

**GUIDELINES  
ON  
POST HARVEST MANAGEMENT,  
SEED PROCESSING  
&  
MARKETING INFRASTRUCTURE**



MISSION FOR INTEGRATED DEVELOPMENT OF HORTICULTURE  
DEPARTMENT OF HORTICULTURE,  
GOVERNMENT OF ANDHRA PRADESH

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## **INTEGRATED POST HARVEST MANAGEMENT GUIDELINES**

Specific programmes which would be taken up under MIDH would include establishment of Pack houses, Integrated Pack houses, Pre-cooling units, Cold Rooms, Mobile Pre-cooling units, Cold Storage units, Controlled (CA) Storage / Modified Atmosphere (MA) Storage / supply of refrigerated vans/containers, primary/mobile processing units, ripening chambers, evaporative/low energy cool chambers, preservation units, onion storage units and zero energy cool chambers. All these projects will be entrepreneur driven through commercial ventures for which Governmental assistance will be credit linked back-ended.

Subsidy in accordance with the cost norms given to PSUs and State Government agencies, Cooperatives, growers' association, farmers group, self-help groups, women farmers groups, recognized/registered by the DMCs, having at least 25 members, will also be entitled to avail assistance for such activities to the same extent. However, assistance will not be credit linked for such agencies but would be back ended subject to condition that they are able to meet their share of the project cost.

Assistance for setting up of new cold storage/ CA Storage/ MA storage will be available to Type – I & Type - II Cold Storage units with latest / new technologies, which are energy efficient with provision for insulation, humidity control, advanced cooling systems etc., having specifications and standards approved by the Ministry as detailed in the website. [www.nhm.nic.in](http://www.nhm.nic.in) / [www.midh.gov.in](http://www.midh.gov.in).

## **A) STEPS TO BE FOLLOWED IN GENERAL:**

### **1) At the time of receiving the proposal from promoter at the ADH office**

- 1) Application along with appraisal should be in prescribed format duly signed by the promoter.
- 2) The documents to be submitted for that particular component are to be verified as per the check list.
- 3) All the project proposals should be numbered in print / ink with index showing the contents as mentioned in check list.
- 4) Issue of acknowledgement to the promoter.

### **2) Verification in ADH office**

- 1) Application should be verified that all the columns are properly filled with the signature of the promoter.
- 2) The documents are to be verified as per the check list and the check list should be duly signed by the ADH for onward submission to State cell.
- 3) If any documents are missing the promoter should be asked to submit the pending documents within one week.
- 4) After receipt of all documents DHM approval has to be obtained.
- 5) The ADH should forward the project proposals in 2 sets (Cold Storages / Ripening Chambers / Primary Processing units / Reefer Vans) along with the check list duly signed by the ADH. If any documents are not required proper justification has to be given for not submitting the documents.
- 6) As the bank consent letter, bank appraisal report and affidavit are most essential documents, the ADH should verify this documents with originals and ADH should attest the duplicate copies before submitting the project proposals to this office.

### **3) After Issue of Administrative Sanction and Execution of The Project**

- 1) Preliminary inspection report in the prescribed format has to be submitted by ADH along with bank disbursement statement to state cell for release of subsidy.
- 2) Periodical inspection at different stages of execution.
- 3) ADHs have to give confirmation regarding the suggestions / remarks given by the technical consultant in techno economic viability report.
- 4) ADH should recommend for constitution of joint inspection team.

#### 4) Joint Inspection

- 1) It is the responsibility of the ADH to coordinate with all the members as constituted in the team for conducting joint inspection.
- 2) The relevant proformas should be properly filled and subsidy is to be recommended for release.

#### 5) MONITORING

- 1) The ADH should periodically visit and inspect the unit to see that whether the unit is being utilized for the purpose for which it is sanctioned.

#### PATTERN OF ASSISTANCE

Sl. No.	Component	Unit cost	Pattern of Assistance
1	Functional Pack house / on farm collection Unit	Rs. 4.00 lakh/unit with size of 9Mx6M	50% of the capital cost.
2	Low cost onion storage structure (25 MT)	Rs. 1.75 lakh /per unit	50% of the total cost.
3	Zero Energy Cool Chamber	Rs.4000/- per unit	50% of the Total Cost.
4	<b>Cold Storage (Construction, Expansion and Modernization)</b>		
i)	Cold storage units Type 1 - basic mezzanine structure with large chamber (of >250 MT) type with single temperature zone	Rs. 8,000/MT, (max 5,000 MT capacity)	Credit linked back-ended subsidy @ 35% of the cost of project in general areas and 50% of cost in case Hilly & Scheduled areas for individual entrepreneurs.
iii)	Cold Storage Units Type 2 with add on technology for Controlled Atmosphere	Additional Rs. 10,000/- / MT for add on components of controlled atmosphere technology. Details are in Appendix-I	Credit linked back-ended subsidy @ 35% of the cost of project in general areas and 50% of cost in case Hilly & Scheduled areas for individual entrepreneurs.
5	Integrated pack house with facilities for conveyer belt, sorting, grading units, washing, drying and weighing.	Rs. 50.00 lakh per unit with size of 9Mx18M	Credit linked back-ended subsidy @ 35% of the cost of project in general areas and 50% of cost in case Hilly & Scheduled areas for individual entrepreneurs
6	Pre-cooling unit	Rs. 25.00 lakh / unit with capacity of 6 MT.	Credit linked back-ended subsidy @ 35% of the cost of project in general areas and 50% of cost in case Hilly & Scheduled areas for individual entrepreneurs

7	Cold room (staging)	Rs. 15.00 lakh/ unit of 30 MT capacity	Credit linked back-ended subsidy @ 35% of the cost of project in general areas and 50% of cost in case Hilly & Scheduled areas
8	Refrigerated Transport vehicles	Rs. 26.00 lakh for 9 MT (MIDH & HMNEH)	Credit linked back-ended subsidy @ 35% of the cost of project in general areas and 50% of cost in case Hilly & Scheduled areas for individual entrepreneurs.
9	Primary / Mobile/ Minimal processing unit	Rs 25.00 lakh / unit	Credit linked back-ended subsidy @ 40% of the capital cost of project in general areas and 55% in case of Hilly & Scheduled areas.
10	Ripening chamber	Rs. 1.00 lakh / MT.	Credit linked back-ended subsidy @ 35% of the capital cost of project in general areas and 50% in case of Hilly & Scheduled areas for a maximum of 300 MT per beneficiary.

- Assistance can also be availed for a combination of PHM infrastructure components by a beneficiary, within the prescribed norms of individual items. Assistance will be available to individuals, Group of farmers/growers/ consumers, Partnership/ Proprietary firms, Self Help Groups (SHGs), Farmers Producer Organization (FPOs), Companies, Corporations, Cooperatives, Cooperative Marketing Federations, Local bodies, Agricultural Produce Market Committees (APMC) & Marketing Boards and State Governments.
- Assistance will also be available for taking up cold chain components so as to integrate the activities into a single project.

## **B) STEPS TO BE FOLLOWED (PROJECT WISE):**

### **1) PACK HOUSE**

#### WORK FLOW FOR PACK HOUSES

S.No.	Steps	Action to be taken
<b>A</b>	<b>Before Sanction</b>	
1	Obtaining Project proposals from farmers	ADH
2	Scrutiny of the proposal as per check list	ADH
3	Obtaining DMC approval	ADH
4	Issue of administrative sanction	Dist. Collector
<b>B</b>	<b>After Sanction</b>	
5	To monitor the completion of the Pack House within 6 months	
6	Obtaining the required bills and scrutiny	ADH
7	Constitution of Joint inspection team for inspecting the Pack House obtaining photographs depicting all the components of pack house with joint inspection team.	ADH
8	Sending proposal along with joint inspection report to State cell for release of assistance	ADH
9	Release of assistance to farmers through online transfer	State cell

In respect of the Joint inspection, the ADH shall organize Joint inspection of the Pack House in presence of promoter duly constituting a committee with the following members:

- 1) Assistant Director of Horticulture (concerned)
- 2) Horticulture Officer
- 3) Horticulture Engineer

The joint inspection report should be sent in format with all necessary certifications.

The ADHs are requested to scrutiny the project proposals of pack houses at their level and maintain the proposals for record purpose in their office and need not forward to State cell. They are requested to obtain the DMC approval and send copy of DMC approval duly attesting and forward to Head Office along with Joint Inspection Report for release of subsidy.

#### **Title of the land and copy of record of right**

The title of the piece of land on which the project is proposed to be set up should be in the name of applicant in the capacity of owner or lessee for minimum period of 10 years. In case of land leased, lease deed it should be registered with the Authority like office of Sub-Registrar, etc. A latest copy of record of right showing this fact should be enclosed with the application. Mortgaged land shall not be treated at par with lease even if the credit institution might have considered so. Similarly, Power of Attorney given by owner of land in favour of applicant shall not qualify him for benefit under the scheme.

**Annexure-I**

<b>Requirements and Costing for a small Pack House</b>						
<b>Sl. No</b>	<b>Detail of structure</b>	<b>Specifications/Details</b>	<b>Qty</b>	<b>Units</b>	<b>Unit rate (Rs)</b>	<b>Total Cost (Rs)</b>
A	Land	Near Metal road, near well, power pole etc	500	yds		Farmer's Own
B	Expenditure Item					
<b>1</b>	<b>Civil Structure</b>					
1.1	Site levelling etc	Levelling land and to make it motorable inside the premises	500	yds	18	9000
1.2	30X20' Packing hall	30X20 ft with GI/Asbestos roof, Hard cement flooring, Windows doors of country wood.	600	sft	425	275000
<b>2</b>	<b>Mechanical</b>					0
2.1	Packing /grading Table (for Mango growers only)	4'X8' of GI or SS material, with 100mm side protection to stop roll off and with provision to drain water	1	Nos	18000	14000
2.2	Washing sheets (HDPE)	Of plastic of not less than 5' length and 2.6' ft width	2	Nos	3750	7500
2.3	Weighing Machine	To weigh upto 300 kgs with an accuracy of + or - 0.1 Kg with atleast 400X 600mm plat form	1	Nos	8000	8000
2.4	Chemical Treatment Washing Tubs (Cement)		3	Nos.	LS	4000
2.5	Desaping Units (for Mango growers only)	1.2 – 1.5mtr.(L)x0.8 – 1.0mtr.(W) x20cm (H);GI rods covered with ½" PVC Pipes	6	Nos.	1500	9000
2.6	Dhapoli Harvestors (for Mango growers only)		12	Nos.	400	4800
<b>3</b>	<b>Electrical</b>					0
3.1	Meter with connection	Single Phase or three phase connection including deposit	1	No	6500	6500
3.2	Electrical Wiring with fuses, switches, holders, bulbs, fans etc.	5 Tube lights, 3 Fans with 2 Hrs. back up	1	Set	7000	7000
<b>4</b>	<b>Water System</b>					0
4.1	Water tank with support	Plastic "Sintex" or equivalent or cement based located at height either outside or with separate support of at least 2000 litres capacity	1	Nos	12500	12500
4.2	Watering pipe	Running parallel to packing hall with at least three taps and flexible water pipe with shower arrangement of 50' length minimum.	100	Rft	25	2500
5	Other assets Small office table, three chairs, almairah, Wooden showels		1	LS	5000	5000
6	Plastic Crates	40 Ltrs. Capacity (25 kgs.)	250	Nos.	240	60000
7	Inverter (Optional)			1	8000	8000
					<b>TOTAL</b>	<b>4,32,800</b>

**LIMITED TO Rs.4,00,000/- (Rupees Four Lakhs only)**

**Signature**



**Annexure-II**

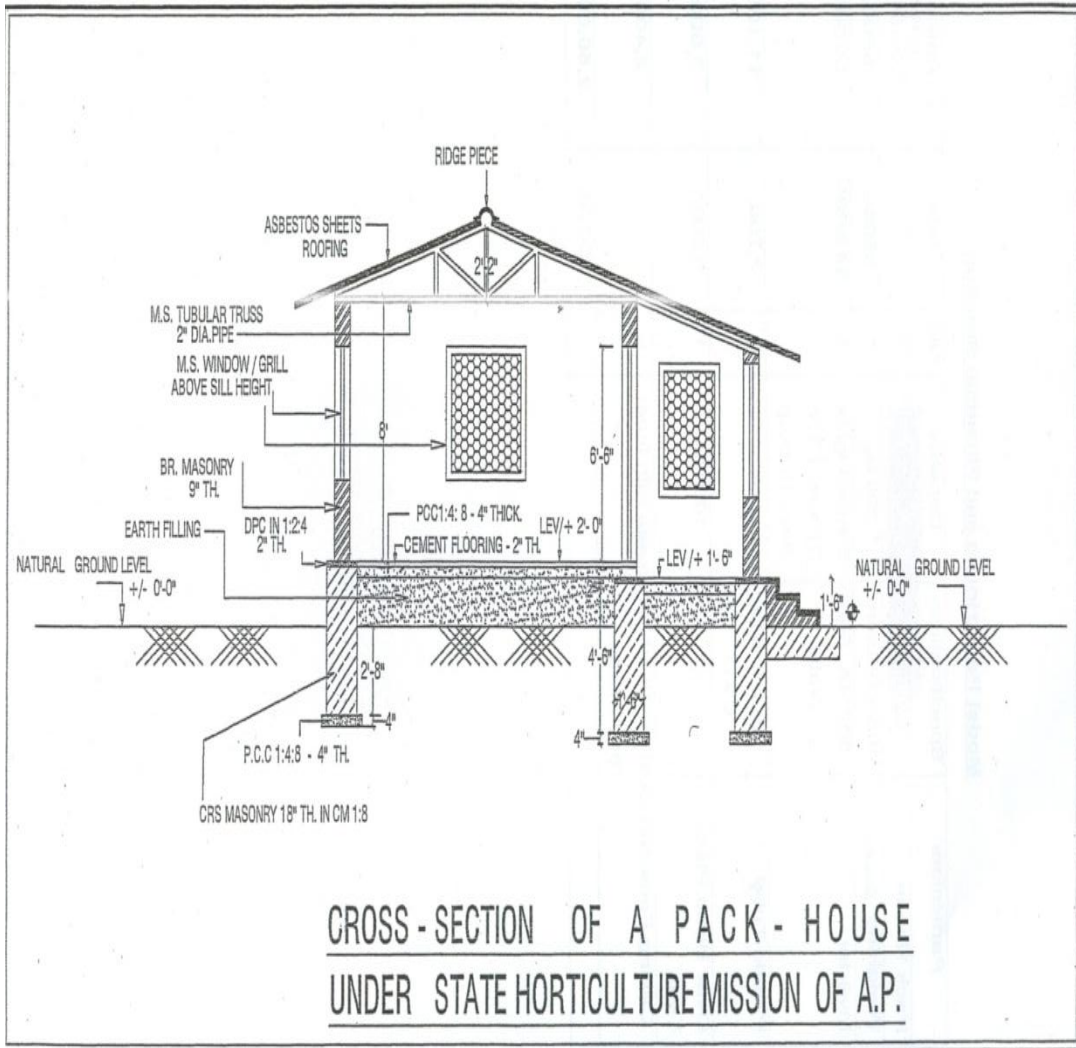
**ESTIMATE FOR THE PROPOSED MODEL PACK HOUSE - SIZE - 30' X 20' = 600 SFT UNDER M.I.D.H.**

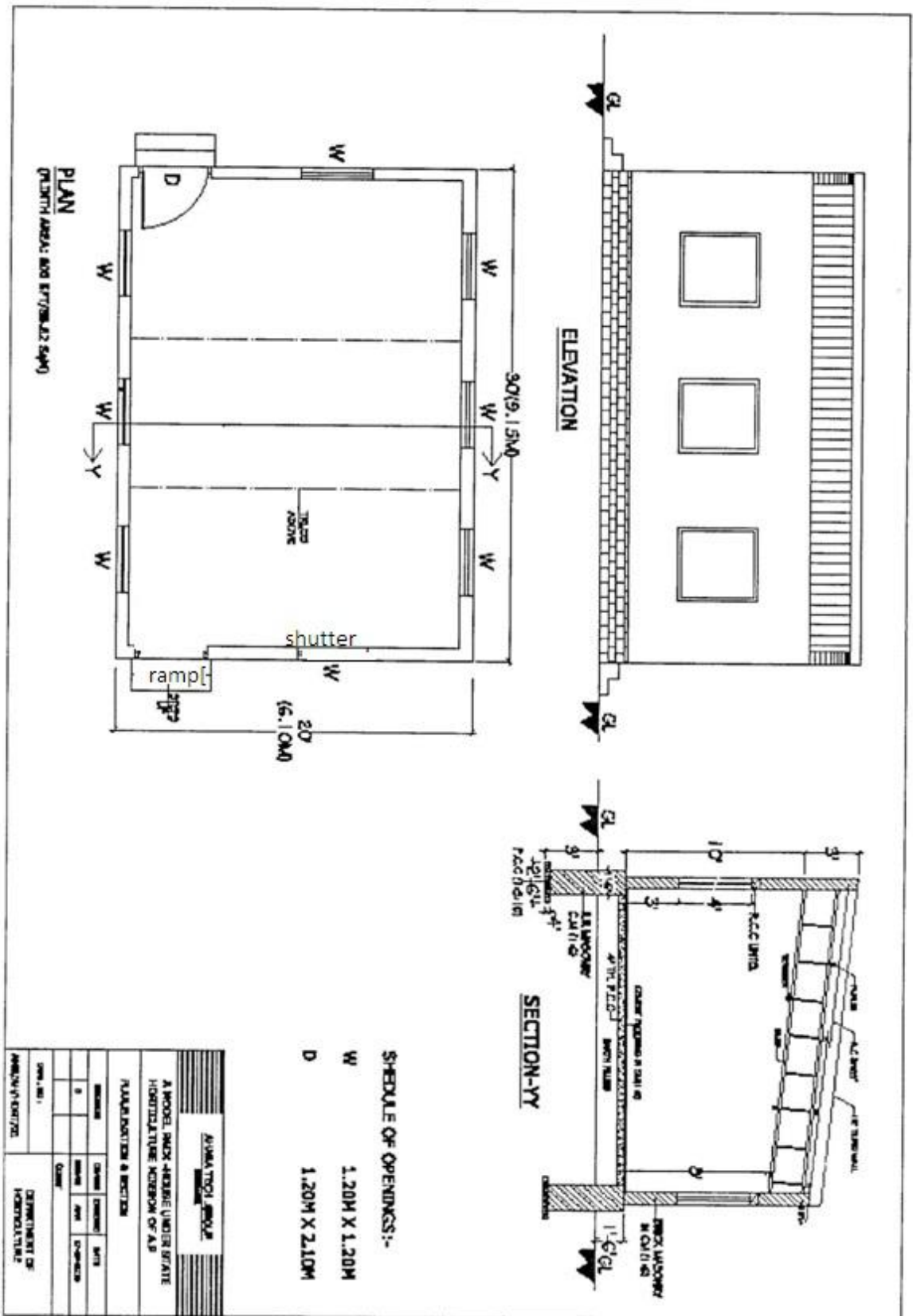
S.NO.	Description of work	Quantity	Rate	Per	Amount (Rs)
1	Earth work excavation in all types of soils for walls and for columns footings as per drawing or as directed by the including dewatering shoring, sheeting, shuttering if necessary all leads, lifts, delifts and back filling trenches with watering and tamping on either of stone masonry upto Ground level, spreading and levelling surplus earth as directed wih in the premises etc., complete	20.60	210.00	Cum.	4326
2	Providing and laying in line and level in cement concrete (1:4:8) Proportion using 40mm guage hard granite well graded aggregate including dewatering, machine mixing, shuttering, vibrating, ramming curing, all leads, lifts, delifts, etc., complete.				
a)	Under foundations	2.26	3000.00	Cum.	6758
b)	Under flooring	4.29	3000.00	Cum.	12870
3	Providing and constructing CRS masonry with cement Mortar (1:6) Proportion in basement including curing, dewatering, lead, lift, delift etc., complete	17.18	2500.00	Cum.	42950
4	Earth filling in basement and/or plinth with soils of approved quality/borrowed with standard specifications in layers of 150 mm to 230 mm (6" to 9") including watering and tamping and thoroughly consolidating.	15.15	165.00	Cum.	2499.75
5	RCC WORK: Reinforced concrete work conforming to IS 456 in M20 Proportion using 6mm to 20mm guage metal with steel centring or form work required including mild or tor steel reinforcement.	1.03	8678.00	Cum.	8938.34
6	Providing and constructing Super structure in 230mm (9") thick wall in cement mortar (1:6) in line and level including watering, curing, lead, lift, delift, cost and conveyance of all materials to site, all incidental and operational charges etc., complete	19.90	4000.00	Cum.	79600

7	Providing and applying 20mm (3/4") thick cement plastering to walls in two coats out of which first coat of 16mm (5/8") thick shall be in cement mortar (1:5) Proportion and the second coat of 4mm (1/8") thickness in cement mortar (1:3) Proportion with sponge finish or fine finish as directed, in line and level including watering, curing, all leads, lifts, delifts, cost and conveyance of all materials to site, all incidental and operational all charges etc., complete.	190.24	165.00	Sqm	31389.6
8	Providing and applying raised and cut pointing over exposed surface of CRS masonry in cement mortar (1:1) including all cost of material, labour, lead, lift, etc., complete course.	18.58	130.00	Sqm	2415.4
9	Providing and laying cement flooring in cement mortar (1:3) with a floating coat of cement slurry and making squares of 2'X2' including all operational charges curing, lead, lift, etc., complete.	49.00	225.00	Sqm	11025
10	Supply and fixing of flush doors in M.S. box frame in 125 X 64mm thick fabricated in 1mm thick sheet with shutter of black board solid core 35mm thick, covered both the surfaces with commercial ply, duly painted two coats of enamel with luppum putty, with the following specifications etc., including cost of c.c. bed blocks in (1:2:4) filling the inner portion of frame with cement mortar (1:8) etc., completer				
a)	M.S. box frame: 127mm X 64mm 12mm X 35mm rebate				
b)	Hold Fast: iron hold fasts, 6 Nosebeded in cement concrete (1:2:4)	2.00	5760.00	Nos	11520
c)	Hinges: 150mm X 40mm iron anodized butt hinges with nettle fold screws 3 Nos or as required				
d)	Shutter: 40mm thick black board of solid core of approved quality				
e)	Tower Bolts: aluminium				
	i) 200mm long - 1 No				
	ii) 150mm long - 1 No				

f)	Handle: aluminium				
	i) 150mm long - 2 Nos				
g)	Stoppers: double barrel				
h)	Aldrop: - 1 No				
i)	Enamel painting two coats with wood primer and two coats of luppum finish of approved quality, colour and shade				
11	Supplying and fixing of Glazed M.S. Windows with 10mm square guard bars at 150mm c/c including hardware and 4mm glass	11.90	3500.00	Sqm	41650
12	Supplying fabricating and erecting in position M.S. tubular trusses in 2" dia "B" class pipe including providing and applying two coats of enamel paint with anti corrosive red oxide primer including all operational charges lead, lift etc., complete	0.75	75000	M.T	56250
13	Providing and laying asbestos sheets roof with charminar asbestos sheets with the required ridge piece including all operational charges lead, lift, etc., complete.	59.94	150.00	Sqm	8991
14	Providing and applying two coats of suryacem paint over the plastered surfaces including cleaning the floor etc., complete.	183.45	21	Sqm	3852.45
				Rs	<b>325057.54</b> <b>say</b> <b>325000/-</b>

Note: Units, Measurements, quantities & rates are only indicative according to SSR-2013 and the total amount is limited to Rs. 2,75,000/- only.





Signature of the Regd. Civil Engineer with Seal.

## CHECK LIST FOR PACK HOUSE UNIT

S. No.	DESCRIPTION	PAGE NO
1.	Application Form along with Appraisal Report	
2.	Detailed Project Report MIDH Guidelines	
3.	DMC Approval	
4.		
5.		

**APPLICATION FOR AVAILING ASSISTANCE / SUBSIDY UNDER MIDH**

**(COMPONENT: PACK HOUSE)**

**Name of the Scheme: Post Harvest Management**

- 1 Name of the Farmer :
- 2 Father / Husband Name :
- 3 Caste (SC/ST/BC/OC) :
- 4 Address: :
- Phone / Cell No.: :
- 5 Land records with Extent in Acres :  
/ Ha.  
(Copy of Pass Book / Adangal)
- 6 Source of Irrigation (Open well / :  
Bore well / Canal)
- 7 Name of the Financing Bank, :  
Loan Amount Proposed
- 8 Whether any Govt. Subsidy :  
availed previously
- 9 Any other relevant information :

**Declaration**

I, \_\_\_\_\_

declare that the particulars furnished above are true to the best of my knowledge and I promise that the benefit obtained from State MIDH Cell will be used for the purpose for which it is given and in case of misuse I am liable for any action deemed to be fit by Govt. of A.P., including recovery of the subsidy amount with 12% interest to the Government.

- Enclosures:** 1. Affidavit  
2. Pattadar Pass Book  
3. Detailed Project Estimate by Civil Engineer  
(Regd. No. along with Seal)

**Signature of the Farmer / Entrepreneur.**

Recommendations of the Horticulture Officer : \_\_\_\_\_

Horticulture Engineer

**Horticulture Officer**

**Asst. Director of Horticulture.**

**FORMAT TO CONDUCT FINAL AND JOINT INSPECTION OF PACK HOUSE BY THE COMMITTEE UNDER POST HARVEST MANAGEMENT COMPONENT OF MIDH, AP.**

Name of the Unit: ..... Place: ..... District: .....

