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कृषि एवं किसान कल्याण मंत्रालय (कृषि अनुसंधान एवं शिक्षा विभाग), भारत सरकार
भाकृअनुप - केन्द्रीय कपास प्रौद्योगिकी अनुसंधान संस्थान
(भारतीय कृषि अनुसंधान परिषद)
Ministry of Agriculture and Farmers Welfare (Department of Agricultural Research and Education), GOVERNMENT OF INDIA
ICAR - CENTRAL INSTITUTE FOR RESEARCH ON COTTON TECHNOLOGY
(Indian Council of Agricultural Research)

File No. SMART Project/Cost Norms/G&P/45 Dated: 03.04.2023

To,
Shri Dashrath L. Tambale
Director, ATMA & Head, Project Implementation Unit, Agriculture,
SMART Project, MSFC Building,
270, Bhamburda, Senapti Bapat Marg,
Opp. Symbiosis College, Gokhalenagar, Pune 411016, MS

Sub: Submission of cost norms, detailed specifications, and protocols for establishment of viable ginning and pressing plant – reg.

Ref: MoU signed dated Feb 07, 2023.

Dear Sir,

With reference to the above subject, please find herewith the cost norms, detailed specifications, and protocols for establishment of viable ginning and pressing plants under the SMART project as mentioned deliverables 3 and 4 in MoU as referred above. The proforma invoice for the same will be sent shortly. The preparation of cost norms for other deliverables is under progress and will be communicated within the dead line.

Thanks, with Regards

(S. K. Shukla)
Director

List of enclosures: 1) Cost norms; 2) Detailed specifications; 3) Standard protocols

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COST NORMS FOR ESTABLISHMENT OF A VIABLE GINNING & PRESSING PLANT UNDER THE SMART PROJECT IN MAHARASHTRA STATE

Procedure adopted for fixing the cost norms for establishment of viable ginning and pressing plant in Maharashtra State under the SMART project -reg.

1. A committee under the Chairmanship of the Director, ICAR-CIRCOT, Mumbai was constituted for fixing the cost norms for establishing viable ginning and pressing plants in Maharashtra State under the SMART project.
2. The committee developed complete detailed specifications and standard protocols for establishment of a viable modern ginning and pressing plants of 10-12 bales/h capacity.
3. The committee approached several Original Equipment Manufacturers (OEMs), stakeholders, ginning entrepreneurs, etc. for cost of each and every machine, equipment, system, etc. as per detailed specifications.
4. The committee worked out the cost norms of the civil work based on the CPWD schedule of rates and consultations from ginneries and other stakeholders.
5. Based on the examination of cost of Plant Machinery and Equipment received from the OEMs, inputs available with the Members of the Committee, feedback and consultations from various stakeholders including gin entrepreneurs, the committee fixed the cost norms for essential Plant, Machinery, Equipment, Allied Machinery, Pre-engineered Buildings, Civil Work, etc. required for establishment of a modern ginning plant of 10-12 bales/h capacity. The detailed cost norms and specifications are given in Annexures A to I, separately.
6. The cost norms given here are inclusive of all prevailing taxes, transportation charges, erection, and commissioning charges, insurance charges during transportation, and MSEB electricity connection charges, etc.
7. The cost norms are considered for standard branded machinery and equipment.
8. The cost norms are strictly based on the assumption that the ginning and pressing machinery as mentioned in annexure A are purchased from a single vendor on the turkey basis.
9. Each item essential for establishment of a modern ginning plant is included in the cost norms. There is no need for considering grant for any other machinery, equipment for establishment of the ginning and pressing plant under the SMART project.
10. The cost norm has not considered insurance charges required essentially for the operation of a ginning and pressing plant.
11.

(S. K. Shukla)
Director

Total Cost for Establishment of a Ginning & Pressing Plant of 10-12 Bales/h Capacity

Sr. No.	Heads	Cost (Rs. in lakh)	Annexures
1.	Ginning & Pressing Machinery with up packing baling press **OR** Ginning & Pressing Machinery with down packing baling press	254.0 **OR** 284.0	A
2.	Complete Electrical Works	45.0	B
3.	Complete Pre-Engineered Buildings (PEBs)	160.0	C
4.	Complete Civil Works	200.0	D
5.	Tractor with Loaders	18.5	E
6.	Weigh bridge	10.0	F
7.	Humidification system	3.5	G
8.	Firefighting system	25.0	H
9.	Orientation course and ginning training programmes	2.0	I
Total Cost for Ginning & Pressing Plant with Up Packing Press		**718.0**	
Total Cost for Ginning & Pressing Plant with Down Packing Press		**748.0**	

Option I: Total Cost for Ginning & Pressing Plant with Up Packing Press (in words): Rupees seven hundred and eighteen lakh only

Option II: Total Cost for Ginning & Pressing Plant with Down Packing Press (in words): Rupees seven hundred and forty-eight lakh only

Annexure A

GINNING & PRESSING MACHINERY (CAPACITY: 10-12 BALES/H)

Sr. No.	Type of Machinery	Cost (Rs. in lakh)
1.	**Seed Cotton Dispensing System/Tractor Hopper Feeder:** Seed cotton storage capacity: 2000 kg, 24 feet long feed belt, Powder coated heavy duty hopper box with acrylic windows, including all essential electricals and control panels, drive arrangement, VFD, etc. **(1 Set)**	**256 Lakh (For Up packing Press)** **286 Lakh (For Down packing Press)**
2.	**Pneumatic Seed cotton Conveying System from Dispenser to Pre-cleaner:** Conveying capacity 5000 kg/h seed cotton to around 10 to 15 m, air separator with vacuum wheel rotary air lock with drive arrangement including frames, V-belts, in-line stone catcher, etc. **(1 Set)**	
3.	**Pre-cleaner:** Seed cotton cleaning capacity: 5000 kg/h, width: 1500 mm, spiked cylinders-06 Nos. with six row spikes, all electricals, drive arrangements, etc. **(1 Set)**	
4.	**Central Trolley System:** Two central trolleys for feeding to 10/12 DR gins each, seed cotton cross inclined belt conveyor (1000 mm) and inclined belt conveyor (1000 mm), microprocessor-based control feeding, including all electricals, drives, accessories, etc. **(2 Sets)** **OR** **Screw Conveyor System:** For feeding 2 rows with 10/12 DR gins in each row, microprocessor-based control feeding, overflow and regulated feeding mechanism, including all electricals, drives, accessories, etc. **(2 Sets)**	
5.	**Auto Feeders for DR Gins:** Heavy duty auto feeders for seed cotton feeding to 54"/60" roller length DR gins, including all electricals, drives, accessories, etc. **(24/20 Sets)**	
6.	**DR Gins with 54" Roller Length:** Capacity: 70-80 kg lint/h, Roller diameter: 170 mm, Robust wide base C.I. frames, including all electricals, drives, accessories, etc. **(24 Sets)** **OR** **DR Gins with 60" Roller Length:** Capacity: 80-90 kg lint/h, Roller diameter: 180 mm, Robust wide base C.I. frames, including all electricals, drives, accessories, etc. **(20 Sets)**	
7.	**Pneumatic Intermittent Lint Suction System:** Capacity: 2000 kg/h lint conveying from DR gins to lint cleaner, 10 HP heavy duty centrifugal fan coupled with electrical motor, 1D2D cyclone separator, 300 mm GI piping, including all electricals, drives, accessories, etc. **(1 Set)**	
8.	**Lint Cleaner:** Lint cleaning capacity: 2000 kg/h, width: 1500 mm, 105 mm spikes, spiked cylinders-06 Nos. with six row spikes, all electricals, drive arrangements, etc. **(1 Set)**	
9.	**Inclined Lint Belt Conveyor System**: Lint conveying capacity: 2000 kg/h from post cleaner to baling press lint slide, Belt length:	

