ADDENDUM NO. 1

PROCUREMENT OF PLANTAIN & BANANA PROCESSING EQUIPMENT FOR ONE DISTRICT ONE FACTORY (IDIF) ENABLE YOUTH (EY) FACILITIES - (SUPPLY & INSTALL) (MOTI/REP/ICB/EY/1D1F/ICB/2022/08)

REVISED TECHNICAL SPECIFICATIONS (SR I)

SR1 Technical Specifications

The supply of goods and related services shall comply with the following technical specifications and standards:

PLANTAIN & BANANA PROCESSING EQUIPMENT

Item A: THREE (3) COMPLETE SETS OF OF SEMI-AUTOMATED PROCESSING EQUIPMENT FOR PLANTAIN TO PLANTAIN FLOUR

Locations:

1. Mireku Nkwanta, Asunafo North Municipal (Goaso)
2. Subri Junction, Bibiani-Anhwiaso (Bibiani)
3. Agogo Industrial Enclave, Asante Akim North (Agogo)

Technical Specifications

Designed Capacity: 4000 kg/day (input of unpeeled plantain) (8 hours working day)

S. No	Equipment	Specification	Unit Per Site	Qty	Total
1	Heavy duty platform weighing scale	• Capacity: 2000kg (min) • Minimum dimension: 1800 x 1800 mm • Load cell based LED display • Battery operated. Battery to be charged by 220 v 50 Hz A C supply	1	3	3
1a.	Freshly harvested plantain washing station	• 0.5 m^3 washing tray with 0.5 m^3 add on table with perforated top for sieving the water from washed plantains. The add on table shall have water collecting tray under the perforated top with water drainage arrangement • All SS 304 construction • For sorting and washing of fruits manually. • Provision for effluent water discharge and fresh water replenishment to be provided • The washing trays and perforated table shall be at convenient height so as not to put any strain on the workers during washing process	2	6	6
1b.	Plantain Peeling station	• Table for peeling of green plantains manually • Table top made of S S 304 • Support structure made of GI sheet 120 GSM not thinner than 3 mm	1	3	3

S. No	Equipment	Specification	Unit Per Site	Qty	Total
		• Length 4 m, Width 2 m, Height 0.7m with seating arrangement of workers on both sides of the table.			
2	Plantain slicers	• Complete with set of blades for long slice, round slice, and strips slices. • With provision to vary the thickness of slices • Capacity: 500kg per hour (maximum) • Material: Stainless steel (food contact part) SS304	1	3	3
3	Blanching machine	• Input capacity shall be 200 kg per batch of 15 minutes • Material: Stainless steel (food contact part) SS 304 • Power: Electricity • To be supplied with all the required accessories	1	3	3
4	Plantain dehydrating unit complete with all accessories and inbuilt temperature regulator	• Max drying temp of hot air: shall not exceed 75^{o}C • Heating source : Electricity • The type of dryer should be electricity operated multiple tray cabinet batch type dryer • Capacity: The drying capacity of the system should be at least 2 tons per batch of 15 hours based on sliced plantain. The dryer should be able to dry the material from initial moisture content of about 60 to 70 % down to about 9 - 10 % to make the sliced plantain suitable for converting them into flour with the help hammer mill • Bidder to decide the number of trays per dryer and number of cabinet dryers required to achieve the drying requirement of minimum of 2 tons in 15 hours • Material: Stainless steel (food contact part) SS 304 • Power: 380V/3PH, 50/60HZ	1	3	3
5	Screw Conveyor (feeding hammer mill with dehydrated plantain slice)	• Type: Suitable screw type that continuously feed hammer mill with dehydrated plantain slice. • Material: Stainless steel (food contact part) SS 304	1	3	3
6	Hammer mill for plantain powder complete with all accessories	• Capacity: 300 kg per hour • Fineness of the flour: - 100 mesh • Material: Stainless steel (food contact part) SS 304 • Powered: Electric motor (suitable HP) • Dust free system.	1	3	3

