

TECHNICAL BULLETIN NO. 2

SERIES OF 2021

**CONSTRUCTION AND
REHABILITATION OF RICE
PROCESSING CENTER
(RPC) AND VILLAGE-TYPE
CORN PROCESSING
CENTER (VTCPC)**



BUREAU OF AGRICULTURAL AND FISHERIES ENGINEERING
ENGINEERING PLANS, DESIGNS, AND SPECIFICATION DIVISION



Republic of the Philippines
OFFICE OF THE SECRETARY
Elliptical Road, Diliman
1100 Quezon City

September 22, 2021

MEMORANDUM ORDER

No. 61
Series of 2021

TO : ALL HEADS OF DA BUREAUS, ATTACHED AGENCIES/
CORPORATIONS, AND REGIONAL EXECUTIVE DIRECTORS

SUBJECT : ADOPTION OF TECHNICAL BULLETIN NO. 2: CONSTRUCTION
AND REHABILITATION OF RICE PROCESSING CENTER (RPC)
AND VILLAGE-TYPE CORN PROCESSING CENTER (VTCPC)

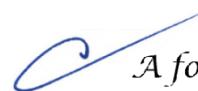
Pursuant to Section 36 of Republic Act No. 10601, also known as the “*Agricultural and Mechanization (AFMech) Law*”, and Memorandum Order No. 50 Series of 2020 “*Revised Guidelines in the Provision of Agricultural Production, Postharvest and Processing Machinery, Equipment, and Facilities*”, to ensure the proper and effective implementation of postharvest facilities, machinery, and equipment for the acceleration and modernization of agricultural and fisheries mechanization in the country, and for the optimization of public investments implemented by the Department of Agriculture (DA), the DA Implementing Office (IOs) are hereby directed to adopt and implement the attached *Technical Bulletin No. 2, Construction and Rehabilitation of Rice Processing Center (RPC) and Village-Type Corn Processing Center (VTCPC)*.

This technical bulletin aims to provide the IOs with the standard validation form, selection criteria, implementation, and rehabilitation procedures for the project. Also, to serve as reference for the preparation of engineering plans, designs and technical specifications of postharvest facilities, machineries, and equipment.

In accordance with the above-mentioned Memorandum Order, further instructions to the IOs are as follows:

1. *Operationalization/Upgrading of Existing RPCs*

The IOs shall conduct assessment of the existing RPCs and VTCPC to validate the conditions/status of the facilities, and to come up with the recommendation for upgrading or rehabilitation of the said intervention. The cost estimates for the upgrading or rehabilitation shall be prepared and proposed for the inclusion in the General Appropriations Act (GAA).



A food-secure and resilient Philippines

with empowered and prosperous farmers and fisherfolk





2. *Utilization of alternative sources of power*

For areas where a three-phase electric supply is not available, the IOs may opt to explore the use of different sources of energy such as single-phase line, wind power, solar power, or provision of generator set. However, it is recommended to conduct a feasibility study (FS) to determine the acceptability and viability of the project in terms of its technical, financial, socio-economic, marketing, and management aspects.

The IOs shall adopt the technical bulletin starting FY 2022. Pending the issuance of the GAA for FY 2022, identified specifications based on the guidelines shall be used for the early procurement of RPC/VTCP for FY 2022 and the succeeding funding years. Revalidation of proposed project sites for FY 2022 may be conducted if necessary, and any adjustments on the physical targets should be supported with justifications.

This Memorandum Order shall take effect immediately upon approval

For compliance.


WILLIAM D. DAR, Ph.D.
Secretary 

Attached: a/s

DEPARTMENT OF AGRICULTURE

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September 22, 2021

TECHNICAL BULLETIN

No. 2

Series of 2021

SUBJECT : TECHNICAL BULLETIN NO. 2 : CONSTRUCTION AND REHABILITATION OF RICE PROCESSING CENTER (RPC) AND VILLAGE-TYPE CORN PROCESSING CENTER (VTCPC)

SECTION I. RATIONALE

Pursuant to Section 36 of Republic Act No. 10601, also known as the “*Agricultural and Mechanization (AFMech) Law*”, and Memorandum Order No. 50 Series of 2020 “*Revised Guidelines in the Provision of Agricultural Production, Postharvest and Processing Machinery, Equipment, and Facilities*”, this guidelines aims to ensure the proper and effective implementation of postharvest facilities, machinery, and equipment for the acceleration and modernization of agricultural and fisheries mechanization in the country, and for the optimization of public investments implemented by the Department of Agriculture (DA).

SECTION II. SCOPE

This technical bulletin shall serve as reference for the construction and rehabilitation of locally and foreign-funded Rice Processing Center (RPC) and Village Type Corn Postharvest Processing Center (VTCPC) implemented by the bureaus, regional field offices, attached agencies and corporations, and other IOs of the DA.

SECTION III. DEFINITION OF TERMS

Drying Center - A roofed structure used to house mechanical dryers for agricultural commodities and as a temporary storage of products.

Implementing Offices (IOs) - refer to any of the units of the DA that provides agricultural machinery, equipment, and facilities such as the national banner programs, regional field offices, DA bureaus, attached agencies and corporations.

Indigenous People Organization (IPO) - refers to a private, nonprofit voluntary organization of ICCs/IPs, duly accredited by the National Commission on Indigenous Peoples (NCIP).

Rice Processing Center (RPC) – a roofed structure with concrete walls and pavement housing system of machinery for rice milling. These processing machines may include those for drying

fresh paddy, pre-cleaning of dried paddy, paddy hulling, separation of rice grains from hulls, destoning, whitening of hulled grains, grading of milled rice, and packaging.

For the new Construction:

RPC I – Multi-stage rice mill will be provided

RPC II – Multi-stage rice mill, Dryer, and warehouse will be provided

Upgrading of RPC - this will cover the provision of additional components for processing to the existing RPC.

Village Type Corn Processing Center (VTCPC)/Corn Processing Center (CPC)- roofed structure with concrete pavement used to store harvested corn and a multi-stage drying system. The system includes machines for drying of corn-on-cobs, shelling, drying of corn grains, bagging of dried grains and series of elevators and conveyors for the movement of materials and products along the system.

SECTION IV. OBJECTIVE

This technical bulletin aims to provide the implementing offices (IOs) with the standard validation form, selection criteria, implementation, and rehabilitation procedures for the project. Also, to serve as reference for the preparation of engineering plans, designs and technical specifications of postharvest facilities, machineries, and equipment.

SECTION V. SELECTION CRITERIA FOR CONSTRUCTION OF RPCs AND VTCPCs

PARAMETERS	CRITERIA		
	RPC I	RPC II	VTCPC
Coverage Area (ha) ¹	100 ha production, minimum	100 ha production, minimum	75 ha production, minimum
Qualified Beneficiaries	<ul style="list-style-type: none"> ● Farmers’ Organization (FO), Farmers’ Association (FA), Farmers’ Cooperative (FC), Irrigators’ Association (IA), Agrarian Reform Beneficiaries Organization (ARBO), and other rural-based organizations duly registered at SEC/CDA/DTI/DOLE ● Indigenous People Organization (IPO) duly accredited by NCIP 		

¹ AO No. 27, Series of 2020: Establishing the Farm and Fisheries Clustering and Consolidation Program (F2C2) Towards Greater Inclusive Agri-Business Development in the Country

	<ul style="list-style-type: none"> • Must have the capability and/or an intention to engage in palay/corn production, processing, trading, and other related enterprise activities 		
Counterpart of the beneficiaries	Lot with minimum of 1,000 sq.m	Lot with minimum of 3,000 sq.m	Lot with minimum of 500 sq.m
	The power source should be available/ready for operation during validation, and prior to the budget proposal.		
Site Requirements	<ul style="list-style-type: none"> • Proposed area must have an available power/electric supply. The following sources may be considered, but not limited to: <ul style="list-style-type: none"> ○ For facilities with low-power requirements for motors [maximum power is 5 kW (5000 W or 6.7 HP)], a single-phase line may be used. If the aggregate power requirement of all the equipment to be operated simultaneously is more than 5 kW, then a 3-phase connection is necessary. ○ For areas where electrical connection is not available, the use of the following energy sources can be considered: <ul style="list-style-type: none"> ▪ Wind Power ▪ Solar Power ▪ Provision of generator set • Accessible to service roads (at least PCCP type of road) • With available water supply • Right-of-way (ROW) issue must be settled wherein there shall have ready documents for ROW acquisition during the budget preparation phase. This may be acquired through donation, negotiated sale, expropriation, or other applicable modes of acquisition as provided by existing relevant laws and issuances, whichever is applicable. • Must not be constructed within the vicinity of residential subdivision, near school and offices • Must not be constructed in hazard-prone areas². 		
Program/Project Feasibility	<ul style="list-style-type: none"> • Should be technically, and socio-economically viable. 		

² HazardHunterPH can be used as reference for the hazard-prone areas.

SECTION VI. MECHANICS OF IMPLEMENTATION

1. Identification and Programming

The IO through its engineering office, in coordination with Agribusiness and Marketing Assistance Division (AMAD), Planning, Monitoring and Evaluation Division (PMED), and Banner Programs shall identify and plan the implementation of the agricultural mechanization and infrastructure projects.

2. Site Validation and Topographic Survey

The IO's engineering office will be responsible for the site validation and topographic survey.

Site validation is a critical stage for the preparation of the design of post-harvest facilities. This will ensure that the design will be site specific based on the location of the project. This process involves the gathering of information about the service area and the processing requirements, among others.

Topographic survey is done to collect accurate information needed for the design and the proposed location for the different components of the system. These data will be used to determine the feasibility of the site, and determine the engineering measures to be undertaken to address the issues on site.

3. Preparation of Feasibility Study (FS), Engineering Design (DED), Program of Works (POW), and Technical Specifications

The FS, DED, POW, and technical specifications will be prepared by the IO's engineering office.

The FS shall be prepared pursuant to Memorandum No. 61, Series of 2020, or the *"Guidelines in the Preparation and Evaluation of Feasibility Study for Agricultural and Fisheries Facilities, Agri-fisheries Machinery and Equipment Service Centers, and Other Agri-Fisheries Mechanization Projects"*.

The DED, POW, and technical specifications shall be submitted to BAFE for review prior to submission for budget proposal.

See Annex A & B for modular design for RPC, and Annex C for modular design of VTCCP.

4. Implementation Stage

- a. The beneficiaries, with the assistance from the IOs/LGUs should secure all the permits, and certificates required for the implementation of the projects;

- b. The IOs will conduct the procurement, and subsequent construction of the processing facilities.

5. Inspection, Testing and Commissioning of the Facilities

The IOs shall facilitate the performance testing and evaluation of facilities after the complete installation of the system to ensure safety operation, and compliance with the design, specifications, and relevant standards.

6. Monitoring and Evaluation

The monitoring and evaluation of this project shall be spearheaded by the IO's engineering office, which includes the monitoring of physical and financial accomplishments during implementation period, as well as physical and operational monitoring after the turnover.

All the constructed RPCs and VTCCPs shall be registered to Agricultural and Biosystems Engineering Management Information System (ABEMIS), which shall be updated by the IOs engineering office for planning and monitoring purposes.

Pursuant to Department Circular No. 1, Series of 2019 on the Guidelines for the Implementation of Constructors' Performance Evaluation System (CPES) at Department of Agriculture, CPES shall be undertaken by DA CPES-IU, in coordination with the accredited DA CPEs to evaluate the infrastructure component of the project. The CPEs shall not in any way be involved (e.g., relatives of the constructors, etc) with the project to be evaluated to ensure objective and unbiased evaluation of the constructors' performance.

7. Operation and Maintenance

After the turn-over of the project, the beneficiaries will be in-charge of the operation, repair, and maintenance of the facility.

For the training on the operation, repair, and maintenance of the machinery, equipment, and facilities shall be conducted by the supplier/contractor, in collaboration with the IO. For the business development and enterprise monitoring, the AMAD can be tapped for assistance. For the capacity development of the farmers, technicians, and operators the assistance from ATI and TESDA may be requested.

8. Rehabilitation

The IOs will conduct assessment of the existing RPCs and VTCCPs, to validate the conditions/status of the facilities. The cost estimates for the rehabilitation/retrofitting shall be prepared and approved by the IOs engineering office. The procurement will also be conducted by the respective IOs.

A refresher course on the operation, repair, and maintenance of the machinery, equipment, and facilities shall be conducted by the IOs, in collaboration with the

suppliers/contractor, ATI and TESDA. For the business development and enterprise monitoring, the AMAD can be tapped for assistance.

SECTION VII. DESIGN CONSIDERATIONS

A. Warehouse

Components	RPC I	RPC II	VTCP
Floor Area (minimum)	300 sq.m	550 sq.m	375 sq.m
Height of Structure	<ul style="list-style-type: none"> The recommended height between the eaves line and the floor is 7 m and 2.5 m between the eaves line and the apex.³ 		<ul style="list-style-type: none"> Eave height: 7m, minimum Apex height: 12 m, minimum⁴
Roof⁵	<ul style="list-style-type: none"> The roof structure shall be composed of steel applied with anti-rust paint. A standard roof truss of 14.5 m span or larger should be used. Roofing materials shall be galvanized iron (G.I.) sheet and other steel sheet with corrosion resistant coating with light colors (e.g., white or beige). Roof vents, when provided, shall be properly screened. Internal pillars supporting roof frames shall be avoided since it can interfere with the pest control and other stock management procedures. Must be provided with necessary lateral and vertical wind braces to resist forces due to strong wind and earthquakes. The inclination of the roofs should be sufficient to drain rainwater quickly, taking into account the water may be forced up by the wind. 		
Walls⁶	<ul style="list-style-type: none"> Walls shall be concreted, smooth finished, and properly painted. The walls' internal surface shall be painted with white emulsion or latex paint for easier detection and removal of dirt, mould, and insect infestation. 		