Sr. No.	Type of Machinery	Cost (Rs. in lakh)
	80/120 feet for up-packing and down packing press, respectively, belt width: 1200 mm, all electricals, drive arrangements, etc. **(1 Set)**	
10.	**UP Packing Baling Press:** Baling capacity 10-12 bales per hour of 170 kg each, oil hydraulic, double box revolving type, handling system, weighing, and bagging system, all electricals, drive arrangements, etc. **(1 Set)** **OR** **DOWN Packing Baling Press:** Baling capacity 10-12 bales per hour of 170 kg each, oil hydraulic, double box revolving type, handling system, weighing, and bagging system, all electricals, drive arrangements, etc. **(1 Set)**	
11.	**Cottonseed Screw Conveyors:** Two lines below 10/12 DR gins and a line of cross conveyor, cottonseed conveying capacity: 2500 kg/h each line below DR gins and 5000 kg/h cross conveyor, all electricals, drive arrangements, etc. **(1 Set)**	
12.	**Cottonseed Belt Type Bucket Elevator:** Capacity: 5000 kg/h cottonseed lifting from about 7 m from cross conveyor, all electricals, drive arrangements, etc. **(1 Set)**	
13.	**Cottonseed Overhead Screw Conveyor:** Capacity: 5000 kg/h cottonseed conveying from bucket elevator to 200' distance, 8 Nos. seed dropping points for heaping, two-way cotton seed manual bagging arrangement at the discharge end of the bucket elevator, all electricals, drive arrangements, etc. **(1 Set)**	
14.	**Fire Detection and Diversion System:** GreCon sensor-based fire detection & diversion of lint from lint suction to lint cleaner with control panel and hooter, all electricals, drive arrangements, etc. **(1 Set)**	
15.	**Allied Machinery and Accessories:** Heavy duty motorized roll cutting machine and roll cutting stand for 54/60" roller length, grease gun, tool box containing 44 items required for operation & fitting work of ginnery, bale handling trolley, etc. **(1 Set)**	
16.	**Structures For Automation Equipment:** Mounting and support structure for all machinery as mentioned in the detailed document	
17.	**CIRCOT Lab Model Gin for Cotton Grading:** Ginning capacity: 4-5 kg seed cotton/h, **r**oller length: 300 mm, all accessories, electricals, drive arrangements, etc.	
18.	**Moisture Meters:** One each for moisture measurement of seed cotton, lint in loose form and bales and cottonseed having appropriate electrodes for measuring moisture from heap and bales. **(3 Sets)**	

Annexure B

COMPLETE ELECTRICAL WORKS

Sr. No.	Type of Machinery	Cost (Rs. in lakh)
1.	**MSEB Demand Charges**	**45.0**
2.	**HT Line to Plant Connection:** From 11kV line to the 400 kVA transformer,	
3.	**Transformer:** Capacity: 400 kVA, 3 phase, 50 Hz and Voltage Ratio 11 kV/ 433 V	
4.	**Incomer Cables and Accessories from Transformer to PCC Panel:** Armourd, 1.1 kV Grade Copper Cables for all lines, earthing of all motors through hot deep GI strip and GI wire, etc.	
5.	**PCC PANEL WITH 1000 AMP CIRCUIT BREAKER:** Incomer capacity of 4 pole, 630-amp MCCB and controlling operations of feeders, etc.	
6.	**Cables and Accessories from PCC To MCC Panel**	
7.	**MCC Panel and Accessories**	
8.	**Field Cable and Accessories from MCC Panel to Electric Motors**	
9.	**APFC Panel with Accessories and Capacitor Bank**	

Annexure C

COMPLETE PRE-ENGINEERED BUILDINGS (PEBs)

First Building Building Description

Sr. No.	**Ginning, Pressing Halls & Cottonseed Storage Building**	**Cost Rs. in lakh)**
1.	Roof Type: **Pitched Roof – Unsymmetrical Slope**	**70.0**
2.	Dimensions: **Length x Width: 15.00 x 84.00m (**Centre to Centre of Steel Columns)	
3.	Clear Height at Lower Side: 11.00m for 03-High Bays & 8.00m for 09-Low Bays from FFL **(For down packing Press) OR** 8.00m from FFL **(For up packing Press)**	
4.	Width Module: 1@15.00m	
5.	Roof Slope: 1:10	
6.	Bay Spacing: **12 Bays@7.00m.**	
7.	Type of End Frames: **End Walls:** Rigid Frame (Expandable Frame) with Wind Column Spacing (**2@7.50m)**	
8.	Type of Bracing in Side walls: Rod Bracing - **Along GL "A & C"**	
9.	Type of Bracing on Roof: Rod Bracing	
10.	Type of Eave: Eave gutter and Downspout **Along GL "A"**	
Open Wall Conditions (First Building)		
1.	Near Side Wall (Along GL "C"): Sheeted from FFL from FL-1 to 9. Full Height Open from FL-9-13.	
2.	Far Side Wall (Along GL "A"): Sheeted from FFL from FL-1 to 9. Full Height Open from FL-9-13. Sheet Curtain of 3.00m from Eaves & Below Open for Access from FL-9-13.	
3.	Partition Walls (Along FL "9"): Full height Sheeted & open for Access	
4.	Left End Wall (Along GL "1"): Full sheeted	
5.	Right End Wall (Along GL "13"): Sheet Curtain of **3.00m** from Eaves & Below Open for Access	

Second Building Building Description

Sr. No.	**Bale and Raw Cotton Storage Building**	**Cost (Rs. in lakh)**
1.	Roof Type: **Pitched Roof – Unsymmetrical Slope**	**90.0**
2.	Dimensions: **Length x Width: 30.00 x 84.00m (**Centre to Centre of Steel Columns)	
3.	Clear Height at Lower Side: 6.50m from FFL.	
4.	Width Module: 1@30.00m	
5.	Roof Slope: 1:10	
6.	Bay Spacing: **12 Bays@7.00m.**	
7.	Type of End Frames: **End Walls:** Rigid Frame (Expandable Frame) with Wind Column Spacing **(4@7.50m)**	
8.	Type of Bracing in Side walls: Rod Bracing - **Along GL "C" Portal Bracing at GL-"G"**	

Sr. No.	Bale and Raw Cotton Storage Building	Cost (Rs. in lakh)
9.	Type of Bracing on Roof: Rod Bracing	
10.	Type of Eave: Eave gutter and Downspout **Along GL "G"**	
Open Wall Conditions (Second Building)		
1.	Open up to **3.00m** from FFL by others & above is sheeted from FL-1to3 Sheet. Curtain of 2.00 m from Eaves & Below Open for Access from FL-3-13	
2.	Common Wall between Area#01 & Area#02.	
3.	Full sheeted from FFL	
4.	Full sheeted from FFL. Curtain of 2.00 m from Eaves	
5.	Sheet Curtain of 2.00m from Eaves & Below Open for Access	

Annexure D

COMPLETE CIVIL WORKS

Sr. No.	Details of Civil Works	Cost (Rs. in lakh)
1.	**First Building: Ginning, Pressing Halls & Cottonseed Storage Building (15.00 x 84.00m)** Excavation, murrum filling, anti-termite treatment, PCC 1:4:8 (M10 Grade), RCC M25 grade, Trimix Flooring 125 mm thickness, M25 grade, TMT/HYSD Steel bars, internal and external plasters and paintings, window grills, AL windows, rolling shutters as given in layout	**200.0**
2.	**Second Building: Bale and Raw Cotton Storage Buildings** Excavation, murrum filling, anti-termite treatment, PCC 1:4:8 (M10 Grade), RCC M25 grade, Trimix Flooring 125 mm thickness, M25 grade, TMT/HYSD Steel bars, internal and external plasters and paintings, rolling shutters as given in layout	
3.	**Blower, cyclone, and dust Rooms** Excavation, murrum filling, anti-termite treatment, PCC 1:4:8 (M10 Grade), RCC M25 grade, Trimix Flooring 125 mm thickness, substructure, super structure, M25 grade, TMT/HYSD Steel bars, internal and external plasters and paintings, steel doors as given in layout	
4.	**Administrative Office, Security Room and Workers' Residence** • Security room (3m x 3m) • Administration office building (7m x 10m) • Workers' residence (18mx4m)	
5.	**Boundary wall:** Wire fencing around 600 m	
6.	**Drainage system for PEB** Hume piping (300, 450 and 600 mm) and chamber work (600x600x600 mm & 750x750x750 mm	
7.	**WEIGH BRIDGE FOUNDATION WITH RAMP & WEIGH BRIDGE CABIN** Excavation, murrum filling, anti-termite treatment, PCC 1:4:8 (M10 Grade), RCC M25 grade, TMT/HYSD Steel bars, internal and external plasters and paintings, flush doors, windows, etc.	
8.	**WBM Roads** 150 m length 9 m wide road	
9.	**Machinery Foundation Work** Excavation, PCC 1:4:8 (M10 Grade), RCC M25 grade, TMT/HYSD Steel bars, substructure, internal and external plasters, water proofing, sand filling	
10.	**Underground water tank (1 lakh litre capacity) 7 m x 5 m x 2.9 m (length x width and depth)**	