S. No	Equipment	Specification	Unit Per Site	Qty	Total
7	Screw Conveyor (between hammer mill and Vibro-Sieving Machine)	• Type: Suitable screw type that continuously feed Vibro-Sieving Machine with plantain flour from the hammer mill. • Material: Stainless steel (food contact part) SS 304	1	3	3
8	Vibro-Sieving Machine	• Capacity 300 kg per hour based on plantain flour • Single deck • Fitted with wire mesh of SS 304 • Mesh size :120 mesh • Additional 2 sieves to be supplied 120 mesh • Complete with vibro motors • All contact parts in SS 304	1	3	3
9	Screw Conveyor with 2 way dischage valve to feed either packing machine or ribon mixture as per requirement	• Type: Suitable screw type that continuously feed either packing machine or Ribbon Mixer with plantain flour from the Vibro-Sieving Machine. As per requirement • Material: Stainless steel (food contact part) SS304	1	3	3
10	Ribbon Mixer	• 300L capacity of mixer. • 3HP geared motor with VFD.	1	3	3
11	Screw Conveyor (between Ribbon Mixer and Filling & Sewing machine)	• Type: Suitable screw type that continuously feed Filling and sewing machine with plantain flour from the Ribbon Mixer. • Material: Stainless steel (food contact part) SS304	1	3	3
12	Filling and sewing machine (for filling bags with plantain flour and sealing/ sewing)	**Dosing mode: Real-time dual speed weigh-fill (high speed bulk fill & slow speed top-up fill)** **Single Head Flour Bagging Machine for Plantain flour** • For non-free flowing material • Material to be Packed: Flour • Density (Flour): 0.55 KG/m^3 • Weighing Range: 1 Kg - 10 Kg • Weighing Speed: 3 to 4 bags per minute • Capacity of feeding hopper: 1 m^3 • Load cell based • Power Supply Electricity • Weighing Accuracy: ± 0.3 % • Air Supply (m^3/min): 5 m^3/min • System Pressure: 6 - 8 bar **Bag Closer with conveyor** • Sewing head with 1 HP motor 4 threads • Conveyor 4 meter long with PU belt with bottom guide	1	3	3

S. No	Equipment	Specification	Unit Per Site	Qty	Total
		• Conveyor height adjustment • Belt width 450 mm • Stitching head should be mount on heavy duty height adjustable pillar with thread stand • Bag Guide raling on both side • Bag movement in both direction • Speed synchronization with VFD • Material: Stainless steel (food contact part) SS 304			

Note:

1. Plantain washing, sorting and peeling shall be done manually

NB: Bidders should take note and provide the following:

1. *All the supplied equipment put together synchronizes in operation to process 4000 kg/day (input of unpeeled plantain) (8 hours working day)*
2. *The assembled equipment fit into a processing area of **9950 mm x 9850mm by a height of 5000mm. The Floor space should include a working space of 1.5m all around within the specified floor area.***
3. *The equipment layout fit for the specified processing area (space).*
4. *The capacity of all the motors on the equipment supplied*
5. *All electric motors shall be suitable for operation on 220V-240V, 50/60Hz, single phase and/ or 380V-415V, 50Hz, 3 phases compliant.*
6. *The cumulative capacity of the motors and average power demand or consumption for start and running of the equipment.*
7. *The minimum load requirement for power panel that is required to be installed for the plant.*
8. *All electrical appliances, motors starter, switches etc should meet IP 54 insulation rating.*
9. *Total electric power required to run the whole plant should be clearly mentioned.*
10. *Provide all other special additional installation that will be required beyond the stated equipment schedule.*
11. *The minimum load requirement for power panel that is required to be installed for the plant.*
12. *Evidence that the equipment quoted are based on the manufacturer's current standard production models and are suitable for continuous operations in tropical conditions.*
13. *All food contact parts are food grade stainless steel (SS304).*
14. *All mild steel components shall be painted with 2 coats of red oxide followed by two coats of enamel plant.*
15. *Bidders should quote for all the machines of the plant on turnkey basis. Quote of Individual Machines will not be accepted.*
16. *Detailed catalogue for each of the machines for the entire processing line shall be provided*
17. *The equipment supplier to arrange installation and commissioning of plant on turn key basis. He has to arrange all installation material like civil foundation of machines, tools, cables, wires, foundation frames, railings, piping, ducting, plumbing, electrification, nuts, bolts, foundation bolts welding set, crane for lifting the machines, labourers, and General Drainage systems (approx. 20m long 300mm U-drains) within the processing area, etc at suppliers cost.*

The above should be clearly stated by all bidders and all drawings for the entire line including dimensions of each machine shall be provided. All the equipment shall strictly fit into the floor space provided. Cost for concrete platforms/pits/foundations, if any, machines anchoring, etc shall be done at the suppliers's cost.