As per project report				As per the inspection and actual investment			
Details	Specifications/Details	Qty	Total Cost (Rs)				
<b>Civil Structure</b>							
Site levelling etc	Levelling land and to make it motorable inside the premises	500	9000				
30X20' Packing hall	30X20 ft with GI/Asbestos roof, Hard cement flooring, Windows doors of country wood.	600 sft.	275000				
<b>Mechanical</b>							
Packing /grading Table (for Mango Growers only)	4'X8' of GI or SS material, with 100mm side protection to stop roll off and with provision to drain water	1	14000				
Washing sheets (HDPE)	Of plastic of not less than 5' length and 2.6' ft width	2	7500				
Weighing Machine	To weigh upto 300 kgs with an accuracy of + or - 0.1 Kg with at least 400X 600mm plat form	1	8000				
Chemical Treatment Washing Tubs (Cement)		3	4000				
Desaping Units (for Mango Growers only)	1.2 – 1.5mtr.(L)x0.8 – 1.0mtr.(W) x20cm (H);GI rods covered with ½”PVC Pipes	6	9000				
Dhapoli Harvesters (for Mango Growers only)		12	4800				
<b>Electrical</b>							
Meter with connection	Single Phase or three phase connection including deposit	1	6500				
Electrical Wiring with fuses, switches, holders, bulbs, fans etc.	5 Tube lights, 3 fans, with 2 hrs backup	1	7000				
<b>Water System</b>							
Water tank with support	Plastic “Sintex” or equivalent or cement based located at height either outside or with separate support of at least 2000 litres capacity	1	12500				
Watering pipe	Running parallel to packing hall with at least three taps and flexible water pipe with shower arrangement of 50' length minimum.	100 Rft	2500				
Other assets Small office table, three chairs, almairah, Wooden showels		LS	5000				
Plastic Crates	40 Ltrs. Capacity (25 kgs.)	250	60000				
Inverter (Optional)			8000				
			<b>4,32,800</b>				

**LIMITED TO Rs.4,00,000/- (Rupees Four Lakhs only)**

**Certificates:**

- 1) This is to certify that Sri./ Smt. \_\_\_\_\_ has established Pack House as per project report and norms of MIDH.
- 2) This is to certify that all the original purchase bills of the items mentioned above have been verified and found correct.
- 3) This is to certify that Sri./ Smt. \_\_\_\_\_ is eligible to avail subsidy of Rs. .... and the same may be released.

**Farmer**

**H.E.**

**H.O.**

**ADH**

**DDH**



## **2. ONION STORAGE STRUCTURES**

### **REQUIREMENTS**

For effective long storage of onion the parameters essential to be looked after are the bulb size, choice of cultivars, cultivation practices, time of harvest, field curing, removal of tops, drying, grading, packing, storage conditions (optimum storage range of relative humidity 65% to 70% with the temperature ranging between 25°C to 30°C).

### **Salient Features of Improved Storage Structures are:**

1. Construction of structure on a raised platform to prevent moisture and dampness due to direct contact of bulbs with the soil.
2. Use of Mangalore tile type roof or other suitable materials to prevent built up of high inside temperature.
3. Increased centre height and more slope for better air circulation and preventing humid micro climate inside godown.
4. Providing bottom and side ventilations for free and faster air circulation and to avoid formation of hot and humid pockets between the onion layers.
5. Avoid direct sunlight or rain water falling on onion bulbs to reduce sun scald, fading of colour and quality deterioration.
6. Maintenance of stacking height to avoid pressure bruising.
7. Periodical disinfection of structures and premises to check rottage.
8. Cost effectiveness of structures is based on utilization of locally available material for the construction.



## PATTERN OF ASSISTANCE :

- Unit cost for 25 MT capacity of Low Cost Onion Storage Structure: Rs.1.75 lakh per unit.
- Subsidy @ 50% of the total cost.

### **TECHNO - FINANCIAL PARAMETERS ADOPTED FOR WORKING OUT THE ECONOMICS OF A 25 MT ONION STORAGE STRUCTURE**

1	Land requirement	6.5 m X 7.0 m
2	Storage space requirement	4.5 m X 6.0 m
3	Technology preferred	Natural or forced ventilation maintaining a temperature between 25 and 30 o C with a relative humidity range of 65 to 70 %.
4	Clearance of storage platform from the ground	60 cm
5	Height of the storage platform	90 to 150 cm

### ESTIMATE FOR ONION STORAGE CAPACITY OF 25 MT.

Sl. No.	Description	Unit	Total	Rate	Amount (Rs.)
1	Excavation for foundation	Cum	3.888	132	513.26
2	P.C.C. 1:4:8 in foundation	Cum	0.729	3000	2187.00
3	R.C.C. 1:2:4 for columns	Cum	2.339	3840	8981.76
4	Nominal Reinforcement to columns	Kg	320	62.40	19968.00
5	Structural Steel Works	Kg	1200	72	86400.00
6	A/C Sheet Roofing	Sq.mtr.	83.2	240	19968.00
7	A/C Sheet Ridge	Rmt	13	144	1872.00
8	2" dia 4/2 bamboo strips @ 3" c/c	Rmt.	1454.4	30	43632.00
		<b>TOTAL</b>			<b>183522.02</b>
				<b>Rounded to Rs.</b>	<b>1,75,000.00</b>



**APPLICATION FOR AVAILING ASSISTANCE / SUBSIDY UNDER MIDH**

**(COMPONENT: ONION STORAGE STRUCTURE)**

**Name of the Scheme: Post Harvest Management**

- 1 Name of the Farmer :
- 2 Father / Husband Name :
- 3 Caste (SC/ST/BC/OC) :
- 4 Address: :  
Phone / Cell No.: :
- 5 Land records with Extent in Acres / Ha. :  
(Copy of Pass Book / Adangal)
- 6 Source of Irrigation (Open well / Bore well / Canal) :
- 7 Name of the Financing Bank, Loan Amount Proposed :
- 8 Whether any Govt. Subsidy availed previously :
- 9 Any other relevant information :

**Declaration**

I, \_\_\_\_\_  
declare that the particulars furnished above are true to the best of my knowledge and I promise  
that the benefit obtained from State MIDH Cell will be used for the purpose for which it is given  
and in case of misuse I am liable for any action deemed to be fit by Govt. of A.P., including  
recovery of the subsidy amount with 12% interest to the Government.

**Enclosures:** 1. Affidavit  
2. Pattadar Pass Book  
3. Detailed Project Estimate by Civil Engineer  
(Regd. No. along with Seal)

**Signature of the Farmer / Entrepreneur.**

Recommendations of the Horticulture Officer : \_\_\_\_\_

**Horticulture Engineer**

**Horticulture Officer**

**Asst. Director of Horticulture.**

**FORMAT TO CONDUCT FINAL AND JOINT INSPECTION OF ONION STORAGE  
STRUCTURE BY THE COMMITTEE UNDER POST HARVEST MANAGEMENT  
COMPONENT OF MIDH, AP.**

Name of the Unit: ..... Place: ..... District: .....

As per project report				As per the inspection and actual investment				
Details	Specifications/Details	Qty	Total Cost (Rs)					

**Certificates:**

- 1) This is to certify that Sri./ Smt. \_\_\_\_\_ has established Onion Storage structure as per project report and norms of MIDH.
- 2) This is to certify that all the original purchase bills of the items mentioned above have been verified and found correct.
- 3) This is to certify that Sri./ Smt. \_\_\_\_\_ is eligible to avail subsidy of Rs. .... and the same may be released.

Promoter   Horticulture Engineer   Horticulture Officer   ADH   DDH

### **3. INTEGRATED PACK-HOUSE**

#### Component Definition

This component refers to modern integrated pack-house with facilities for conveyer belt system for, sorting and grading, washing, drying and weighing.

#### Component Description

A modern integrated pack-house unit enables small lot sourcing of horticulture produce, and should be built close to farming area. A maximum admissible cost norm of 50 lakhs per integrated pack-house unit is applicable for each beneficiary. The actual value of the equipment will vary as per design options. The unit capacity of an integrated pack-house is considered at 16 MT per day and is considered for output from 2MT/hour sorting grading line, running for 8 hours a day. The design capacity of each project will be considered pro-rata – for example a 32 MT per day throughput will be equivalent to 2 pack-houses. The included equipment are weighing scales, mechanised facilities like conveyer belt for sorting, grading units and where applicable washing, drying units.

The component “Integrated Pack-house” includes:

1. Receiving area, covered: a covered shaded area for arriving produce to be off-loaded and undergo pre-selection and weighing.
2. Enclosed covered sorting and grading area: a food handling hall with mechanised handling and cleaning equipment.
3. Sorting and Grading conveyors: mechanised roller or belt based system to allow working personnel to selectively pick and choose produce for next activity, capable of handling 16 MT of output per day. Water based conveyor system used for some crops.
4. Washing/Drying equipment: where required, mechanised washing and drying lines.
5. Packaging area: designated area where produce is manually packaged into market lots.
6. Electricity generator: a DG set to produce power for equipment operations. Where alternate energy options (bio-mass based generators, solar powered generators, etc.) are used, add-on technology component will apply.

An area of 9 x 18 metres is the indicative enclosed area for each pack-house. Each pack-house appraised under this component should have minimum equipment to facilitate the basic sorting and grading. Additionally washing, drying and weighing equipment can also be installed so that product is readied for packaging. In special cases, such as bulk storage for perishables like apples, sorting grading facility is built adjoining the storage facility to sort storable quality. These pack-house facilities can handle upto 150MT per day. Where the sorting grading line incorporates electronic sorting, the related add-on technology component can be applied.

Facility for conveyer belt system depends upon product to be handled. For example in case of mangoes. conveyer belt system is used. In case of Bananas water troughs are used in place of conveyer belt system.

**Sample thematic layouts: Sample layouts – the actual dimensions will depend on final plan layout**

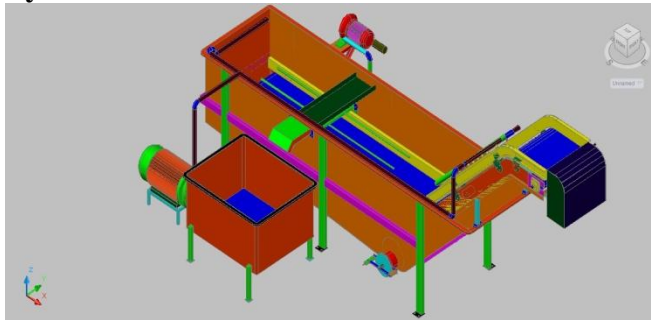
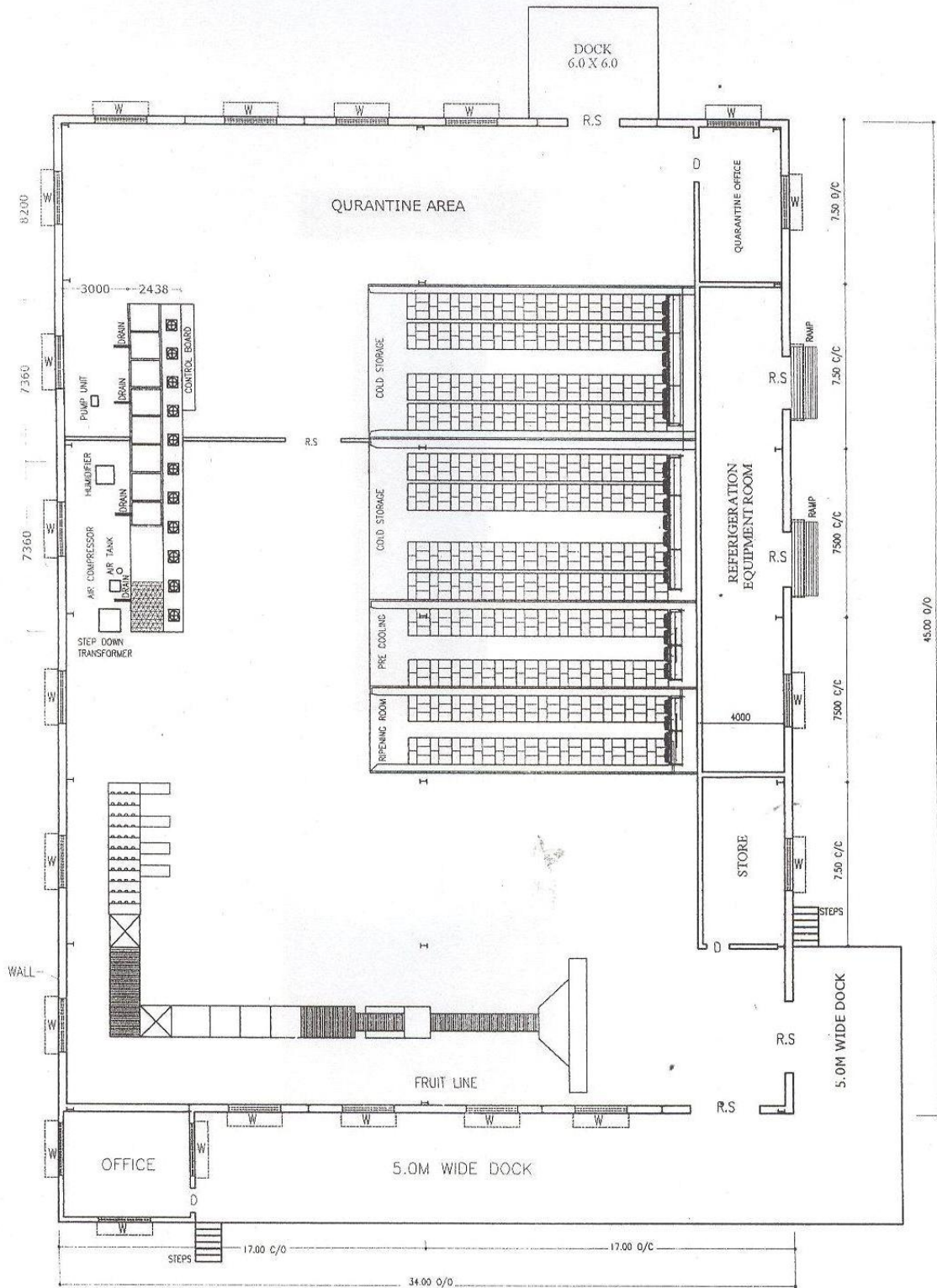


IMAGE OF CONVEYOR BELT



# TYPICAL DRAWING OF INTEGRATED PACK HOUSE WITH ALL ADDITIONAL COMPONENTS





**INTEGRATED PACK-HOUSE**

#	Component: Integrated Pack house	Description <i>(refer sample sheet)</i>
1	Pack house Handling capacity (MT/day)	
2	Products to be handled	
3	Area of the pack house (m <sup>2</sup> )	
4	Receiving Area (L x W x H) m	
5	Dimension of the building (L x W x H) m	
6	Handling Area (L x W x H) m	
7	Roof Details	
8	Outer walls and Flooring Details	
9	Lighting - Internal and External (Type, Numbers and wattage)	
10	Door/ Window Details	
11	Pest control Details	
12	Fumigation Details	

#	Component: Integrated Pack house	Description (refer sample sheet)
13	De-sapping tables	
14	Mechanised Conveyor system & capacity (tons/hour)	
15	Washing and Drying machinery (if used)	
16	Power generating unit (kVA)	
17	Inclusion of Pre-cooling chamber in pack-house (Y/N)	
18	Inclusion of staging cold-room in pack-house (Y/N)	
19	Layout Drawing	

*Project declares compliance with all mandatory codes and regulations are complied with*

## **4. PRE-COOLING UNIT**

### **Component Definition**

The component Pre-Cooling Unit refers to a specialised cooling room that rapidly removes field heat from fresh produce after harvest and thereby prepares the cargo for subsequent shipping. Pre-cooling or post-harvest cooling is one of the most critical steps in preparing fruits and vegetables for the extended cold-chain. Pre-cooling unit must have an adjoined staging cold room in all pack houses.

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**Assistance for Pre-Cooling Unit will be linked to Pack House / Integrated Pack House and Cold Room (Staging).**

**Individual Pre-Cooling Units cannot be financially assisted by MIDH.**

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### **COMPONENT DESCRIPTION**

A maximum admissible cost norm of Rs.25.00 lakh/unit is applicable for each beneficiary. The total capacity of a pre-cooler component considered is 18MT per unit, i.e. capable of pre-cooling 3 batch loads of 6 MT per day. A pro-rata cost shall be considered in proportion to other capacities or design options.

#### **The component “Pre-cooling unit” includes:**

1. **Insulated room**: Thermally insulated room, designed to precool 6 MT of fresh produce in temperature controlled conditions and high humidity levels.
2. **Pre-cooler unit**: Heat exchange coil with high airflow fans designed to maintain very high Relative Humidity levels for batch load of 6MT.
3. **Evaporating and Condensing Unit**: Air cooled or water cooled condensing unit with refrigeration capacity and associated evaporator unit to pull down the field heat of 6MT of fresh produce in 4 to 6 hrs.
4. **Controls**: Electronic controller for controlling refrigeration and for temperature and Relative Humidity monitoring.
5. **Electricity generator**: a DG set to produce power for equipment operations. Where alternate energy options (bio-mass based generators, solar powered generators, etc.) are used, add-on technology component (MIDH Appendix II-xv) will apply.
6. In case of cold storages (type 2) which are designed with high capacity refrigeration to pre-cool and pull down the produce temperature in each storage chamber (i.e. CA enabled cold stores for apples, pears), 1% of the cold storage volumetric capacity can be considered under component of pre-cooler with a maximum capacity of 100MT.

Other kind of pre-cooling systems include the vacuum cooler, hydro-cooler, etc. and these have unique designs and will be considered for appraisal on project basis.

Modern pre-cooler design incorporate equipment and design aspects to sustain high RH levels (upto 98%) and high air flow and static pressure conditions. This allows for maximum penetration of cooling medium for rapid temperature exchange and minimal loss of moisture. Once this energy intensive phase is completed, the produce is shifted

into an adjoining cold room in preparation for onward dispatch to cold storages or for direct market access. The pre-cooler is then reused for the next harvest batch. Approximately 3 complete cooling cycles of 6 hours each can be output from a forced air pre-cooler every 24 hours. In example of apple stores, the precooling is effected inside the cold store chamber over and refrigeration capacity is suitably designed for this function.




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### Reference Data Sheet

#	Component: Pre-cooling unit	Description
1	Produce to be pre-cooled	Name the produce types to be handled.
2	Unit Package load	Specify packaging used- Pallet, Boxes, others.
3	Pre-cooler volumetric capacity	Provide pre-cooler physical volume in cubic meters. Specify the (L x B x H) of pre-cooling unit in metres
4	Cooling System used	Describe type of precooling - forced-air cooling, hydro-cooling / icing / vacuum cooling / room cooling.
5	Temperature and RH levels.	Temperature in degree Celsius and relative humidity in % designed for.
6	Pull down time (batch time)	Time duration per batch to bring the initial product temperature to the storage temperature.
7	No of batches planned in a day	List the number of batches planned per day.
8	Refrigeration Load	Estimated refrigeration load in kW.

9	Insulating material used	Type of insulating material, thickness and 'UValue'.
10	Evaporator/Chiller make	Maker name and model of the evaporator/chiller unit.
11	Air flow & static pressure.	Pre-cooler air flow in cubic meter per hour and static pressure in kPa.
12	No of fans	Specify the quantity of evaporator fans and connected motor power.
13	Water pump capacity	Specify the water flow in m <sup>3</sup>
14	Motor rating	Specify the pump motor capacity in kW.
15	Make of condensing unit	Maker name and model of condensing unit.
16	Refrigeration of condensing Unit	Specify the capacity of condensing unit in kW.
17	Condensing unit type	Specify the whether it is air cooled or water cooled.
18	Door details	Dimensions, insulation material and thickness of the door.
19	Controls Used	Specify the electronic controller for room temperature and relative humidity monitoring & control.
20	Refrigerant used	Technical name of refrigerant.
21	Total connected Power	Specify the total connected power in kW.
22	Power generating unit	Details of electric generator used (kVA). Capacity must be sufficient for operating pre-cooler and staging cold room.
23	Layout Drawing	Provide layout drawings of the pre-cooling unit including pack-house and staging cold room.

All mandatory rules & regulations (BIS, ISO, IS etc.) relevant to the item must be complied with.

## 5. COLD ROOM

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### Component Definition

This component is an insulated and refrigerated chamber which is a necessary combination for Pre-Cooling Unit and serves as a transient storage, while allowing the pre-cooler to be utilised for next batch load of incoming produce.

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**Assistance for Staging Cold Rooms will be linked to existing & new pre-coolers. Individual Cold Room (Staging) units cannot be financially assisted by MIDH.**

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### Component Description

A maximum admissible cost norm of Rs.15 lakh/unit for a storage capacity of 30 MT is applicable for each beneficiary. A pro-rata cost shall be considered in proportion to other capacities or design options.

The component “Cold room (staging)” includes:

- 1) An insulated room of 100m<sup>3</sup> volume - capacity to store 30MT
- 2) Associated refrigeration equipment.
- 3) Staging area – adjoining enclosed area to load vehicle for dispatch.

The component has been kept separate but must be appraised only when attached to a pre-cooling unit. The beneficiary must be advised that the cold room (staging) necessitates the following:

- 1) Other preconditioning facility (integrated pack-house).
- 2) An appended Pre-cooler unit.
- 3) An ante-room for staging.

The design specifications of such cold rooms are similar to a cold store, with the refrigeration design to suit humidity and temperature ranges for horticulture produce. Where pre-coolers are built appended to an existing cold store, the cold store itself serves this purpose.

### Recommendations

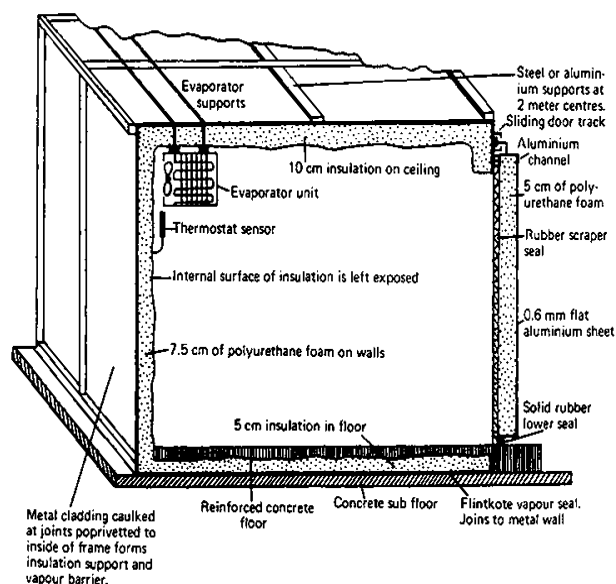
In view of the fact that existing cold stores at farm-gate may need to select only individual component items to fulfil the operational need to serve as pack-houses, the integrated pack-house / pre-cooler / staging cold room items have been kept as individual components so that such existing cold stores can select to suit requirements. **For new installations, it is recommended that all three components be created, as applicable.**

These first three series of components are created at production areas (farm level) and will close a critical missing link in cold-chain for the horticulture sector. Without this combination of components, there is no scope for domestically grown produce to safely access our existing cold stores. The integrated pack-house, pre-cooler and cold room (staging) are effectively points of origin of the fresh produce cold-chain.

## Cold Room Image



## Cold Room Line Drawings



## Reference Data Sheet

#	Component: Staging Cold Room	Description
1	Products to be stored	Name the produce types to be pre-cooled and stored.
2	Temperature and RH levels.	Temperature in degree Celsius and relative humidity in % designed for.
3	Staging cold room dimension	Dimensions of the insulated cold room (L x B x H) in mtrs.
4	Insulation used	Type of insulating material and thickness along with 'U Value'.
5	Refrigeration Load	Total refrigeration load in kW.
6	Evaporator/Air-cooler make	Maker name and model of the evaporator/air-cooler unit.
7	Evaporator construction	Details for heat exchange coil, fans.
8	Air flow	Air cooler air flow in cubic meter per hour.
9	No of fans	Quantity of evaporator fans and connected motor power.
10	Make of condensing unit	Maker name and model of condenser unit.
11	Refrigeration of condensing Unit	Refrigeration Capacity of condensing unit in kW.
12	Door details	Provide the dimensions, insulation material and thickness of the door.
13	Controls Used	List the electronic controller for room temperature and relative humidity monitoring & control.
14	Refrigerant used	Technical name of refrigerant.
15	Total connected Power	Total electric Load in kW.
16	Layout Drawing	Provide layout drawings of the staging cold room unit including pre-cooler and pack-house.

(All mandatory rules & regulations (BIS, ISO, IS etc.) relevant to the item must be complied with.)