Annexure E

TRACTOR WITH LOADERS

Sr. No.	Type of Machinery	Cost (Rs. in lakh)
1.	**Tractor:** Turbo charged Engine of 55 HP power at 2400 RPM, Maximum Lifting capacity-2000 kg, Forklift bucket attachment for handling of seed cotton and 2 bales of 170 kg each **(1 Set)**	**18.5**

Annexure F

WEIGH BRIDGE

Sr. No.	Type of Machinery	Cost (Rs. in lakh)
1.	**Weigh Bridge:** Weighing Capacity: 50 MT, Fully Electronic Pit less, MS Platform size: 12 x 3m, Division: 10 kg, Tolerance ± 25kg including all accessories and electricals **(1 Set)**	**10.0**

Annexure G

HUMIDIFICATION SYSTEM

Sr. No.	Type of Machinery	Cost Rs. in lakh)
1.	**Fogger Type Humidification System:** Pumping capacity 90 liters per hour**,** 10 mm, Nozzle (30 Nos.)- each 2-4 lph water spraying capacity complete with fittings, all electricals, drive arrangements, etc. **(1 Set)**	**3.5**

Annexure H

FIREFIGHTING SYSTEM

Sr. No.	Type of Machinery	Cost Rs. in lakh)
1.	**Complete Fire Fighting System:** CO_2 fire extinguishers (**6 kg-5 Nos & 9 kg-5 Nos**), dry chemical powder fire extinguisher (**6 kg-10 Nos & 9 kg-5 Nos**), 52 BHP diesel engine driven pump set (2280 litre/min water pumping capacity and head 60 m), 50 HP electric motor driven pump set (2280 litre/min water pumping capacity and head 60 m), Jockey pump set (180 litre/min water pumping capacity and 70 m head), complete fire hydrant systems**,** all accessories, electricals, drive arrangements, etc. **(1 Set)**	**25.0**

Annexure I

Mandatory Orientation Training Programme and Ginning Training Programme at Ginning Training Centre of ICAR-CIRCOT, Nagpur

Sr. No.	Training Programme	Cost (Rs. in lakh)
1.	Orientation training programme	2.0
2.	Basics of grading and ginning training programme	

DETAILED TECHNICAL SPECIFICATIONS FOR ESTABLISHMENT OF A VIABLE GINNING & PRESSING PLANT UNDER THE SMART PROJECT IN MAHARASHTRA STATE

Detailed Specifications for Establishment of a Ginning & Pressing Plant of 10-12 Bales/h Capacity

Sr. No.	List of Items	Annexures
1.	Ginning & Pressing Machinery	A
2.	Complete Electrical Works	B
3.	Complete Pre-Engineered Buildings (PEBs)	C
4.	Complete Civil Works	D
5.	Tractor with Loaders	E
6.	Weigh bridge	F
7.	Humidification system	G
8.	Firefighting system	H

Annexure A

Detailed Specifications of Ginning & Pressing machinery of 10-12 bales/h capacity

Sr. No.	Machinery and Detailed Specifications	Nos.
1	**SEED COTTON DISPENSING SYSTEM FOR 10-12 BALES PER HOUR GINNING PLANT CAPACITY WITH ACCESSORIES** • Seed cotton storage capacity: 2000 kg • Powder coated heavy duty hopper box with acrylic windows • Dispensing endless 3-ply rubber belt (1200 mm width) • Driving rubber coated rollers (1200 mm width) with support &ball bearings • Feeding spiked rollers (04 Nos.) with bearings and side acrylic windows • Branded dust & water proof heavy duty bearings • Dynamic balancing of all feeding and dynamic rollers @ 3600rpm • Foundation bolts, nuts and washers, required support structures tomake a complete system • It shall be coupled with stone cum heavy POD remover setupwhich works on pneumatic gravity principles • Seed cotton trash separating facility to the best extent area • Front doors shall be fully openable for ease in maintenance andremoval of entrapped long contaminants **Electricals and Transmission System** • Drive arrangement for feeding spiked rollers with 2 HP electric motor, pulley set including idler tension pulley and B-type V-belts& mounting frame. • Drive arrangement for seed cotton dispensing cum module belt conveyor with 5 HP geared electric motor (20 RPM) & gear box (GR 20:1) along with duplex chain & sprocket sets (TLB-Tapered Lock Bush type) including tension idler and mounting frame • VFD (Heavy duty branded) for control of speed of feeding rollers having provision for reverse direction movement • Fully covered control panel for outdoor operation with overload & short circuit protection system	1 set
2	**PNEUMATIC SEED COTTON CONVEYING SYSTEM FROM DISPENSER TO PRE- CLEANER WITH ACCESSORIES** • High static pressure and desired air volume centrifugal fan to convey minimum of 5000 kg/h seed cotton to a distance of around 10 to 15 m from dispenser box to the pre-cleaner. Air Separatorwith Vacuum Wheel Rotary Air Lock with drive arrangement including frames, V-belts etc. • In-line stone catcher with one diversion for emergency down point operation	1 set

Sr. No.	Machinery and Detailed Specifications	Nos.
	• Automatic seed cotton overflow collection system with control panel & pneumatics. • Heavy duty centrifugal fan • Diameter 1120 mm (1D3D) cyclone separator with fittings, 0.9 mm G.I. ducting and piping of 330 mm piping for seed cottonconveying. • Dust receiver with rotary air lock • G.I. reducers, bends, diverters with flap, M.S. flanges for ducting, damper plug • Foundation bolts, Heavy duty bearings, required support structuresto make a complete system **Electrical and Transmission System** • Heavy duty centrifugal fan **with 30 HP electrical motor** and drive arrangements • Air Separator with Vacuum Wheel and **5 HP geared motor**; Rotary Air Lock with **2 HP geared motor**; Drive arrangement including frames B-type V-belts etc. • Maintenance platform and Railing – 600mm width	
3	**PRE-CLEANER WITH ACCESSORIES (6 CYLINDER INCLINED TYPE) MOUNTED ON ELEVATED STRUCTURE** • Seed cotton cleaning capacity: 5000 kg/h • Width: 1500 mm • Dynamically balanced spiked cylinders (165 mm diameter "C- class" pipe having thickness 5.4 mm) – 06 Nos. with six row spikes(length -140 mm & diameter – 12 mm) • Adjustable trash grid bars clearance between grid to roll outer diameter (grid bar dia. 10 mm & gap between grid bar maximum 10mm) • Sheet metal work shall be of 16 and 18 SWG MS sheet with proper workmanship. • Seed cotton reservoir box • Provision for by-pass of seed cotton • Trash collection screw conveyor • Acrylic windows • G.I. ducting for suction system • Foundation Bolts and nuts • Complete structure with ladder and side support for maintenance **Electricals and Transmission System**	1 set

