%	Responsible for the monitoring of fabrication and assembly of the equipment

(21) BUDGET BY IMPLEMENTING AGENCY

IMPLEMENTING AGENCY	PS	MOOE	EO	Total
Year 1	2,110,844.00	1,258,672.00	423,000.00	3,792,516.00
Year 2	769,786.00	437,698.00	-	1,207,484.00
Year n				
TOTAL				5,000,000.00

(22) OTHER ONGOING PROJECTS BEING HANDLED BY THE PROJECT LEADER: 1
(number)

Title of the Project	Funding Agency	Involvement in the Project
Anthropometric Survey of Farmers in Oriental Mindoro	Mindoro State University	Project Leader

(23) OTHER SUPPORTING DOCUMENTS (Please refer to page 2 for the additional necessary documents.)

I hereby certify the truth of the foregoing and have no pending financial and/or technical obligations from the DOST and its attached Agencies. I further certify that the programs/projects being handled is within the prescribed number as stipulated in the DOST-GIA Guidelines. Any willful omission/false statement shall be a basis of disapproval and cancellation of the project.

	SUBMITTED BY (Project Leader)	ENDORSED BY (Head of the Agency)
Signature		

Printed Name	ENGR. MARK KEYLORD S. ONAL	DR. LEVY B. ARAGO, JR.
Designation/Title	INSTRUCTOR/OIC-HEAD OF INSTITUTE OF AGRICULTURAL AND BIOSYSTEMS ENGINEERING	MinSU UNIVERISTY PRESIDENT/ CHAIRPERSON RRDCC-MIMAROPA
Date	SEPTEMBER 25, 2023	SEPTEMBER 25, 2023

Note: See guidelines/definitions at the back.



15 January 2024

REYNALDO V. EBORA, Ph.D.

Executive Director

DOST-PCAARRD

Timugan, Economic Garden, Los Baños, Laguna

Dear *Dr. Ebora*,

Greetings from Mindoro State University (MinSU)!

The Mindoro State University (MinSU), in cooperation with DOST-MIRDC and DOST-MIMAROPA had a project entitled *“Development of Automated Banana Leaf Singeing Technology Using Rice Hull Gasifier”* under *Accelerated R&D Program for Capacity Building of Research and Development Institutions and Industrial Competitiveness: Collaborative Research and Development to Leverage Philippine Economy (CRADLE) Program*. The project aims to address the needs of micro, small, and medium enterprises (MSMEs) to provide safer, reliable, and cost-effective banana leaf singeing technology for food contact materials. The project started last November 2023.

The Project Leader, Engr. Mark Keylord S. Onal, and his team from the Institute of Agricultural and Biosystems Engineering at MinSU, had conducted a preliminary visit to PhilRice on September 13-14, 2023. The objective of the preliminary activity was to talk about the possible collaboration and to discuss the Memorandum of Agreement (MOA) since the project team is proposing to utilize the PhilRice design of rice hull gasifier. During their visit, the technical team of PhilRice recommended the used of Rice Hull Carbonizer instead of the Rice Hull Gasifier as their heat source in their proposed automated banana leaf singeing technology. PhilRice presented to the visiting team their existing technology utilizing the rice hull carbonizer as heat source for cooking, and for some of their projects like roaster and oven, which are related to the proposed project of banana leaf singeing technology.

In line with this, the project team of MinSU is requesting for the change in the source of heat in their approved project thereby resulting to the change in the project title from *“Development of Automated Banana Leaf Singeing Technology Using Rice Hull Gasifier”* to *“Development of Automated Banana Leaf Singeing Technology Using Continuous-type Rice Hull (CtRH) Carbonizer”*. Attached is the edited proposal and the summary of the meeting conducted with PhilRice. No changes in the Line Item Budget was done.

May this request merit your kindest consideration. Should you require any further information you



DOST-PCAARRD

Department of Science and Technology

**PHILIPPINE COUNCIL FOR AGRICULTURE, AQUATIC AND NATURAL RESOURCES
RESEARCH AND DEVELOPMENT**



OFFICE OF THE EXECUTIVE DIRECTOR

February 6, 2024

DR. CHRISTIAN ANTHONY C. AGUTAYA

Officer-in-Charge
Office of the President
Mindoro State University
Alcate, Victoria, Oriental Mindoro

Dear Dr. Agutaya:

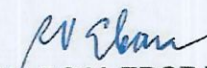
This is to inform you that DOST-PCAARRD has approved your request to change the project title of the ongoing DOST-funded, PCAARRD-monitored project titled, **"Development of Automated Banana Leaf Singeing Technology Using Rice Hull Gasifier"** under the *Collaborative Research & Development to Leverage Philippine Economy (CRADLE)* program. The project is headed by Engr. Mark Keylord S. Onal considering the recommendation of the Philippine Rice Research Institute (PhilRice) to use rice hull carbonizer instead of rice hull gasifier as heat source as it is simpler to operate.

With this, the new project title will be **"Development of Automated Banana Leaf Singeing Technology Using Continuous-type Rice Hull (CtRH) Carbonizer."**

We look forward to the successful implementation of the project.

Thank you.

Very truly yours,


REYNALDO V. EBORA, PhD
Executive Director

Cc: Engr. Mark Keylord S. Onal, Project Leader, MinSU
DOST-SPD





DOST-PCAARRD

Department of Science and Technology

**PHILIPPINE COUNCIL FOR AGRICULTURE, AQUATIC AND NATURAL RESOURCES
RESEARCH AND DEVELOPMENT**



OFFICE OF THE EXECUTIVE DIRECTOR

February 6, 2024

DR. CHRISTIAN ANTHONY C. AGUTAYA

Officer-in-Charge
Office of the President
Mindoro State University
Alcate, Victoria, Oriental Mindoro

Dear Dr. Agutaya:

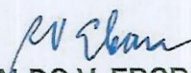
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We look forward to the successful implementation of the project.

Thank you.

Very truly yours,


REYNALDO V. EBORA, PhD
Executive Director

Cc: Engr. Mark Keylord S. Onal, Project Leader, MinSU
DOST-SPD