**INTEGRATED PACK-HOUSE**

#	Component: Integrated Pack house	Description <i>(refer sample sheet)</i>
1	Pack house Handling capacity (MT/day)	
2	Products to be handled	
3	Area of the pack house (m <sup>2</sup> )	
4	Receiving Area (L x W x H) m	
5	Dimension of the building (L x W x H) m	
6	Handling Area (L x W x H) m	
7	Roof Details	
8	Outer walls and Flooring Details	
9	Lighting - Internal and External (Type, Numbers and wattage)	
10	Door/ Window Details	
11	Pest control Details	
12	Fumigation Details	



#	Component: Integrated Pack house	Description (refer sample sheet)
13	De-sapping tables	
14	Mechanised Conveyor system & capacity (tons/hour)	
15	Washing and Drying machinery (if used)	
16	Power generating unit (kVA)	
17	Inclusion of Pre-cooling chamber in pack-house (Y/N)	
18	Inclusion of staging cold-room in pack-house (Y/N)	
19	Layout Drawing	

*Project declares compliance with all mandatory codes and regulations are complied with*

**PRE-COOLING UNIT**

#	Component: Pre-cooling unit	Description (refer sample sheet)
1	Produce to be pre-cooled	
2	Unit Package load	
3	Pre-cooler volumetric capacity(m <sup>3</sup> )	
4	Cooling System used	
5	Temperature (°C) and RH levels (%)	
6	Pull down time (batch time)	
7	No of batches planned in a day	
8	Refrigeration Load (kW)	
9	Insulating material used-along with thickness and U-value.	
10	Evaporator/Chiller make	
11	Air flow (cum/hr) & static pressure (kPa)	
12	No of evaporator fans and motor power(kW)	
13	Water pump capacity (m <sup>3</sup> )	

#	Component: Pre-cooling unit	Description (refer sample sheet)
14	Motor rating (kW)	
15	Make of condensing unit	
16	Refrigeration of condensing Unit (kW)	
17	Condensing unit type	
18	Door details-dimensions, insulation material and thickness of door.	
19	Controls Used	
20	Refrigerant used	
21	Total connected Power (kW)	
22	Power generating unit (kVA)	
23	Layout Drawing	

*Project declares compliance with all mandatory codes and regulations are complied with*

**COLD ROOM (Staging)**

#	Component: Staging Cold Room	Description (refer sample sheet)
1	Products to be stored	
2	Temperature (°C) and RH levels (%)	
3	Staging cold room dimension (L x B x H) m	
4	Insulation used-Type, thickness and 'U' value	
5	Refrigeration Load (kW)	
6	Evaporator/Air-cooler make	
7	Evaporator construction details	
8	Air flow (cum/hr)	
9	No of fans	
10	Make of condensing unit	
11	Refrigeration of condensing unit (kW)	
12	Door details- dimensions, insulation material and thickness of the door.	
13	Controls Used	

#	Component: Staging Cold Room	Description ( <i>refer sample sheet</i> )
14	Refrigerant used	
15	Total connected Power (kW)	
16	Layout Drawing	

*Project declares compliance with all mandatory codes and regulations are complied with*

**PRELIMINARY REPORT for INTEGRATED PACK HOUSE / COLD STORAGE / RIPENING CHAMBER /  
MINIMAL PROCESSING UNIT / SEED PROCESSING UNIT  
(Release of First Installment)**

- A Component :
- B **Details of Project** :
- (i) . Name of the project :
- (ii). Address for communication :  
with telephone No. :
- C **Project Location with Address** :
- (i). Survey No :
- (ii). Village :
- (iii). Mandal :
- D Constitution (Individual/ Joint Individual /  
Partnership Firm / Company. :
- E (i). Proposed Activity :
- (ii). Type :
- (iii). Proposed type of cooling system :
- F Name of the Promoter :
- G **Present physical status of the project :**
- (i) Land development :  
status/boundary/road :
- (ii) Stage of cold store building :  
civil/pre engineered as on :  
inspection date. :
- (iii) Type of produce to be stored :
- (iv) Whether all the machinery installed as :  
per DPR or not (Please specify) :
- H **Bank Details :**
1. Bank Name :
2. Branch :
3. Bank Sanction Date :
4. Loan Account No :
5. Bank disbursement statement with :  
A/c. No. :
6. Letter from Banker :  
(Subsidy Account no. given by bank) :

It is recommended to release 1<sup>st</sup> installment Rs. \_\_\_\_\_  
(Rupees. \_\_\_\_\_ only) as credit linked back ended subsidy as the construction  
of the unit was started.

Horticulture Engineer

Horticulture Officer

Asst. Director of Horticulture

# FORMAT

(Forwarding letter of Bank for Conducting JIT )  
Name & Full Address of the FI/Bank (on letter head)

To  
The Mission Director & Commissioner of Horticulture,  
Govt. of Andhra Pradesh,  
Public Gardens, Nampally,  
GUNTUR

**Subject : Request for Joint Inspection of the project**

Sir,

MIDH, A.P., had released Rs. .... as credit linked back-ended subsidy in respect of project of \_\_\_\_\_Village \_\_\_\_\_ District \_\_\_\_\_ State \_\_\_\_\_ Vide letter no ..... As per instruction, the subsidy amount has been kept in Subsidy Reserve Fund account of the bank and interest benefit is being passed on to the beneficiary. Now project is complete as per original proposal and we have also disbursed full Term loan sanctioned for the above mentioned project. In addition to documents submitted by bank at the time of claim of subsidy such as copy of the Appraisal Note, Term Loan sanction letter, copy of Record of Right, following documents required for Joint Inspection are being submitted with the request to conduct Joint Inspection of the project to decide final subsidy claim.

S. No	Particulars	Enclosed or Not
1	Details of date-wise release of term loan	
2	Completion certificate by Bank/FIs	
3	Undertaking from promoter (as prescribed by NHM)	
4	Extract of subsidy reserve fund account of bank in which estimated subsidy has been kept	

It is certified that the original of above documents and documents submitted at the time of subsidy claim by bank pertaining to the projects are kept in Bank/FI, which can be shown at the time of random monitoring by the Department or any agency authorized by the Department.

(Seal and Signature of the Bank's Officer )

Name : \_\_\_\_\_

Name of the Bank :

Address :

Phone/Fax/Mobile No.: \_\_\_\_\_

Place : \_\_\_\_\_

Date : \_\_\_\_\_

**FORMAT**  
**(On Letter head of the CA)**

**To**

**The Mission Director & Commissioner of Horticulture,  
Govt. of Andhra Pradesh,  
GUNTUR.**

We have examined the books of accounts and other relevant records maintained by M/s. / Shri / Smt. \_\_\_\_\_ (Name of the Beneficiary) at its office situated at \_\_\_\_\_ (Address of project) for \_\_\_\_\_ (Project activity). These accounts are maintained by the Company's management, partners of the firm / proprietor of the concerned / grower / NGO / and our responsibility is to verify the truth and fairness of these records and verification of amount expended for acquisition / construction of fixed assets / establishment and other expenditure.

We conducted our work in accordance with the Audits and Accounting Standards generally accepted in India. Those Standards require that we plan and perform our verification to obtain reasonable assurance about whether these accounts are true and fair are free of material misstatement. A verification included examining on 100% basis, evidence audit includes examining, on a test basis assessing the accounting principles used and significant estimates made by the grower, as well as evaluating the overall financial statement presentation. We believe that our audit provides reasonable basis of our opinion.

**We verify that**

- a) We have obtained all the information and explanation that to the best of our knowledge and belief were necessary for the purpose of our verification.
- b) In our opinion, proper books of accounts as required by law have been kept by the Company / firm / sole proprietorship concern / grower / NGO for the financial period \_\_\_\_\_ and these books of account represent true and fair view of the transaction entered into by the Company / firm / sole proprietorship concern / grower / NGO.
- c) In our opinion, the Company / firm / sole proprietorship concern / grower / NGO has incurred a capital expenditure amounting to Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_ only) for acquisition / construction of fixed assets and the same is being reflected properly in the books of accounts. The valuation made of major components of the project and whole project is tabulated as follows:



**Establishment of Project:**

S. No.	Component	Proposed Expenditure as per LOI	Cost as appraised by Bank before term loan sanction	Cost assessed by CA	Remarks
1					
2					
3					
	TOTAL				

Total : \_\_\_\_\_

**MEANS OF FINANCE**

S. No.	Item	Project Cost as per DPR	Project Cost as per Appraisal Report	Actual Cost
1	Promoter's Equity			
2	Term Loan			
3	Unsecured Loan			
4	Grant from NHM			
5	Others			
	TOTAL			

**We recommend Rs. .... as the cost of the whole project.****Signature and Seal of C.A.  
with Membership No.****Date:**

FORMAT TO CONDUCT FINAL AND JOINT INSPECTION OF **PRE-COOLING UNIT** BY THE COMMITTEE UNDER POST HARVEST MANAGEMENT COMPONENT OF

MIDH, A.P.

Name of the Unit: ..... Place: ..... District: .....

Sl. No.	Particulars	Specifications as per MIDH	As per project report			As per the inspection and actual investment				
			Capacity	Qty./ Nos.	Amount (Rs.)	Specifications	Capacity	Qty.	Amount (Rs.)	Remarks
1	Produce to be pre-cooled									
2	Unit Package load									
3	Pre-cooler volumetric capacity									
4	Cooling System used									
5	Temperature and RH levels.									
6	Pull down time (batch time)									
7	No of batches planned in a day									
8	Refrigeration Load									
9	Insulating material used									
10	Evaporator/Chiller make									
11	Air flow & static pressure.									
12	No of fans									
13	Water pump capacity									
14	Motor rating									
15	Make of condensing unit									
16	Refrigeration of condensing Unit									
17	Condensing unit type									
18	Door details									
19	Controls Used									
20	Refrigerant used									
21	Total connected Power									
22	Power generating unit									
	<b>TOTAL</b>									
23	Bank loan disbursed to the promoter (Rs.in lakhs)									
24	Promoters margin amount (Rs.in lakhs)									
	<b>Total :</b>									

## TECHNICAL SPECIFICATIONS OF COLD ROOM

Sl. No.	Particulars	Specifica-tions as per MIDH	As per project report			As per the inspection and actual investment				
			Capa-city	Qty./ Nos.	Amount (Rs.)	Specifi-cations	Capa-city	Qty.	Amount (Rs.)	Remarks
1	Products to be stored									
2	Temperature and RH levels.									
3	Staging cold room dimension									
4	Insulation used									
5	Refrigeration Load									
6	Evaporator/Air-cooler make									
7	Evaporator construction									
8	Air flow									
9	No of fans									
10	Make of condensing unit									
11	Refrigeration of condensing Unit									
12	Door details									
13	Controls Used									
14	Refrigerant used									
15	Total connected Power									
16	Layout Drawing									
17	Other Assets (Specify)									
	<b>Total :</b>									
18	Bank loan disbursed to the promoter (Rs.in lakhs)									
19	Promoters margin amount (Rs.in lakhs)									
	<b>Total :</b>									

### Certificates:

- 1) This is to certify that Sri./ Smt. \_\_\_\_\_ has established **Pre- Cooling Unit** as per project report and norms of MIDH.
- 2) This is to certify that all the original purchase bills of the items mentioned above have been verified and found correct.
- 3) This is to certify that Sri./ Smt. \_\_\_\_\_ is eligible to avail subsidy of Rs. \_\_\_/- and the same may be released.

Promoter                      H.E.                      H.O.                      ADH                      DDH                      Banker                      Senior Officer (MIDH)

## **6. COLD STORAGE:**

The Assistant Director concerned shall submit the project proposal in 2 sets (one in original and one in duplicate) with all the documents as per check list along with application as prescribed by the MIDH along with his recommendations for placing the project proposal in the SLEC meeting for approval.

The project proposal should be numbered in print / ink with index showing the contents as mentioned in check list.

Bank appraisal is different from bank consent letter, wherein the project is discussed and appraised in a more detailed manner for sanction of loan amount. Each bank will be having its own proforma of appraisal.

As per the directions of the MIDH the projects shall be recommended as per the following component wise cost.

<b>SI.No.</b>	<b>Item</b>	<b>% of the project cost (range)</b>
1	Civil construction	50 – 55
2	Thermal insulation	10 – 15
3	Refrigeration system	20 – 25
4	Electrical system	10 – 15

### **Calculation of Capacity for Subsidy:**

**3.4 Cubic meters (cum) / 120 Cubic feet (cft). of chamber volume shall be considered equivalent to 1 (One) MT of storage capacity.**

### **Description of components and Cost Norms**

<b>SI. No.</b>	<b>Description</b>	<b>Cost Norms</b>
1	<b>Cold Storage units Type – 1</b> – basic mezzanine structure with large chamber (of > 250 MT) type with single temperature zone.	<ul style="list-style-type: none"><li>❖ @ Rs.8,000/- MT for capacity upto 5000 MT</li><li>❖ @ Rs.7,600/- MT for capacity between 5001 to 6500 MT.</li><li>❖ @ Rs.7,200/- MT for capacity between 6501 to 8000 MT.</li><li>❖ @ Rs.6,800/- MT for capacity between 8001 to 10000 MT.</li></ul>

2	<b>Cold Storage units Type - 2</b> - Pre Engineering Building (PEB) Type for multiple temperature and product use, more than 6 chambers of <250 MT and basic material handling equipment.	❖ @ Rs.10,000/- MT for capacity upto 5000 MT ❖ @ Rs.9,500/- MT for capacity between 5001 to 6500 MT. ❖ @ Rs.9,000/- MT for capacity between 6501 to 8000 MT. ❖ @ Rs.8,500/- MT for capacity between 8001 to 10000 MT.
3	<b>Cold Storage units Type - 2</b> - with add on technology for Controlled Atmosphere	Additional Rs.10,000/- MT for add on components of controlled atmosphere technology as per component-wise cost ( <b>APPENDIX II</b> )
4	Technology induction and modernization of cold-chain	❖ @ Rs.5000/- MT, for capacity between 5001 to 10000 MT. ❖ Components of modernization includes PLC equipment, packaging lines, dock levelers, advanced graders, alternate technologies, stacking system, modernization of insulation and refrigeration etc. ( <b>APPENDIX II</b> )

#### **Title of the land and copy of record of right**

The title of the piece of land on which the project is proposed to be set up should be in the name of applicant in the capacity of owner or lessee for minimum period of 10 years. In case of land leased, lease deed it should be registered with the Authority like office of Sub-Registrar, etc. A latest copy of record of right showing this fact should be enclosed with the application. Mortgaged land shall not be treated at par with lease even if the credit institution might have considered so. Similarly, Power of Attorney given by owner of land in favour of applicant shall not qualify him for benefit under the scheme.

ADH shall see that data logger / PLCs are installed by the promoter as mentioned in technical standards.

➤ As the following documents are mandatory the ADH shall obtain the same for seeking techno viability advice before placing the project in SLEC:

1. Layout of the proposed cold storage unit in accordance to the statutory building by laws and building codes and standards duly approved by a registered architect and structural engineer.
2. Technical data sheets of each equipment namely compressors, condensers, cooling towers, Air cooling units giving general layout, dimensions, material of construction, rated capacity, operating parameters and COP duly certified by respective equipment manufactures with respect to relevant codes and standards.

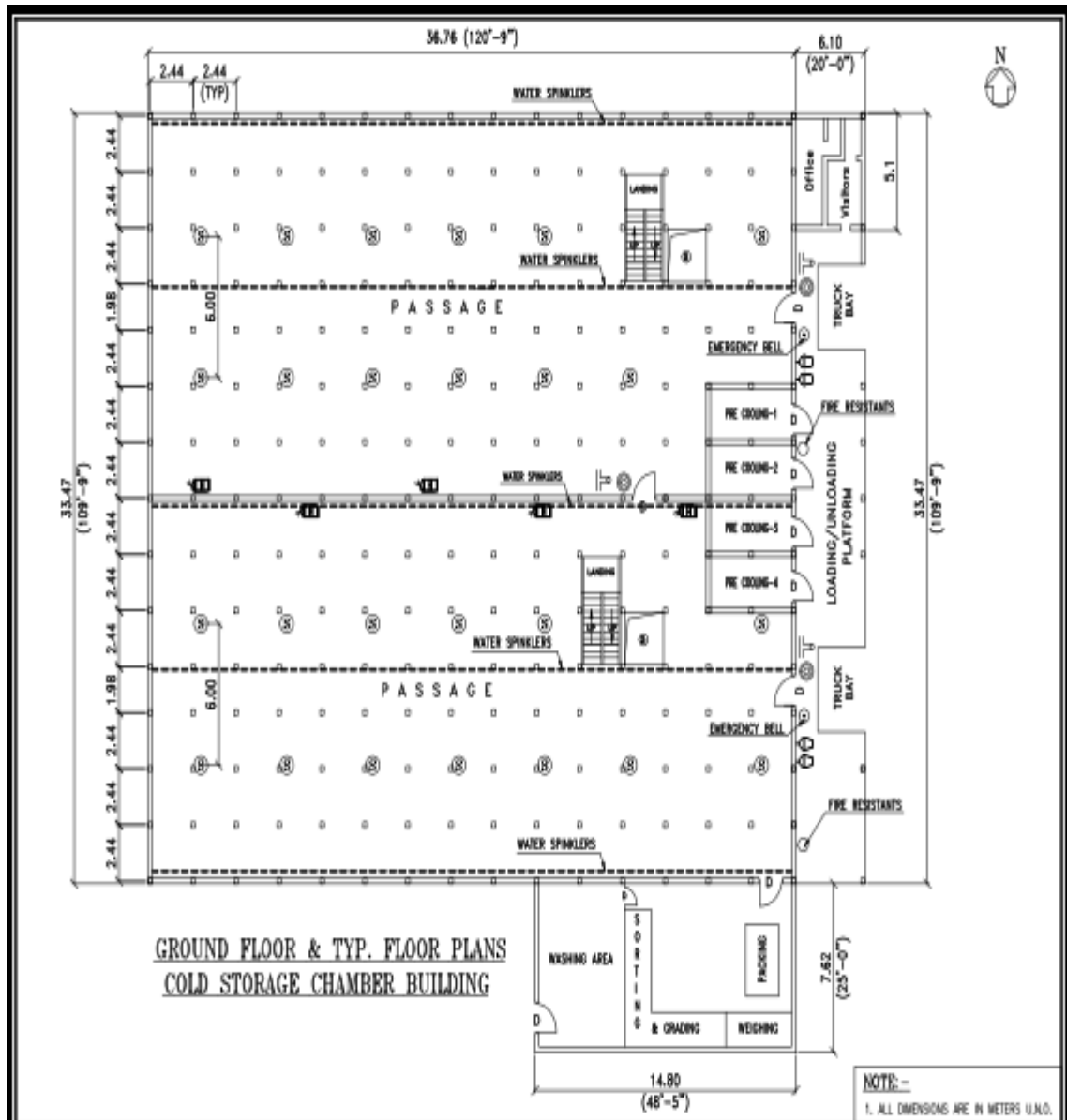
- The project proposal received in State cell from the ADH with all the above required documents shall be forwarded to the technical consultants for Techno economic Viability study.
- The project proposals that are economically and technically viable shall be placed before the SLEC for approval.
- After SLEC approval, the Commissioner of Horticulture will issue Administrative Sanction proceedings to the applicant unit.
- **“Old projects which are complete and have started commercial production should not be recommended to NHM just for reimbursement of subsidy”.**
- **The projects appraised at District Level with due diligence, subsidy should be commensurate with promoter’s share and in no case subsidy should exceed the term loan sanctioned by the lending bank. The loan amount should be higher than the subsidy amount.**
- The ADHs after receiving the In principle sanctions, shall inspect the site and submit the preliminary report in the mentioning the status and progress of the project work duly recommending for the release of 1<sup>st</sup> installment subsidy to the concern bank.
- Basing on the preliminary report of the ADH concerned the State cell shall release 1<sup>st</sup> installment subsidy to the concerned bank of the promoter through online transfer.
- After completion of the project, the ADH shall recommend through a letter for joint inspection of the project along with bank disbursement statement / completion letter from Banker.
- After obtaining permission from state office, the ADH shall conduct Joint Inspection with the following committee members:
  - ❖ ED / Sr. Officer from Commissionerate / Project Director, APMIP / DDH of the concerned district.
  - ❖ Technical Consultant
  - ❖ Assistant Director of Horticulture concerned.
  - ❖ Horticulture officer concerned.
  - ❖ Horticulture Engineer
  - ❖ Promoter
  - ❖ Banker

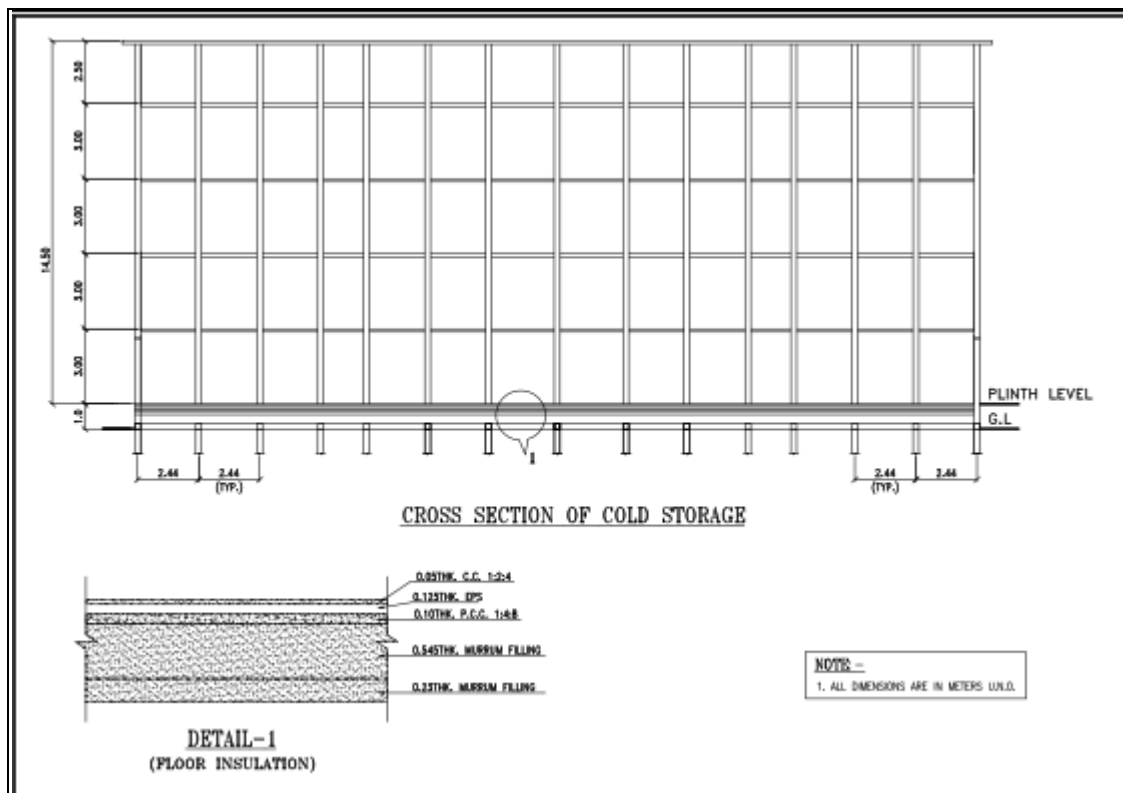
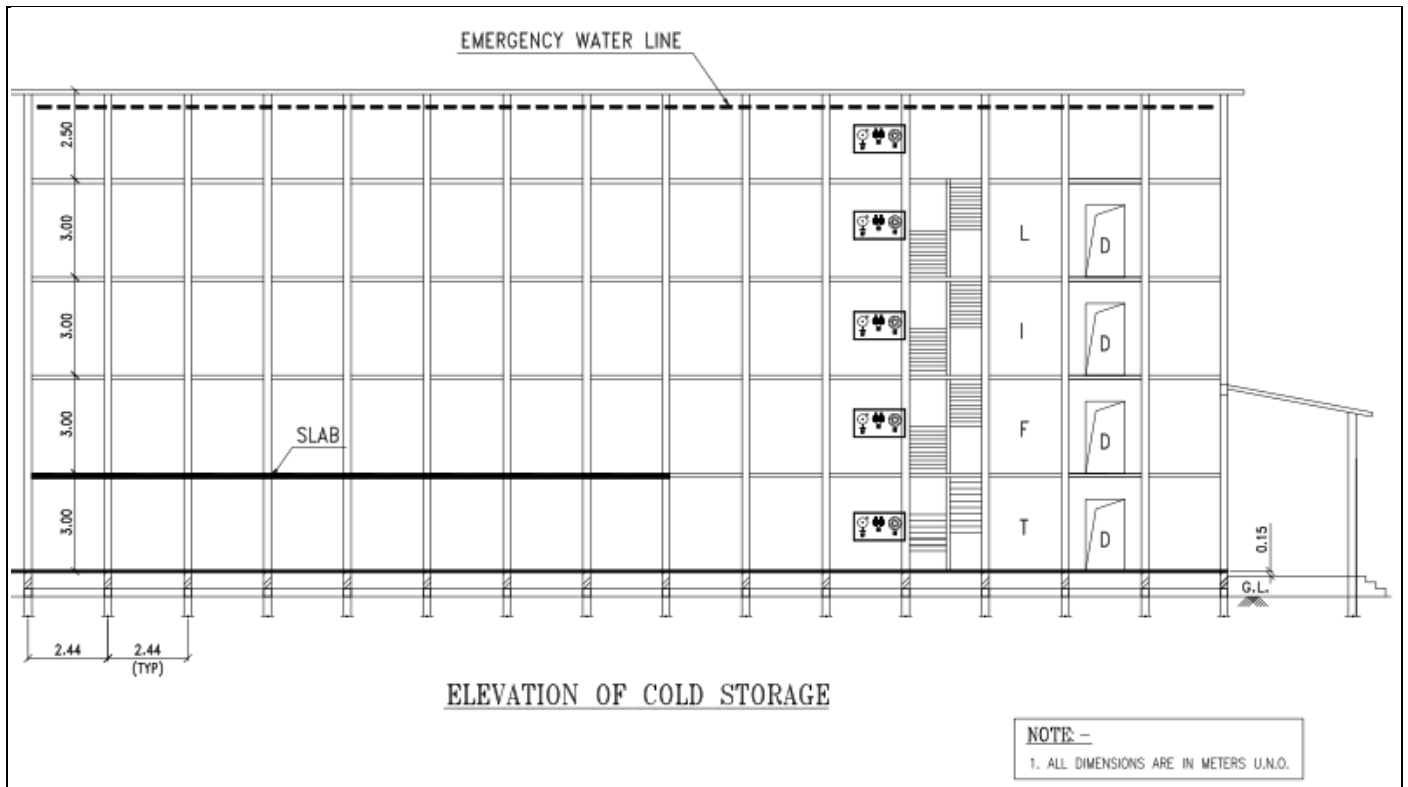
The committee shall submit Joint inspection report in the prescribed Formats for Cold Storage and based on the recommendations of the Committee, the final installment of the subsidy shall be released to the concerned bank of the promoter.