Sr. No.	Machinery and Detailed Specifications	Nos.
	• Main motor 7.5 HP with Pulleys, V-belts (B-Section), Base Frame for driving spiked cylinders • Geared 3 HP Motor for trash collection screw conveyor with drive arrangements	
4	**SEED COTTON DISTRIBUTION SYSTEM**	
4A	**CENTRAL TROLLEY SYSTEM** • Comprising of two Trolleys with reduction gear box, PLC system, Photo-cells, Proximity switches, Structure & Railing, capable of distributing seed cotton to upto 20 DR Gins (60" roller length)/24 DR Gins (54" roller length). Complete with structure, **electric motors (5HP- 2 Nos., 1440 rpm)** and drive arrangements • **Seed Cotton Cross Inclined Belt Conveyor (1000mm)** to convey Seed Cotton from Pre-cleaner to Seed Cotton Inclined Belt Conveyor (Approx. 50 feet). Complete with structure, **electric motors (5HP, 1440 rpm)** and drive arrangements • **Seed Cotton Inclined Belt Conveyor (1000mm)** to convey Seed Cotton Cross Inclined Belt Conveyor to Central Trolley (Approx. 30 feet). Complete with structure, **electric motors (3HP, 1440 rpm)** and drive arrangements.	1 set
4B	**SCREW CONVEYOR SYSTEM WITH ACCESSORIES (2 ROWS WITH 10/12 DR IN EACH ROW) AND OVERFLOW HANDLING SYSTEM** • Heavy duty smoothly machined burr less seam welded longitudinal conveyor with twin regulator arrangement for 5000 kg/h seed cotton distribution to 10/12 DR gins each on either side, drawn from 5 mm continuous helicoids (416 mm diameter minimum) with heavy duty hanger bearings & pedestals, Geared couplings, Heavy duty 2.5 mmthickness sheet metal trenches for the screw conveyors. Trenches shall have provision for separating sand, dust and other trash particles. • **DC motor (power: 30 W)** type seed cotton auto regulator for feeding to each DR gin. • Microprocessor based photo sensors whish shall work on distance& colour pigment to control seed cotton feeding to each DR gins shall have two layers of glass for dust protection. • End plates, Heavy duty branded bearings, shafts, drive arrangement suitable for **7.5 HP motor.** • Outlet mouth for seed cotton overflows discharge. • Foundation bolts and nuts, required support structures to make a complete system **Overflow Handling & Regulated Seed Cotton Feeding System with**	

Sr. No.	Machinery and Detailed Specifications	Nos.
	accessories • Overflow Hopper with Feed Rollers to collect overflown seedcotton from the Distribution Conveyor of 20/24 DR gins and Pneumatic Kit for Overflow Hopper. • System shall be suitable to handle overflow of 32 DR Gin Plantcomplete with Ducting, Photo Sensors, and Changeover Valves, etc.	
5	**AUTO FEEDERS FOR DR GINS AND ACCESSORIES**	
5A	**AUTO FEEDERS FOR DR GINS AND ACCESSORIES** • Good quality heavy duty Auto Feeders for feeding seed cotton to 54-inch roller length DR Gins. • Hopper (sheet metal thickness 1.6 mm and 2.0 mm (minimum) forside and front panels). • 3-ply canvass belts fitted with spikes for feeding or 3-ply canvass belts fitted with spikes for feeding on RNR green belt as additional support • Acrylic observation windows; Heavy duty UCT bearings and take up units. • Hinge brackets & pin mounting brackets for gins. • Lower roller of the feeder shall have through shaft between 4 bearings (2 at each side) • Drive arrangement including A-section V-belts, pulleys, idlers etc. for rotation of belts at 40 rpm	24 Nos
5 B	**AUTO FEEDERS FOR DR GINS AND ACCESSORIES** • Good quality heavy duty Auto Feeders for feeding seed cotton to 60-inch roller length DR Gins • Hopper (sheet metal thickness 1.6 mm and 2.0 mm (minimum) forside and front panels). • 3-ply canvass belts fitted with spikes for feeding or 3-ply canvass belts fitted with spikes for feeding on RNR green belt as additional support • Acrylic observation windows; Heavy duty UCT bearings and take up units. • Hinge brackets & pin mounting brackets for gins. • Lower roller of the feeder shall have through shaft between 4 bearings (2 at each side) • Drive arrangement including A-section V-belts, pulleys, idlers etc. for rotation of belts at 40 rpm	20 Nos

Sr. No.	Machinery and Detailed Specifications	Nos.
6	**DOUBLE ROLLER (DR) GINNING MACHINE AND ACCESSORIES**	
6 A	**DR Gins with 54" Roller Length** • **Roller diameter 170 mm,** Capacity: 70-80 lint/h • Connecting housing bearing No. 22212, sealed gajan pin bearingNo. 6902, two stepped pulley on motor shaft • Robust Wide Base C.I. frames, Precise CNC machined & Heattreated alloy steel material for all moving components • Roller speed: About 100 rpm for leather roller, adjustable up to +/-10% • Beater speed: 1000 oscillations per minute +/- 10% • Gears box with helical gears for power transmission, Multipurposegrease 10 kg filled in each DR gin • Foundation bolts, nuts and spring washers **Electricals and Transmission System** • Heavy duty 5 HP electric motor (Min. B class insulation) withdrive arrangement, drive pulleys, B-class V-belts, slide rails, sheetmetal belt covers/guards for each DR gin	24 Nos
6 B	**DR Gins with 60" Roller Length** • Roller diameter 180 mm, Capacity: 80-90 kg lint/h • Connecting housing bearing No. 22212, sealed gajan pin bearingNo. 6902, two stepped pulley on motor shaft • Robust Wide Base C.I. frames, Precise CNC machined & Heattreated alloy steel material for all moving components • Roller speed: About 100 rpm for leather roller, adjustable up to +/-10% • Beater speed: 1000 oscillations per minute +/- 10% • Gears box with helical gears for power transmission, Multipurposegrease 10 kg filled in each DR gin • Foundation bolts, nuts and spring washers **Electricals and Transmission System** • Heavy duty 5 HP electric motor (Min. B class insulation) withdrive arrangement, drive pulleys, B-class V-belts, slide rails, sheetmetal belt covers/guards for each DR gin	20 Nos
7	**PNEUMATIC INTERMITTENT LINT SUCTION SYSTEM FROM DR GINS TO LINT CLEANER WITH ACCESSORIES** • Low static pressure and high air volume centrifugal fan to conveyup to 2000 kg/h lint collected from 20/24 DR gin to the lint cleaner, branded **heavy duty 10 HP electrical motor** on centrifugal fan • Air Separators with Vacuum Wheels and **5 HP geared motor** • Drive arrangements including frames, B type V-belts etc.	1 set

Sr. No.	Machinery and Detailed Specifications	Nos.
	• Lint collection hoppers for each DR gin made of 0.9 mm G.I. sheet with no narrowing for easy transportation of lint from gins to pneumatically operated valve and avoiding lint chockage • DIA 815 MM (1D2D) cyclone separator with fittings • Around 0.9 mm thick G.I. ducting and piping of 300 mm inner diameter for lint conveying for each DR to lint cleaner • G.I. reducers, bends, diverters with flap, M.S. flanges for ducting • Foundation bolts, nuts and washers, heavy duty bearings, Support structure, etc. to make complete system	
8	**LINT CLEANER AND ACCESSORIES (6 CYLINDER INCLINED TYPE)** • Lint cleaning capacity: 2000 kg/h • Inclined type lint cleaner with 06 Number of cylinders with 1500mm width and having M.S. Spikes of 105 mm length and 12 mm diameter • Feed rollers (2 Nos.) and Lint by-pass arrangement. • Body made out of Hot Rolled sheet metal with thickness 2.5 mm (minimum) with proper workmanship. • Foundation bolts, nuts and washers, acrylic windows and support structure **Electricals and Transmission System** • Drive arrangements including pulleys, base frame suitable for **2 HP geared motor** for feed rollers and **7.5 HP for main rollers.**	1 set
9	**INCLINED LINT BELT CONVEYOR SYSTEM** • For conveying lint from post cleaner to baling press and for dropping lint on Lint Slide with Accessories (80 and 120 feet belt length for up-packing and down packing press, respectively). • M24 3 ply rubberized belt of 8 mm thickness and 1200 width • Box type with skirting belts • Lint Slopper **Electricals and Transmission System** Drive arrangements including pulleys, base frame suitable for **5 HP geared motor**	1 set
10	**AUTOMATIC COTTON BALING PRESS (10-12 BALES PER HOUR) WITH AUTOMATIC BALE HANDLING, BAGGING AND WEIGHING SYSTEM**	