³ PAES 418:2002: Primary Processing Plant for Fresh Fruits and Vegetable

⁴ MO 02, Series of 2020: Adoption of the 2019 Reference Manual of Agricultural Machinery and Equipment

⁵ Ibid.

⁶ Ibid.

	<ul style="list-style-type: none"> ● A concrete strip of 1 m shall be laid around the warehouse to prevent rain from eroding the base of the walls below the damp course. ● There shall be no opening between wall and roof.
Doors⁷	<ul style="list-style-type: none"> ● There shall be at least two doors such that there will be a rotation of stocks on a first in, first out basis ● The door shall be wide for easy access, yet fit tightly for insect control and fumigation. Roll up doors are generally used since its capability to close tightly. ● It is recommended that the doors are made of steel or at least reinforced along their lower edges with metal plate as protection against rodents. ● The size of the entrance is at least 6 m wide and 4 m high for normal temperature of the warehouse. ● A canopy shall be constructed over every entry door to allow continuous loading and unloading even when it rains. The dimension of canopy is at least 6 m wide and 1 meter overhang
Flooring⁸	<ul style="list-style-type: none"> ● The floor should be adequately strong and capable of withstanding heavy loads and vibrations. ● The floor shall be elevated or constructed higher than the existing ground. The floor should be at least 1m above the ground to consider possible flood occurrence in the area, to permit easy loading or unloading into trucks at the sides of the warehouse. ● There shall be provisions for wear resistance and safety (refractoriness and elimination of skidding risks). ● The floor should be smooth and easy to clean. It should be free from cracks where moisture from the ground may affect the stored grain. ● Moisture sealing compound or asphalt should be provided to fill the floor cracks against moisture. ● With provision for intake pit (optional) ● Floor construction should conform with the National Building Code and National Structural Code of the Philippines.
Ramp	<ul style="list-style-type: none"> ● Based on the National Building Code, the slope of the ramp shall not be more than a ratio of 1:8 ● Handrails shall also be provided with at least 0.9 m high relative to the flooring of ramp.

⁷ Ibid.

⁸ Ibid.

<p>Foundation, Columns, & Beams</p>	<ul style="list-style-type: none"> ● Foundation, columns and beams should be made from reinforced concrete. ● Foundation, columns and beam construction should conform with the National Building Code and National Structural Code of the Philippines.
<p>Ventilation⁹</p>	<ul style="list-style-type: none"> ● Vents should be provided near the floor level, at the top of the walls near the grid line. ● Ventilation openings such as louvers shall be fitted on the outside with anti-bird grills (20mm mesh) and on the inside (10 cm behind the grills) with insect screens (removable for cleaning), which will deter most insects. ● Adequate natural ventilation openings shall be provided with shutters so that ventilation may be controlled. ● Optional provisions for the continuous ridge vent built on the rooftop to provide good ventilation in addition to the louvers all over the warehouse. ● In addition to natural ventilation, exhaust fans should be installed.
<p>Rodent Proofing¹⁰</p>	<ul style="list-style-type: none"> ● An iron sheet used for rodent barrier should have an optimum size but will not obstruct the entrance and will not impede mobility. ● As shown in Figure 1, its height should be little over 60 cm and fixed by a mortise and tenon joint or by hinge. Polished artificial stone is usually used for wall rodent barrier. <div data-bbox="715 1254 1332 1646" data-label="Diagram"> </div> <p style="text-align: center;">Figure 1. Rodent barrier</p> <ul style="list-style-type: none"> ● On all possible entries within the warehouse, there should be a screen for bird and rodent to prevent animal

⁹ Ibid.

¹⁰ PNS/PAES 419:2015: Warehouse for bag type storage of grains

	entry.
Insect and Microorganism Control	<ul style="list-style-type: none"> ● In cases of insect infestation and presence of mold, fumigation should be carried out. ● The appropriate pest control should be used for insect pests or microorganisms. ● The warehouse should have a special locked storage room for fumigants. ● During fumigation, dosage of the chemical and airtight conditions must be carefully observed. ● This should be constructed as separate room to avoid contamination
Lighting¹¹	<ul style="list-style-type: none"> ● Good quality and well-distributed artificial lighting shall be provided at all places where natural light is unavailable or insufficient. ● Lighting requirement per operation: <ul style="list-style-type: none"> - Inspection Areas = 540 lux - Operating Areas = 220 lux - Other Areas = 110 lux ● Recommended lighting color is either cool white (light bulb color temperature = 4000° Kelvin) or bluish-white (light bulb color temperature = 5000° Kelvin)¹²
Electrical	<ul style="list-style-type: none"> ● All electric power points shall be placed at a sufficient height above the floor. ● All plugs shall be fitted with circuit breakers that are appropriate for the power rating of the machineries and equipment and ideally, the main supply shall have an earth leakage trip switch. ● There shall be a constructed service entrance post for service entrance wires. ● Inclusion of KW-HR Meter, Transformer if needed, outside building transmission lines. ● All electrical wiring design and installation shall conform to the Philippine Electrical Code.
Parking	<ul style="list-style-type: none"> ● Recommended parking spaces for trucks and other vehicles should be at least 50 square meters
Fire Extinguishing System¹³	<ul style="list-style-type: none"> ● Fire extinguishers shall be conspicuously located where they will be readily accessible and immediately available

¹¹ Ibid.

¹² Ibid.

¹³ RA 9514: The Fire Code of the Philippines

	<p>in the event of fire. Preferably they shall be located along normal paths of travel, including exits from areas.</p> <ul style="list-style-type: none"> ● Portable fire extinguishers other than wheeled types shall be securely installed on the hanger or in the bracket supplied or placed in cabinets or wall recesses. The hanger or bracket shall be securely and properly anchored to the mounting surface in accordance with the manufacturer’s instructions. ● Fire extinguishers having a gross weight not exceeding eighteen kilogram (18 kg) shall be installed so that the top of the fire extinguisher is not more than one and a half meter (1.5 m) above the floor. Fire extinguishers having a gross weight greater than eighteen kilogram (18 kg), except wheeled types, shall be so installed that the top of the fire extinguisher is not more than one meter (1.0 m) above the floor. In no case shall the clearance between the bottom of the fire extinguisher and the floor be less than one hundred millimeters (100 mm). ● Shall conform to the provisions under the Fire Code of the Philippines
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B. Machineries and Equipment

This section provides the minimum components of the facility and recommended specifications for the new construction of RPC and VTCP. Moreover, this can also be used as reference for the upgrading, retrofitting, or rehabilitation of the said facilities.

Components	Minimum Specifications
RPC I	
Multi-stage Rice Mill ¹⁴	<ul style="list-style-type: none"> ● Milling Capacity: 1 ton/h, minimum ● Milling degree: Well-milled ● Hulling efficiency: 75%, minimum ● Milling Recovery Index: 0.98 ● Prime mover: Engine / Electric motor (Single-phase/ three-phase) ● Minimum components: <ul style="list-style-type: none"> ○ Loading bin/hopper with sliding gate; ○ Paddy pre-cleaner system; ○ Rubber huller ○ Paddy separator, tray-type, 3-layers, min. ○ Destoner;

¹⁴ Ibid.

	<ul style="list-style-type: none"> ○ Multi-pass Whitening system (should be 3 or more passes); ○ Brewer's rice sifter; ○ Steel bucket elevators (complete set) ○ Electrical material for electronic motor connections (wires, conduits, fittings) ○ Appropriate Electric Control panel ○ Rice hull bin (60 cu.m., minimum) ○ Set of manufacturer's standard tools and accessories
Moisture meter	<ul style="list-style-type: none"> ● Portable ● Capacitance type
Weighing Scale	<ul style="list-style-type: none"> ● Capacity: 1 ton
RPC II	
Multi-stage Rice Mill	<ul style="list-style-type: none"> ● Output Capacity: 1.0 tons/h, minimum ● Milling degree: Well-milled ● Hulling efficiency: 75%, minimum ● Milling Recovery Index: 0.98 ● Prime mover: Engine / Electric motor (Single-phase/ three-phase) ● Minimum components: <ul style="list-style-type: none"> ○ Loading bin/hopper with sliding gate; ○ Paddy pre-cleaner system; ○ Rubber huller ○ Paddy separator, tray-type, 3-layers, min. ○ Destoner; ○ Multi-pass Whitening system (should be 3 or more passes); ○ Brewer's rice sifter; ○ Steel bucket elevators (complete set) ○ Electrical material for electronic motor connections (wires, conduits, fittings) ○ Appropriate Electric Control panel\ ○ Rice hull bin (60 cu.m., minimum) ○ Set of manufacturer's standard tools and accessories
Batch- Recirculating ¹⁵ dryer	<ul style="list-style-type: none"> ● Holding capacity: 6 tons (minimum), fresh paddy ● Moisture Reduction rate: 0.8% per hour ● Moisture gradient: 2%, maximum ● Operating temperature: 40 - 80°C

¹⁵ Ibid.

	<ul style="list-style-type: none"> ● Power Supply: Electric motor, 220 V, single-phase ● Products quality: <ul style="list-style-type: none"> ○ Cracked grain (% increase): 3%, maximum ○ Head rice (% decrease): 5%, maximum ○ Hulled/damaged grain (%increase): 2%, maximum ● Minimum components: <ul style="list-style-type: none"> ○ With dust collection system; ○ With drying air and grain temperature display; ○ With viewing window for every module; ○ Bagging bin with minimum capacity appropriate to the system ○ Equipped with biomass furnace
Biomass Furnace ¹⁶	<ul style="list-style-type: none"> ● Heating system: indirect-fired ● Heating system efficiency: 50%, minimum ● Furnace Efficiency: 65%, minimum ● Burning efficiency: 95%, minimum ● With automatic drying air temperature control ● With automatic ash unloader, and with provision for collection of discharge ash
Moisture meter	<ul style="list-style-type: none"> ● Portable ● Capacitance type
Weighing Scale	<ul style="list-style-type: none"> ● Capacity: 1 ton
VTCP	
Corn-on-cob dryer ¹⁷	<ul style="list-style-type: none"> ● Non-conventional ● Source of energy: Biomass fuel, indirect fired (heating system eff: 50%) ● Loading capacity: 10 tons, minimum ● Moisture content reduction rate: 0.25%/hour, minimum ● Noise level: 92 dB (A), maximum for 6 hours operation ● With intake pit at floor level ● With loading belt conveyor ● Set of manufacturer's standard tools and accessories
Corn sheller ¹⁸	<ul style="list-style-type: none"> ● Prime Mover: Diesel/Gasoline Engine ● Fuel Consumption: 0.82 g fuel per kg. output, maximum ● Output capacity: minimum 1t/h, corn at 20% moisture content nominal

¹⁶ Ibid.

¹⁷ Ibid.

¹⁸ Ibid.

	<ul style="list-style-type: none"> ● Shelling Recovery: 97%, minimum ● Shelling efficiency: 99.5%, minimum ● Total Machine Loss: 3%, maximum ● Purity: 98%, minimum ● Mechanically damaged (broken) kernel: 3%, maximum ● Net Cracked Kernel: 5%, maximum ● Noise Level: 92 dB (A), maximum for 6 hours continuous operation ● Set of manufacturer's standard tools and accessories
Batch- Recirculating dryer	<ul style="list-style-type: none"> ● Non-conventional (biomass fuel), indirect-fired ● Load Capacity: 6 tons, minimum ● Moisture Reduction rate: 0.8% per hour ● Moisture gradient: 2%, maximum ● Operating temperature: 40 - 80°C ● Power Supply: Electric motor, 220 V, single-phase ● Products quality: <ul style="list-style-type: none"> ○ Cracked grain (% increase): 3%, maximum ○ Head rice (% decrease): 5%, maximum ○ Hulled/damaged grain (%increase): 2%, maximum ● Minimum components: <ul style="list-style-type: none"> ○ With fan or cyclone or exhaust air of dryer; ○ With bucket elevator; ○ With temporary storage bin after drying (12 tons capacity at 14% MC) ○ With dust collection system connected to dryer; ● With built-in moisture meter/controller
Biomass Furnace	<ul style="list-style-type: none"> ● Capable of heating ambient air to 120° C at airflow rate of 40,000 cfm ● Heat Exchanger: fire tubes or equivalent heat resistant material ● Combustion chamber: refractory brick or castable able to withstand 900° C ● Heating system: Biomass fuel, indirect-fired ● Heating system efficiency: 50%, minimum ● Furnace Efficiency: 65%, minimum ● Burning efficiency: 95%, minimum ● With automatic drying air temperature control ● With automatic ash unloader, and with provision for collection of discharge ash; ● With biomass fuel bin: 1.6 tons, minimum capacity of corn cobs
Control Panel	<ul style="list-style-type: none"> ● With on/off buttons and panel indicators for temperatures, electric voltage and electric current

Electric Power transformer	<ul style="list-style-type: none"> ● Generator set (70 kVA) or three phase, whichever is available on-site ● with kW-hour meter
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C. After-Sales, Warranty and Other Provisions

After-Sales Service for Machinery

For the machinery component of the project, pursuant to PNS/BAFS/PAES 192:2016 on the "Guidelines on After-Sales Services", the manufacturer/distributor/dealer shall issue a warranty certificate to the buyer. A warranty for at least one (1) year upon the acceptance of the procuring entity of the machinery.

Moreover, the manufacturer/distributor/dealer shall provide training on the operation, repairs, and maintenance of the agricultural and fisheries machinery. Also, an Operator's Manual shall be provided containing full information on the method of installation and operation.