## TYPICAL DESIGN-FOR LAYOUT

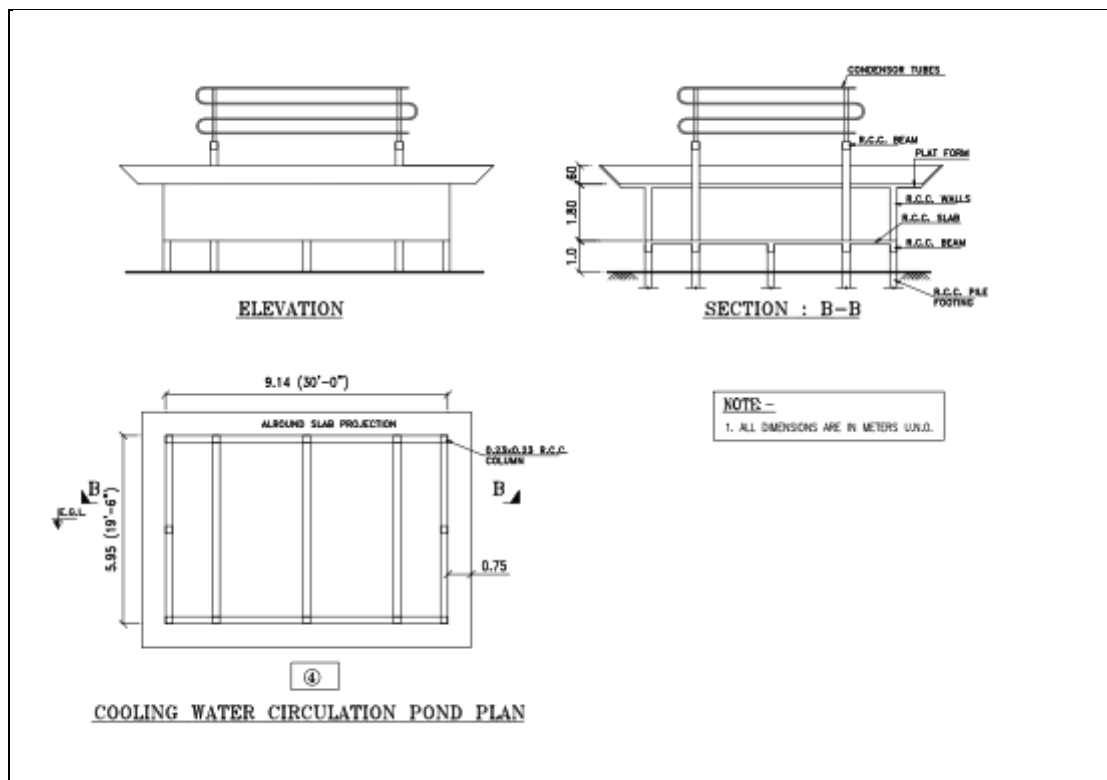
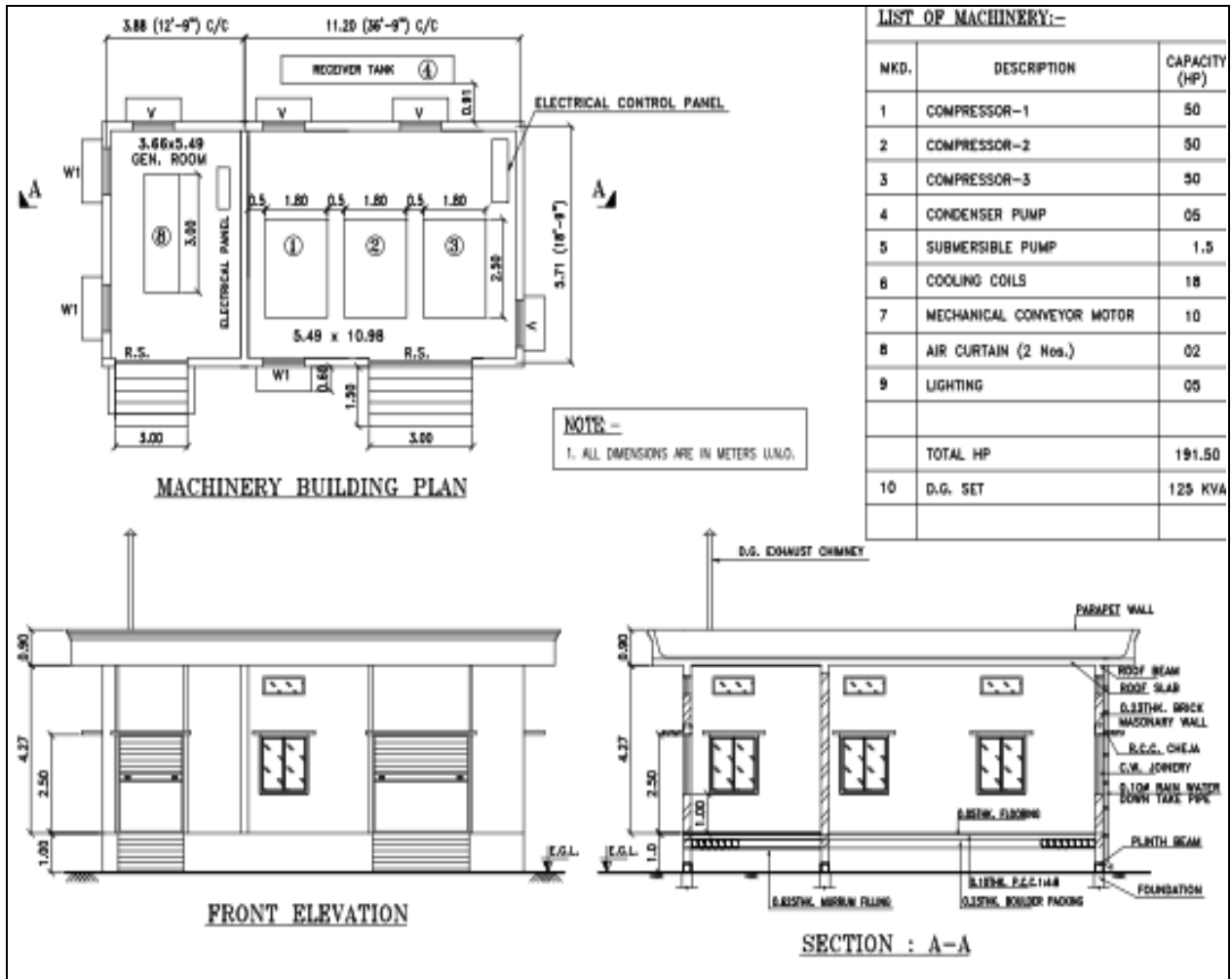
### 1. Cold Store Capacity & Typical Layout of A Four Chamber Design















- Each chamber of 20 x 17 x 12.5
- Capacity of each chamber - 1250 MT based on 3.4 m / MT
- Each bag of 50kg
- Ante room and other areas as marked on the layout.









AREA STATEMENT:-			LEGEND:-	
DESCRIPTION	SIZE (IN Meters.)	AREA (IN Sq. Meters.)		
Built up Area of Cold Storage Chamber Area	33.47 x 36.76	1230.36		FIRE EXTINGUISHER
Built up Area of G.I. Sheet Loading/Unloading Platform	6.10 x 33.47	204.17		HOSE REELS
Built up Area of R.C.C Roof Machine Room	7.39 x 9.53	70.43		FIRE EQUIPMENTS
Built up Area of R.C.C Roof Gen. Set Room	4.12 x 7.39	30.45		FIRE BUCKETS
Built up Area of R.C.C Water Circulation Tank	7.39 x 9.07	67.03		FIRE RESISTANTS
Built up Area of Office	5.10 x 7.62	38.86		EMERGENCY BELL
Built up Area of Store Room	7.39 x 9.53	70.43		WATER SPINKLERS
Built up Area of Workers Room	3.89 x 7.39	28.75		EMERGENCY OPEN WALL
Proposed Built up Area		1740.48		EMERGENCY WATER LINE
Total Land Area	3913.86 Sq. mts			WET RISER
PARKING AREA (10%)	391.39 Sq. mts			ELECTRICAL PUMP
TOT LOT AREA	391.39 Sq. mts			ELECTRICAL PUMP
GREENARY (10%)	391.39 Sq. mts			JOCKEY PUMP
				BOOSTER PUMP
				UNDER GROUND WATER TANK (1,00,000 Lts.)
				OVER HEAD TANK (10,000 Lts.)

## CONSTRUCTION FEATURES:-

The general norms for conventional construction are as follows:

Foundation:	Conventional Foundation / Pile Foundation / Raft Foundation - to be designed by qualified & licensed structural / civil engineer. The design shall meet the relevant seismic zone norms for earthquake proof designs.
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### Cold Chamber:

Walls	230 mm Brick walls / solid concrete blocks with sand- cement plaster
Roof	<p>RCC slabs or Truss Roof with GI / Pre-coated GI Sheet cover. RCC slab to have proper water proofing with reflective colour paint / China mosaic finish. Slab to have proper slope for rain water drainage. In case of truss roof, provision to be made for fixing insulated panels on the ceiling &amp; supporting of cooling units from the trusses (alternatively cooling units can be supported on floor mounted frame structure on top floor).</p> <p><b>Provision for FRP sheets for natural lighting to be made in roof sheeting at certain locations.</b> For ventilation of attic, provision of ridge monitor or turbo ventilators (which require no electric power) can be made. Alternatively roof can also be designed by installing insulated roof panels with proper slope &amp; sealing of longitudinal &amp; lateral joints. The work to be handled by experienced agencies to ensure a trouble free roof structure. The roof may be kept walkable for maintenance.</p>

Floor	The floor comprises of base concrete, in cold stores with suitably lower levels in cold chambers. The level difference between cold chambers and ante room to be equal to the thickness of floor insulation plus the layer of PCC or tremix finish.
Inter-floors	The basic structure can be RCC columns & beams or steel columns & steel beams
Grating	Wooden batten grating or steel grating using flats / square tubes etc. The interfloors have to be designed for a product loading of 900 kg/m <sup>2</sup> min. Where AC units are located on top floor, the structure has to be suitable for the unit static & dynamic loads.
Ante Room	This shall be designed to accommodate staircase, electrical hoist cage and have wider doors. Provision for fire escape stair & exits to be made as per local norms. The interfloors in ante room to have doors to each cold room on each floor.

#### **Rooms for machines, Electricals etc.**

Dock	Loading & unloading dock shall be designed with RCC slab roof or sheet roofing. However the machine roof can have RCC slab-roof to accommodate the evaporative condensers, pump sets, water tank, water softener etc. The dock area to accommodate suitably sized office & toilet for staff & labour.
Strip Curtains	To be provided to reduce infiltration during loading/ unloading. Air curtains can also used although they consume energy.
Ancillaries	Underground fresh water storage, storage for fire fighting, water supply & sanitary arrangements, compound wall / fencing, main gate, security, small canteen / electrical sub-station & D.G.set platform, roads & parking place for vehicles etc. Green land scaping with benches for labourers.

#### **THERMAL INSULATION**

Cold chambers have to be insulated on walls, ceilings / roofs & floors with proper insulating material of adequate thickness, with provision for vapour barrier on outer side & proper cladding/ cover on inner side. The commonly insulation materials are:

- a. Expanded polystyrene
- b. Rigid Polyurethane foam
- c. Rigid phenolic foam
- d. Mineral wool / glass wool
- e. Extruded polystyrene

The ancillary materials to be used include:

- a) Vapour barrier eg. aluminium foil, polyurethane sheet, with bitumen / cold mastic adhesives
- b) Teakwood batten pegs, Tees etc.
- c) G.S. sheet runners (avoid wooden batten runners)
- d) Cladding of profiled / pre-coated G.S. sheets 0.5 / 0.6 mm thick / Fiber glass sheets of suitable thickness

### **For Conventional Insulation**

#### **Walls & Ceiling**

1. Primer Coat followed by two layers of bitumen
2. Fixing aluminums foil min. 50 microns
3. Fixing wooden pegs at suitable intervals
4. Fixing two layers of insulation with staggered joints
5. Fixing G.S sheet runners over the pegs in longitudinal & lateral directions
6. Fixing profiled & pre coated g.s. sheets, 0.5 / 0.6 mm thick over the runners with proper finishing of joints. Alternatively FRP sheets can be used.

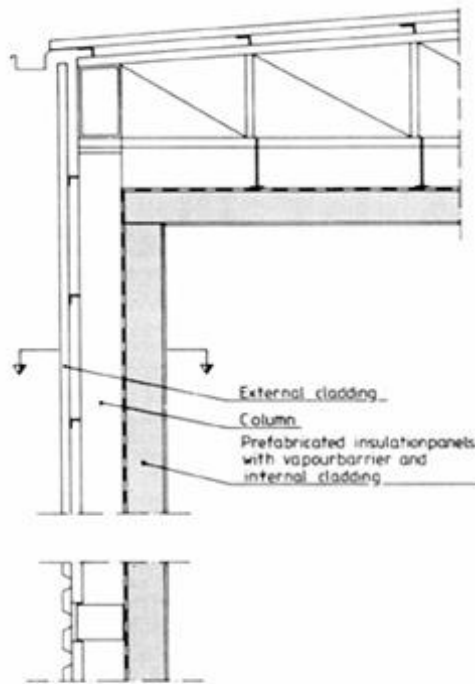
#### **Floor**

1. Laying of polythene sheet, min. 250 microns, as vapour barrier
2. Fixing insulation slabs in two layers with bitumen as adhesive for the first layer
3. Covering with tarfelt
4. Laying PCC / tremix of 75 mm / 100 mm thickness

### **For Insulated Panel Structure**

#### **Walls & Ceiling**

1. Perimeter of the plinth to be in level for panel installation
2. Panels to have cam lock or tongue / grove joints
3. Sheet metal flashing to be provided on all concrete / wall ceiling joints internally & externally. PVC coving or concrete curbing to be provided on wall - floor joints.
4. Horizontal Tie bracings to be provided between vertical wall panels & external columns, to take care of wind loads.
5. Adequate numbers of Pressure relief ports to be provided on all chambers with electrical Connection.



Example of panel built cold store. External structure.

## 6. Insulated doors shall be suitable for panel mounting

Minimum insulation thickness for various insulation materials

Type of insulation	Material		Wall		Ceiling/ roof U value = 0.24 W/m <sup>2</sup> K	Floor U value = 0.29 W/m <sup>2</sup> K
	P Density Kg/M <sup>3</sup>	K (at 10°C) W/mK	Thickness mm	Thickness mm	Thickness mm	Thickness mm
EPS	15	0.036	150	72	150	125
PUF	32	0.023	100	50	100	100
XPS <sup>#</sup>	30-35	0.025 <sup>#</sup>	100	50	100	100

### Notes

- K values from IS661:2000 at 10 °C for all insulation materials except XPS
- K value<sup>#</sup> in case of XPS is as per ISO/FDIS 4898:2008(E) at 10°C mean/28days minimum
- U values are the recommended heat transmission coefficients for cold storage temperature range -4 to 2°C by IS661:2000
- All values rounded off in multiples of inch (25 mm)

## Cooling Load Calculations

Chamber size: 20x17x12.5

### Basic Assumptions:

Ambient Conditions	: 0.4% annual for Delhi - 42°C/ 22.1°
(ASHRAE data)	: 0.4% for March in Delhi (for loading period only) - 34.9°C/ 19.9°C
Loading period	: 20 days
Specific heat of the potato	: 3.433kJ/kg
Ventilation air	: 4 air changes/ day
Heat of respiration at 3°	: 0.018W/kg (Ref. - Ashrae Refrigeration handbook 2006)
(California potato) at 15°	: 0.027W/kg.
Occupancy	: 4 people working for 12 hours during loading
Lighting load	: 1.85 kW for 12 hours during loading period for 4chambers
Enthalpy wheel for ventilation	: 70% energy recovery
Fan load	: Estimated based on refrigeration capacity of each chamber, (Ref. W.F .Stoecker, Industrial refrigeration handbook) Front face(40x12.5) orientation of the building assumed to be 60 degree west of south
Insulation U values as per IS 661	: 2000
Transmission load calculated on the basis of ASHRAE RTS method.	
Pull down period	: 24 hrs

### TYPICAL SPECIFICATIONS OF REFRIGERATION SYSTEM

- Products that can be stored: Potatoes, Apples, pears for storage above 1°C.
- Estimated refrigeration capacity : 340 - 370 kW
- Refrigerant : Anhydrous Ammonia / Freon
- Gravity feed system

## Refrigeration Compressors & Motors

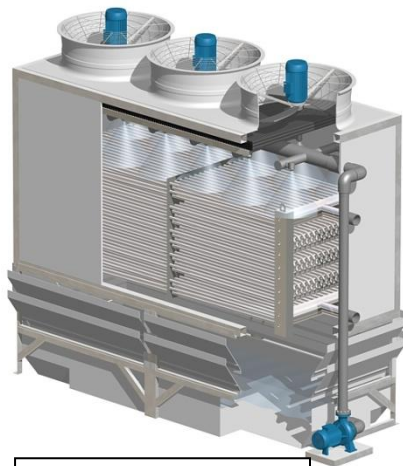
Quantity	3 Nos each of 50% capacity(One standby)
Type	Reciprocating, multi cylinder complete with water cooled head / jackets, with accessories like oil separators, capacity control & unloaded start. Alternatively screw compressor, open type with Accessories
Capacity at (-) 3 deg C Evaporating & 38deg C Condensing	185 to 190 kW
Estimated Motor rating	55 kW x 1450 RPM, TEFC Sq. cage, class F insulation, suitable for 415 V, 3 ph, 50 c/s. AC supply

### Image of Compressor



## Evaporative Condenser

Coil Section	Hot dip galvanized M.S. pipes CDW Boiler quality tubes or S.S.304 tubes
Fan Section	With 2 / 3 Axial Flow Fans with Cast Aluminium OR S. impellers, complete with TEFC Sq. cage motors, Class F insulation & IP-55 protection
Water sump tank	S.S.304 or M.S. Epoxy coated with necessary connections
Other provisions	Water spray arrangement, air inlet grilles, eliminators of suitable design
Unit casing	with removable G.S sheet panels & inspection windows etc.
Estimated Heat rejection capacity at 38 deg C condensing & and applicable WB temp	480 to 500 kW



**Evaporative  
Condenser**



**Atmospheric Condenser**

## H.P. Receiver

Horizontal Ammonia receiver complete	With necessary connections, reflex type level gauge etc.
Capacity	1500 liters (min)
Material of construction	Boiler quality steel plates
Quantity	2 Nos. (Two nos are suggested since some states regulations call for Pressure testing of high pressure vessels on a periodic basis)



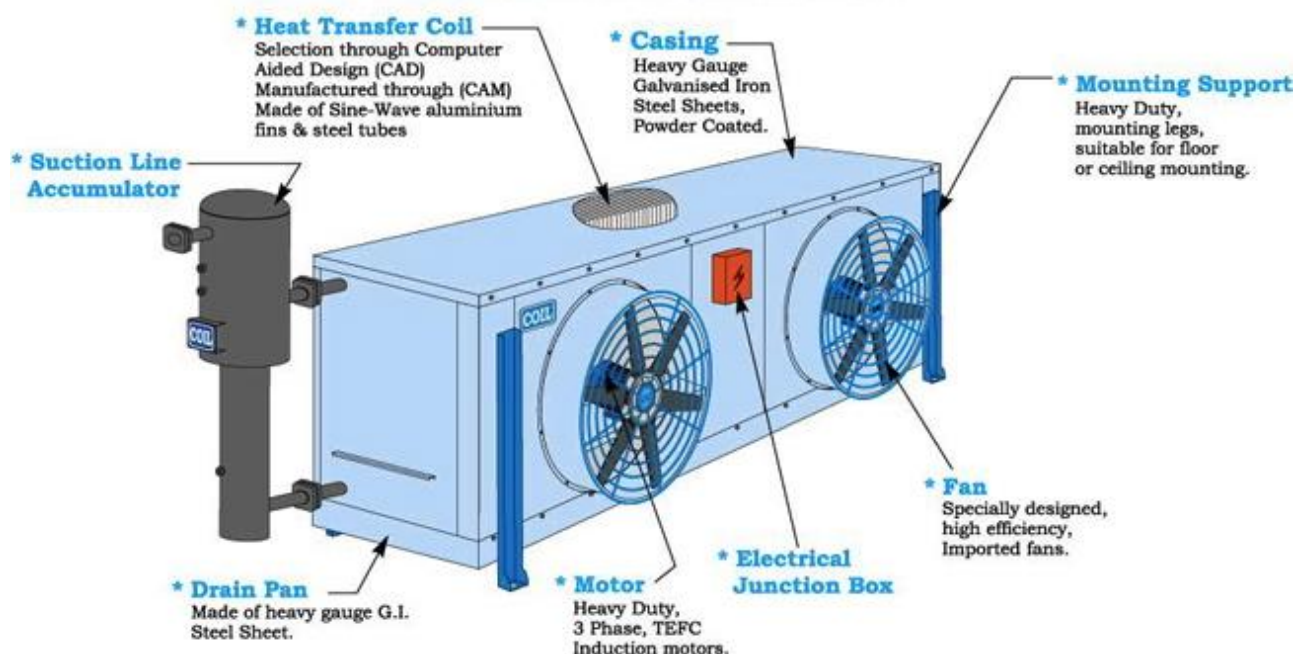
## Air Cooling Units

a) Finned Cooling coil	Coil design to be suitable for gravity feed / pump circulation as per design
M.O.C	Hot dip galvanised M.S. pipes CDW Boiler quality tubes or S.S.304 tubes & Aluminium fins with proper bonding system
Fin spacing	6.25 to 8.5 mm (3-4 FPI)
b) Axial Flow fans	With cast aluminium / S.S. / FRP impellers, with variable pitch, TEFC Squirrel cage motors with class F insulation, IP-55 protection
c) Accumulator	Vertical / horizontal with necessary connections (in case of gravity feed units)
d) Unit casing	G.S. sheet duly painted, drain pan of G.S / M.S with epoxy paint
e) Defrosting arrangement	Water
<b>Unit capacities</b>	3 nos per chamber
Estimated capacity each at (-) 3 deg C Evaporating & 5 deg C T.D (between evap temp & air entering temp)	34.5 to 38.3 kW
Estimated coil surface area	270 to 330m <sup>2</sup>
Estimated air flow capacity each	9 to 10 m <sup>3</sup> /s

For fruits & Vegetables requiring higher humidities, lower delta T, higher flow rates of air and higher coil surface areas need to be used.

For 1 no. F & V cold store	3 nos
Estimated capacity each at (-) 2 deg C Evaporating & 4 deg CT.D	38.3 kW
Estimated coil surface area	300 to 380 m <sup>2</sup>
Estimated air flow capacity each	10 to 12 m <sup>3</sup> /s

## - Ammonia Air Cooling Units -



### Refrigerant Piping, Fittings & Valves

Piping Interconnecting piping between compressor, condenser, receiver and cooling units	M.S. black piping conforming to IS-1239 and other relevant Indian standards
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### Water Piping, Fitting & Valves

Piping shall be used for a) Condenser water circulation b) Compressor cooling c) Defrosting d) Drain lines	Piping to be G.I class B for sizes up to 65 NB & M.S. black pipe conforming to IS-1239. Valves up to 40 NB to be Gate / Globe type. Valves 50 NB / larger to be butterfly type.
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### Water Pump sets

Water flow capacity to take care of condenser water flow & compressor head / jacket cooling	2 nos. (one standby)
Capacity	13 to 14 lps

### Thermal insulation for refrigerant piping etc.

Material for insulation for refrigerant suction line, accumulators etc	a) EPS pipe section b) PUF pipe section with 0.6 mm Aluminium or 0.5 mm GI pre coated sheet cladding c) Nitrile Rubber / EPDM / pipe section / other acceptable materials with woven glass cloth with UV treated pigmented epoxy Coating.
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### Duct Mouth pieces

To be provided on each fan outlet for uniform distribution of air at the topmost level

GI sheet ducting as per IS 655

### Ventilation for cold chambers

System to be designed for providing adequate air changes / day	Axial flow / Inline duct fans with cleanable inlet filters, GI sheets / Aluminium / PVC ducting upto cold chambers and ducting for exhaust from cold chambers to outside Heat exchanger with energy recovery wheel or heat pipe can be used for cooling the incoming air from the exhaust air. Typical efficiencies of heat exchangers are 70% or higher.
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### Humidification

External humidification for 90 to 95 % RH	Fogger type external humidification system with 2 to 10 micron particles with automatic regulation
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### Controls

Temperature control	Temp Indicators cum controllers for individual chambers. Temperature scanners and a centralized temperature indication in machine room
RH control	RH indicator & controller
CO <sub>2</sub> control	CO <sub>2</sub> sensors for regulation of ventilation system
Refrigerant flow controls	Liquid level controls, solenoid valves etc.
PLC control systems	For overall control of various parameters

### Installation, Testing & Commissioning

Installation	The plant shall be installed, tested & commissioned as per IS 660.
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### Liquid Overfeed System:

The above design recommendations are for gravity feed for air cooling units. It is also possible to use pump circulation system (overfeed system) requiring following components:

- a. Centralized ammonia L.P receiver
- b. Ammonia pumps - 2 nos
- c. Refrigerant flow & safety controls
- d. Interconnecting piping - both supply & return lines shall be insulated

In this case the individual accumulators for AC units & level controls etc. are not required. The coil surface area may be 5 - 10% lower.