Sr. No.	Machinery and Detailed Specifications	Nos.
10 A	**DOWN PACKING TYPE** • Single stage, Double Box, Door-less, Down Packing, Oil hydraulic,Lift box press with capacity 10-12 bales per hour (bale weight of 170 and box size 1220 x 460 mm, Platen Assembly for 12 Nos. of Baling Straps • Double acting hydraulic cylinders for upto 400 Tonnes force for final pressing • Lint slide with louvers arrangement, Lint reserve box, Fibre pusher and Hydraulic tramper with 10 HP motor • Hydraulic power pack: Main Hydraulic Pumping Unit with Vane Pumps 220 Bar Working Pressure of 40 HP Electric Motor. Complete Piping & fittings, directional control valves, etc. • Box Rotating system with Motor 3 HP and alarm system • Hydraulic Oil HLP 68; 8 drums of 210 litre each. • Push button console, Motor Control Centre (MCC) with all feeders complete with junction boxes electrical wiring & switch gears. PLC panel comprising standard programmable logic controller with electronics & control desk with HMI (Human Machine Interface) display • Suitable Photo Sensors for safety devices at press, Control Panelsfor each equipment wherever required, suitable Pneumatic cylinders for all the equipment, air compressors, control switch and fans be included as per requirement for complete plant. • Cooling system having heat exchanger with cooling tower with one each 2 HP and 3 HP motor • Bale ejector and bale handling system, weighing and bagging system with Trolley & drive arrangement. • High structural platform with inclined support & ladder for easy maintenance	1 set

Sr. No.	Machinery and Detailed Specifications	Nos.
10 B	**UP PACKING TYPE** • Single stage, Double Box, Door-less, Up Packing, Oil hydraulic,Lift box press with capacity 10-12 bales per hour (bale weight of 170 and box size 1220 x 460 mm, Platen Assembly for 12 Nos. of Baling Straps • Double acting hydraulic cylinders for upto 400 Tonnes force for final pressing • Lint slide with louvers arrangement, Lint reserve box, Fibre pusher and Hydraulic tramper with 10 HP motor • Hydraulic power pack: Main Hydraulic Pumping Unit with Vane Pumps 220 Bar Working Pressure of 30 HP Electric Motor. Complete Piping & fittings, directional control valves, etc. • Box Rotating system with Motor 3 HP and alarm system • Hydraulic Oil HLP 68; 8 drums of 210 litre each. • Push button console, Motor Control Centre (MCC) with all feeders complete with junction boxes electrical wiring & switch gears. PLC panel comprising standard programmable logic controller with electronics & control desk with HMI (Human Machine Interface) display • Suitable Photo Sensors for safety devices at press, Control Panelsfor each equipment wherever required, suitable Pneumatic cylinders for all the equipment, air compressors, control switch and fans be included as per requirement for complete plant. • Cooling system having heat exchanger with cooling tower with one each 2 HP and 3 HP motor • Bale ejector and bale handling system, weighing and bagging system with Trolley & drive arrangement. • High structural platform with inclined support & ladder for easy maintenance • Suitable depth of foundation below the ground level • Suitable water proofing for prevention of water leakage specially during rainy season • Suitable ladder and civil structure for maintenance work in the well	1 set
11	**COTTONSEED BELOW 20/24 DR GINS CONVEYORS AND CROSS CONVEYOR WITH ACCESSORIES** • Two lines of heavy duty 216 mm standard diameter continuous helicoids of 3 mm thickness – minimum with 60 mm pipe diameter cottonseed longitudinal screw conveyor fitted underneath of DR gins in cemented trench for conveying of cottonseed received from 10/12 DR gins of each line having conveying capacity of 2500 kg/h of each line. • Conveyors fitted with conveyor brackets & pins consisting of bearing with	1 set

Sr. No.	Machinery and Detailed Specifications	Nos.
	grease pipes to minimize the friction, nuts and bolts; driving arrangements including chains, sprockets, **5 HP geared electric motor, mounting frame etc.**; Support plate; Foundation bolts, nuts and spring washers. • A line of cross conveyor for conveying of cottonseeds from both longitudinal conveyors to bucket elevator having conveying capacity of 5000 kg/h. • **Cross Seed Conveyor** of 216 mm standard continuous helicoids of 3 mm thickness (min.) with 60 mm pipe diameter fitted with conveyor brackets and pins consisting of bearing with grease pipes to minimize the friction. Length approximately 5 m. • Drive arrangements with Chain Power Transmission suitable for **3 HP electric motor** coupled with Gear Box for each line (3 Nos), mounting frame, etc.	
12	**COTTONSEED B E L T T Y P E BUCKET ELEVATOR WITH ACCESSORIES** • Bucket elevator with head and tail pulley arrangement for lifting cottonseed about 7 m from cross conveyor with capacity of about 5000 kg/h cottonseed • Drive arrangement including gear box and **5 HP** electric motor, pulleys, chains, sprockets and accessories. • Foundation bolts, nuts and washers etc. • Working platform and support structure, etc.	1 set
13	**COTTONSEED OVERHEAD SCREW CONVEYOR** • Overhead screw conveyor (200' length: 216 mm diameter) for conveying of cottonseed from bucket elevator to storage area, along with drives, **5 HP electric motor**, gear box and accessories. • Seed dropping points (8 Nos.) in overhead screw conveyor for heaping of cottonseed. • Two-way cotton seed manual bagging arrangement fitted at the discharge end of bucket elevator	1 set
14	**FIRE DETECTION AND DIVERSION SYSTEM** Fire detection (GreCon) & diversion from lint suction to lint cleaner with control panel and hooter MS 'Y' diverter with pneumatic arrangement with flap Fire diversion pneumatic cylinder with extra air reservoir & accessories Air Compressor with **1 HP motor.** Fire diversion Fan with **7.5 HP motor** for fire diversion	1 set

Sr. No.	Machinery and Detailed Specifications	Nos.
15	**ALLIED MACHINERY AND ACCESSORIES** • Heavy duty motorised roll cutting machine and roll cutting stand for 54/60 inch roller length • Grease gun • Tool box containing 44 items required for operation & fitting workof ginnery • Bale Handling Trolley: Two-wheel air-tired manual operated light weight Trolleys	1 set
16	**STRUCTURES FOR AUTOMATION EQUIPMENT** Mounting and support structure for dispensing system, pneumatic seed cotton conveying system, pre-cleaners, all air separators, cotton distribution screw conveyor/trollies, lint cleaners, all cyclones, all blowers, bucket elevator, overhead screw conveyor, cross flow conveyor, ladders, foundation base plates, trench coverings, structure for all other machinery to make them properly useful and walking-platform for visitors to see the working of machinery in height areas.	1 set
17	**CIRCOT LAB MODEL GIN FOR GRADING** • Single roller (300 mm length) CIRCOT lab model CLOY ginmachine • Ginning capacity: 4-5 kg seed cotton/h • Drive arrangement including 1 HP single phase motor, V-belts,pulleys, chain, sprockets etc. • Turned, finished and grooved 250 mm length leather roller	1 set
18	**COTTON MOISTURE METERS** • Branded moisture meter to determine moisture content of seed cotton (cup type electrode and 36" long electrode for measuring moisture), lint and cottonseed and bales • Moisture Range: 4-30% for raw cotton and lint • Digital display, provision to store minimum 100 readings	1 set each

Annexure B

DETAILED SPECIFICATIONS OF ELECTRICAL WORK

Sr. No.	Machinery and Detailed Specifications	Nos.
1	**HT LINE TO PLANT CONNECTION** • Electrical connection from 11kV line to the 400 kVA transformer, control panel, DP structure, cabling, liaising with MSEB, demand charges, earthing work, etc. • Metering kiosk	1 set
2	**TRANSFORMER** • Copper wound, Oil immersed, hermetically sealed distribution outdoor transformer, 3 phase, 50 Hz and 400 kVA • Voltage Ratio 11 kV/ 433 V • Maximum mean winding temperature rise: 65^0C • Dielectric liquid-Mineral oil according to IEC/ANSI Standard • Voltage and frequency variations on supply side: +/- 10% and +/- 5%, respectively • Standard accessories	1 set
3.	**INCOMER CABLES AND ACCESSORIES FROM TRANSFORMER TO PCC PANEL** • Armoured, 1.1 kV Grade Copper Cables for all lines. • Double compression cable glands for all lines. • Copper type cable terminals for all lines. • Maintenance free earthing with 3 m length. • Long earthing rods including conductive solution. • Earthings of all motors through hot deep GI strip and GI wire.	1 set
4.	**PCC PANEL WITH 1000 AMP CIRCUIT BREAKER** • Incomer capacity of 4 pole 630 amp MCCB and controlling operations offeeders like 'ginning, bale press, utility and lighting independently. • Digital multi-function metering for current, voltage and energy meters along with suitable CT with electrolyte copper buses • All wires are 1.1 kV grade with colour identification. • All ferruling through electronic machine. • Copper insulated lugs.	1 set