Warranty for Infrastructure Project

For infrastructure projects, pursuant to the Revised 2016 IRR of the RA 9184, the warranties shall be made:

- I. From the time of project construction commenced up to final acceptance, the contractor shall assume full responsibility for the following:
 - a. Any damage or destruction of the works except the occasioned by *force majeure*; and
 - b. Safety, protection, security, and convenience of his personnel, third parties, and the public at large, as well as the works, equipment, installation and the like to be affected by his construction work

- II. One (1) year from the project completion up to the final acceptance or the defects liability period.
 - a. The contractor shall undertake the repair works, at his own expense, of any damage to the infrastructure on account of the use of materials of inferior quality, within ninety (90) days from the time the HoPE has issued an order to undertake repair. In case of failure or refusal to comply with this mandate, the Procuring Entity shall undertake such repair works and shall be entitled to full reimbursement of expenses incurred therein upon demand.
 - b. The defect liability period shall be covered by the Performance security of the contractor, which shall guarantee that the contractor performs his responsibilities.

D. Testing, Commissioning, and Acceptance

The testing and commissioning of the components of the facility shall be undertaken by the suppliers, prior to the actual system testing to facilitate efficient testing.

Pursuant to Section 18 of RA 10601 also known as the Agricultural and Fisheries Mechanization (AFMech) Law, Agricultural and fisheries machinery and equipment to be sold in the market shall pass through testing and evaluation by the Agricultural Machinery Testing and Evaluation Center (AMTEC) in accordance with the national policies and guidelines to be promulgated by the Secretary. Specifically, before it can be assembled, manufactured and commercially sold in the market, the model of the machine and any modification thereof should be tested by the AMTEC and should pass the prescribed quality and performance standards.

Moreover, based on Memorandum Order (MO) No. 35, Series of 2018, otherwise known as the Guidelines on AMTEC Testing and Evaluation of Irrigation Systems, Processing facilities and other Agricultural Systems of the like in the DA, its RFOs, attached agencies, bureaus and government-owned and controlled corporations, the following procedures should be observed:

1. AMTEC Testing and evaluation should be conducted after the complete installation of machinery on site.
2. The AMTEC test report shall be submitted prior to the acceptance and payment of the procuring entity.

Moreover, based on MO No. 50, Series of 2020, an acceptance/compliance report shall be issued by the RAED and shall serve as basis on accepting the delivered goods/infrastructure.

For reference and guidance.



ENGR. ARIODEAR C. RICO
Director IV

Attached: a/s

ANNEX A

MODULAR DESIGN FOR THE ESTABLISHMENT OF RICE PROCESSING CENTER I



REPUBLIC OF THE PHILIPPINES

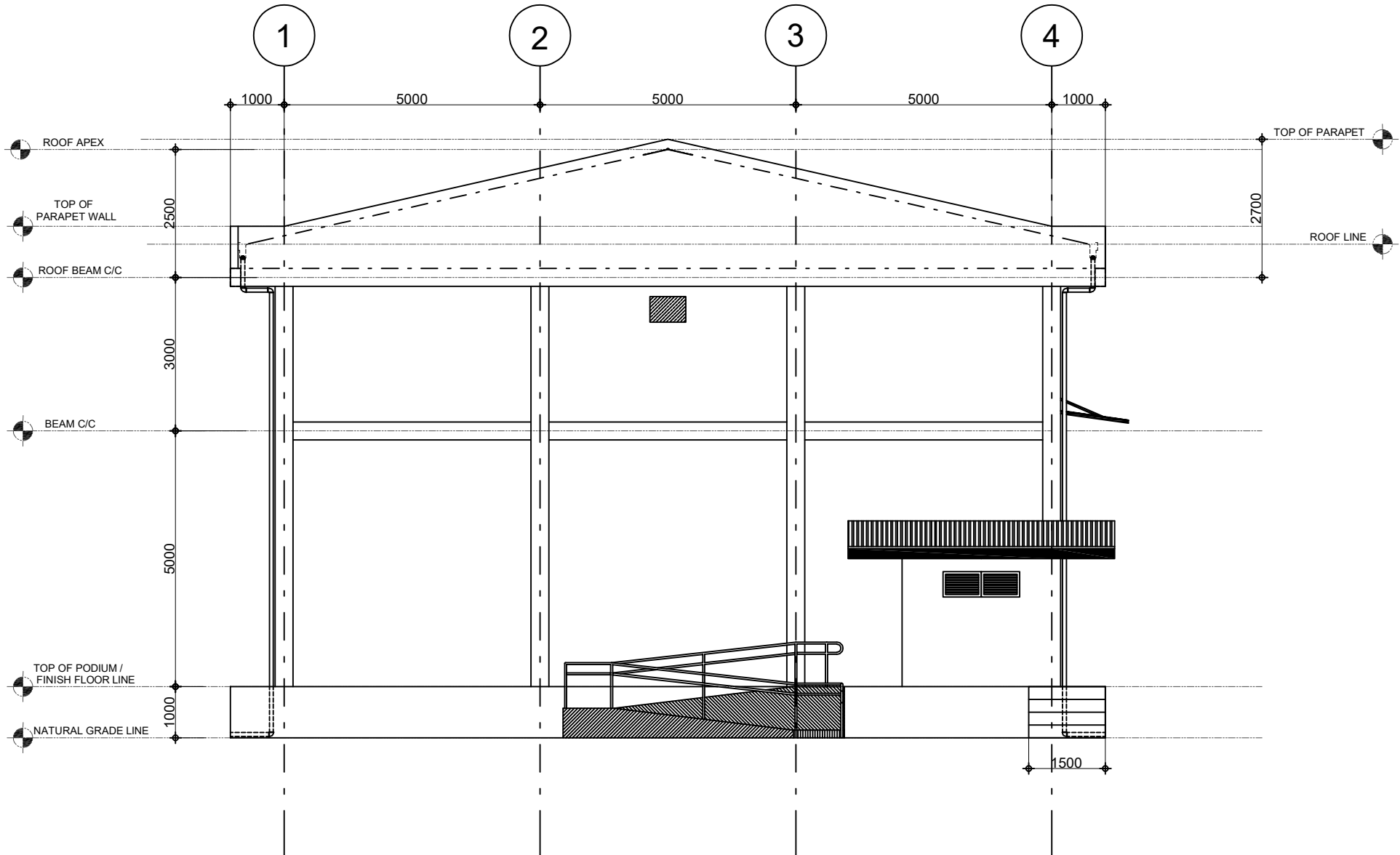
DEPARTMENT OF AGRICULTURE



A
1-1
PERSPECTIVE VIEW
 SCALE: _____ NTS



PROJECT TITLE	Sheet Content:	Sheet No.:
MODULAR DESIGN FOR THE ESTABLISHMENT OF RICE PROCESSING CENTER I	PERSPECTIVE VIEW	A-01
PROJECT LOCATION		

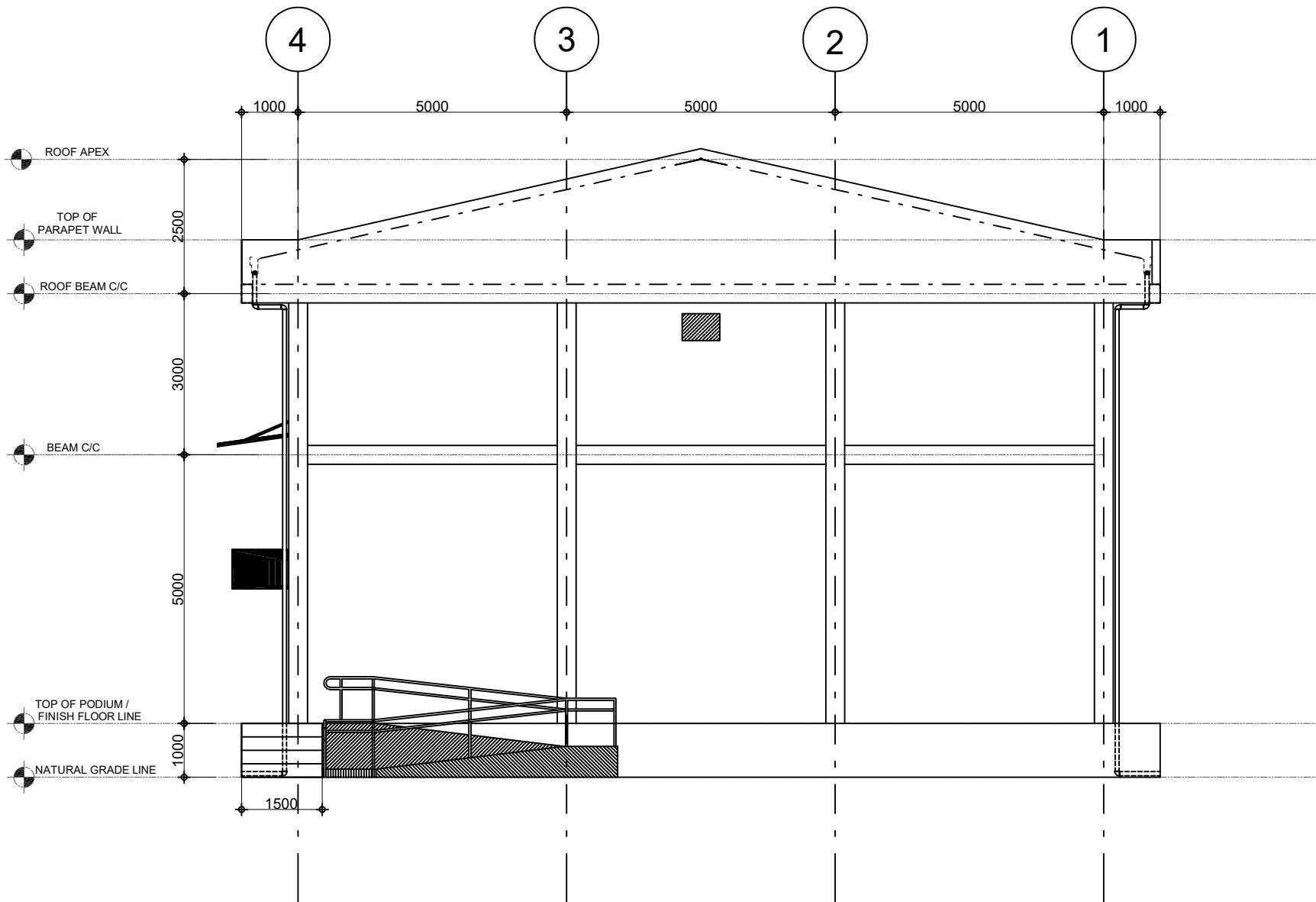


A
3-1
FRONT ELEVATION
 SCALE: 1000:1 m



PROJECT TITLE	MODULAR DESIGN FOR THE ESTABLISHMENT OF RICE PROCESSING CENTER I	PROJECT LOCATION
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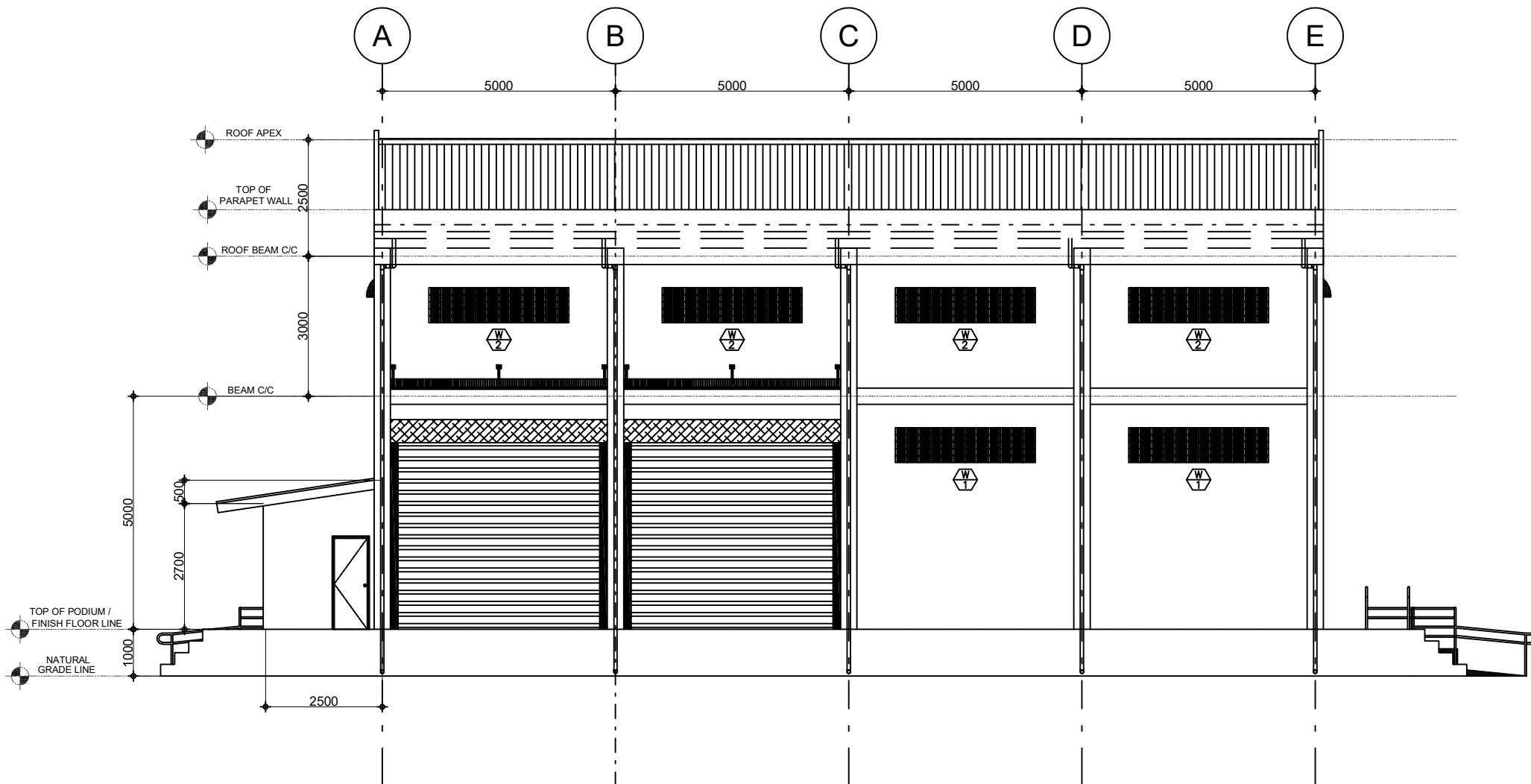
Sheet Content: FRONT ELEVATION	Sheet No.: A-03
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A
4-1
REAR ELEVATION
 SCALE: _____ 1000:1 m