Process Flow Diagram of Plantain Flour Plant:-

Removal of Bad Fruits

Removal of outer core

Cutting plantain into slices

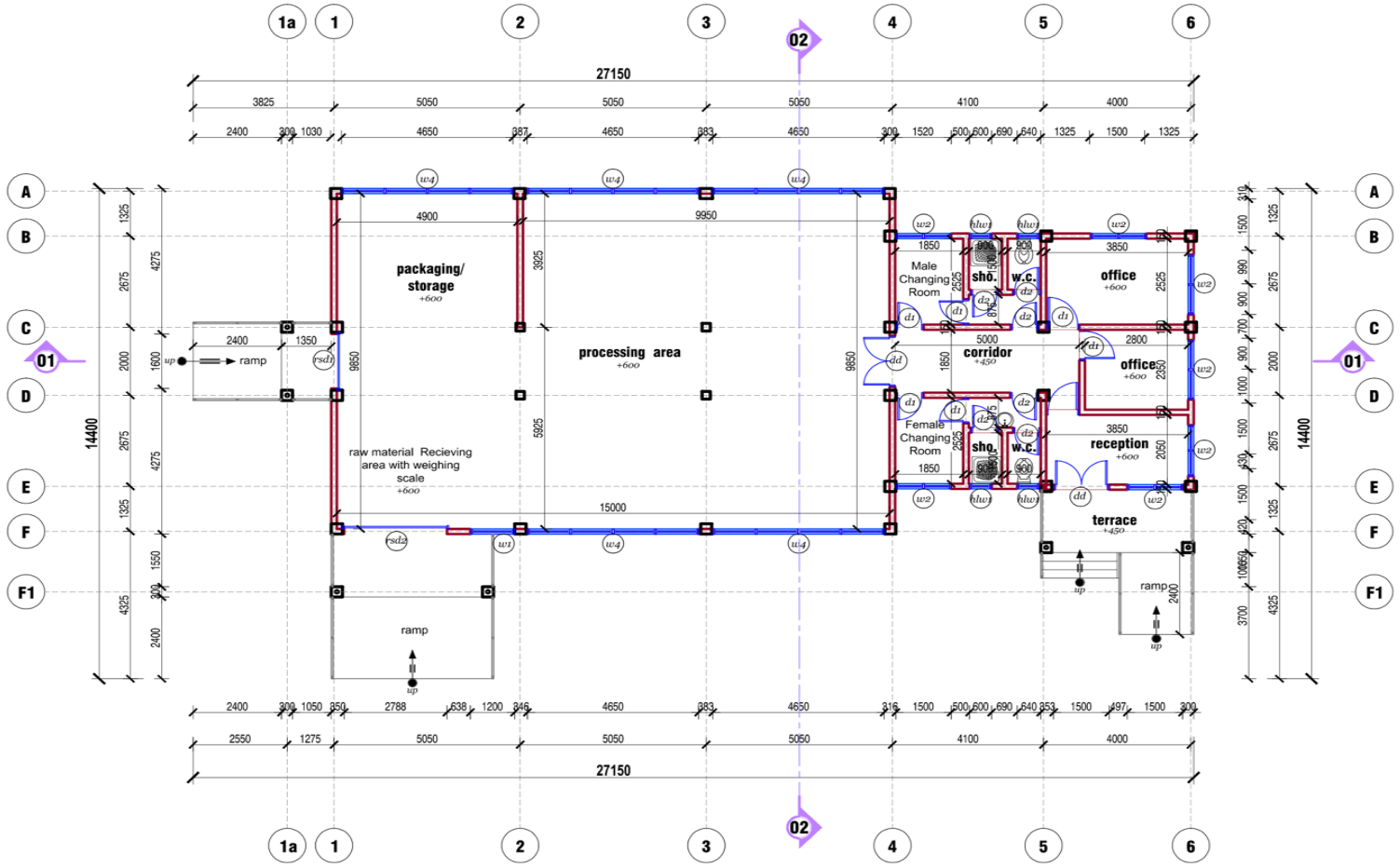
Removal of water from plantain (Max 75°C for 24 hrs.)