### ELECTRICAL INSTALLATION

#### Substation

Substation with a rating of about 200kW	<ol style="list-style-type: none"><li>a. Step down transformer suitable for incoming H.T. voltage / 433 V as per IS- 2026 / other applicable standards</li><li>b. Two pole / four pole structure as per local requirements</li><li>c. Outdoor type metering cubicle with approved meter, CTs / PTs etc.</li><li>d. Earthing station as per requirement</li><li>e. Switchyard fencing with gates as per Electrical Board requirements</li></ol>
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#### D.G.Set for standby power

D.G.set complete with accessories and with weather-proof and noise-proof canopy as per local pollution control norms	Estimated Rating : 160kW for single One big and one small can also be used
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Main power distribution panel with changeover facility for normal electric supply & D.G. set supply. With ongoing feeders for various electrical panels

#### Electric panels

Electric panels for	<ol style="list-style-type: none"><li>a. Refrigeration</li><li>b. Lighting, Electric hoist, Fans</li><li>c. APFC (Automatic Power Factor Correction) panel</li><li>d. Water supply, fire fighting etc.</li></ol>
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#### Power & Control cabling etc.

Power and Control cabling, Earthing etc for various electrical circuits	Aluminium armoured conductors for main power lines & equipment lines & copper conductors for lighting, control wiring etc.
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## Lighting

Lighting in <ul style="list-style-type: none"> <li>a. cold stores, ante room</li> <li>b. other areas</li> <li>c. outside areas</li> </ul>	The light fittings should be energy efficient eg. CFL fittings for cold chambers. A central switch may be provided
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## Electrical hoist

Electric hoist	With wire ropes, steel fabricated cage with guides & openable doors for material movement, product lifting
Capacity	2 MT of product

## SAFETY PROVISIONS

Provision for handling accidental leakage of ammonia	Ammonia sensors in cold chambers near ACUs & machine room Emergency ventilation for machine room Safety release of refrigerant to water sump Ammonia masks First aid kit Instructions for handling emergencies
Fire protection	Fire sensors in cold chambers & machine room. Dry & water based fire fighting systems as per specs below. Sprinklers for high pressure receivers
Emergency lighting system	May be solar PV cells with batteries & controller
Emergency alarm system	To be provided with switches near all cold store doors and alarms located in common public areas
Lightning arrestors for the building as per local regulations	

## Fire Fighting

### (Dry Type )

Fire fighting equipment necessary for extinguishing liquid, solid and electrical fire :	<ul style="list-style-type: none"><li><b>a)</b> Dry chemical powder type 5.0 Kg Cap with ISI Mark Fire Extinguisher complete with wall mounting bracket.</li><li><b>b)</b> Carbon Di-Oxide (CO 2 ) type 4.5 Kg. capacity Fire Extinguisher complete with wall mounting bracket.</li><li><b>c)</b> G.I. Fire Buckets</li><li><b>d)</b> M.S. Stand for Fire Buckets</li></ul>
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### Water based

System shall comprise of	<ul style="list-style-type: none"><li>i) 2 sets of Water supply pumps.</li><li>ii) 2 sets Fire fighting pumps</li><li>iii) G.I. piping, class C with necessary fittings &amp; valves</li><li>iv) Rubber Hose reel</li><li>v) Canvas Hose pipe</li><li>vi) M.S. Fabricated hose box with key</li></ul>
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## Referral Basic Data Sheet for Cold Storage Type 1:

### **i) Cold Store Chamber Sizing and Capacity**

- Please enclose Sketch with Plan layout and sections showing the storage chamber

Details	Chamber 1	Chamber 2	Chamber 3	Chamber 4	Chamber 5
Temp. Zone & Relative Humidity conditions	0 to 2 °C 90-95% RH	0 to 2 °C 95 - 100% RH	0 to 2 °C 65 - 75% RH	0 to 2 °C 90 - 95% RH	0 to 2 °C 85 - 90% RH
Name of Produce	Potato	Seed			
Number of platform per chamber	4	4			
Type of platform used	Wood grating	Steel grating			
Dimensions of CS chambers in each group (L x W x H) m	23 x 20 x 11				
Storage Capacity of each chamber in tons	1488 MT				
Storage unit used (Bags, crates, carton, bulk heap, etc.)	Bags	Bags	Bags		
Total number of storage unit	29750	25000			
Weight per storage unit	50 kg	50 kg			
Heat load per chamber (kW)					
Any other information	Describe other information like bulk heap storage and number of cooling tunnels, total cooling load per chamber.				

Figures / data are as examples for user Each chamber is a common temperature zone

### **ii) Handling Area**

Details	Dimensions	Temp °C
Describe Handling, receiving area (covered, open shed)	Handling Area Dimensions (L x W x H)m	Expected temperature in handling area.
Describe Loading / Unloading platform	Dimensions (L x W x H) m of the loading and unloading platforms.	Expected temperature in loading platform

Loading and handling area may be common in some storage designs

### **i) Facility covered Areas**

Cold Storage Area and height	Total floor area in m <sup>2</sup> (sum of all storage chambers internal area.)
Machine room area/ height	Dimensions in metres
Generator room area / height	-- " --
Admin Block area / height	-- " --

**ii) Building & Construction Details**

Type of building construction	Specify if building is with RCC civil construction or with pre-engineered structural steel construction with insulated panels.
External walls/Internal walls /Partition walls of cold chambers	Specify whether the walls are constructed with civil building with insulation slabs fixed in the walls or composite panels used.
Specification of Roof/Ceiling	Specify ceiling is construction – civil work with insulation slabs fixed or composite panels used.
Lighting fixtures in cold chambers	Specify use of special lights and fixtures with weather protection.
Specification in handling/External compound areas	Materials used in construction of handling, external compound area.
Others	Describe if chambers are divided into vertical temperature zones (RCC floors, insulated vertically)

**iii) Insulation and Vapour Barrier**

Type of Insulation	Wall		Ceiling / Roof	Floor
	External	Internal		
Specification of insulation material	Describe the type of material used for insulation of walls/ceiling and partition and floor.			
Specification of composite panels	Describe the type of composite insulated panels used for insulation			
Relevant IS Code	State applicable IS Codes applicable for the specification of the below characteristics of the insulation material used.			
Thermal Conductivity (k-value) at +10°C (mean temperature)	Indicate the heat transfer ability of the product in W/m.K at 10 °C mean temperature			
U-value	Provide the U-value of the insulation.			
Thermal diffusivity (m <sup>2</sup> / sec)	Indicate heat transfer relative to the storage of thermal energy.			
Vapour barrier specification	Describe type of material and thickness of the vapour barrier used.			
Total Insulation thickness	Indicate total insulation thickness and number of layers.			
Specification on Cladding	Describe external finish / cladding material			
Locking/Fixing & Sealing System in case of Metal Skin composite Panels	Cam lock system for discontinuous panels / Tongue and Groove joints for continuous composite panels (Single or double).			

**iv) Cold Store Doors & Air / Strip barriers or curtains**

Description	Details
No. of doors per chamber.	Quantity of number of insulated doors.
Type hinged / sliding/ Rolling	Type of Door movement and Operation.
Size of door opening	Internal clear opening dimensions (W x H).
Insulation Material	Type of insulation along with its 'U-value'.
Thickness of Insulation	Provide the thickness of insulation in millimetre.
Type of skin	Galvanised/Stainless steel/GRP
Provision of Strip curtains/Air curtains – nos.	Strip or Air curtains used – number and dimension (W x H)
Internal Emergency Door release	Internal release mechanism for emergency opening even when locked from outside or Push button type alarm located inside the cold chambers near the door.



**v) Heat Load Estimation Inputs**

Product Storage condition	List Product wise storage temperature in °C, relative humidity required in %, Air circulation rate in CMH.
Loading Period	Total no. of days/weeks for completion of product loading in a season.
Maximum storage period	Product wise maximum storage period planned in weeks/months.
Product loading temperature	Product loading temperature during the peak season in °C.
Loading rate per day	Daily throughput in metric tons which enters into the cold storage.
Pull down period	Time in hours to bring initial product temperature to storage temperature.
Estimated Daily unloading rate from each cold chamber	Provide the unloading rate in MT per day.
Ante Room cum staging area conditions	List Temperature to be maintained in °C
CO <sub>2</sub> Concentration Control	List recommended range of CO <sub>2</sub> concentration in PPM.
Fresh air changes	Number of air changes per day considered
Brief Description of Fresh Air Ventilation system	Capacity of Fresh Air Fans for Replenishment of fresh air into each of the cold chambers.
Explain heat recovery system, if used	Description of heat recovery system, recommended efficacy, type of system, cross heat exchange used.

**vi) Heat Load Calculation of Cooling System - Summary**

Ambient Conditions	Peak conditions based on summer
Dry Bulb temperature (Summer)	

Building dimensions:	Provide the Dimensions of the building, total capacity of storage and number of chambers.
Total Capacity of the storage:	

Note: Please attach additional heat load estimation for, as applicable depending upon, different group of commodity planned.

Refrigeration Load		During Loading (kW)	During Holding (kW)
Transmission Load (kW)		Heat transferred through walls, ceiling and floor due to difference in outside and inside temperature	
Product Load (kW)		Heat transferred from the product due to difference in product temperature at the time of loading and storage room temperature.	
Internal Load (kW)	Lighting load	Internal heat generated due to lights in the cold room.	
	Occupancy load	Heat transferred due to human activity within the cold room.	
Infiltration Load (kW)		Heat transferred from outside air during door opening.	
Ventilation/ Fresh Air Refurbishment Load (kW)		Heat transferred d fresh air replenishment	
Equipment Load - Evap. Fan motors, MHE etc. (kW)		Total Heat transferred from various above sources in a day.	

Compressor Operation Hours/Day	Pull Down Period	Indicates compressor running hrs. during pull down time of the product in a day
	Holding period	Indicates compressor running hrs after the product reaches the room storage temperature.
	Defrosting Period	Duration of Defrosting in a day.

Total Refrigeration Description(kWh)	Peak Period(kWh)	Holding Period(kWh)

### Cooling System Design Detail

#### vii) Cooling System Configuration: Mechanical Refrigeration

Type of Refrigerant	Provide the technical name of the refrigerant.
Total refrigeration system capacity	Provide the total refrigeration capacity in kW.
Type of System	Direct Expansion/ Gravity Feed/ Overfeed/ Secondary pump.
Type of compressor	Reciprocating/Screw/Scroll.
Type of capacity control	Step less/ step in / Auto unloading of cylinders.
Specify Unloading steps in percentage	Screw Compressor from 10 to 100% Reciprocating from 25 to 100%.
Type of condenser	Atmospheric/ Evaporative/water cooled/Air cooled.
Cooling Towers (if applicable)	Natural draft/ Induced Draft.
Type of Evaporators/ Air cooler	Ceiling or Floor mounted - Induced draft/ Forced Draft / Dual discharge.
Type of defrosting	Air/ Water / Electric/ Hot gas.
Humidification System & Control	Describe the method of humidification and controls used. If using dehumidifier explain here.

### Refrigeration Equipment Details

#### viii) Compressor/ Rack Detail

Compressor/ Racks Type, Make & Model	Qty.	Comp. RPM	Operating Parameters SST. / Cond. Temp (°C)	Refrigeration Capacity (kW)	Power Consumption (kW)	Total connected Motor (kW)	Remarks Working /Standby
					Full load: Part load:		

#### ix) Condenser Details

Condenser Type, Make & Model	Qty.	Operating Parameters Condensing Temp.(CT) WBT, water in/out temp(°C)	Condenser Heat Rejection Capacity (kW)	Electric Fan /Pump Motor Rating (kW)	Total Electric Power (kW)	Remarks Working /Standby

#### x) Cooling Tower Details ( if applicable)

Cooling Tower Type, Make & Model	Qty	Operating Parameters DB & WB Water Temp, in/out (°C)	Cooling Tower Capacity (kW)	Fan & Pump Capacity (CMH/LPS) & Motor (kW)	Total Electric Power (kW)	Remarks Working /Standby

**xi) Pressure Vessels**

Description	Type Horizontal Vertical	Refrigerant	Operating Temp & Pressure	Construction Shell, Dish Ends & Nozzles	Total Refrigeration load	Holding Volume
Low Pressure						
High Pressure						

**Note:** The design and testing of the pressure vessel should comply with ASME Sec VIII Div 1.

**xii) Evaporators /Air Cooling Units (ACU)**

ACU Type, Make & Model	Nos.	Operating Parameters Evap. (SST) & TD* (°C)	Cooling Capacity (kW)	Air Flow (CMH) & Face Velocity (m/s)	Material of Coil Tubes & Fins	Fin pitch (mm)	Total Fan Electric Power (kW)

\*TD – Temperature difference between Evap. (SST) °C & Return Air (at coil inlet).

**Note:** Please attach Detailed Technical Performance Data Sheets of each equipment namely Compressors, Condensers, Cooling Towers, Air Cooling Units giving General Layout and Dimensions duly Certified by the respective equipment manufacturers with reference to the Relevant Codes & Standards.

**xiii) Electrical Installation:**

Total Connected load	Provide the total connected electrical power in kW.
Estimated power requirement at Peak Load Period	Provide the maximum power consumed during peak demand in kW.
Estimated power requirement at Holding Load Period	List the power consumed during holding period in kW.
Estimated power requirement at Lean Load Period	List the power consumed during lean periods in kW.
Capacity of Transformer	Provide the rated capacity of the transformer in kVA.
Size of Capacitor	Provide the Size of capacitor bank for power factor correction & their operation.
Make & Capacity of standby D.G. Sets	Provide the make and rated Capacity of the Generator in kVA.

**xiv) Material Handling procedure**

Procedure	Brief Description
Material Handling Procedures & Equipment	Describe the details of product movement inside the cold storage and equipment used.
Capacity of mechanised belt conveyor if any- Rating of motor	Electric motor capacity in kW connected for lifts / hoists / conveyors etc.
Any other device please specify	

**Attach a Plan & Layout of the proposed Cold Store unit approved by a Registered Architect.**

**xv) Safety Provisions**

**Include Machine room ventilation system for self-containing**

Fire Fighting equipment installed as per Fire safety standards of State Fire Department	Yes / No
	All Fire -fighting equipment complied as per state Fire-fighting department
Handling measures for Refrigerants & Leaks installed	Specify the sensor types and alarm system used, if any
Safety devices – LP/HP cut outs, safety valves, shut off valves etc. installed	
Emergency lighting in Cold chambers & other areas installed	
Lightening arrestors installed	
Any other safety provisions (describe)	

**xvi) Energy Saving Equipment & Measures**

Details of Energy Saving devices	Brief Description and Savings
Light Fixtures	Type of light fixtures-CFL/LED.
Natural Lighting for general areas	Specify the provision for natural lighting is included.
VFD / Electronic Technology for fans / compressors	Control of fan motors speed using variable frequency drives or by electronic technology in 2 steps fan for evaporators.
Refrigerant Controls and Automation	Automation controls used to save energy for optimizing the performance of the refrigeration system.
Air Purger	List the type and operation of air purger.
Power Factor Controller	Measure of efficient use of electrical power in the connected system.
Energy recovery	Provide use of energy recovery for ventilation system.
PLC Control & Data Acquisition	Automation for monitoring and control of the parameters and Refrigeration plant.
Any other Components	Describe the monitoring and control used such as CO <sub>2</sub> scrubbers, odor control, ozonisers, ethylene scrubber etc.

**xvii) Estimated Performance Parameters of Proposed Cold Store**

Parameters	Peak Period	Holding Period
Coefficient Of Performance (COP) of the Cold Store Unit	COP of the cold storage during peak and holding periods.	
Power Consumption (kWh/Day)	Power consumption during peak and holding period.	
Prevailing Electricity costs	Provide prevailing electricity costs in Rs/kWh.	

**xviii) Brief description of any other technologies or infrastructure used**

Reefer trucks operated (if any)	
Specialised packaging lines(if any)	
PLC Automation(if any)	
Dock Levellers systems(if any)	
Alternate energy options(if any)	
Modern Pack-house(if any)	
Others	

Append details in separate data sheets for 'add-on components' if also applying for these components.

**All mandatory rules & regulations (BIS, ISO, IS etc.) relevant to the item must be complied with.**

## CHECK LIST

<b>S. No.</b>	<b>DESCRIPTION</b>	<b>PAGE NO</b>
1.	Application Form along with Appraisal Report	
2.	Basic Data Sheet with Complete Technical Aspects	
3.	Detailed Project Report MIDH Guidelines	
4.	Bank Sanction Letter along with appraisal Report	
5.	Approval from Gram Panchayat / Municipality / Town Planning	
6.	SSI Registration Certificate	
7.	Fire Department Approval	
8.	PAN Card Copy of the unit	
9.	Electricity Approval	
10.	DMC Approval	
11.	Promoter's Affidavit as per Prescribed Format	
12.	Land Document	
13.	Land Conversion Certificate	
14.	Certificate from Civil Design Engineer	
15.	Certificate from Bank for Non-Availing Subsidy from any other State/Central Govt. Department.	
16.	Insurance of the Fixed Assets	

**APPLICATION FOR AVAILING ASSISTANCE / SUBSIDY UNDER MIDH**

**(COMPONENT: COLD STORAGE)**

**Name of the Scheme: Post Harvest Management**

- 1 Name of the Farmer :
- 2 Father / Husband Name :
- 3 Caste (SC/ST/BC/OC) :
- 4 Address: :
- Phone / Cell No.: :
- 5 Land records with Extent in Acres / Ha. :  
(Copy of Pass Book / Adangal)
- 6 Source of Irrigation (Open well / Bore well / Canal) :
- 7 Name of the Financing Bank, Loan Amount Proposed :
- 8 Whether any Govt. Subsidy availed previously :
- 9 Any other relevant information :

**Declaration**

I, \_\_\_\_\_

declare that the particulars furnished above are true to the best of my knowledge and I promise that the benefit obtained from State MIDH Cell will be used for the purpose for which it is given and in case of misuse I am liable for any action deemed to be fit by Govt. of A.P., including recovery of the subsidy amount with 12% interest to the Government.

- Enclosures:** 1. Affidavit  
2. Pattadar Pass Book  
3. Detailed Project Estimate by Civil Engineer  
(Regd. No. along with Seal)

**Signature of the Farmer / Entrepreneur.**

Recommendations of the Horticulture Officer : \_\_\_\_\_

**Horticulture Engineer**

**Horticulture Officer**

**Asst. Director of Horticulture.**

# PRELIMINARY REPORT FOR COLD STORAGE UNIT

## (Release of First Installment)

- A Component :
- B **Details of Project** :
- (i) . Name of the project :
- (ii). Address for communication  
with telephone No. :
- C **Project Location with Address** :
- (i). Survey No :
- (ii). Village :
- (iii). Mandal :
- D Constitution (Individual/ Joint Individual /  
Partnership Firm / Company. :
- E (i). Proposed Activity :
- (ii). Type :
- (iii). Proposed type of cooling system :
- F Name of the Promoter :
- G **Present physical status of the project :**
- (i) Land development  
status/boundary/road :
- (ii) Stage of cold store building  
civil/pre engineered as on  
inspection date. :
- (iii) Type of produce to be stored :
- (iv) Whether all the machinery installed as  
per DPR or not (Please specify) :
- H **Bank Details :**
1. Bank Name :
2. Branch :
3. Bank Sanction Date :
4. Loan Account No :
5. Bank disbursement statement with  
A/c. No. :
6. Letter from Banker  
(Subsidy Account no. given by bank) :

It is recommended to release 1<sup>st</sup> installment Rs. \_\_\_\_\_  
(Rupees. \_\_\_\_\_ only) as credit linked back ended subsidy as the  
construction of the unit was started.

Horticulture Engineer

Horticulture Officer

**Asst. Director of Horticulture**



# JOINT INSPECTION REPORT FOR COLD STORAGE

## I. GENERAL INFORMATION

- 1) Name of the Unit with full address :  
(Sy. No. / Area / Village / District)
- 2) Date of Issue of Administrative Sanction :
- 3) Name of CEO of Company / Managing Director :
- 4) Constitution: Individual / Group of Individuals / :  
Society / Partnership Firm / Pvt. Ltd. Company / :  
Public Ltd. Company :
- 5) Date of Inspection of the Project :
- 6) Name & Designation of the Committee members :  
(a)  
(b)  
(c)  
(d)
- 7) Name of the Bank (with Full address & :  
Phone & Fax No.) :  
a) Subsidy reserve fund account no. :
- 8) Date of start of the project :
- 9) Date of Completion of the project :
- 10) a) Date & amount of Sanction of Term Loan :  
b) Repayment Period :
- 11) Land Details
  - i. Whether land is in the name of promoter: Yes / No
  - ii. Whether land is a Regd. Lease land for : Yes / No  
Minimum 10 years in favour of applicant  
(in case of lease)

Name & Signature  
Applicant

Name & Signature  
of Expert

Name & Signature  
of Inspecting Officer  
(Bank)

Name & Signature  
of ADH concerned

Name & Signature of  
Senior Officer  
from MIDH

## II. TECHNICAL SPECIFICATION OF THE PROJECT AT THE TIME OF FINAL JOINT INSPECTION

	Description / Specification	As per Detailed Project Report (DPR)		As per Joint Inspection by the team		
		Capacity / Qty.	Amount (Rs.in lakhs)	Capacity / Qty.	Amount (Rs.in lakhs)	Remarks
1.	<u>Present physical status of the project</u> (i) Installation of power transformer/electricity supply equipment (ii) Installation of Refrigeration cooling system (iii) Type of produce					
	(i) No. of Chambers					
	(ii) Size of each Chamber (in sq.mtrs.) Chamber-1 Chamber-2 Chamber-3 Chamber-4 Size of Machinery Room (in sq.mtrs.)					
2	<b>TECHNICAL DETAILS</b>					
a)	Type of Compressor					
b)	Make /Model No./ Serial No.					
c)	Motor Type / Capacity of the Motor in H.P / Make					
d)	Refrigeration Capacity in Kw/TR					
e)	Total No. of Compressors Installed					
f)	Total No. of Motors Installed					
g)	Total Capacity of Motors in HP					
h)	Type of Evaporative Coils					
i)	Total No. of ACU's Installed					
j)	No. of Fans per Unit					
k)	Capacity of ACU in Kw/TR					
l)	Total Capacity of ACU's In TR					
m)	Type of Condenser					
n)	Capacity of Condenser in TR					
3	<b>Type of Doors</b>					
a)	Thickness of Insulation					
b)	Insulation Material Used for the Door With Density					
5	Generator Make Model No. Capacity in KV					
6	Material Handling Lift Capacity					
7	Thickness of the Walls					
8	Type of Insulation used for walls Wall insulation Thickness/ Density Vapor Barrier used –Details					

9	Floor Insulation Type .....					
	Thickness .....					
10	Ceiling Insulation Material used Thickness - Recommendation of Pre Inspecting Officer					
11	Capacity of Transformer					
12	Fire Safety Devices installed or not					
13	Type of Commodities Stored					
14	Brief info on the Market Potential					
15	Any other Information					

### III. MEANS OF FINANCE & ASSESSMENT OF THE UNIT AT THE TIME OF JOINT INSPECTION

Sl. No.	Particulars	Project Cost		Actual investment		Remarks
		As per project report	As appraised by Banker	Loan amount released by Banker	Promoters Margin money	
1	2	3	4	5	6	7
<b>I.</b>	<b>Means of Finance</b>					
1.	Capital					
2.	Term Loan from Bank					
3.	Subsidy / Margin Money / Un-Secured Loans					
	Total:					
<b>II.</b>	<b>Assessment</b>					
1.	Cost on Land					
2.	Civil Works					
3.	Cost on Building					
4.	Cost on Plant & Machinery					
	Total:					

#### Certificate:

1. This is to certify that the promoter has established cold storage as per the norms of the MIDH.
2. This is to certify that the promoter has fulfilled all the terms and conditions laid down in the Administrative Sanction issued by the Department.
3. This is to certify that the project is eligible to avail subsidy of Rs. \_\_\_\_\_ and the same may be released as final installment.

Name & Signature  
of Applicant

Name & Signature  
of Expert

Name & Signature  
of Inspecting Officer  
(Bank)

Name & Signature  
of ADH concerned

Name & Signature  
of Senior Officer  
from MIDH

# FORMAT

(Forwarding letter of Bank for Conducting JIT )  
Name & Full Address of the FI/Bank (on letter head)

To  
The Mission Director & Commissioner of Horticulture,  
Govt. of Andhra Pradesh,  
Public Gardens, Nampally,  
GUNTUR

**Subject : Request for Joint Inspection of the project**

Sir,

MIDH, A.P., had released Rs. .... as credit linked back-ended subsidy in respect of project of \_\_\_\_\_ Village \_\_\_\_\_ District \_\_\_\_\_ State Vide letter no ..... As per instruction, the subsidy amount has been kept in Subsidy Reserve Fund account of the bank and interest benefit is being passed on to the beneficiary. Now project is complete as per original proposal and we have also disbursed full Term loan sanctioned for the above mentioned project. In addition to documents submitted by bank at the time of claim of subsidy such as copy of the Appraisal Note, Term Loan sanction letter, copy of Record of Right, following documents required for Joint Inspection are being submitted with the request to conduct Joint Inspection of the project to decide final subsidy claim.

S. No	Particulars	Enclosed or Not
1	Details of date-wise release of term loan	
2	Completion certificate by Bank/FIs	
3	Undertaking from promoter (as prescribed by NHM)	
4	Extract of subsidy reserve fund account of bank in which estimated subsidy has been kept	

It is certified that the original of above documents and documents submitted at the time of subsidy claim by bank pertaining to the projects are kept in Bank/FI, which can be shown at the time of random monitoring by the Department or any agency authorized by the Department.