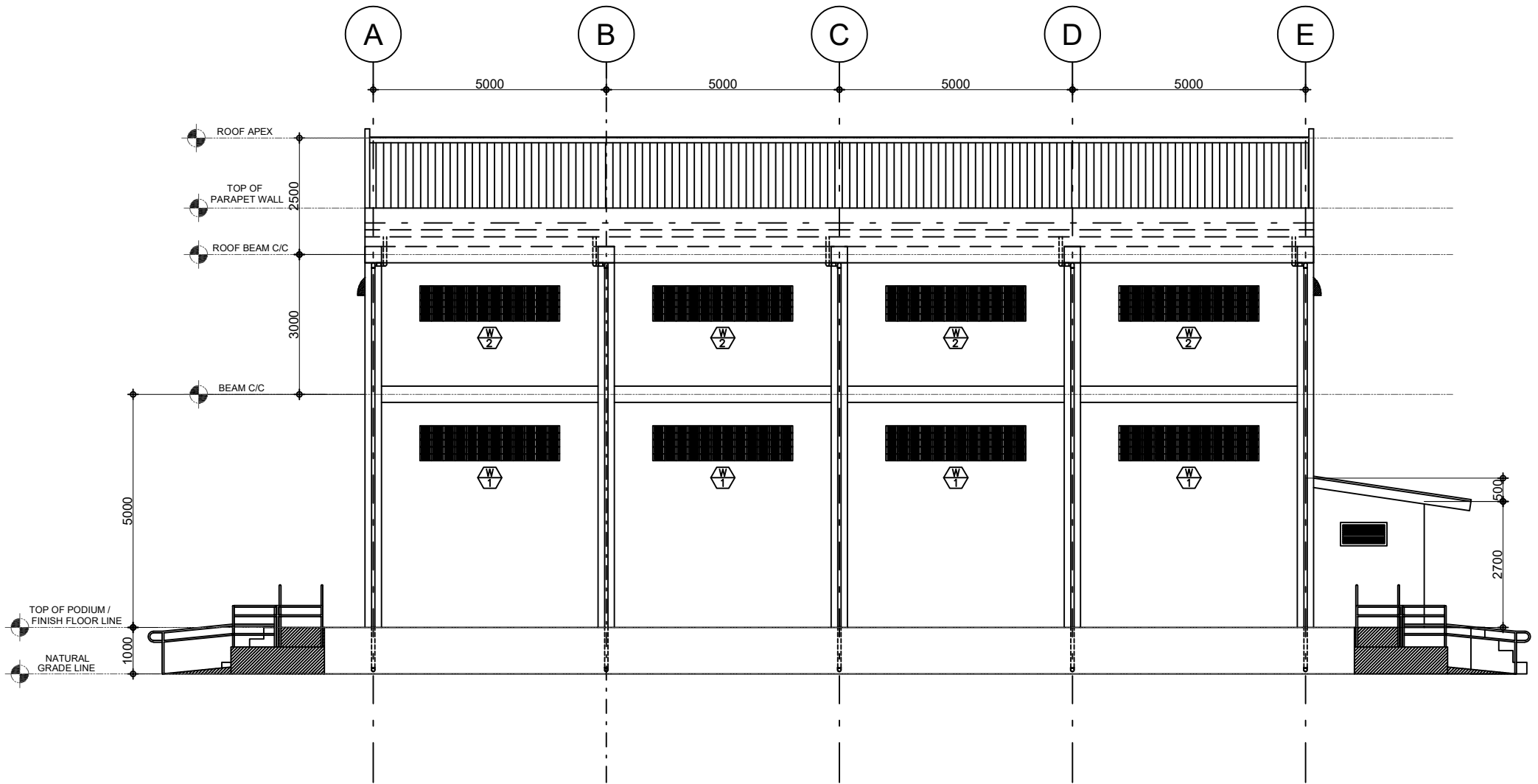
PROJECT TITLE	Sheet Content:	Sheet No.:
MODULAR DESIGN FOR THE ESTABLISHMENT OF RICE PROCESSING CENTER I	REAR ELEVATION	A-04
PROJECT LOCATION		



A
RIGHT SIDE ELEVATION
 5-1 SCALE: 1000:1 m



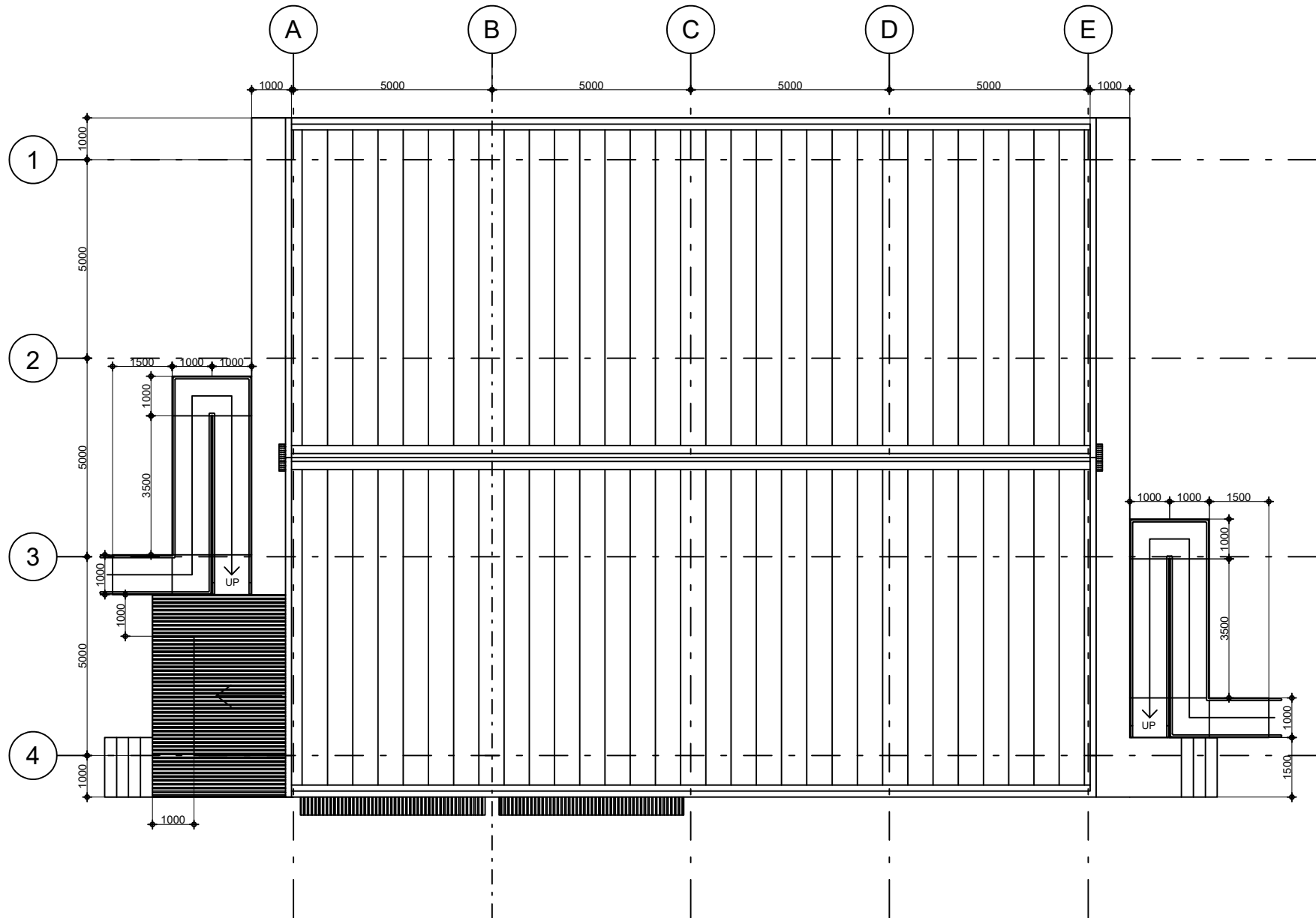
PROJECT TITLE	Sheet Content:	Sheet No.:
MODULAR DESIGN FOR THE ESTABLISHMENT OF RICE PROCESSING CENTER I	RIGHT SIDE ELEVATION	A-05
PROJECT LOCATION		



A
6-1
LEFT SIDE ELEVATION
 SCALE: _____ 1000:1 m

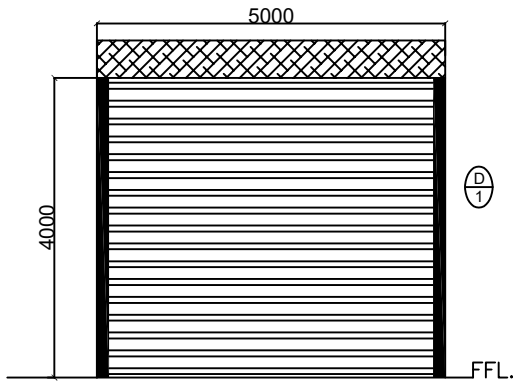


PROJECT TITLE	Sheet Content:	Sheet No.:
MODULAR DESIGN FOR THE ESTABLISHMENT OF RICE PROCESSING CENTER I	LEFT SIDE ELEVATION	A-06
PROJECT LOCATION		

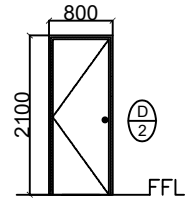


A **TOP ELEVATION**
7-1 SCALE: 1000:1 m

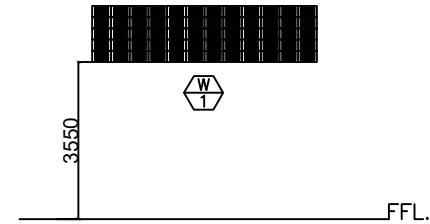




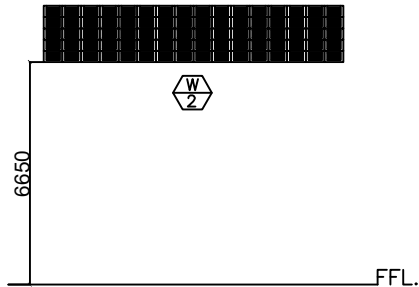
DESCRIPTION:
 GALVALUME ROLL UP
 DOOR WITH COMPLETE
 LOCKSET
 LOCATION: SEE FLOOR
 PLAN



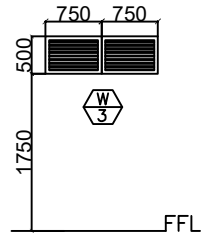
DESCRIPTION:
 $\frac{1}{2}$ " ORDINARY PLYWOOD
 AND JAMB DOOR
 CHOCOLATE BROWN
 STAINED FINISH WITH
 COMPLETE LOCKSET
 LOCATION: SEE FLOOR
 PLAN



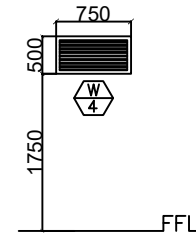
DESCRIPTION:
 4" CONCRETE LOUVER
 BLOCKS 60 PCS
 (5 ROWS, 12 COLUMNS)
 WITH ALUMINUM FRAME
 SCREEN (#16 MESH)
 LOCATION: SEE ELEVATION
 PLAN



DESCRIPTION:
 4" CONCRETE LOUVER
 BLOCKS 60 PCS
 (5 ROWS, 12 COLUMNS)
 WITH ALUMINUM FRAME
 SCREEN (#16 MESH)
 LOCATION: SEE ELEVATION
 PLAN



DESCRIPTION:
 ALUMINUM LOUVER WINDOW
 WITH ALUMINUM FRAME
 SCREEN (#16 MESH)
 LOCATION: SEE ELEVATION
 PLAN



DESCRIPTION:
 ALUMINUM LOUVER WINDOW
 WITH ALUMINUM FRAME
 SCREEN (#16 MESH)
 LOCATION: SEE ELEVATION
 PLAN

A
 8-1

SCHEDULE OF DOORS & WINDOWS

SCALE:

1000:1 m



PROJECT TITLE
MODULAR DESIGN FOR THE ESTABLISHMENT OF RICE PROCESSING CENTER I

PROJECT LOCATION

Sheet Content:

SCHEDULE OF DOORS &
 WINDOWS

Sheet No.:

A-08

ANNEX B

MODULAR DESIGN FOR THE ESTABLISHMENT OF RICE PROCESSING CENTER II



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF AGRICULTURE



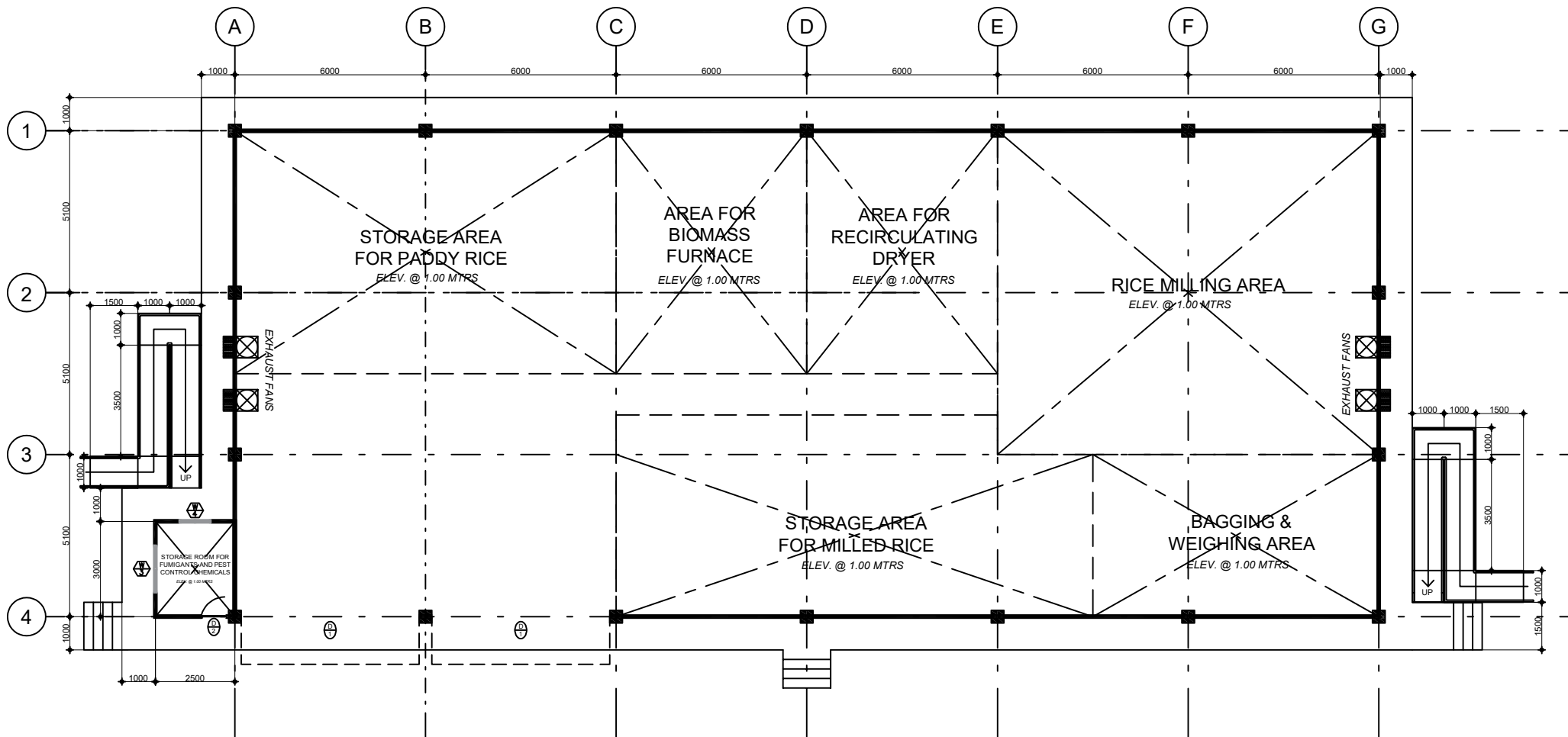
A
PERSPECTIVE VIEW
1-1
SCALE:
NTS



PROJECT TITLE	MODULAR DESIGN FOR THE ESTABLISHMENT OF RICE PROCESSING CENTER II	PROJECT LOCATION
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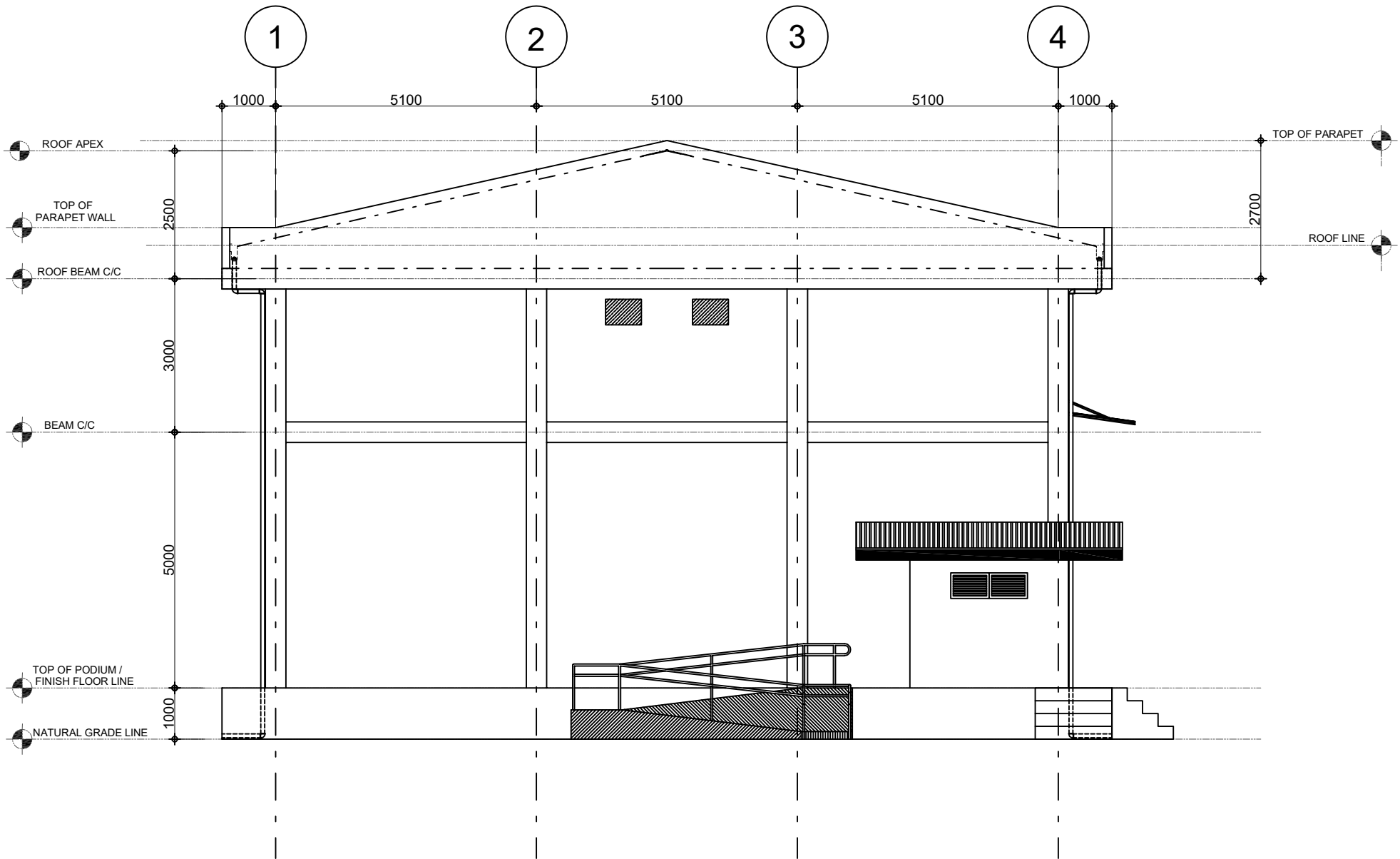
Sheet Content:
PERSPECTIVE VIEW

Sheet No.:
A-01



A FLOOR PLAN
2-1 SCALE: 1000:1 m





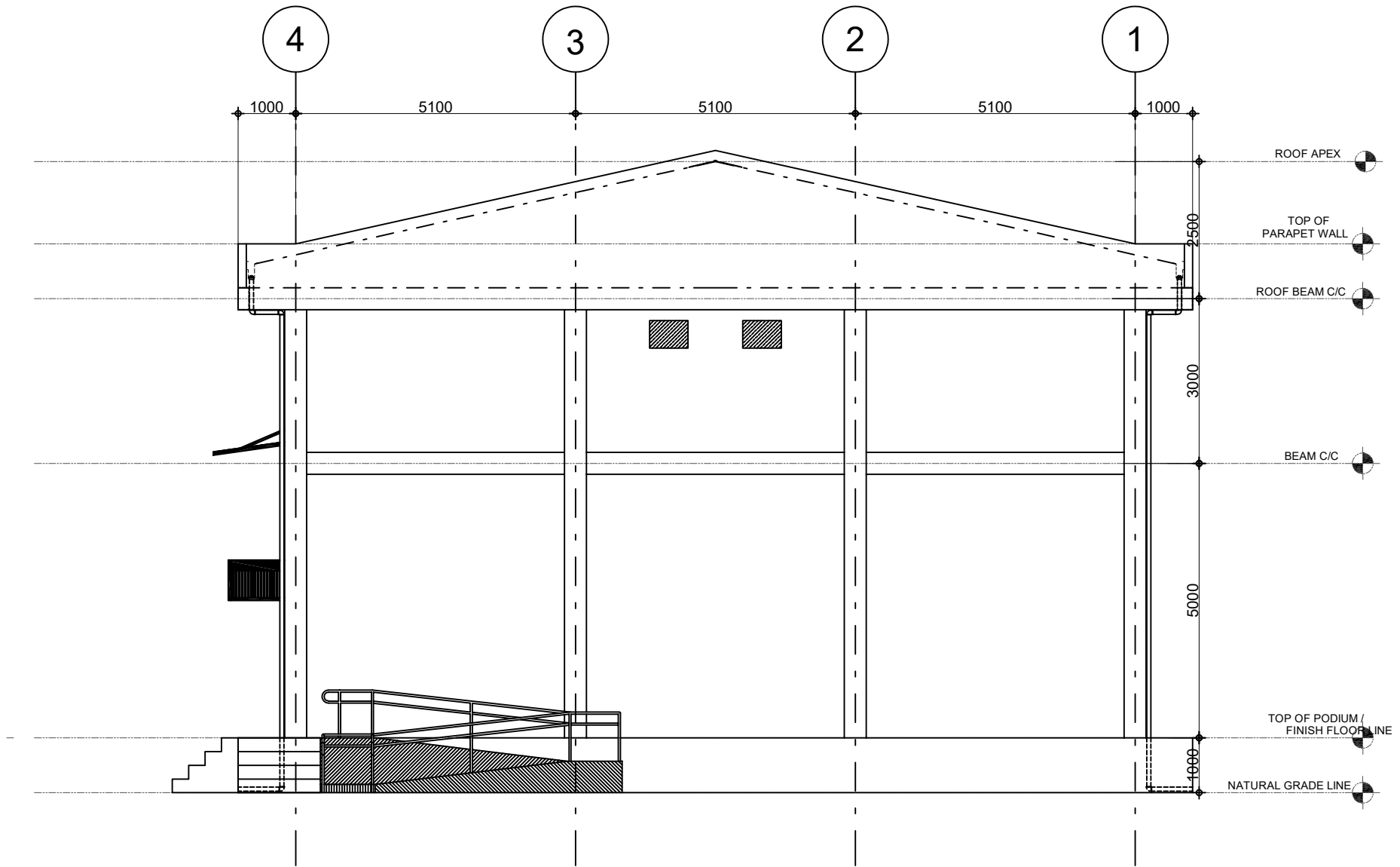
A
3-1
FRONT ELEVATION
 SCALE: 1000:1 m



PROJECT TITLE	MODULAR DESIGN FOR THE ESTABLISHMENT OF RICE PROCESSING CENTER II	PROJECT LOCATION
---------------	---	------------------