Sr. No.	Machinery and Detailed Specifications	Nos.
5.	**CABLES AND ACCESSORIES FROM PCC TO MCC PANEL** • Armoured, 1.1 kV Grade Copper Cables for all lines. • Double compression cable glands for all lines. • Copper type cable terminals for all lines. • Maintenance free earthing with 3 m length GI rod of dia 40 mm • Long earthing GI rods including conductive solution • Earthing of all motors through GI strip and GI wire.	1 set
6.	**MCC PANEL AND ACCESSORIES** • Operating facility near to the machine with latch type stop button. • All motors shall have Motor Protection Circuit Breaker (MPCB) and Contactor and over load and short circuit protections. • All motors shall be of suitable current ratings as per plant requirement. • All motor feeders show motor running status through LED indications on panel. • MCC Panel shall have tripping provisions in case of under voltage, over voltage and reversal phase rotation. • Main incomer shall have 100% neutral isolation by providing 4 poles MCCB with panel door interlock additional facility with providing incomer forces, fire diverter, compressors • Digital metering for current and voltage • Suitable bus rating with electrolyte copper bus • All cables of 1.1 kV grade with colour identifications • All ferruling through electronic machine. • Copper insulated lugs.	1 set
7.	**Field Cable And Accessories from MCC Panel to Electric Motors** • Armoured, 1.1 kV Grade Copper Cables for all lines. • Double compression cable glands for all lines. • Copper type cable terminals for all lines. • Maintenance free earthing with 3 m length GI rod of dia 40 mm • Long earthing rods including conductive solution. • Earthings of all motors through GI strip and GI wire. • All cables lying on GI perforated cable tray with supporting on 50x50x6 mm angle.	1 set

Sr. No.	Machinery and Detailed Specifications	Nos.
8.	**APFC Panel With Accessories and Capacitor Bank** • Capacitor Bank of 12 stages and 415 VAC to control power factor near to the set point by switching on-off capsule capacitors in rangeof 2-25 kVAR. • All capacitor operation shall be done through capacitor duty contactor and intelligent PF control meter. • Capacitor duty contactors • Digital Automatic Power Factor Correction (APFC) controller • Suitable bus rating with electrolyte copper buses • All wires of 1.1 kV grade with colour identification • All ferruling through electronic machine. • Lugs are copper insulated lugs. • 200 mm exhaust fan for panel ventilation with canopy	1 set

Annexure C

COMPLETE PRE-ENGINEERED BUILDINGS (PEBs)

Building Description

Sr. No.	First Building: Ginning, Pressing Halls & Cottonseed Storage Building
1.	Roof Type: **Pitched Roof – Unsymmetrical Slope**
2.	Dimensions: **Length x Width: 15.00 x 84.00m (**Centre to Centre of Steel Columns)
3.	Clear Height at Lower Side: 11.00m for 03-High Bays & 8.00m for 09-Low Bays from FFL **(For down packing Press) OR** 8.00m from FFL **(For up packing Press)**
4.	Width Module: 1@15.00m
5.	Roof Slope: 1:10
6.	Bay Spacing: **12 Bays@7.00m.**
7.	Type of End Frames: **End Walls:** Rigid Frame (Expandable Frame) with Wind Column Spacing (**2@7.50m)**
8.	Type of Bracing in Side walls: Rod Bracing - **Along GL "A & C"**
9.	Type of Bracing on Roof: Rod Bracing
10.	Type of Eave: Eave gutter and Downspout **Along GL "A"**
Open Wall Conditions (First Building)	
1.	Near Side Wall (Along GL "C"): Sheeted from FFL from FL-1 to 9. Full Height Open from FL-9-13.
2.	Far Side Wall (Along GL "A"): Sheeted from FFL from FL-1 to 9. Full Height Open from FL-9-13. Sheet Curtain of 3.00m from Eaves & Below Open for Access from FL-9-13.
3.	Partition Walls (Along FL "9"): Full height Sheeted & open for Access
4.	Left End Wall (Along GL "1"): Full sheeted
5.	Right End Wall (Along GL "13"): Sheet Curtain of **3.00m** from Eaves & Below Open for Access

Building Description

Sr. No.	Second Building: Bale and Raw Cotton Storage Building
1.	Roof Type: **Pitched Roof – Unsymmetrical Slope**
2.	Dimensions: **Length x Width: 30.00 x 84.00m (**Centre to Centre of Steel Columns)
3.	Clear Height at Lower Side: 6.50m from FFL.
4.	Width Module: 1@30.00m
5.	Roof Slope: 1:10
6.	Bay Spacing: **12 Bays@7.00m.**
7.	Type of End Frames: **End Walls:** Rigid Frame (Expandable Frame) with Wind Column Spacing **(4@7.50m)**

Sr. No.	Second Building: Bale and Raw Cotton Storage Building
8.	Type of Bracing in Side walls: Rod Bracing - **Along GL "C" Portal Bracing at GL-"G"**
9.	Type of Bracing on Roof: Rod Bracing
10.	Type of Eave: Eave gutter and Downspout **Along GL "G"**
Open Wall Conditions (Second Building)	
1.	Open up to **3.00m** from FFL by others & above is sheeted from FL-1to3 Sheet. Curtain of 2.00 m from Eaves & Below Open for Access from FL-3-13
2.	Common Wall between Area#01 & Area#02.
3.	Full sheeted from FFL
4.	Full sheeted from FFL. Curtain of 2.00 m from Eaves
5.	Sheet Curtain of 2.00m from Eaves & Below Open for Access

***Note: Cost norms have been worked out by considering following design norms**

Design Loads

Design Dead Load (kN/m^2) on roof	0.15
Design Live Load (kN/m^2) on frame	0.75
Wind Speed (m/s) (AS PER IS: 875 PART -3 1987)	44.0
Solar Load (kN/m^2) on roof	0.0
Earthquake Zone	III

Sheeting Panel

Roof Panel	0.50 mm thick TCT (Bare Galvalume Sheet)
Wall Panel	0.50 mm thick TCT (Pre-Painted Galvalume Sheet)

Accessories

Description	**Quantity**
Canopy without soffit– 3.0m Projected	02 Nos.
Skylight Panel, Polycarbonate (1m x 3.2m) (Roof only)	24 Nos. in first building and 33 Nos. in second building
Frame openings 5.0 m x 5.0 m	02 Nos.

Applicable Codes

All buildings included in this proposal are designed in accordance with the following codes:

Loads on the building are applied in accordance with:

IS-875 PART-1 (1987) Code of practice for Design Loads IS-875 PART-2 (1987) Code of practice for Design Loads IS-875 PART-3 (2015) Code of practice for Design Loads
IS-1893 PART-1 (2002) Criteria for Earthquake Resistant Design of Structures

Hot rolled sections and Built-Up Sections are designed in accordance with: IS-800:2007

Cold formed members are designed in accordance with: IS-801 PART-1 (1975)

Welding is applied in accordance with:

The Edition (2006) of Structural Welding Code – Steel (AWS D1.1M : 2006) By American Welding Society (AWS)

Wind Speed is calculated in accordance with:

IS 875 (Part 3): 2015 Code of practice for Design Loads

Seismic Load is calculated in accordance with:

IS 1893 (Part 1): 2002 CRITERIA FOR EARTHQUAKE RESISTANT DESIGN OF STRUCTURES

Material Specifications

No.	Materials	Specifications	Minimum Strength
1.	**Primary Members (Make: TATA/SAIL/ JSPL)**		
	• Beams & Columns	IS 2062: 2006 Grade E-350 (or) its Equivalent.	F_y = 34.5 kN/cm^2
	• Tubes	IS 4923: 2017	F_y = 21.0 kN/cm^2
	• ISMC & ISMB	IS 2062: 2011 Grade E250	F_y = 25.0 kN/cm^2
2.	**Secondary Members – Zee & Cee Sections (make AM/Apollo)**		
	• Material Finish	G.I – IS 277_2018 or equivalent	F_y = 34.5 kN/cm^2
3.	**Sheeting (Tata BSL/Bhushan Power/JSW)**		
	• Bare / Colour coated Galvalume steel	Comprising of 55% aluminum + 43.5% zinc + 1.5% silicon as per ASTM A-446 Grade E	F_y = 55.0 kN/cm^2
4.	**Gutters & Downspouts ****		
		Gutters will usually be made from the materials used for Wall sheeting.	
5.	**X-Bracing Members**		
	• Rods	IS 2062: 2011 Grade E250	F_y = 25.0 kN/cm^2
	• Angles	IS 2062: 2011 Grade E250	F_y = 25.0 kN/cm^2
6.	**Anchor Bolts**	IS 2062: 2011 Grade E250 (or) its Equivalent, Bolts with One coat of Epoxy primmer	F_y = 25.0 kN/cm^2 F_u = 40.0 kN/cm^2
7.	**High Strength Bolts (For Primary Connections)**	IS 1367 CL 8.8 (or) its Equivalent	F_u = 80.0 kN/cm^2
8.	**Connection Bolts**	IS 1367 CL 4.6 (or) its Equivalent	F_u = 40.0 kN/cm^2

Fy = Yield Strength, Fu = Ultimate Tensile Strength

Annexure D

COMPLETE CIVIL WORKS

Sr. No.	Details of Civil Works
1.	**First Building: Ginning, Pressing Halls & Cottonseed Storage Building (15.00 x 84.00m)** Excavation, murrum filling, anti-termite treatment, PCC 1:4:8 (M10 Grade), RCC M25 grade, Trimix Flooring 125 mm thickness, M25 grade, TMT/HYSD Steel bars, internal and external plasters and paintings, window grills, AL windows, rolling shutters as given in layout
2.	**Second Building: Bale and Raw Cotton Storage Buildings (30.00x84.00 m)** Excavation, murrum filling, anti-termite treatment, PCC 1:4:8 (M10 Grade), RCC M25 grade, Trimix Flooring 125 mm thickness, M25 grade, TMT/HYSD Steel bars, internal and external plasters and paintings, rolling shutters as given in layout
3.	**Blower, cyclone, and dust Rooms** Excavation, murrum filling, anti-termite treatment, PCC 1:4:8 (M10 Grade), RCC M25 grade, Trimix Flooring 125 mm thickness, substructure, super structure, M25 grade, TMT/HYSD Steel bars, internal and external plasters and paintings, steel doors as given in layout
4.	**Administrative Office, Security Room and Workers' Residence** • Security room (3m x 3m) • Administration office building (7m x 10m) • Workers' residence (18mx4m)
5.	**Boundary wall:** Wire fencing around 600 m
6.	**Drainage system for PEB** Hume piping (300, 450 and 600 mm) and chamber work (600x600x600 mm & 750x750x750 mm)
7.	**WEIGH BRIDGE FOUNDATION WITH RAMP & WEIGH BRIDGE CABIN** Excavation, murrum filling, anti-termite treatment, PCC 1:4:8 (M10 Grade), RCC M25 grade, TMT/HYSD Steel bars, internal and external plasters and paintings, flush doors, windows, etc.
8.	**WBM Roads** 150 m length 9 m wide road

Sr. No.	Details of Civil Works
9.	**Machinery Foundation Work** Excavation, PCC 1:4:8 (M10 Grade), RCC M25 grade, TMT/HYSD Steel bars, substructure, internal and external plasters, water proofing, sand filling
10.	**Underground water tank (1 lakh litre capacity) 7 m x 5 m x 2.9 m (length x width and depth)**

Standard protocols for civil work

1) Cement OPC 53 Grades
2) Steel bars, standard TMT bars
3) Water proofing in water tanks, down packing press foundation
4) Foundation work as per lay out drawing
5) Authorised civil contractor shall be engaged for civil work
6) Windows, doors and grills of standard branded materials
7) Tools and tackles in scope of contractor

Annexure E

2	**Tractor (55 HP) with seed cotton and cotton bale attachments** • Turbo charged Engine of 55 HP power at 2400 RPM • Power steering • Maximum Lifting capacity – 2000 kg • Gear Box: 9 Forward and 3 Reverse • PTO: 540 RPM • Fuel tank: 65 litre capacity (Min.) • Tyres: Front – 6.5x20, 8PR; Rear – 16.9 x 28, 12 PR • Battery: 88 Ah, 12 Volt battery, 40 amp • Roll over protection structure (ROPS) and Hard Canopy • Forklift bucket attachment for Seed Cotton Handling • Bucket attachment for bale handling: 2 Bales (170 kg each) • Standard Tools and Accessories including Jack of standard capacity	1 set

Annexure F

1	**Weigh bridge: Capacity - 50 Tonnes** • Branded heavy duty weigh bridge with Capacity: 50 MT • Type: Fully Electronic Pit less • Platform size: 12 x 3m, MS platform 10 mm top plate • Division: 10 kg • Tolerance ± 25kg; Repeatability & Reliability • Load Cells: Hermetically sealed Compression Type (10 Nos.) protected from dust and water IP 68 weather proof junction box • Digital Indicator with RS-232 and RS-485, Ethernet and networking interface • Connected with a computer and B/W Laser printer • Control Unit: Microcontroller based • Armourd cable from load cell to junction box and from junctionbox to indicator • Standard Tools, fittings and Accessories	1 set

Annexure G

1	**FOGGER TYPE HUMIDIFICATION SYSTEM WITH ACCESSORIES AND WATER SOFTENER SYSTEM** • High pressure pump having 90 liters per hour capacity **with 1 HP Motor,** 10 mm diameter pipes of about 100 m length • Nozzle (30 Nos.), 2-4 lph capacity complete with fittings • Electrical panel & control (water level sensor & its controller) • Safety water tank (capacity 500 liters) for level controlling & pump safety • Pipe and fittings from service tank to pump • Water softening system, hard water pump, salt water tank (capacity 500 litres), soft water storage tank (capacity 5000 liters), Regeneration pump • Complete fittings, accessories and electrical motors and fittings	1 set

Annexure H

1	**COMPLETE FIRE FIGHTING SYSTEM** **A. Liquid and Dry CO2 Fire Extinguisher Cylinders** • CO2 fire extinguisher (**6 kg – 5 Nos and 9 kg – 5 Nos**) • Dry chemical powder fire extinguisher (**6 kg – 10 Nos and 9 kg – 5 Nos**) **B. Fire Pump Setups** • Diesel engine driven pump (2280 litre/min water pumping capacity and head 60 m), **BHP of diesel engine 52 HP** • Electric motor driven pump (2280 litre/min water pumping capacity and head 60 m), **Electric motor power 50 HP** • Jockey pump (180 litre/min water pumping capacity and 70 m head) **Electric motor 12.5 HP** • Including motor control panel with power cables, GI sheet cable tray, GI earthing strip, foot valves, basket type strainer, brass ball valve, pressure switches, pressure gauges, air release valve, etc. **C. Fire Hydrant System** • MS pipes, butterfly valves, yard hydrants, RL hose pipes, short branch pipe, hose drum, fire tower, fire bridge inlet connection, etc.	1 Set

Standard Protocol for Establishment of a Viable Ginning and Pressing plant Under SMART Project

The industries seeking financial assistance under SMART project has to adhere to the standard protocol established by implementing agency for starting ginning and pressing industry. The standard protocol mainly focusses on the basic facilities expected to be available with the applicant industry before filing application, eligibility criterion, essential machinery, infrastructure and conditions and management practices to be followed to maximize the quality of the cotton processed along with the overall production of and returns in the ginning industry.

A) Mandatory Orientation Training Programme at Ginning Training Centre of ICAR-CIRCOT, Nagpur

Ginning Training Centre of ICAR-CIRCOT, Nagpur is the only centre in India that imparts training on establishment and operation of ginneries. The basic information for establishing a ginning and its operation is essential for viable ginning plants. It is observed that many a times newly established ginneries face risk of losses/closure due to inadequate information. In order to avoid these types of incidences, orientation training is must for the new owners/management.