(Seal and Signature of the Bank's Officer )

Name : \_\_\_\_\_

Name of the Bank :

Address :

Phone/Fax/Mobile No.: \_\_\_\_\_

Place : \_\_\_\_\_

Date : \_\_\_\_\_

## FORMAT

(On Letter head of the CA)

To

**The Mission Director & Commissioner of Horticulture,  
Govt. of Andhra Pradesh,  
GUNTUR.**

We have examined the books of accounts and other relevant records maintained by M/s. / Shri / Smt. \_\_\_\_\_(Name of the Beneficiary) at its office situated at \_\_\_\_\_(Address of project) for \_\_\_\_\_(Project activity). These accounts are maintained by the Company's management, partners of the firm / proprietor of the concerned / grower / NGO / and our responsibility is to verify the truth and fairness of these records and verification of amount expended for acquisition / construction of fixed assets / establishment and other expenditure.

We conducted our work in accordance with the Audits and Accounting Standards generally accepted in India. Those Standards require that we plan and perform our verification to obtain reasonable assurance about whether these accounts are true and fair are free of material misstatement. A verification included examining on 100% basis, evidence audit includes examining, on a test basis assessing the accounting principles used and significant estimates made by the grower, as well as evaluating the overall financial statement presentation. We believe that our audit provides reasonable basis of our opinion.

### **We verify that**

- a) We have obtained all the information and explanation that to the best of our knowledge and belief were necessary for the purpose of our verification.
- b) In our opinion, proper books of accounts as required by law have been kept by the Company / firm / sole proprietorship concern / grower / NGO for the financial period \_\_\_\_\_and these books of account represent true and fair view of the transaction entered into by the Company / firm / sole proprietorship concern / grower / NGO.
- c) In our opinion, the Company / firm / sole proprietorship concern / grower / NGO has incurred a capital expenditure amounting to Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_only) for acquisition / construction of fixed assets and the same is being reflected properly in the books of accounts. The valuation made of major components of the project and whole project is tabulated as follows:

**Establishment of Project:**

S. No.	Component	Proposed Expenditure as per LOI	Cost as appraised by Bank before term loan sanction	Cost assessed by CA	Remarks
1					
2					
3					
	TOTAL				

Total : \_\_\_\_\_

**MEANS OF FINANCE**

S. No.	Item	Project Cost as per DPR	Project Cost as per Appraisal Report	Actual Cost
1	Promoter's Equity			
2	Term Loan			
3	Unsecured Loan			
4	Grant from NHM			
5	Others			
	TOTAL			

We recommend Rs. .... as the cost of the whole project.

Signature and Seal of C.A.  
with Membership No.

Date:

## **7. REFER VANS (Refrigerated Transport):**

This component refers to Reefer Trucks – vehicle road transport with fixed insulated carriage body equipped with active refrigeration designed for temperature controlled carriage of horticulture produce. All refrigerated trucks supported under these guidelines must incorporate GPS based location tracking system and be installed with data logging temperature and humidity sensors. Varied vehicle capacities and sizes are supported.

### **Component Description**

The cost norm is applicable for vehicles of multiple carriage capacity vehicles.

**A Reefer Van must comply with all relevant rules and regulations in its manufacture and operations. A reefer truck comprises of the following-**

1. Truck chassis with motive tractor and cabin with an Insulated chamber for reefer cargoes.
2. Insulated Doors with door securing and sealing system
3. Independently fuelled Refrigeration equipment with sufficient air flow depending on size of chamber. Reefer unit should be operable with dual power source.
4. GPS tracking enabled and data logging system to monitor humidity and temperature. At least four data loggers must be supplied with each vehicle.
5. Associated refrigeration monitoring and controlling panel.

Refrigerated trucks of Smaller capacity vehicles shall be supported through State Horticulture Missions. Vehicles of less than 4MT capacity (>12 m<sup>3</sup> space) are normally not suitable for active refrigeration as the carriage space further reduces. However, new technologies allow this option and a case to case appraisal can be undertaken for these sizes.

There is no cap on the total number of vehicles but the transport must serve horticulture produce on at least one leg of its trip.

**Note: 3 Cubic meters (Cum)/106 Cubic feet (Cft). of chamber volume shall be considered equivalent to one MT of storage capacity.**

**The ADH has to recommend for the joint inspection of the reefer van after completion of the following:**

- i) Fabrication of the van is to be completed
- ii) The van should be painted with logo of MIDH and assisted by department of horticulture and MIDH.

The ADH shall conduct joint inspection with the members constituted by this office and the joint inspection reports have to be submitted in the format. Based on the recommendations of the Committee, the final installment of the subsidy shall be released to the concerned bank of the promoter through online transfer.

**DOCUMENTS TO BE SUBMITTED ALONG WITH PROPOSAL & JOINT INSPECTION REPORT**

- (a) Copy of proforma invoice of chassis, body and refrigeration units of the vehicles duly confirmed by the lending bank (to be attached to the proposal).
- (b) Copy of the payment receipts of chassis, body and refrigeration unit etc. of the vehicles duly confirmed by the lending bank (to be send along with joint inspection report).
- (c) Copy of the delivery challans of the body and chassis of the vehicles (to be send along with joint inspection report).

**BASIC DATA**

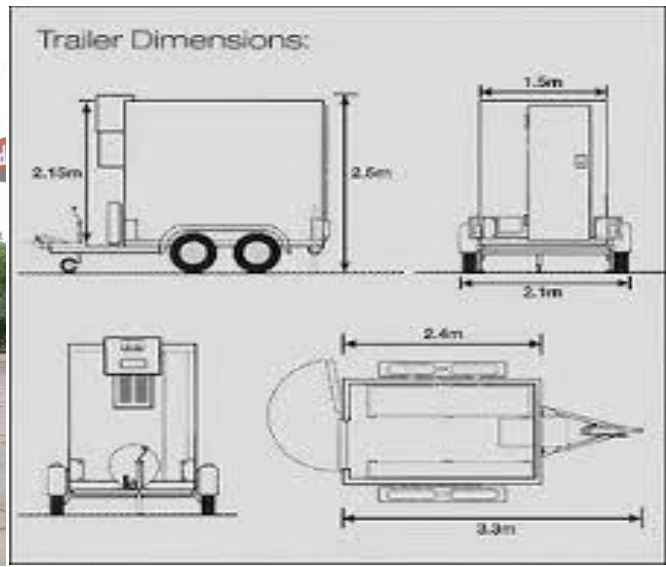
**TECHNICAL DETAILS**

#	Component: Reefer Container	Description
1	Container dimensions	20 standard: 8' x 8.5' x 20', 27 to 28 cum
2	Insulation details	Thermal Conductivity value / mm
3	Tare weight	kgs
4	Gross weight	Kgs
5	Temperature recording	type
6	GPS System	Must be fitted
7	Refrigeration capacity	kW
8	Refrigerant used	Technical name of refrigerant
9	Fresh air exchange	Describe system fitted
10	Diesel/electric auto-switching	Describe dual power unit
11	Air flow cum/hr (CFM)	Evaporator air flow in CFM
12	Temperature control precision +/- °C	Precision in controls in °C
13	Name of Manufacturer	
14	Year of manufacture	
15	Any design enhancement	Describe design changes is any



**SPECIFICATIONS & DIAGRAMS (FOR REFERENCE ONLY)**

Type	refrigerator truck body, freezer vans box
Truck type	Isuzu, FAW, Dongfeng, JAC, Foton and so on
Material	FRP sandwich polyurethane panel
Size	Length 2-10m, Width 1-10m, Height 1-10m
Door Frame	1.5mm stainless steel
Floor	aluminum sheet / FRP / Stainless Steel
Panels	Fiberglass Sandwich Polyurethane
Ceiling Light Quantity	1 Set of LED
Thickness of panel	40mm, 52mm, 62mm, 72mm, 82mm, 102mm or as requested
Side door	Optional
Temperature	-18°C ~ +25°C



## CHECK LIST

<b>S. No.</b>	<b>DESCRIPTION</b>	<b>PAGE NO</b>
1.	Application Form along with Appraisal Report	
2.	Basic Data Sheet with Complete Technical Aspects	
3.	Detailed Project Report MIDH Guidelines	
4.	Bank Sanction Letter along with appraisal Report	
5.	Approval from Gram Panchayat / Municipality / Town Planning	
6.	SSI Registration Certificate	
7.	Fire Department Approval	
8.	PAN Card Copy of the unit	
9.	Electricity Approval	
10.	DMC Approval	
11.	Promoter's Affidavit as per Prescribed Format	
12.	Land Document	
13.	Land Conversion Certificate	
14.	Certificate from Civil Design Engineer	
15.	Certificate from Bank for Non-Availing Subsidy from any other State/Central Govt. Department.	
16.	Insurance of the Fixed Assets	

**APPLICATION FOR AVAILING ASSISTANCE / SUBSIDY UNDER MIDH**

**(COMPONENT: REFER VAN (REFRIGERATED TRANSPORT))**

**Name of the Scheme: Post Harvest Management**

- 1 Name of the Farmer :
- 2 Father / Husband Name :
- 3 Caste (SC/ST/BC/OC) :
- 4 Address: :
- Phone / Cell No.: :
5. Total Cost of Refer Van :  
(break-up may be attached)
- 7 Name of the Financing Bank, :  
Loan Amount Proposed
- 8 Whether any Govt. Subsidy :  
availed previously
- 9 Any other relevant information :

**Declaration**

I, \_\_\_\_\_

declare that the particulars furnished above are true to the best of my knowledge and I promise that the benefit obtained from State MIDH Cell will be used for the purpose for which it is given and in case of misuse I am liable for any action deemed to be fit by Govt. of A.P., including recovery of the subsidy amount with 12% interest to the Government.

**Enclosures:** 1. Affidavit  
2. Pattadar Pass Book  
3. Detailed Project Estimate by Civil Engineer  
(Regd. No. along with Seal)

**Signature of the Farmer / Entrepreneur.**

Recommendations of the Horticulture Officer : \_\_\_\_\_

**Horticulture Engineer**

**Horticulture Officer**

**Asst. Director of Horticulture.**

**FINAL JOINT INSPECTION REPORT OF REEFER VAN**

Name of the Firm : \_\_\_\_\_

District : \_\_\_\_\_

Place : \_\_\_\_\_

Account No : \_\_\_\_\_

(Rs. In Lakhs)

Sl. No.	Particulars	Project Cost		Actual investment		Remarks
		As per project report	As appraised by Banker	Loan amount released by Banker	Promoters Margin money	
1	2	3	4	5	6	7
1.	Cost on vehicle					
2.	Cost of the refrigeration unit & container					
3.	Cost of fabrication					
4.	Others					
	<b>Total:</b>					

Sri, .....S/o. .... has purchased Refrigerated Van (Reefer Van) for transport of horticulture produce as per technical specifications of MIDH with refrigeration unit of Make .....with model no. ....with capacity .....MT with vehicle registration no. ....

Sri, \_\_\_ is eligible for Rs. \_\_\_\_\_/- towards purchase of reefer van. It is certified that the van was displayed with logo of MIDH and also written as "THE FINANCIAL ASSISTANCE GIVEN BY DEPARTMENT OF HORTICUTLURE & MIDH" on the van. The vehicle \_\_\_\_\_ purchase bills were verified.

It is recommended to release subsidy of Rs. \_\_\_\_\_/- to Sri. ....

Name & Signature of Applicant

Name & Signature of Expert

Name & Signature of Inspecting Officer (Bank)

Name & Signature of ADH concerned

Name & Signature of Senior Officer from MIDH

## FORMAT

(Forwarding letter of Bank for Conducting JIT )  
Name & Full Address of the FI/Bank (on letter head)

To  
The Mission Director & Commissioner of Horticulture,  
Govt. of Andhra Pradesh,  
Public Gardens, Nampally,  
GUNTUR

Subject : Request for Joint Inspection of the project

Sir,

MIDH, A.P., had released Rs. .... as credit linked back-ended subsidy in respect of project of \_\_\_\_\_ Village \_\_\_\_\_ District \_\_\_\_\_ State Vide letter no ..... As per instruction, the subsidy amount has been kept in Subsidy Reserve Fund account of the bank and interest benefit is being passed on to the beneficiary. Now project is complete as per original proposal and we have also disbursed full Term loan sanctioned for the above mentioned project. In addition to documents submitted by bank at the time of claim of subsidy such as copy of the Appraisal Note, Term Loan sanction letter, copy of Record of Right, following documents required for Joint Inspection are being submitted with the request to conduct Joint Inspection of the project to decide final subsidy claim.

S. No	Particulars	Enclosed or Not
1	Details of date-wise release of term loan	
2	Completion certificate by Bank/FIs	
3	Undertaking from promoter (as prescribed by NHM)	
4	Extract of subsidy reserve fund account of bank in which estimated subsidy has been kept	

It is certified that the original of above documents and documents submitted at the time of subsidy claim by bank pertaining to the projects are kept in Bank/FI, which can be shown at the time of random monitoring by the Department or any agency authorized by the Department.

(Seal and Signature of the Bank's Officer )

Name : \_\_\_\_\_

Name of the Bank :

Address :

Phone/Fax/Mobile No.: \_\_\_\_\_

Place : \_\_\_\_\_

Date : \_\_\_\_\_

## **8. RIPENING CHAMBERS**

The Assistant Director concerned shall submit the project proposal in 2 sets (one in original and two sets in duplicate) with all the documents as per check list along with application as prescribed by the MIDH along with his recommendations for placing the project proposal in the SLEC meeting for approval.

**For the purpose of these guidelines, 11 cubic metres of storage space is considered equivalent to 1 Metric Ton ripening capacity.**

**A cost norm of Rs 1.00 lakh per MT is applied for ripening chambers.**

**Ripening chambers can be designed for multi-tiered pallet based storing or structures for basic storage. The standard cost norm need not uniformly apply across all designs and appraisers must consider actual design and structure type before recommending appropriate subsidy.**

## **TECHNICAL STANDARDS**

### **1. Background Facts**

Ripening is the process by which fruits attain their desirable flavour, quality, colour and other textural properties. On the basis of ripening behaviour, fruits are classified as:

#### **(i) CLIMACTERIC:**

Climacteric fruits are defined as fruits that enter 'climacteric phase' after harvest i.e. they continue to ripen. During the ripening process the fruits emit ethylene along with increased rate of respiration. Ripe fruits are soft and delicate and generally cannot withstand rigors of transport and repeated handling. These fruits are, therefore, harvested hard and green but near full maturity and are ripened near consumption areas by using ripening aid. Even fully mature fruits of this category may be ripened by using ripening aid to get uniform ripening in large lots for bulk transport and marketing.

Small dose of ethylene is used to induce ripening process under controlled conditions of temperature and humidity. Climacteric fruits are mango, banana, papaya, guava, sapota, kiwi, persimmon, fig, apple, passion fruit, apricot, plum and pear.

#### **(ii) NON-CLIMACTERIC:**

Non-climacteric fruits once harvested do not ripen further. Non-climacteric fruits produce very small amount of ethylene and do not respond to ethylene treatment. There is no characteristic increased rate of respiration or production of carbon dioxide.

Non-climacteric fruits are citrus, pineapple, grape, strawberry, pomegranate, lichi, wat ermelon and cherry.

**The essential requirements of an ethylene ripening system are:**

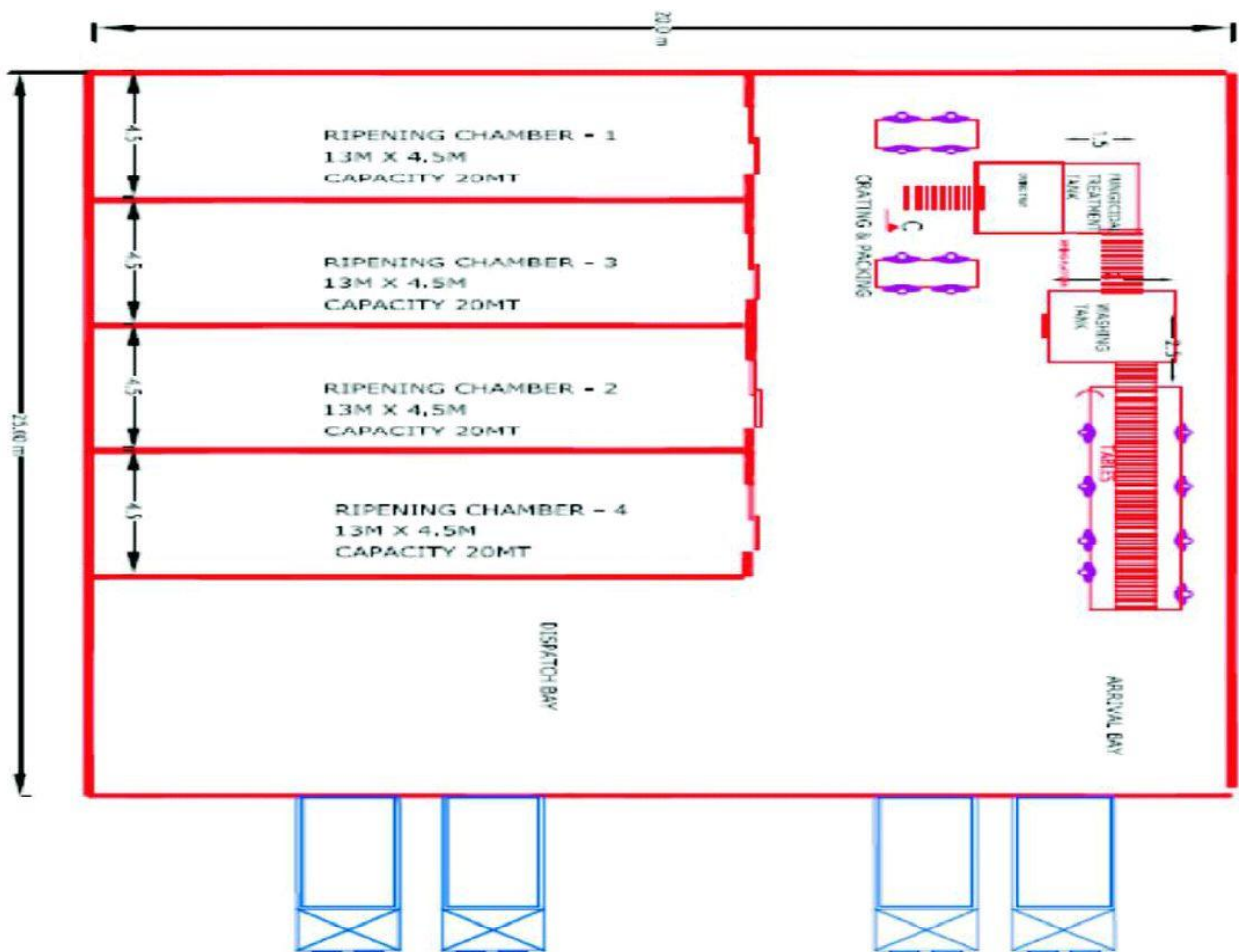
- A reasonably air tight room with insulation
- A temperature control system for cooling and/ or heating
- An air circulation and ventilation system
- Humidity control
- An ethylene gas injection system and
- An electric control system

### 1. A Typical Layout and Types of Ripening Unit

A Typical lay out of a fruit Ripening unit may have a number of chambers and a pack house. Number of chambers will depend on ripening cycle in terms of number of days for which system has been designed.

Pack house may not be necessarily an integral part of ripening unit and may be at a different site also.

**Typical Layout of a Fruit Ripening Unit**

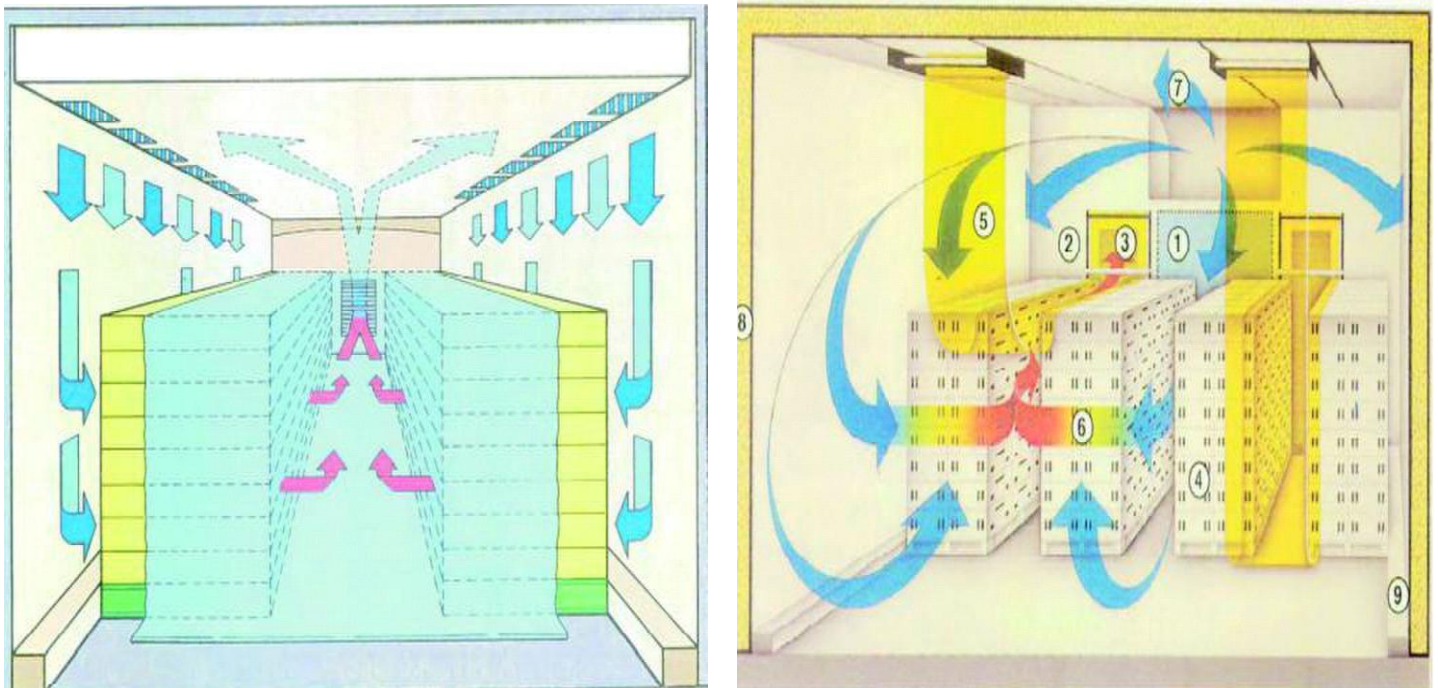


### a. Ripening Room Type-1

This type of ripening room has insulated cold room with addition of ethylene equipment. For maintain desired level of low temperature and humidity, ceiling mounted Fin Coil Evaporator (close to wall panel, leaving some gap for suction) will be connected to the Condensing Unit Outside. Fruits with perforated plastic crates will be placed in the room. The air is allowed through the plastic crates by modifying its flow by simple arrangements like tarp etc, thus ensuring uniform air circulation, uniform ethylene distribution and fruits ripening. A simple ventilation system is provided, to provide automatic or manual vent control to keep CO<sub>2</sub> within the limits. In an Automatic Ventilation system a dual inlet/discharge damper operates in parallel with the fan to allow fresh air from outside to replace the air within the room when venting is required. In contrast to it, in a Manual Ventilation System, ventilating effect in ripening rooms is achieved by opening the doors for about 20 minutes every 12 hours after the first 24 hours of ripening. Stacking will be done in floor (single tier) only, up to a reasonable height, which will facilitate for inspecting ripening status of fruits. Since, single tier system is generally considered; Mechanized Material handling equipments (Forklifts) need not be required. Simple Hand pallet trucks are more than sufficient to handle the produce.

Figure-2

#### Illustrations of Ripening Units Type- 1





## 2. A Guide for Fruit Ripening

Fruits are ripened with ethylene exposure at certain prescribed Temperature and Relative Humidity level of 90-95%. Following is broad guide for fruit ripening condition.

Table-1

S.No.	Produce Details	Ethylene Concentration (ppm)	Ethylene Exposure Time (hours)	Ripening Temperature (°C)	Storage Temperature after ripening (°C)
1	Banana	100-150	24-48	15-18	13-14
2	Mango	100	24	20-22	10-13
3	Papaya	100	24-48	20-25	About at 7
4	Pears	100-150	24-72	18-22	About at 0°C
5	Tomato	100-150	24-48	18-20	12.5

## 3. TECHNICAL STANDARDS FOR RIPENING CHAMBERS/ UNITS

### I. Background Facts

It is also noticed that ripening chambers which are being set up under various schemes of horticulture development, do not adhere to appropriate technical standards. Main shortcomings noticed are as follows-

- Inadequate building design;
- Use of inadequate / unreliable insulation material with insufficient K value
- Use of obsolete and energy inefficient refrigeration units
- Lack of uniform air flow circulation system
- Lack of controlled conditions and technology for ethylene, temperature and relative humidity
- Lack of proper ventilation systems and exhaust fans for CO<sub>2</sub> emission
- Lack of monitoring and control system and display devices;
- Use of unsafe electrical devices

It is therefore, necessary to prescribe appropriate technical standards in respect of modern, p ressurised fruit ripening units which are given in following chapter.