Sheet Content:
FRONT ELEVATION

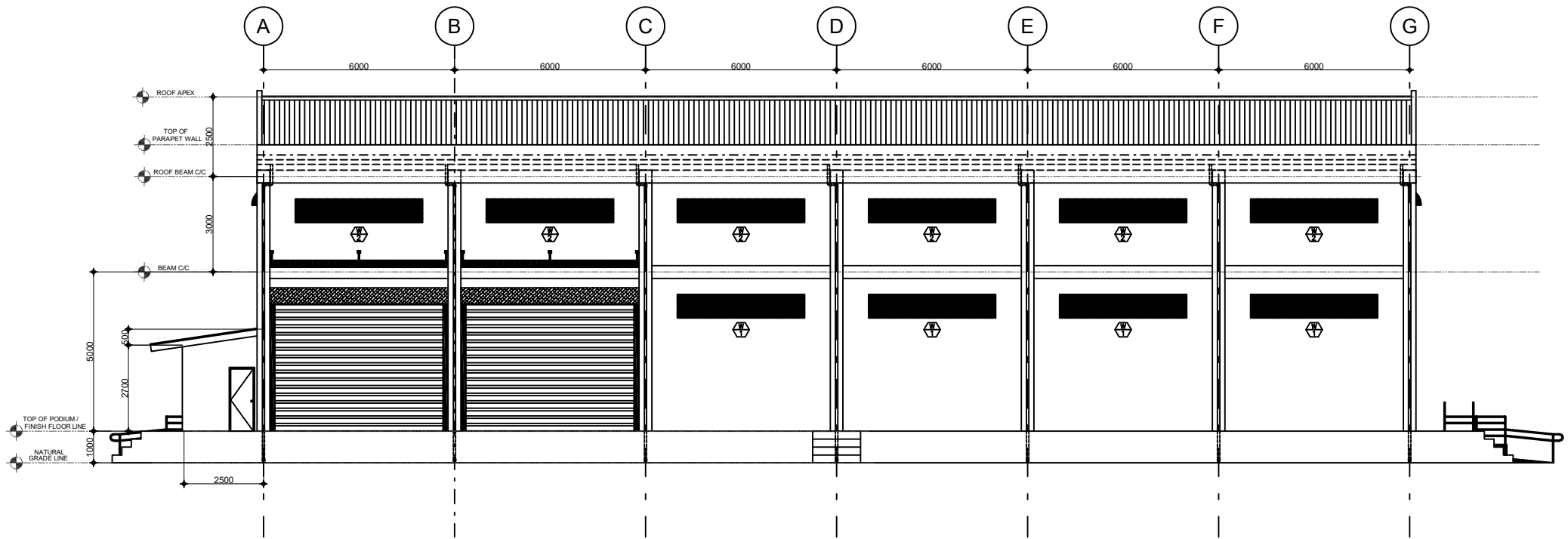
Sheet No.:
A-03



A REAR ELEVATION
4-1 SCALE: 1000:1 m



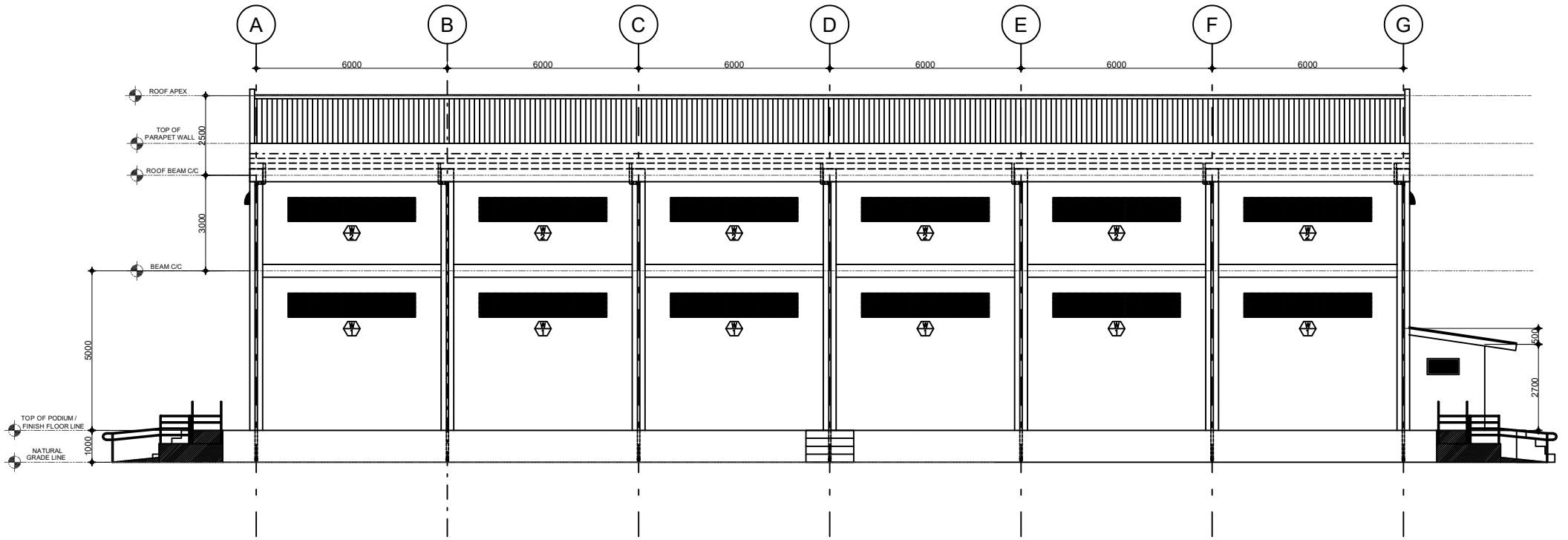
PROJECT TITLE	Sheet Content:	Sheet No.:
MODULAR DESIGN FOR THE ESTABLISHMENT OF RICE PROCESSING CENTER II	REAR ELEVATION	A-04
PROJECT LOCATION		



A **RIGHT SIDE ELEVATION**
 SCALE: 1000:1 m



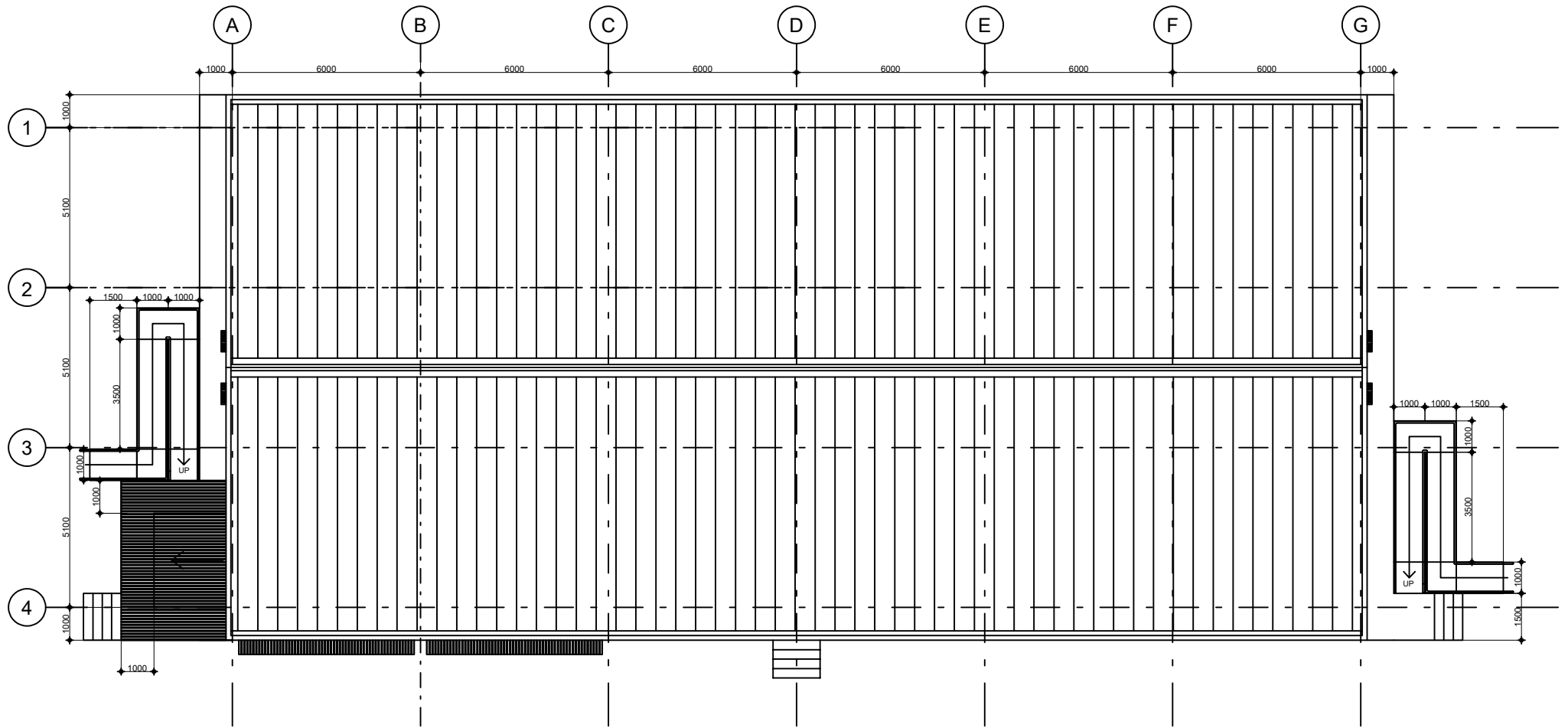
PROJECT TITLE	Sheet Content:	Sheet No.:
MODULAR DESIGN FOR THE ESTABLISHMENT OF RICE PROCESSING CENTER II	RIGHT SIDE ELEVATION	A-05
PROJECT LOCATION		



A
6-1
LEFT SIDE ELEVATION
 SCALE: 1000:1 m



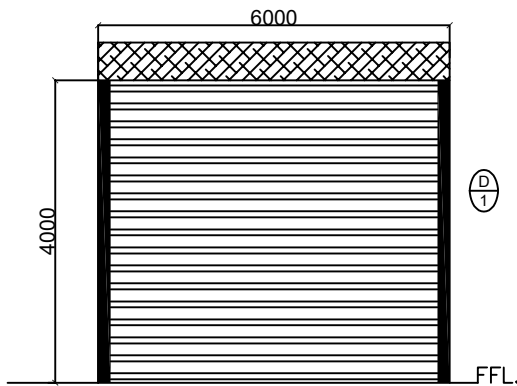
PROJECT TITLE	Sheet Content:	Sheet No.:
MODULAR DESIGN FOR THE ESTABLISHMENT OF RICE PROCESSING CENTER II	LEFT SIDE ELEVATION	A-06
PROJECT LOCATION		



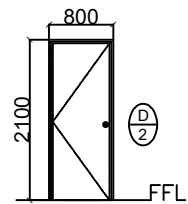
A **TOP ELEVATION**
7-1 SCALE: 1000:1 m



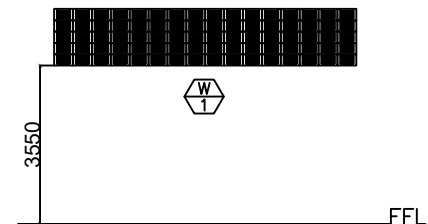
PROJECT TITLE	Sheet Content:	Sheet No.:
MODULAR DESIGN FOR THE ESTABLISHMENT OF RICE PROCESSING CENTER II	TOP ELEVATION	A-07
PROJECT LOCATION		



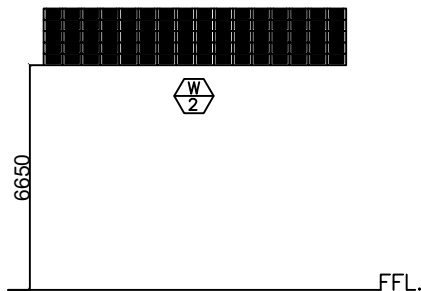
DESCRIPTION:
 GALVALUME ROLL UP
 DOOR WITH COMPLETE
 LOCKSET
 LOCATION: SEE FLOOR
 PLAN



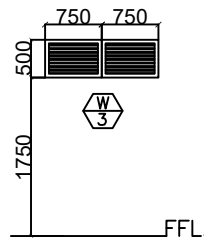
DESCRIPTION:
 1/2" ORDINARY PLYWOOD
 AND JAMB DOOR
 CHOCOLATE BROWN
 STAINED FINISH WITH
 COMPLETE LOCKSET
 LOCATION: SEE FLOOR
 PLAN



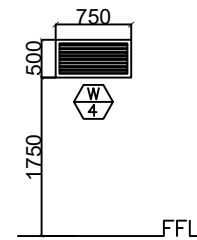
DESCRIPTION:
 4" CONCRETE LOUVER
 BLOCKS 80 PCS
 (5 ROWS, 16 COLUMNS)
 WITH ALUMINUM FRAME
 SCREEN (#16 MESH)
 LOCATION: SEE ELEVATION
 PLAN



DESCRIPTION:
 4" CONCRETE LOUVER
 BLOCKS 80 PCS
 (5 ROWS, 16 COLUMNS)
 WITH ALUMINUM FRAME
 SCREEN (#16 MESH)
 LOCATION: SEE ELEVATION
 PLAN



DESCRIPTION:
 ALUMINUM LOUVER WINDOW
 WITH ALUMINUM FRAME
 SCREEN (#16 MESH)
 LOCATION: SEE ELEVATION
 PLAN



DESCRIPTION:
 ALUMINUM LOUVER WINDOW
 WITH ALUMINUM FRAME
 SCREEN (#16 MESH)
 LOCATION: SEE ELEVATION
 PLAN

A
 8-1

SCHEDULE OF DOORS & WINDOWS

SCALE:

1000:1 m



PROJECT TITLE
MODULAR DESIGN FOR THE ESTABLISHMENT OF RICE PROCESSING CENTER II

PROJECT LOCATION

Sheet Content:

SCHEDULE OF DOORS &
 WINDOWS

Sheet No.:

A-08

ANNEX C

MODULAR DESIGN FOR THE ESTABLISHMENT OF VILLAGE-TYPE CORN PROCESSING CENTER



REPUBLIC OF THE PHILIPPINES

DEPARTMENT OF AGRICULTURE

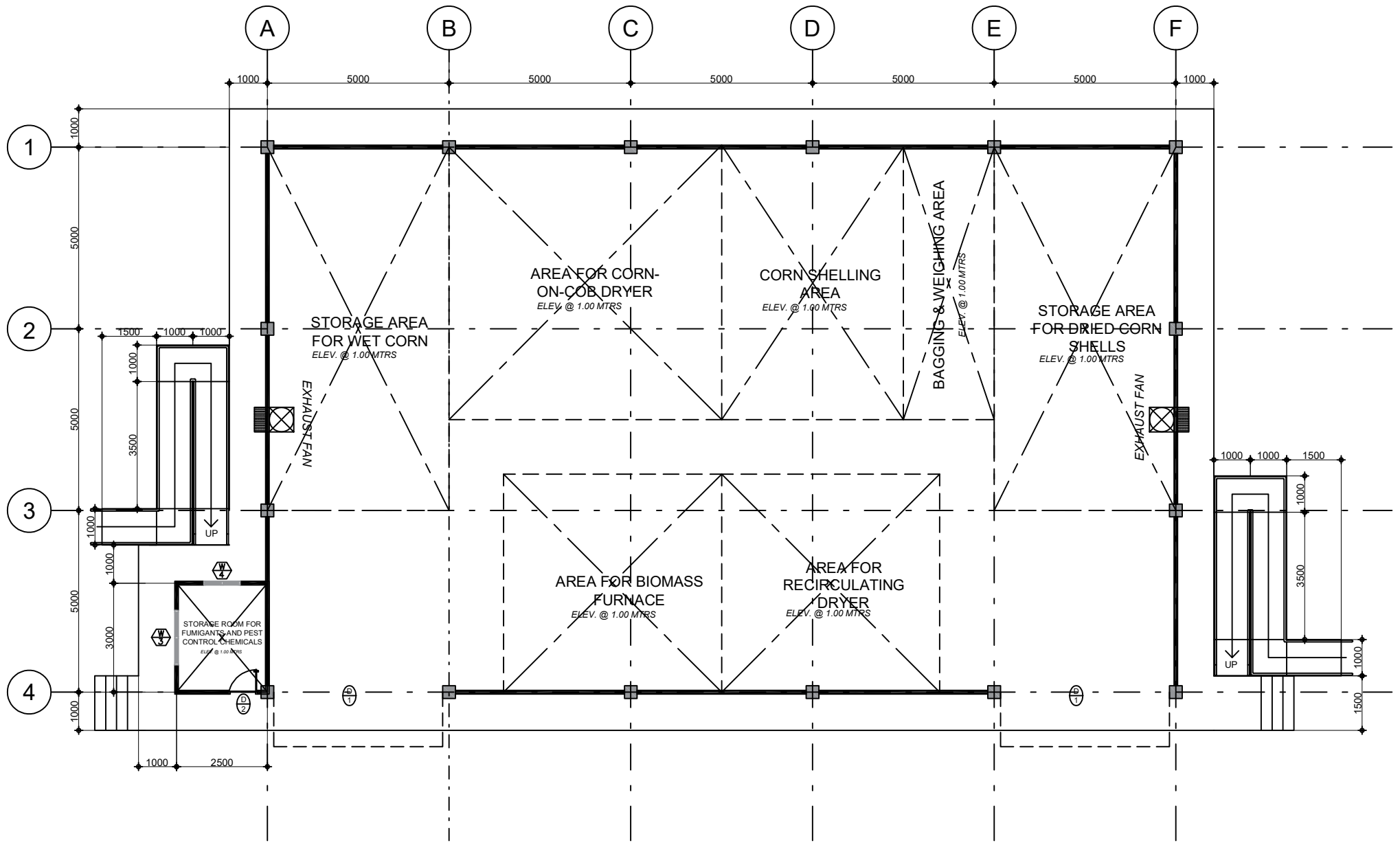


A
1-1
PERSPECTIVE VIEW
 SCALE: _____ NTS



PROJECT TITLE	MODULAR DESIGN FOR THE ESTABLISHMENT OF VILLAGE-TYPE CORN PROCESSING CENTER	PROJECT LOCATION
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Sheet Content:	Sheet No.:
PERSPECTIVE VIEW	A-01



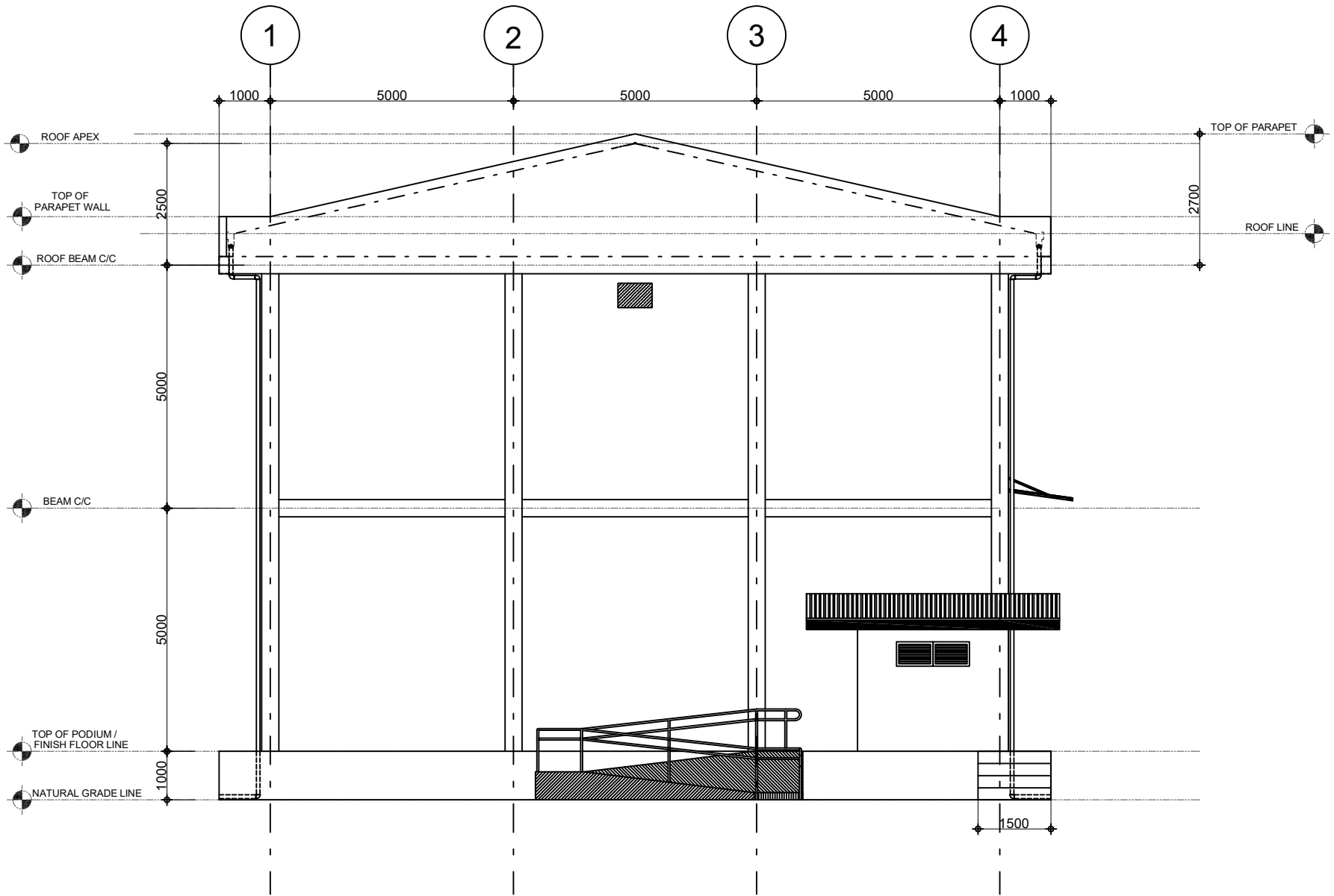
A
FLOOR PLAN
 2-1 SCALE: 1000:1 m



PROJECT TITLE	MODULAR DESIGN FOR THE ESTABLISHMENT OF VILLAGE-TYPE CORN PROCESSING CENTER	PROJECT LOCATION
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Sheet Content:
FLOOR PLAN

Sheet No.:
A-02

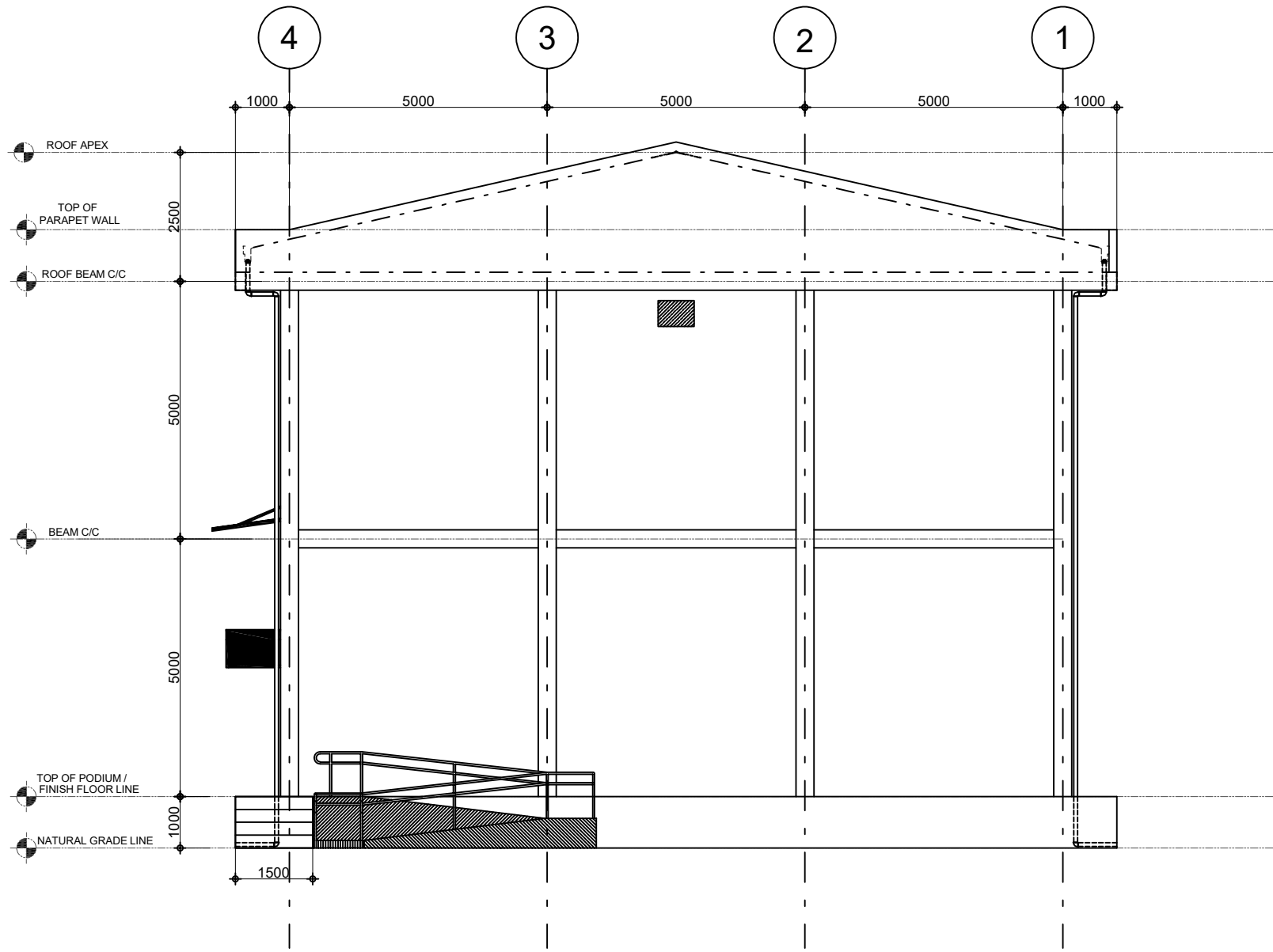


A
3-1
FRONT ELEVATION
 SCALE: 1000:1 m



PROJECT TITLE	MODULAR DESIGN FOR THE ESTABLISHMENT OF VILLAGE-TYPE CORN PROCESSING CENTER	PROJECT LOCATION
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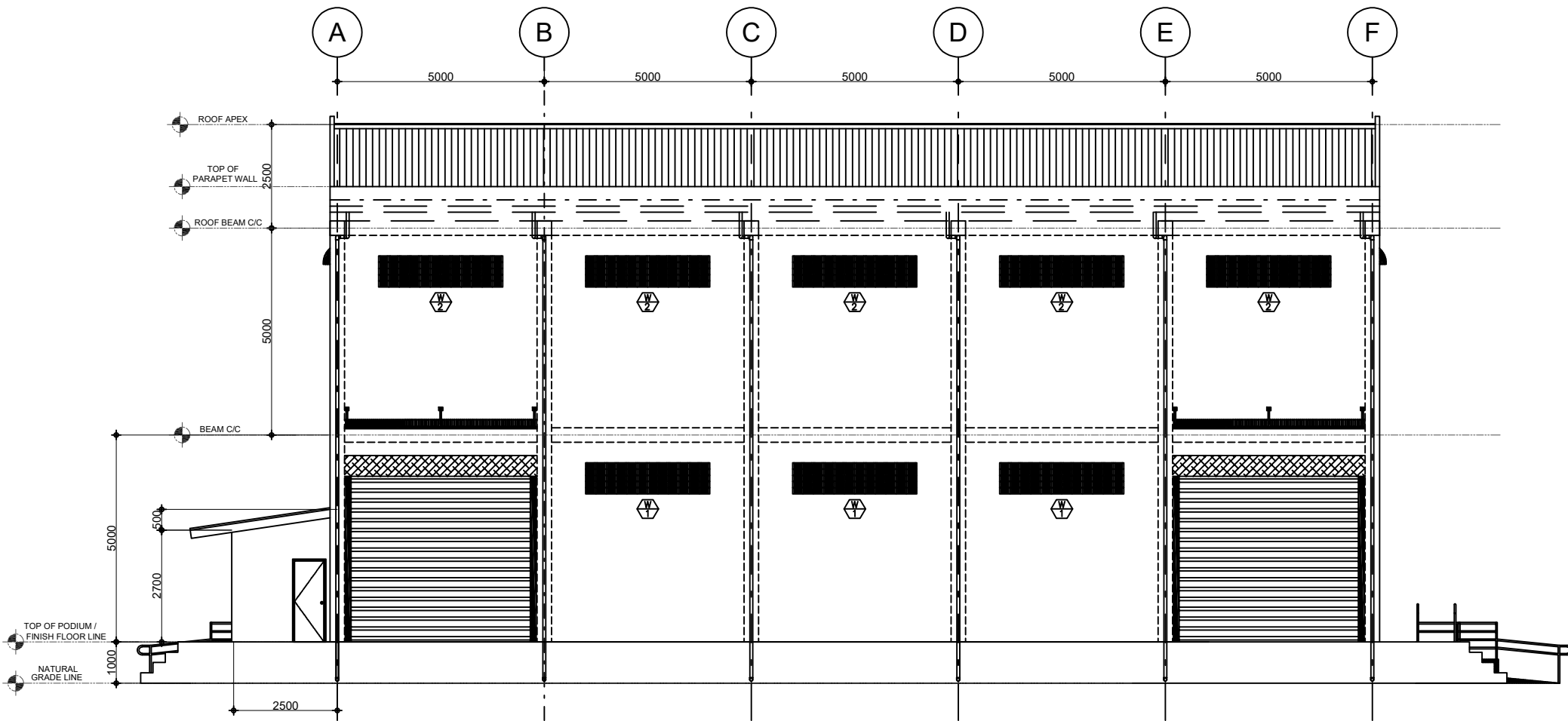
Sheet Content: FRONT ELEVATION	Sheet No.: A-03
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A
REAR ELEVATION
4-1
SCALE: 1000:1 m