Grinding Plantain into flour

Sieving of flour through for mesh

Ribbon Mixer - For Mixing with imported cassava flour, or other flour as per requirement

Moisture proof packaging in HDPE bags



GROUND FLOOR PLAN

Item B: ONE (1) COMPLETE SET OF SEMI-AUTOMATED PROCESSING EQUIPMENT FOR BANANA TO BANANA CHIPS

Location:

1. Mpraeso, Kwahu South

Technical Specifications

Designed Capacity: 2000 kg/day (input of unpeeled banana) (8 hours working day)

S. No	Equipment	Specification	Qty
1	Heavy duty platform weighing scale	• Capacity: 1000kg (min) • Minimum dimension: 1200mm x 1200mm • Load cell based LED display • Battery operated. Battery to be charged by 220 v 50 Hz A C supply	1
2	Stainless steel washing trough	• 1800mm x 600mm	2
3	Peeling station	• Long stainless-steel table with attached sinks (6no) 4.00m long.	1
4	Banana Slicing Machine	• Capacity: 200kg/hr. • Complete with set of blades for long slice, and round slices. • Thickness: should vary in the range of 2mm to 6mm of sliced banana. • Material: Stainless steel (food contact part) SS304	1
5	Banana Chips frying unit	• Batch type • Heating source: Electricity • Complete with all accessories like deoiling machine, deoiling output conveyor, filter box, oil tank, oil adding pump, oil circulating pump etc • Capacity: Suitable for frying peeled banana at 80kg/batch within 10minutes. • Material: All food Contact Parts shall be made of SS304 • All accessories ready to use for making Banana chips with tilting arrangement	1
6	Banana Chips Flavoring Unit with powder feeder with output conveyor	• Capacity: Suitable for an input of fried banana chips @ 40 – 50 kg/batch • Material: All Contact Parts shall be made of SS304	1
7	Utilities and Accessories	• Capacity: Suitable for the Banana Chip Making Plant. • Pumps, SS motor control box, plumbing, piping etc. to make complete banana chips line complete ready to use	1 complete Set
8	Automatic Chip packing machine	• Vertical Form Fill Seal Machine (VFFS) • Pouch capacity: 10 – 100grams • Capacity (pouch per minute): 30 – 40 • Machine power: Suitable HP • Driven type: Electric	1

Note:

1. Banana washing, sorting and peeling shall be done manually

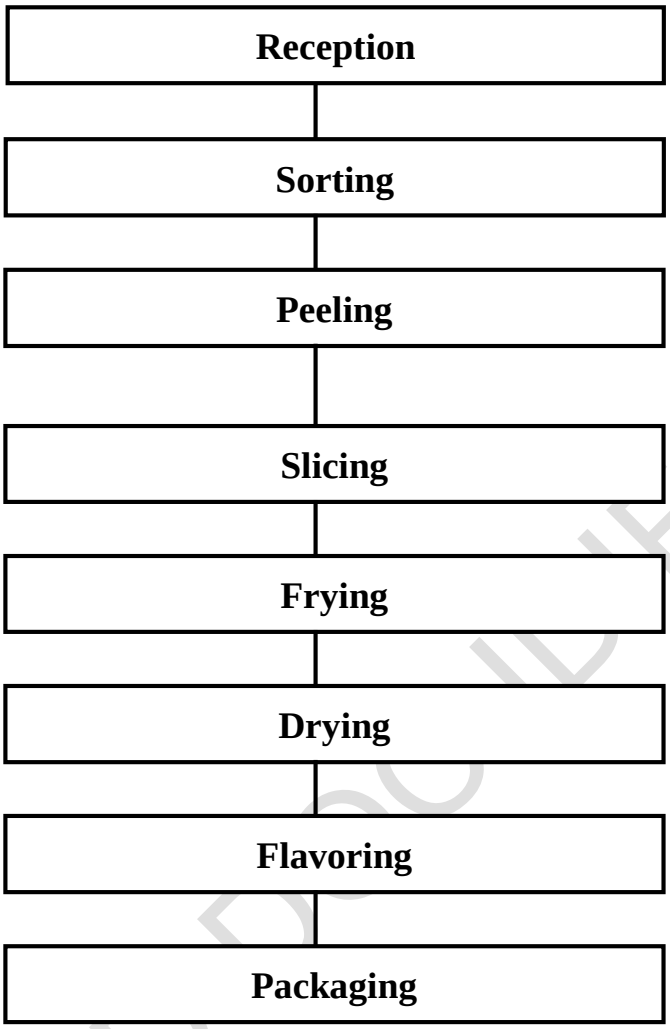
NB: Bidders should take note and provide the following:

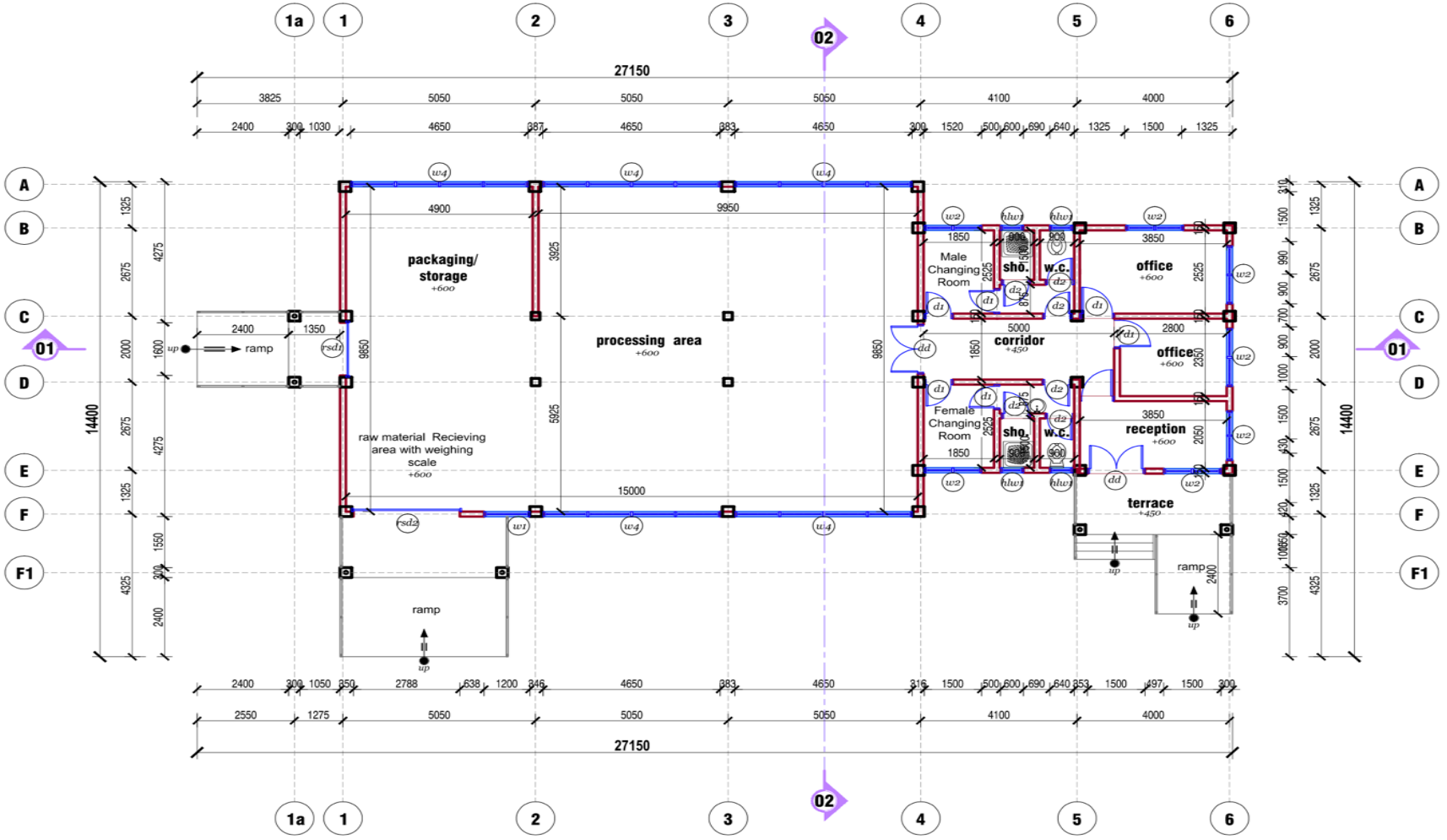
1. *All the supplied equipment put together synchronizes in operation to process 2000 kg/day (input of unpeeled banana) (8 hours working day).*
2. *The bidder must submit a detailed technical commentary on each equipment detailed technical specifications to indicate their understanding /inference of the equipment and the salient features/advantages of the equipment offered.*
3. *The assembled equipment fit into a processing area of **9950 mm x 9850 mm by a height of 5000mm. The Floor space should include a working space of 1.5m all around within the specified floor area.** And bidder should mention any additional civil foundation, structural requirement needed to set up the plant.*
4. *The layout diagram for the plant to be submitted for the specified processing area (space).*
5. *The capacity of all the motors on the equipment supplied with Motor control panels required for main and power points.*
6. *The cumulative capacity of the motors and average power demand or consumption for start and running of the equipment.*
7. *Motor Control Centres / Electric Contract panel for the plant are not to be quoted. Only Motor, starter and switch should be quoted. Cost of motor, starter switch should be included in the cost of machines.*
8. *Make of bearings shall be SKF/NTN/NRB/FYH/ Equivalent*
9. *Make of motors shall be siemens/Rotomotive/Bonfuglioli/ SEW/Equivalent.*
10. *Make of VFD if fitted any shall be Schneider/Siemens /equivalent.*
11. *Bidders to quote all accessories and utilities like storage tanks, pumps, piping, oil tanks, burner, steam boilers, air compressors, foundation frames of the machines, dust collector air ducting, elevation pit cover, etc. which are required to complete the plant on turn key basis.*
12. *The minimum load requirement for power panel that is required to be installed for the plant.*