## II. Technical Parameters for Pressurised Ripening Chamber

Unless specifically otherwise mentioned, all the applicable latest codes and standards published by the Bureau of Indian Standards and all other standards, shall govern in all respects of design, workmanship, quality, properties of materials, method of testing and method of measurements. Generally relevant 'IS specification' and 'Code of Practices' shall be used for all electrical, mechanical and civil works / installation, however, wherever IS code is not available, relevant standard codes of ASME / ASHRAE / IIR or other International Codes are to be followed. Latest revisions will be followed in all cases. Even for Ripening of Fruits and Vegetables' the process as recommended by IS Standards (e.g. IS 11977 of 1987 for ripening of green banana) or as per International Standards should be followed. For further guidance, following technical parameters may be followed:

***Storage capacity of ripening chamber may depend on fruits to be ripened & stacking and air-flow system. In this context, banana may be taken as reference crop for calculation of storage capacity for a given volume of storage space.***

S.No	Items / Particular	Minimum Technical Specifications
1	Civil Structure - building design	<p><b>Civil Structure</b></p> <ul style="list-style-type: none"> <li>a. Structural Safety - Structural design as per BIS Code</li> <li>b. Adherence to local Building Regulations</li> <li>c. Concrete floor with sufficient load bearing capacity</li> <li>d. Chamber size is not smaller than 50 Cu M for preventing building up of high concentration of ethylene</li> </ul>
2	Ripening Room Dimensions	<ul style="list-style-type: none"> <li>a. Ripening Room dimensions will depend on number of tiers and number of pallets to be stored. On an average 11M<sup>3</sup> per MT of banana fruits in ripening units for 10 MT or larger capacity and 12 M<sup>3</sup> /MT for ripening units of less than 10 MT capacity. For this purpose, volume of one chamber is taken in to account.</li> <li>b. Number of chambers may vary from four to eight depending on ripening cycle in terms of number of days. Chambers will be generally identical in dimension. In low cost solution, one ethylene exposure chamber may be accompanied by single storage hall of, say, four times the size of the former. However, in such low cost solutions, lots of different ripening stages being stacked together, it may not be possible to provide temperature conditions recommended for each of them.</li> <li>c. Further Increase in number of chambers in multiple of ripening cycle may be undertaken but situation in which mechanised handling is possible, multi tier ripening chamber is an alternative option available. Number of tiers may go up to three.</li> </ul>

3	Ripening Room Construction	<p><b>Construction Features</b></p> <p>a) Ripening Room Chambers should be designed and constructed to hermetically seal with appropriate closures / doors. The key feature of ripening rooms is that conditioned air is forced through the product rather than the product just stored in a temperature or series of pallets before returning to the evaporator. Therefore, any “air-stacking” or “cross-stacking” of boxes is not necessary, and the result is less space requirement, lesser handling of the fruit and improved product quality. It is for this reason that they are recommended even for ripening of fruits in crates and are mandatory for fruits in CFB boxes and single or multi-tier stacking system.</p> <p>b. The airflow within the ripening rooms is to be designed to penetrate all boxes of fruit with an even airflow throughout the room resulting in all fruit being ripened uniformly. Recommend air flow is 0.3 cfm per pound of bananas or 2000 m3/ per hour / per metric ton of product. If the pulp temperature difference between the warmest and coolest fruit is less than 1 o F or 0.55 o C then there is adequate airflow.</p> <p>c. Plenum chamber is recommended so as to equalise pressure through the product for uniform distribution/flow of air and ethylene through the product.</p>
		<p>d. Ripening rooms may be constructed of PUF panels or by application of suitable thermal insulation with vapour barrier and cladding on walls, floor and ceiling of civil structure. Panels are prefabricated building components filled with insulation, clad on both sides with facing materials and arranged with a jointing means to connect panels and may be preferred. In any case, inner chamber surface should be of food grade cladding.</p> <p>e. The insulation envelope shall be designed to ensure that air pressure created by fans does not affect the integrity of the cold store structure or the panel joints.</p> <p>f. The height of wall panels is often such that care must be taken to ensure that adequate stability of the wall panels is maintained. If ceiling support are provided, the ceiling support system shall be connected to the main structure in a manner which takes into account.</p> <p>i. The method of supporting the insulating ceiling panels,</p> <p>ii. The position of the supports to avoid local over stress within the supports, the suspended ceiling or the main structure,</p> <p>iii. The expansion and contraction of the main structure.</p>
4	Ripening Room Doors	<p>Ripening doors should be designed for minimal gas leakage. In general.</p> <p>i. For single tier loading, hinged doors, and in some cases, sliding doors are used. The doors should be designed for rugged operation and easy access for incoming and outgoing fruits on pallets.</p>

		<ul style="list-style-type: none"> <li>ii. When stacking is multi-tier and handling of pallets is mechanised, wider openings of doors are required.</li> <li>iii. Care should be taken when positioning doors adjacent to fans to avoid ingress or egress of air as significant changes in store pressure can occur when such doors are opened.</li> <li>iv. Where possible the door should be located on the external (Warm side) of the cold store insulation.</li> <li>v. Suitable gaskets shall be provided to form a seal around the door opening.</li> <li>vi. Large doors shall be supported by a sub-frame independent of the insulating panels.</li> <li>vii. Automatic doors shall open and close promptly.</li> <li>viii. Automatic doors shall incorporate a safety device to avoid injury to personnel or damage to product in the case of accidental closure.</li> <li>ix. All doors required for means of escape purposes shall be easily and immediately operable from the inside at all times. Doors, which open automatically, are not acceptable for means of escape unless they have a manual override and can be opened manually in the event of a power failure.</li> <li>x. In case of multi tier stacking, doors are rolling up type and therefore, following desirable safety features for doors should be ensured- <ul style="list-style-type: none"> <li>a. Internal Door Release</li> <li>b. Bottom Edge Pressure operated safety stop</li> <li>c. Cable break Electrical safety stop</li> <li>d. Spring Break Mechanical Safety Stop</li> <li>e. Vision Panel with emergency Knock out panel</li> <li>f. Vertical “D” section flexible seal for effective sealing in condition of reverse airflow for uniform ripening. Seal should be strong enough to withstand impact from pallets during loading operations and flexible enough to create an adequate seal between air seals should be supported continuously along the full length of room but should be easy to remove a seal for cleaning or replacement.</li> <li>g. Door protection by Goal Post Protection which protect door perimeters or single Fixed Bollards doors suitable for ripening chamber.</li> </ul> </li> </ul>
5	Insulation Material	<ul style="list-style-type: none"> <li>i. <b>INSULATION MATERIAL</b> <ul style="list-style-type: none"> <li>a. Some manufacturers recommend Rockwool or Polysocyanurate (PIR) core composite panels for fire proofing. However, Polyurethane (PUR) Foam / EPS / Extruded polystyrene are also used.</li> <li>b. PUF panels are advisable for ripening chambers. Minimum 60mm thick up to 120mm thick (PUF) insulated sandwiched panel</li> </ul> </li> </ul>

		<p>(minimum density of 40 Kg/ M<sup>3</sup>) insulation material having minimum R value of 2.6 M<sup>2</sup>.K /W are recommended for easy in-situ construction and vapour barrier effect. Floor shall have PUF slab 60mm (minimum density of 40Kg / M<sup>3</sup>) or any other equivalent insulating material is recommended.</p> <p>c. Covering floor insulation with 100mm concrete is recommended. Floor finish should be smooth with polymer coating so has to be kept clean.</p> <p>ii. <b>FACING MATERIALS</b>-One of the following coverings may be used; the first three are used more frequently than the others and a minimum total coated thickness of 0.5 mm is recommended. A vapour seal shall be used on the outer facing of materials, which are permeable, such as brick masonry:</p> <ol style="list-style-type: none"> <li>Galvanized steel sheeting</li> <li>Suitable plastic coated galvanized steel sheeting</li> <li>Polyester coated galvanized steel sheeting</li> <li>Stainless steel sheeting</li> <li>Aluminium sheeting</li> <li>Aluminium /zinc protected steel sheeting</li> <li>Glass reinforced plastics</li> </ol> <p>iii. <b>ADHESIVES</b></p> <ol style="list-style-type: none"> <li>Certain adhesives have a combustible solvent base which can be absorbed by and remain in the panel insulation. These solvents should, therefore, be avoided.</li> <li>Certain adhesives should be stored under controlled conditions and the manufacturer's requirements should be strictly observed; many adhesives have a maximum shelf life.</li> <li>Adhesives should not have a lingering taint.</li> </ol>
6	Temperature & Humidity levels	Ripening is preferred at a lower temperature but above level of chilling injury. System has to be designed to achieve prescribed ripening conditions in terms of temperature and relative humidity for target fruits. Generally, RH level of 90-95% is recommended to prevent moisture loss.
7	Heat Load Calculation and Refrigerant	Cooling and heating system needs to be designed based on heat load calculation. As per Kyoto Protocol standards, any eco-friendly refrigerant should be used including ammonia, R-134a and R 404a.
8	Cooling / heating coils and plenum chamber	<ol style="list-style-type: none"> <li>Cooling coils are manufactured from copper or Stainless steel tubes and Aluminium Fins. The coils must provide exceptionally large surface area to ensure high natural humidity levels within ripening rooms. In case of ammonia as refrigerant, copper tube shall not be used.</li> <li>In case of a plenum chamber; cooling coils and fans must be easily accessible via single access hatch located above or at the end of the plenum chamber at roof level. Ceiling voids should be fully illuminated to facilitate inspection of coils at regular intervals.</li> <li>Electrical heating elements should be used for heating ripening room during lower temperature season as per design requirement</li> </ol>

		<p>and be placed in easily accessible locations. Open flame type chamber heating should never be used due to explosive nature of ethylene.</p> <p>d. Fixing of the cooler shall be arranged to avoid disturbance of the ceiling panel support system. Ceiling panels in the vicinity of the cooler units will be subjected to continual variations in temperature and therefore, relative movement during defrost cycles.</p>
9	Material to be used for ripening	Ethylene gas with suitable detection and dosing equipment to maintain ethylene concentration within required levels depending on product (Range 10 to 200 ppm).
10	Ethylene Generator and Dosing device	<p>a. Ethylene may be introduced in ripening chambers in one of the three ways by using independent ethylene generator with regulator; ethylene cartridges and ethylene-nitrogen mixture (5% ethylene + 95% nitrogen) cylinder. Whichever method is used, the duty holder should ensure that there are adequate means of dispersing the ethylene gases throughout the ripening room on its release.</p> <p>b. Centralized Ethylene supply with Automation for multiple chambers for controlled and safe dosing of ethylene may be preferred for larger units.</p> <p>c. If a generator containing ethanol based solution requires to be moved, it should be switched off, the mains cord removed from the socket outlet, and the manufacturer's instructions closely followed.</p> <p>d. It may be borne in mind that ethylene in concentration above 27000 ppm may explode.</p>
11	<b>Specification for Air circulation system</b>	<p>i. Minimum air flow should be 2000M<sup>3</sup> per hour, per MT of product ripened at 95%.</p> <p>ii. In Ripening Units type-1, air circulation is modified for uniform ripening by introduction of system of Tarp, Tarp/Lock Sock System / Air Bag for Vertical Air Circulation or Horizontal Air Flow.</p> <p>iii. In case of Ripening Units type -2, air circulation fans should have adequate static pressure for uniform air / ethylene flow through the ventilation holes provided in fruits. For this, large diameter, reversible axial flow fans should be installed in the false ceiling accessible via a single access hatch for air supply under pressure. Each fan should preferably be equipped with venture inlet to process. In such cases, pallet isolation must be provided for energy savings in part load conditions by providing a series of isolation dampers along the length of the ripening chamber. This function is operated by making proper selection for pallet isolation on computerised Ripening Room Management System.</p>

12	Ventilation System	<p>a. When fruits are ripening, they release carbon dioxide which will build up in a ripening room. The CO<sub>2</sub> production begins as the fruit ripens enters the “climacteric” phase, or the period when bananas release ethylene and have an elevated rate of respiration (along with a great deal of other physiological changes). Respiration involves the uptake of oxygen, the release of carbon dioxide, and the breakdown of starches. Carbon dioxide concentrations above 1% (10,000 ppm) will retard ripening , delay the effects of ethylene and cause quality problems. Suitable venting system consisting of fans/dampers/open – shut valves should be installed to maintain CO<sub>2</sub> concentration below 5000 ppm.</p> <p>b. In ripening rooms Type-1, ventilation may be automatic or manual.</p> <p>c. In case of ripening rooms type-2, with pallet isolation, ventilation may be provided by a roof mounted fan which is identical in specification to the pressure fans.</p> <p>d. In case of automatic forced air exhaust / ventilation system with ducting, a dual inlet / discharge damper operates in parallel with the fan to allow fresh air from outside to replace the air within the room when vent is required. Automatic exhaust fans (either timed or sensor – based) or “flow-through” (constant) ventilation are provided at two locations (one near ceiling of chamber and another a little above floor level) in each chamber. This also evacuates the ethylene after the desired exposure period and helps to maintain CO<sub>2</sub> concentration low (below 5000 ppm) during the ripening cycle for proper ripening. In such cases, opening and shutoff actuators/valves control is affected by CO<sub>2</sub> sensor and timer device.</p>
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13	Sensor and Control devices	<p>a. Suitable sensors are controlled devices should be used for maintaining following parameters. For this, temperature &amp; humidity loggers and Ripening Chamber Air Analysis Kit (for Ethylene and CO<sub>2</sub> levels) may be used.</p> <p style="padding-left: 40px;">i. Temperature; ii. Relative humidity iii. Ethylene concentration; iv. CO<sub>2</sub> Concentration</p> <p>b. PLC device also known as Ripening Room Management System – “RMS” is must in Ripening Unit Type-2. The controller provides total control of the ripening system allowing operators secure and password protected access to following functions-</p> <p>c. Clear real time temperature display and control</p> <p>d. Fan speed and energy usage</p> <p>e. Ventilation intervals</p> <p>f. Relative humidity indicator and control</p> <p>g. Ethylene level monitoring and regulation</p> <p>h. Door control</p> <p>i. Lighting control</p> <p>j. Pallet loading and isolation</p> <p>k. Differential Pressure Display Differential Pressure Display provides the ripener with an indication of air pressure drop cross the fruit pallets. This information along with information from Temperature. Ethylene gas sensors located inside chamber, within pallets and within boxes / plastic bags, is used to determine the setting of the inverter drive based on factors such as the type of product packaging and fruit, amount of pallets in the room and current stage of the ripening process. The RMS for multi-chamber pressure ripening system should preferably be able to be configured to allow all rooms to be viewed and controlled locally and, or remotely.</p>
14	Electrical plug point	<p>a. For operating portable Ethylene Generator, an Electrical plug point is required inside the room. Metal clad Plug point in the Metal socket housing with the independent circuit breaker system, in order to isolate the system independent with the rest of the System, is recommended.</p> <p>b. For centralized gas emission, no electrical connections are required inside the room.</p>
15	Pallet Racking and Material Handling	<p>a. Ripening unit with single tier stacking should have a manually operated pallet lifting and carrying device. Pallet racking system comprises of box section construction which may be designed as per BS 5950 or equivalent IS standard for strength and cleanliness, providing easy access for pallet loading at high level.</p> <p>b. For multi-tier stacking motorised forklift should be provided. In such cases, in order to assist loading at upper levels, fork lift guides are to be installed to form a centre aisle which are strengthened by back filling with concrete. These guides are to be tapered at the front. To facilitate loading and centralising the fork lift truck in the drive in racking, the middle and upper tiers of racking are offset from the lower tier. An access ladder is also provided to the rear wall for access to an optional grated walkway at middle and upper pallet levels.</p>



		c. Typical palletisation systems are shown in section 3.
16	Some useful Appliances and Instruments	<p>Weighing Scales and Fruit Inspection Instruments such as follow-</p> <ol style="list-style-type: none"> <li>a. Weighing scale</li> <li>b. Firmness Tester</li> <li>c. Refractometer</li> <li>d. Sizers and Callipers</li> <li>e. Produce Knife</li> </ol>
17	Safety Certification	<ol style="list-style-type: none"> <li>I. Various fire detection and prevention systems and devices are commercially available and use of these is good practice. They include detectors for heat and smoke; fixed water-sprinkling system, inert gas snuffing systems, smoke release valves, flameproof barriers, fire breaks formed by the separation of chambers, etc. All devices used shall have been tested at low temperatures and shown to be satisfactory.</li> <li>II. Certification for safe storage of ethylene and for system for prevention of ignition and explosion from competent authority, as per statutory requirement, if any, must be taken. Similarly, safety for workers against suffocation must be ensured. Certification from following Certification Authority is necessary <ol style="list-style-type: none"> <li>a. Factory Inspector</li> <li>b. Fire Fighting Inspector</li> <li>c. Electrical safety Inspector</li> </ol> </li> </ol>

### Variation / Amendment Claus

The standards prescribed above are not intended to prevent or discourage variations arising out of new concepts, innovations and R & D in building design & construction, thermal insulation and cooling & refrigeration technology etc. However, any variations or deviations from the above prescribed standards must be supported by scientific / technical details for prior approval of the competent authority, on the basis of merit who may decide the proposal in view of relevant technical details including critical storage requirements, energy efficiency (coefficient of performance), availability of Standards, environmental concerns, safety etc.

Similarly, periodic amendment of standards for general application may also be undertaken by the National Horticulture Mission in consultation with a committee of subject matter experts duly constituted for this purpose.

# Guidelines for Stacking & Typical Construction Features of a Ripening Unit

Appendix I

## Some Typical Pallets' Arrangements

Figure - 5  
A Typical Pallet

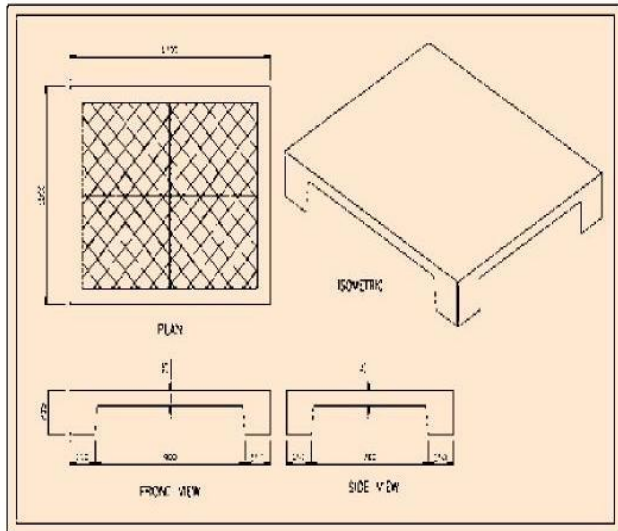


Figure - 6  
A Typical Crate

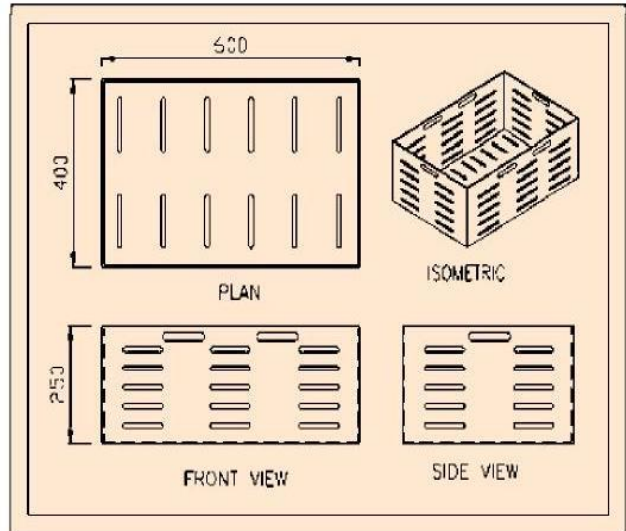
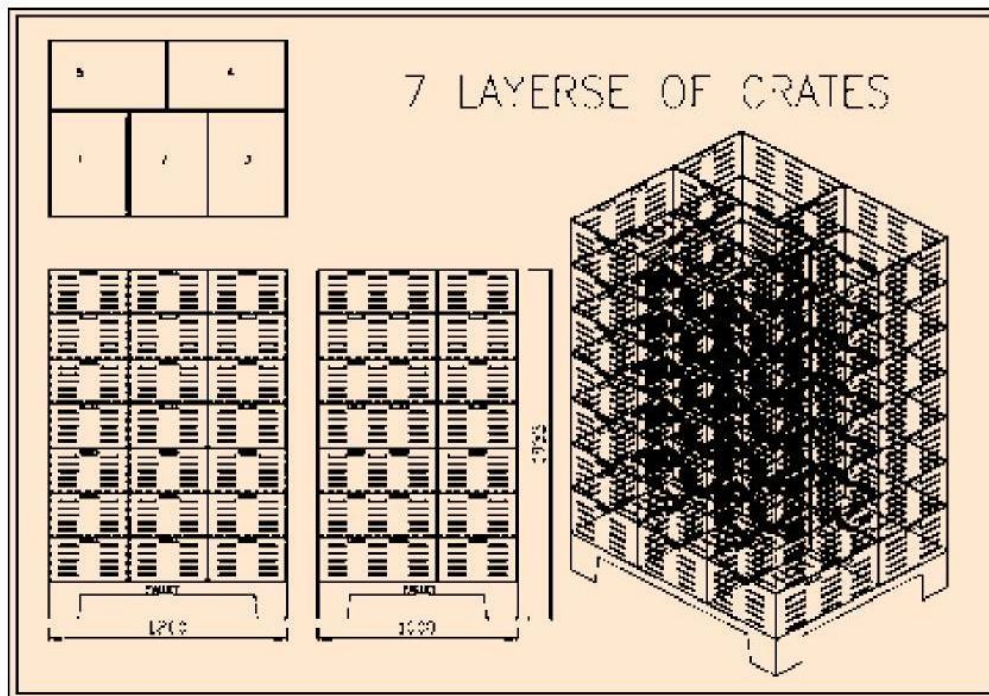
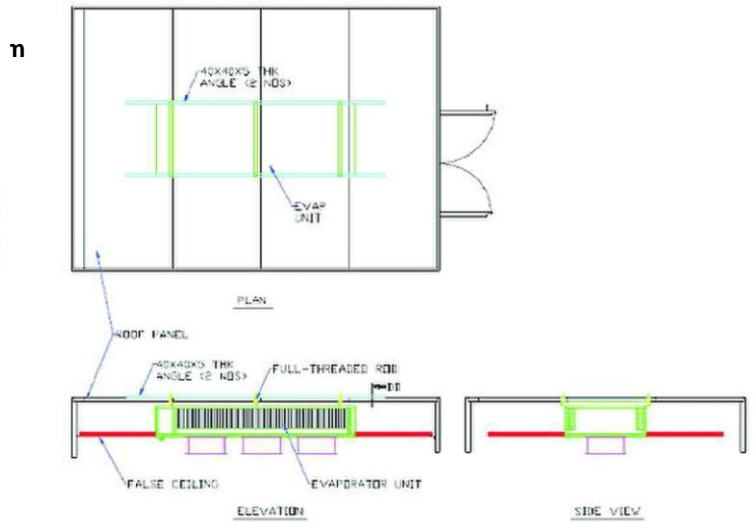
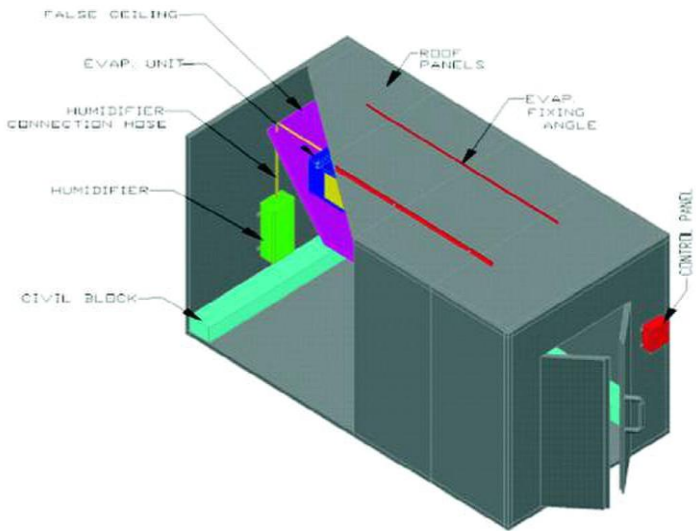


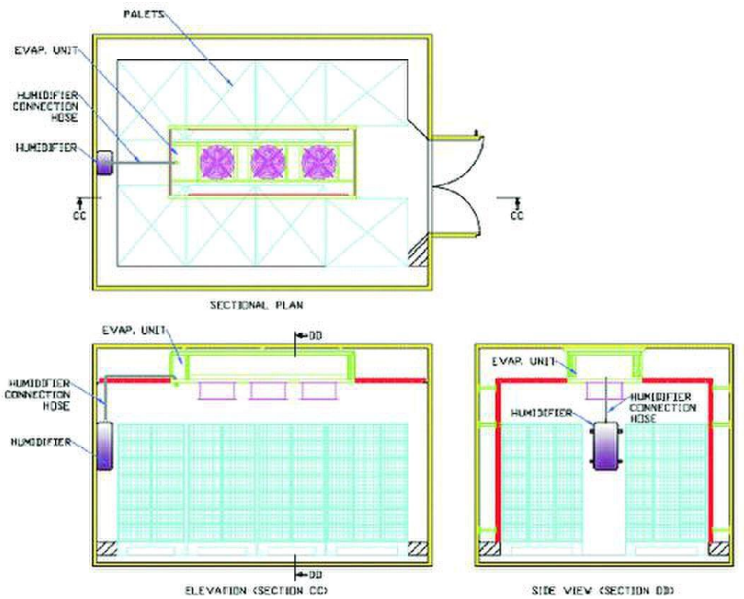
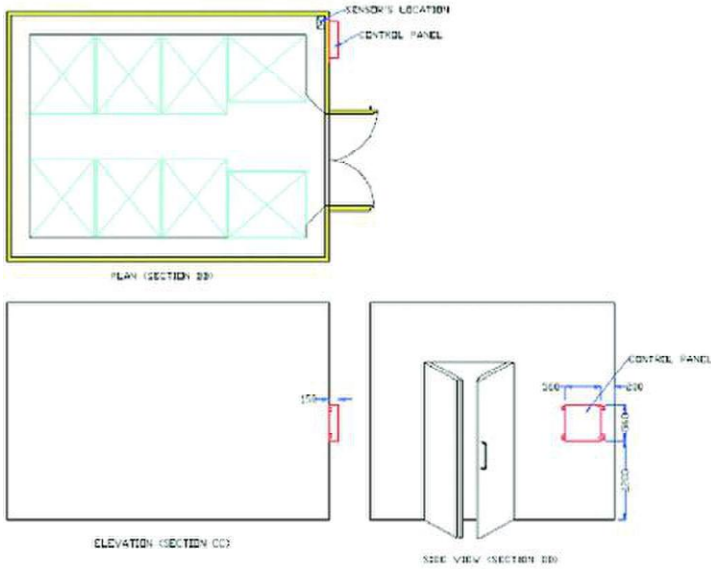
Figure - 7  
A Typical Pallet – Crates Arrangement