PROJECT TITLE	Sheet Content:	Sheet No.:
MODULAR DESIGN FOR THE ESTABLISHMENT OF VILLAGE-TYPE CORN PROCESSING CENTER	REAR ELEVATION	A-04
PROJECT LOCATION		



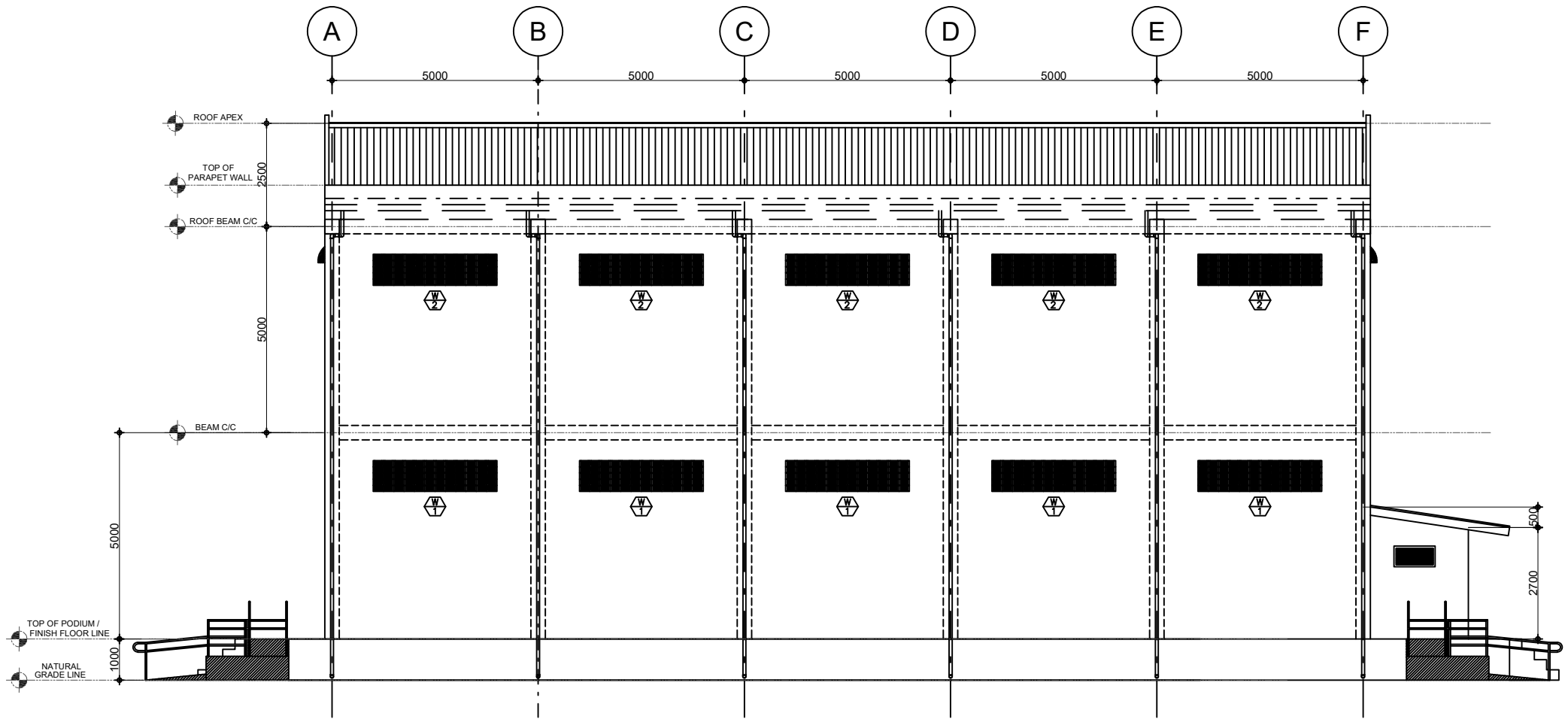
A
5-1
RIGHT SIDE ELEVATION
 SCALE: 1000:1 m



PROJECT TITLE
MODULAR DESIGN FOR THE ESTABLISHMENT OF VILLAGE-TYPE CORN PROCESSING CENTER
 PROJECT LOCATION

Sheet Content:
RIGHT SIDE ELEVATION

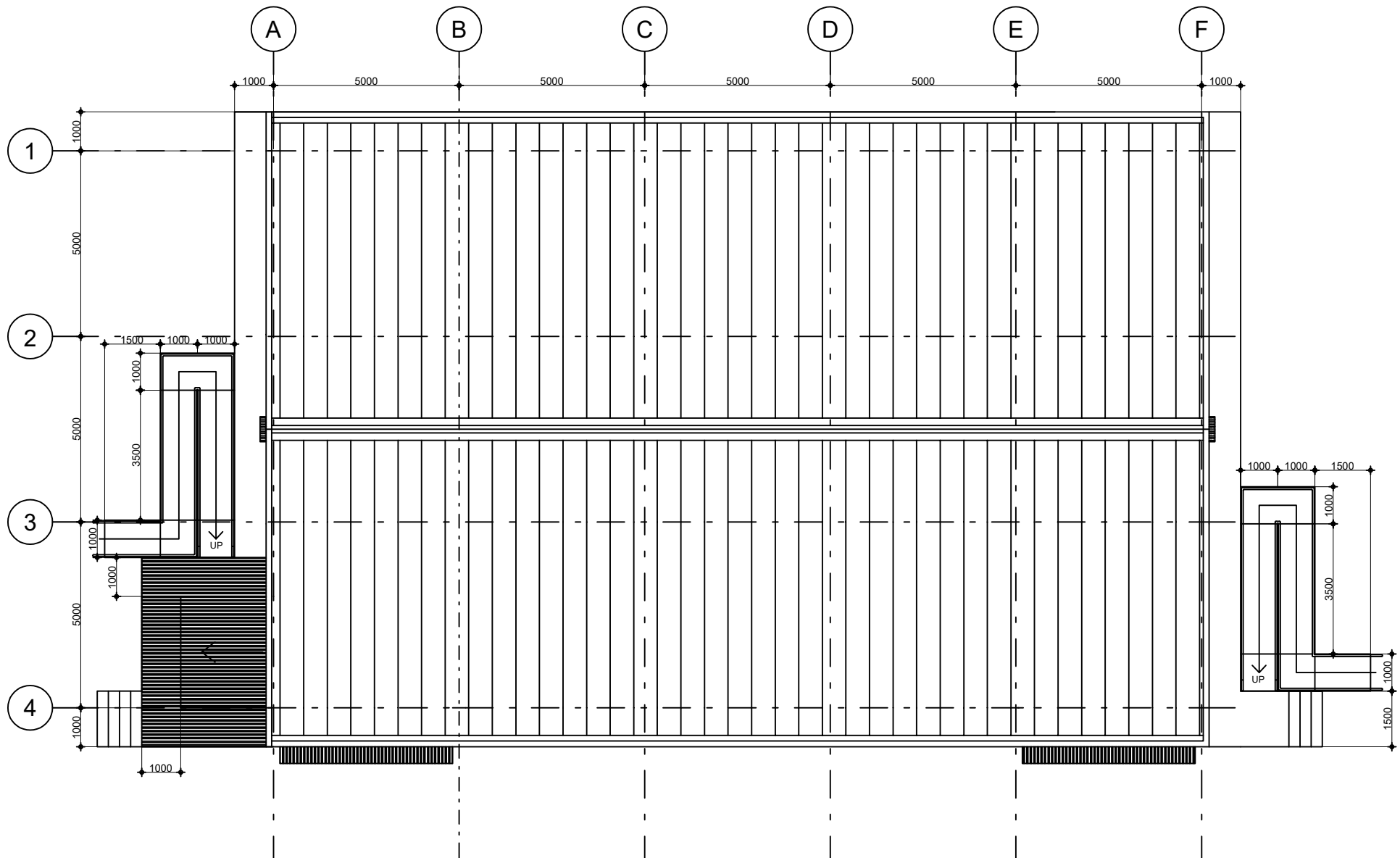
Sheet No.:
A-05



A **LEFT SIDE ELEVATION**
6-1 SCALE: 1000:1 m



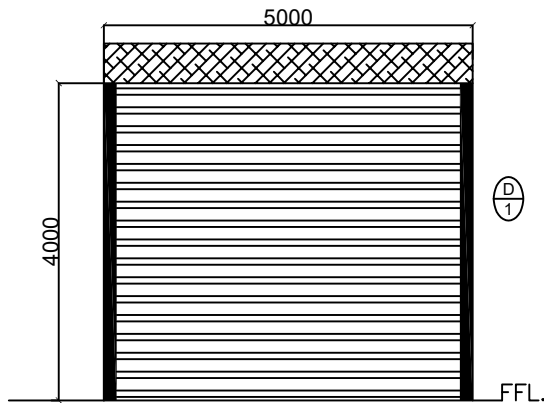
PROJECT TITLE	Sheet Content:	Sheet No.:
MODULAR DESIGN FOR THE ESTABLISHMENT OF VILLAGE-TYPE CORN PROCESSING CENTER	LEFT SIDE ELEVATION	A-06
PROJECT LOCATION		



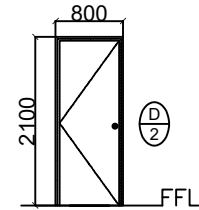
A TOP ELEVATION
7-1 SCALE: 1000:1 m



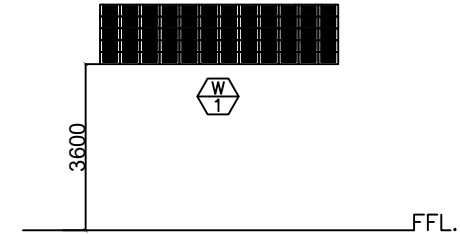
PROJECT TITLE	Sheet Content:	Sheet No.:
MODULAR DESIGN FOR THE ESTABLISHMENT OF VILLAGE-TYPE CORN PROCESSING CENTER	TOP ELEVATION	A-07
PROJECT LOCATION		



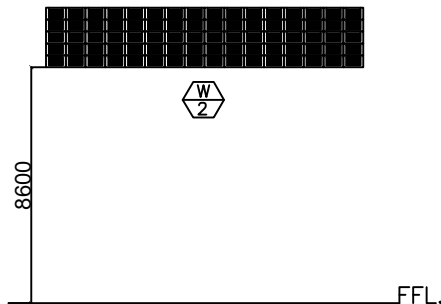
DESCRIPTION:
 GALVALUME ROLL UP
 DOOR WITH COMPLETE
 LOCKSET
 LOCATION: SEE FLOOR
 PLAN



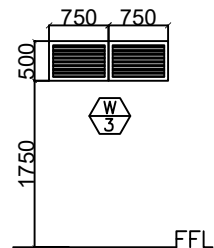
DESCRIPTION:
 $\frac{1}{2}$ " ORDINARY PLYWOOD
 AND JAMB DOOR
 CHOCOLATE BROWN
 STAINED FINISH WITH
 COMPLETE LOCKSET
 LOCATION: SEE FLOOR
 PLAN



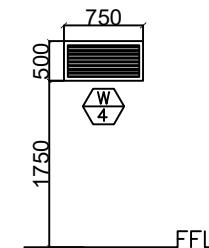
DESCRIPTION:
 4" CONCRETE LOUVER
 BLOCKS 60 PCS
 (5 ROWS, 12 COLUMNS)
 WITH ALUMINUM FRAME
 SCREEN (#16 MESH)
 LOCATION: SEE ELEVATION
 PLAN



DESCRIPTION:
 4" CONCRETE LOUVER
 BLOCKS 60 PCS
 (5 ROWS, 12 COLUMNS)
 WITH ALUMINUM FRAME
 SCREEN (#16 MESH)
 LOCATION: SEE ELEVATION
 PLAN



DESCRIPTION:
 ALUMINUM LOUVER WINDOW
 WITH ALUMINUM FRAME
 SCREEN (#16 MESH)
 LOCATION: SEE ELEVATION
 PLAN



DESCRIPTION:
 ALUMINUM LOUVER WINDOW
 WITH ALUMINUM FRAME
 SCREEN (#16 MESH)
 LOCATION: SEE ELEVATION
 PLAN

A
 8-1

SCHEDULE OF DOORS & WINDOWS

SCALE: 1000:1 m



PROJECT TITLE
MODULAR DESIGN FOR THE ESTABLISHMENT OF VILLAGE-TYPE CORN PROCESSING CENTER

PROJECT LOCATION

Sheet Content:

SCHEDULE OF DOORS &
 WINDOWS

Sheet No.:

A-08



BUREAU OF AGRICULTURAL AND FISHERIES ENGINEERING

Sugar Regulatory Administration (SRA) Compound, North Avenue,
Diliman, Quezon City
www.bafe.da.gov.ph