13. *All electrical appliances, motors starter, stitches etc should meet IP 54 insulation rating.*
14. *All electric motors shall be suitable for operation on 220V-240V, 50/60Hz, single phase and/ or 380V-415V, 50Hz, 3 phases compliant.*
15. *Total electric power required to run the whole plant should be clearly mentioned.*
16. *All food contact parts are food grade stainless steel (SS304).*
17. *All mild steel components shall be painted with 2 coats of red oxide followed by two coats of enamel plant.*
18. *Evidence that the equipment quoted are based on the manufacturer's current standard production models and are suitable for continuous operations in tropical conditions.*
19. *Provide all other special additional installation that will be required beyond the stated equipment schedule.*
20. *Bidders should quote for all the machines of the plant on turnkey basis. Quote of Individual Machines will not be accepted.*
21. *The equipment supplier to arrange installation and commissioning of plant on turn key basis. He has to arrange all installation material like civil foundation of machines, tools, cables, wires, foundation frames, railings, piping, ducting, plumbing, electrification, nuts, bolts, foundation bolts welding set, crane for lifting the machines, labourers, and General Drainage systems (approx. 20m long 300mm U-drains) within the processing area, etc at his cost.*

The above should be clearly stated by all bidders and all drawings for the entire line including dimensions of each machine shall be provided. All the equipment shall

strictly fit into the floor space provided. Cost for concrete platforms/pits/foundations, if any, machines anchoring, etc shall be done at the contractor's cost.

Process Flow Diagram of Banana and Plantain Chips:-





GROUND FLOOR PLAN