Hence, one or two main personnel engaged in management of ginnery whose proposal has been approved under SMART project for financial assistance must undergo an 'Orientation Training Programme' at GTC of ICAR-CIRCOT, Nagpur to get acquainted themselves with the basic knowledge of the cotton production, procurement, ginning, cotton quality, marketing and other related aspects. GTC organises year-round regular training programmes. Hence, 1 week orientation training programme of GTC shall be made as prerequisite for release of fund under SMART project.

B) Basic amenities for a viable ginnery

1. **Site:** Proposed G&P industry site should be near to cotton growing area having seed cotton production of around 1,00,000 quintals per season.
2. **Land:** Adequate land should be available as owned or on lease for at least for a period of 99 years. Ideal land requirement is 4-5 acres. The minimum requirement would be 2-3 acres.
3. **Road:** Proposed project site should be easily approachable by road for four-wheel vehicles.
4. **Electricity:** Adequate supply of 3 phase electricity should be available on continuous basis.
5. **Water:** Proposed site should have permanent source of water source like well or bore well with enough water availability throughout the year.

C) Eligibility Criterion

A unit seeking assistance under the SMART scheme must fulfil the following criterion to become eligible

1. Must have beforehand the basic amenities as stated above for establishment of ginning & pressing industry.
2. Intent to establish a composite ginning and pressing factory with minimum production capacity of 10-12 bales/h or 5000 kg seed cotton/h.
3. Intent to establish a complete modern unit that possess essential machinery, PEBs, civil works and other essential infrastructure as specified in detail in Annexures A-H.
4. There is requirement of about Rs 7 crore for establishment of a modern ginnery with complete infrastructure and machinery. The interested parties must have requisite fund to meet all expenditure.
5. Must have provision for sufficient **working capital (Approx. minimum Rs. 2 crores**) to ensure smooth functioning of the ginning and pressing industry.
6. Must have intent to follow all the prescribed guidelines, rules and regulations prescribed by the impending agency of SMART .
7. There is a minimum period of six months are required for establishment of the ginning and pressing plant. Hence, the erection shall start latest by May month to realize the cotton season.

D) Options for establishment of Viable Ginnery

The complete list of ginning machinery along with detail specifications is given in annexures A to H. There are two/three options available for establishment of a viable ginning plant. The enlisted options are practiced widely in industries and have more or less same output with each options. Hence, the parties can choose any one among available options as listed below:

1. **Seed cotton distribution system options:** Screw conveyor **OR** Trolley conveyor.
2. **Double roller (DR) gin options:** 20 DR gins of 60" roller length **OR** 24 DR gins with 54" roller length
3. **Baling press:** Down packing **OR** Up packing

E) Essential Machinery for Maintaining Cotton Quality

The following machinery are essential for producing best quality bales from ginneries.

1. The first stage of seed cotton conveying must be essentially pneumatic type conveying seed cotton from dispenser to pre- cleaner. No deviation from this system shall be permitted.
2. Pre-cleaner of 6-cylinder cleaning system.
3. Post-cleaner of 6-cylinder cleaning system.
4. Inclined belt type lint conveyor system must have 80' length for proper humidification.

F) Essential Infrastructure

The infrastructure facilities listed below should be essentially a part of the ginning and pressing industry. The list is only qualitative. For information in quantity size, number, specifications and other details please refer detailed specification document for establishment of ginning and pressing industry under SMART.

1. **Gin, Press and Cottonseed Storage house:** Pre-Engineered Steel Building closed structure with pitched roof with dimension 15 x 84 m (1260 sq. m) for plant comprising down packing press with clear height at lower Side; 11m for high bays and 8m for low bays from FFL. However, cottonseed storage area shall be open for drying of seeds.
2. **Seed cotton and bale storage area:** Pre-Engineered Steel Building closed structure for bale storage and open structure for raw cotton storage with pitched roof with dimension 30 m x 84 m (2520 sq. m) with clear height of 6.5m from FFL respectively.
3. **Underground Water Tank:** Underground Water tank capacity of 1.00 lakh
4. **WBM Road:** WBM approach road with at least 9 m width.
5. **Other civil structures** such as weigh bridge room, office building, labour quarter, security room, etc.

G) Essential Conditions

A ginning industry must fulfil following essential conditions so as to avail the benefits under SMART project scheme

1. **Quality Standards:** Ginning industry must oblige to the quality control orders issued by the government time to time in respect of bale standards.
2. **Branded machinery:** Branded ginning, pressing and other allied machinery should be procured from the reputed manufacturers on **turnkey** basis especially from the approved list of Manufacturers/supplier identified by the SMART.
3. **Gin press fitter:** A ginning unit should have minimum of 2 gin fitters and 2 assistants (oil and grease men in each shift.
4. **Press operator/fitter:** A ginning unit should have minimum of 1 press operator and 1 press fitter.
5. **Ginning Plant Engineer/Manager:** A ginning unit should have one ginning plant engineer cum manager to oversee the functioning of the entire plant.
6. **Training of Human Resource:** A minimum of 10 personnel engaged in cotton procurement, cotton grading, cotton marketing, gin and press operation and maintenance, gin supervision and management in ginning industry must have been trained from the ICAR-CIRCOT, Mumbai.

H) Management Practices

The aim of the ginners should be to maximize the quality of the cotton processed along with the overall production of and returns in the ginning industry. The quality of processed cotton and overall production capacity of a ginning industry greatly depend on the how well its infrastructure comprising of machinery and civil structural are built and maintained, the management practices followed during processing operation and the ultimately the contamination level in the ginned cotton. The important management practices need to be practiced are enumerated below.

1. Select appropriate machinery and infrastructure, carry out ginning by following technically sound protocol and with the help of skilled and trained workers
2. Maintain ideal process condition while ginning, optimum settings and adjustments for each machine as recommended by manufacturer, ensure timely repairs and maintenance in order to achieve highest quality and productivity

3. It is necessary to ensure proper utilization of the facilities created in the ginning industries. The installed machines such as pre-cleaner and lint cleaner should not be by-passed during cotton processing to obtain lint with minimal trash and contamination
4. Maintain seed cotton moisture content of less than 11% during storage, 4-6% during pre-cleaning and 7-8% during ginning and around 8.5% during pressing in bales
5. Direct application of water on seed cotton and lint should be avoided. For moisture application; humidification systems should be practiced
6. Create awareness among workers for production of trash and contamination free cotton
7. Better management practices with do's and don'ts while cotton procurement and processing should be followed
8. Bales should be packed in accordance with BIS specifications
9. Mixing of cottons of different varieties and different grades should be avoided
10. Trashes should be quarantined/mechanically treated before disposal to avoid spread of Pink bollworm to neighborhood of ginning industry

I) Fire protection in ginning industry

Ginning industry is more prone to fire hazards as cotton is almost pure cellulose and ignites and burns easily and quickly. Hence for prevention of fire in ginning factories following standard protocol must be followed.

1. A ginning industry should have firefighting arrangement instead of depending on local fire brigade station. Factory should have close liaison with the fire station
2. For effective firefighting a minimum pressure of 7 kg/cm^2 is required. Therefore, a complete fire-fighting with minimum of 10 hydrant points with diesel engine (50 HP) driven pump (2280 litre/min water pumping capacity and head 60 m) is essential. The hydrant shall be located such a way that any portion of storage area is protected by at least two hydrants at a distance not exceeding 35 m
3. Water tank: A water reservoir of not less than lakh liters capacity and a ground level water tank should be available in the factory premises to ensure adequate quantity of water to meet emergency needs
4. Water should be readily available inadequate quantity near heaps, bale storage, gin and press house as and when required
5. Location of control panel of firefighting system should be away from the seed cotton and bale storage area and easily approachable in case fire occurs
6. Employees shall be trained in the use of hydrants and hose pipes
7. DVR of CCTV shall be kept in office to avoid its damage during fire.
8. Ready bales shall be kept at safe distance from press hall.
9. Press hall shall be kept free from storing any fire hazard material.
10. Wooden furniture and almirah shall not be kept in ginneries.
11. Diesel shall be stored preferably in office not in ginning area.
12. Regular fire drill is to be conducted for keeping staff in ready condition.