## Typical Construction Features of a Ripening Unit



## Typical Control Panel & Sensor Locations



## 9. LOW COST RIPENING CHAMBERS

The Technical committee has prepared the unit cost and design of **Low cost Ripening chambers** in which two types of unit costs along with Designs are evolved. The component wise, material wise details of the unit costs and designs are furnished below:

### TYPE-I - STEEL STRUCTURE POLYSHEET

**OUTSIDE STRUCTURE**



**INSIDE STRUCTURE**



### TYPE-II - Brick wall structure & Powder coated GI sheet



## TYPE - I

<b>Model Project for Low Cost Ripening Chamber-Steel Structure &amp; Poly Sheet ( 44 MT )</b>			
S.No.	Component	Description	Cost (Rs.)
1	Civil Works- Foundation	Min Size - 50 ft x 30 ft =1500 Sft - Construction Cost per Sft for Civil works including material & Labour @ Rs.50/- per Sfat	75,000.00
2	Ripenign Chambers- Fabrication & Errection	Complete GI Pipe Truss & Purlin - 1.5 mt (Telescopic Insertion) Bay width 14 mtrs , Top & Bottom cord with 40 mm GI Pipe and 25 mm braching. 32 mm ms pipes for top and sides above brick massonry at 3 mtrs level GI Sheet gutter of 26 guage	37,500.00
3	Multi-layer Poly Film 150 gsm	6500 Sq ft of Double Layered White & Black 200 Micron UV stablided Poly film will be laying to the Top of the Structure, Front & back side of the truss with requiried Alluminium Profiles is used	14,000.00
4	Ethylene Gas System	Easy Ripe- Ethylene Gas Generators are considered in this project - 2 units per chamber are considered	45,000.00
5	Cooling Pads	Cooling Pads of 30 ft x 15 ft = 450 sft area on the back side wall considered with completer FRP Housing for Cooling Pad , required filters and fixtures with 0.5 HP pump.	4,500.00
6	Circulation Fans	50 inch Slow speed beltdriven Fans -Axil flow fans - 2 fans per Unit are considered	18,000.00
7	Civil Structure & Aluminum Frames	Alluminium frame for Circualtion fans	7,500.00
8	Electricification works	Electrifications for Fan & Pad Motors and Independent Control Panel for Auot Operation of the System	5,000.00
<b>Total Cost of Each Unit</b>			<b>2,06,500.00</b>

★	Size of the Chamber	1500 Sft Area
★	Capacity of the Chamber	15.24 mt x 9.14 mt x 3.5 mt = 488 Cu Mt
★	Capacity is Calculated @ 11 Cu Mt per M.T	44 M.Tons
★	Total Cost of Each Unit - Rs.	2,06,500.00
★	Cost per M.T limited to	Rs.4,690/-
★	Pattern of Assistance	35% as back-ended subsidy
★	Max. assistance permissible	6000 MT

## TYPE - II

<b>Model Project for Low Cost Ripening Chamber-Brick Wall Structure with Powder Coated GI Sheet on Top ( 44 MT )</b>			
S.No.	Component	Description	Cost
1	Civil Works- Foundation	Min Size - 50 ft x 30 ft =1500 Sft - Construction Cost per Sft for Civil works ( Brick Wall Structure with Powder Coated GI Sheet on Top) including material & Labour @ Rs.200/- per Sft	3,00,000.00
2	Ripenign Chambers- Fabrication & Errection	Complete GI Pipe Truss & Purlin - 1.5 mt (Telescopic Insertion) Bay width 14 mttrs , Top & Bottom cord with 40 mm GI Pipe and 25 mm braching. 32 mm ms pipes for top and sides above brick massonry at 3 mtrs level GI Sheet gutter of 26 guage	15,000.00
3	Bubble Sheet	Aluminum Bubble Sheet attached to the Roof Sheeting for insualtion - Rs.10/- per Sft	15,000.00
4	Ethylene Gas System	Easy Ripe- Ethylene Gas Generators are considered in this project - 2 units per chamber are considered	45,000.00
5	Cooling Pads	Cooling Pads of 30 ft x 15 ft = 450 sft area on the back side wall considered with completer FRP Housing for Cooling Pad , required drain channel, water drip channel and pipe and complete plumbing with required filters and fixtures with 1.5 HP pump.	9,000.00
6	Circulation Fans	50 inch Slow speed belt driven Fans -Axil flow fans - 2 fans per Unit are considered	18,000.00
7	Civil Structure & Aluminium Frames	Aluminium Frame for Circulation fans to avoide corrosion, as the fans are installed near the cooling pads.	7,500.00
8	Electrification works	Electrifications for Fan & Pad Motors and Independent Control Panel for Auot Operation of the System	5,000.00
<b>Total Cost of Each Unit</b>			<b>4,14,500.00</b>

★	Size of the Chamber	1500 Sft Area
★	Capacity of the Chamber	15.24 mt x 9.14 mt x 3.5 mt = 488 Cu Mt
★	Capacity is Calculated @ 11 Cu Mt per M.T	44 M.Tons
★	Total Cost of Each Unit	Rs.4,14,500.00
★	Cost per M.T. limited to	Rs.9,420/-
★	Pattern of Assistance	35% as back-ended subsidy
★	Max. assistance permissible	3000 MT

### Basic Design Data Sheet for Ripening Chambers

Sl. No.	Specifications	Units	Parameters
1.	Storage Capacity (In terms of Mango)	M.Tons	
2.	Room Size (l x w x ht)	Each in Mtrs	
3.	Room Volume	Each in Mtrs	
4.	Ripening Rooms	Nos.	
5.	Total Volume	Cu Mtr	
6.	Capacity of Each Chamber	MTs	
6	Storage Capacity	MTs	
7	Type of Structure	Type-1	
		Type-2	
8.	No. Circulation Fans installed per Chamber		
9.	Size of the Circulation Fan	Size	
10.	Total No. of Cooling Pads installed	Lot	
11.	Ethylene Gas System	Make	
12.	No. of Ethylene Generators installed		
13.	Design RH in ripening Room	%	
14.	Product Incoming Temperature	Deg C	
15.	Pull Down Period	Hours	
16.	Wall /Ceiling/floor insulation	Type	
17.	Insulation Thickness		
18.	Wall Thickness	mm	
19	Ceiling Insulation Thickness	mm	
20.	Floor Insulation Thickness	mm	
21	Doors Size		
22.	Type of Door		
23.	No. of Doors		

## CHECK LIST

<b>S. No.</b>	<b>DESCRIPTION</b>	<b>PAGE NO</b>
1.	Application Form along with Appraisal Report	
2.	Basic Data Sheet with Complete Technical Aspects	
3.	Detailed Project Report MIDH Guidelines	
4.	Bank Sanction Letter along with appraisal Report	
5.	Approval from Gram Panchayat / Municipality / Town Planning	
6.	SSI Registration Certificate	
7.	Fire Department Approval	
8.	PAN Card Copy of the unit	
9.	Electricity Approval	
10.	DMC Approval	
11.	Promoter's Affidavit as per Prescribed Format	
12.	Land Document	
13.	Land Conversion Certificate	
14.	Certificate from Civil Design Engineer	
15.	Certificate from Bank for Non-Availing Subsidy from any other State/Central Govt. Department.	
16.	Insurance of the Fixed Assets	



**APPLICATION FOR AVAILING ASSISTANCE / SUBSIDY UNDER MIDH**

**(COMPONENT: RIPENING CHAMBER)**

**Name of the Scheme: Post Harvest Management**

- 1 Name of the Farmer :
- 2 Father / Husband Name :
- 3 Caste (SC/ST/BC/OC) :
- 4 Address: :
- Phone / Cell No.: :
- 5 Land Extent in Acres / Ha. :  
(Copy of Pass Book / Adangal)
- 6 Source of Irrigation (Open well / Bore well / Canal) :
- 7 Name of the Financing Bank, Loan Amount Proposed :
- 8 Whether any Govt. Subsidy availed previously :
- 9 Any other relevant information :

**Declaration**

I, \_\_\_\_\_

declare that the particulars furnished above are true to the best of my knowledge and I promise that the benefit obtained from State MIDH Cell will be used for the purpose for which it is given and in case of misuse I am liable for any action deemed to be fit by Govt. of A.P., including recovery of the subsidy amount with 12% interest to the Government.

**Enclosures:** 1. Affidavit  
2. Pattadar Pass Book  
3. Detailed Project Estimate by Civil Engineer  
(Regd. No. along with Seal)

**Signature of the Farmer / Entrepreneur.**

Recommendations of the Horticulture Officer : \_\_\_\_\_

**Horticulture Engineer**

**Horticulture Officer**

**Asst. Director of Horticulture.**

# PRELIMINARY REPORT FOR RIPENING CHAMBER UNIT

## (Release of First Installment)

- A Component :
- B **Details of Project** :
- (i) . Name of the project :
- (ii). Address for communication  
with telephone No. :
- C **Project Location with Address** :
- (i). Survey No :
- (ii). Village :
- (iii). Mandal :
- D Constitution (Individual/ Joint Individual /  
Partnership Firm / Company. :
- E (i). Proposed Activity :
- (ii). Type :
- F Name of the Promoter :
- G **Present physical status of the project :**
- (i) Land development  
status/boundary/road :
- (ii) Stage of unit building  
Civil / Pre engineered as on  
inspection date. :
- (iii) Type of produce to be stored :
- (iv) Whether all the machinery installed as  
per DPR or not (Please specify) :
- H **Bank Details :**
1. Bank Name :
2. Branch :
3. Bank Sanction Date :
4. Loan Account No :
5. Bank disbursement statement with  
A/c. No. :
6. Letter from Banker  
(Subsidy Account no. given by bank) :

It is recommended to release 1<sup>st</sup> installment Rs. \_\_\_\_\_  
(Rupees. \_\_\_\_\_ only) as credit linked back ended subsidy as the  
construction of the unit was started.

Horticulture Engineer

Horticulture Officer

Asst. Director of Horticulture

# JOINT INSPECTION REPORT FOR RIPENING CHAMBER

## I. GENERAL INFORMATION

- 1) Name of the Unit with full address :  
(Sy. No. / Area / Village / District)
- 2) Date of Issue of Administrative Sanction :
- 3) Name of CEO of Company / Managing Director :
- 4) Constitution: Individual / Group of Individuals / :  
Society / Partnership Firm / Pvt. Ltd. Company / :  
Public Ltd. Company :
- 5) Date of Inspection of the Project :
- 6) Name & Designation of the Committee members :  
(e)  
(f)  
(g)  
(h)
- 7) Name of the Bank (with Full address & :  
Phone & Fax No.) :  
a) Subsidy reserve fund account no. :
- 8) Date of start of the project :
- 9) Date of Completion of the project :
- 10) a) Date & amount of Sanction of Term Loan :  
b) Repayment Period :
- 11) Land Details
  - iii. Whether land is in the name of promoter: Yes / No
  - iv. Whether land is a Regd. Lease land for : Yes / No  
Minimum 10 years in favour of applicant  
(in case of lease)

Name & Signature  
Applicant

Name & Signature  
of Expert

Name & Signature  
of Inspecting Officer  
(Bank)

Name & Signature  
of ADH concerned

Name & Signature of  
of Senior Officer  
from MIDH

## FORMAT

(Forwarding letter of Bank for Conducting JIT )  
Name & Full Address of the FI/Bank (on letter head)

To  
The Mission Director & Commissioner of Horticulture,  
Govt. of Andhra Pradesh,  
Public Gardens, Nampally,  
GUNTUR

**Subject : Request for Joint Inspection of the project**

Sir,

MIDH, A.P., had released Rs. .... as credit linked back-ended subsidy in respect of project of \_\_\_\_\_ Village \_\_\_\_\_ District \_\_\_\_\_ State Vide letter no ..... As per instruction, the subsidy amount has been kept in Subsidy Reserve Fund account of the bank and interest benefit is being passed on to the beneficiary. Now project is complete as per original proposal and we have also disbursed full Term loan sanctioned for the above mentioned project. In addition to documents submitted by bank at the time of claim of subsidy such as copy of the Appraisal Note, Term Loan sanction letter, copy of Record of Right, following documents required for Joint Inspection are being submitted with the request to conduct Joint Inspection of the project to decide final subsidy claim.

S. No	Particulars	Enclosed or Not
1	Details of date-wise release of term loan	
2	Completion certificate by Bank/FIs	
3	Undertaking from promoter (as prescribed by NHM)	
4	Extract of subsidy reserve fund account of bank in which estimated subsidy has been kept	

It is certified that the original of above documents and documents submitted at the time of subsidy claim by bank pertaining to the projects are kept in Bank/FI, which can be shown at the time of random monitoring by the Department or any agency authorized by the Department.

(Seal and Signature of the Bank's Officer )

Name : \_\_\_\_\_

Name of the Bank :

Address :

Phone/Fax/Mobile No.: \_\_\_\_\_

Place : \_\_\_\_\_

Date : \_\_\_\_\_

## FORMAT

(On Letter head of the CA)

To

**The Mission Director & Commissioner of Horticulture,  
Govt. of Andhra Pradesh,  
GUNTUR.**

We have examined the books of accounts and other relevant records maintained by M/s. / Shri / Smt. \_\_\_\_\_ (Name of the Beneficiary) at its office situated at \_\_\_\_\_ (Address of project) for \_\_\_\_\_ (Project activity). These accounts are maintained by the Company's management, partners of the firm / proprietor of the concerned / grower / NGO / and our responsibility is to verify the truth and fairness of these records and verification of amount expended for acquisition / construction of fixed assets / establishment and other expenditure.

We conducted our work in accordance with the Audits and Accounting Standards generally accepted in India. Those Standards require that we plan and perform our verification to obtain reasonable assurance about whether these accounts are true and fair are free of material misstatement. A verification included examining on 100% basis, evidence audit includes examining, on a test basis assessing the accounting principles used and significant estimates made by the grower, as well as evaluating the overall financial statement presentation. We believe that our audit provides reasonable basis of our opinion.

### **We verify that**

- a) We have obtained all the information and explanation that to the best of our knowledge and belief were necessary for the purpose of our verification.
- b) In our opinion, proper books of accounts as required by law have been kept by the Company / firm / sole proprietorship concern / grower / NGO for the financial period \_\_\_\_\_ and these books of account represent true and fair view of the transaction entered into by the Company / firm / sole proprietorship concern / grower / NGO.
- c) In our opinion, the Company / firm / sole proprietorship concern / grower / NGO has incurred a capital expenditure amounting to Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_ only) for acquisition / construction of fixed assets and the same is being reflected properly in the books of accounts. The valuation made of major components of the project and whole project is tabulated as follows:

**Establishment of Project:**

S. No.	Component	Proposed Expenditure as per LOI	Cost as appraised by Bank before term loan sanction	Cost assessed by CA	Remarks
1					
2					
3					
	TOTAL				

Total : \_\_\_\_\_

**MEANS OF FINANCE**

S. No.	Item	Project Cost as per DPR	Project Cost as per Appraisal Report	Actual Cost
1	Promoter's Equity			
2	Term Loan			
3	Unsecured Loan			
4	Grant from NHM			
5	Others			
	TOTAL			

**We recommend Rs. .... as the cost of the whole project.**

**Signature and Seal of C.A.  
with Membership No.**

**Date:**

## **10. PRIMARY PROCESSING / MINIMAL PROCESSING UNITS**

Processing of horticultural produce and value addition is an important activity. While primary / minimal processing units are promoted under MIDH, large scale processing units are promoted by Ministry of Food Processing Industries (MFPI), out of their ongoing Schemes.

Application form along with all required documents as per the check list has to be forwarded to State cell for taking approval from SLEC. After receiving of administrative sanction, ADH has to submit Preliminary Inspection Report. After the unit is completed ADH has to recommend for joint inspection of the unit.

The ADH shall conduct joint inspection with the members constituted by this office and the joint inspection reports have to be submitted in prescribed format. Based on the recommendations of the Committee, the final installment of the subsidy shall be released to the concerned bank of the promoter through hortnet.

### **Title of the land and copy of record of right**

The title of the piece of land on which the project is proposed to be set up should be in the name of applicant in the capacity of owner or lessee for minimum period of 10 years. In case of land leased, lease deed it should be registered with the Authority like office of Sub-Registrar, etc. A latest copy of record of right showing this fact should be enclosed with the application. Mortgaged land shall not be treated at par with lease even if the credit institution might have considered so. Similarly, Power of Attorney given by owner of land in favour of applicant shall not qualify him for benefit under the scheme.

<b>Sl. No.</b>	<b>Component</b>	<b>Unit Cost</b>	<b>Assistance</b>
1	Cashew Processing Unit	25.00	Credit linked back-ended subsidy @ 40% of the capital cost of project in general areas and 55% in case of Hilly & Scheduled areas.
2	Tomato Ketchup Plant	25.00	
3	Turmeric Cooking Plant	25.00	
4	Garlic / Onion Dehydration Plant	25.00	
5	Honey Process Plant	25.00	
6	Papaya Tooty Fruity Processing Plant	25.00	
7	Red Chilly Dryer Plant	25.00	
8	Pineapple Processing Plant	25.00	

**Cashew Processing****Stage 1 -DRYING**

The raw cashew nuts are procured from the local farmers and local market. These cashew nuts are dried in the sun for a period of two days and are then stored in the gunny bags for processing through the year. The process of sun drying helps in removal of excess moisture thus resulting in longer storage. The processing of cashew nut is a four stage process, each designed to produce quality edible cashew kernel.

**Stage 2 - Steam Roasting**

The outer shell of the raw cashew nuts has to be removed to produce the edible cashew kernel. The outer shell of the cashew is very hard and it contains a corrosive oil which is harmful for human consumption. The process of steam roasting helps in removal of this hard shell with minimal effort. The raw cashew nuts are put in a drum connected to a mini boiler. The steam from this mini boiler is passed over the cashew nuts placed in the drum for a period of 10 -15 minutes. These cashew nuts are left in the drum for 20 minutes for proper roasting. The roasted cashew nuts are then taken out of the drum and placed in the open air for a period of around 12 hours to let them cool down and help in removal of the cashew shells.

**Stage 3 - Shell Cutting**

The roasted cashew nuts are then taken to the cutting department to remove the outer shell. This is a complex process and requires highly skilled labor to get maximum unbroken kernel output. This process required each cashew nut to be individually placed between blades of the machine operated manually to remove the outer shell. This process results in production of cashew kernel with soft inner shell. These nuts are then placed in a oven which is constantly maintained at a temperature of about 60 degrees for a period of 24 hours to make the inner shell brittle.

**Stage 4 -HOT CHAMBER**

In this stage, cashew kernels are heated to 70-85 degree centigrade. The main purpose of this heating is to eliminate moisture and gumming between cashew kernels and adhering testa.



### **Stage 5 – Peeling**

The inner shell of the kernel has to be removed to produce the white nuts. The peeling process is designed to remove this inner soft shell after the kernel is removed from the oven. The kernel is used for peeling after it is left in the open for a period of 12 hours. This cooling helps in peeling process. Each nut is individually peeled to get white nuts. These white nuts are then sent to the grading department.

### **Stage 6 – Grading**

The process of grading is designed to sort the white cashew kernel into different grades. The white kernel is divided into two main types wholes and pieces. The wholes are further divided into 15 grades and the pieces are divided into 9 main grades. The process of sorting wholes and the pieces is based on the size, color and texture of the nuts. The sorting is done based on the set international sizes. These nuts are then once again placed in the oven to make the nuts crispier before they are sent to the packaging department.

### **Stage7 - Packing**

Cashew Kernels are fumigated before packing. Then, it is passed through a cleaning line, where dead insects, foreign particles, if any are removed. Finishing touches are given to grades by removing lower grades.

1. The cashew kernels are packed into plastic bags of different sized for sale in local market and in tins of 10kgs for sending to other markets.
2. Cashew kernels are packed in controlled atmosphere. Ambient air is removed and replaced with CO<sub>2</sub> and Nitrogen gasses.

## CASHEW PROCESS FLOW CHART – RELEVANT MACHINERY



**BASIC DATA SHEET FOR CASHEW PROCESSING UNIT**

<b>CIVIL Works - Shed Specifications</b> (Shed Size = 40' x 30' (or) 60' x 20' = 1200 sq. ft)					
<b>Sl. No.</b>	<b>Description</b>	<b>Length (ft)</b>	<b>Width (ft)</b>	<b>Unit</b>	<b>Area (Sq. ft) / Quantity</b>
1	PCC Platform with 1.5' plinth height (Concrete Flooring)			Sq. ft	1200
2	Shed (Iron Gutters, truss and purlin & GI / Asbestos Roof sheets) (22' centre height and 17' wall height)			Sq. ft	1200
3	17' height wall (9 inch thickness) all-round the shed – Cost includes Bricks + Cement+ Sand + Mason Charges				
4	Two Rolling Shutters of size 8' x 8'	8'	8'	Nos	2
5	Six Glazed M.S. Windows of size 5' x 3' with 10mm square guard bars at 150mm c/c including hardware and 4mm glass	5'	3'	Nos	6

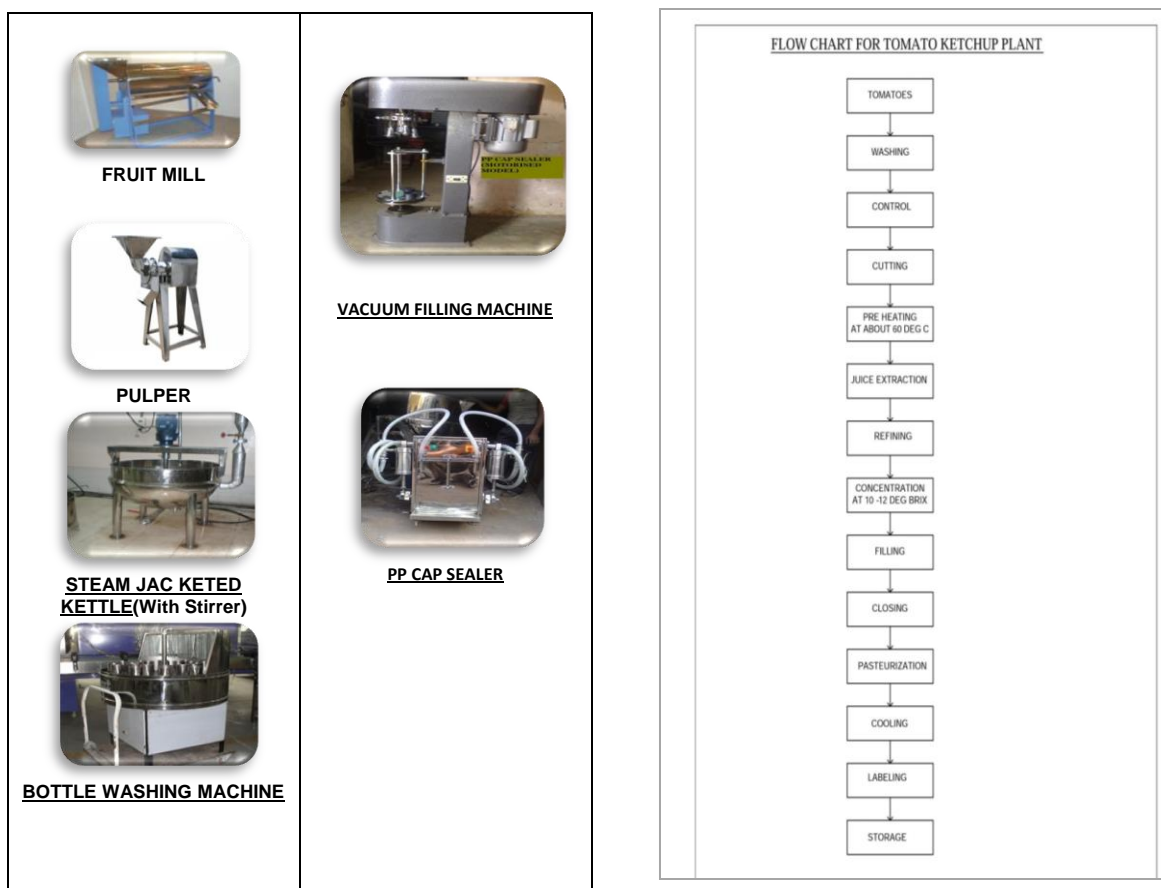
<b>Machinery Details</b>					
<b>Sl. No</b>	<b>Item</b>	<b>Machine Details</b>		<b>Motor</b>	
		<b>Make</b>	<b>Capacity (Kg / Hr)</b>	<b>Make</b>	<b>Capacity (HP / KW)</b>
1	Raw Cashew Grader				
2	Steam Boiler With Cooker				
3	Electrical Oven				
4	Automatic Cashew Shell Cutting Machine				
5	Cashew Nut Peeling Machine				
6	Air Compressor				
7	Kernel Separator				
8	Grading Machine				
9	Humidifier				
10	Laboratory Equipment				
11	Weighing Scale				
12	Sealing Machines				
13	Fire Safety Equipment				

<b>Electrical Equipment</b>			
<b>SI No</b>	<b>Item</b>	<b>Capacity</b>	<b>Quantity</b>
1	Electrical Supply & Transformer		
2	Cables, Wires, Lights & Fans		
3	Generator		

**Total Project Cost = ± Rs 25.00 Lakhs**

**TOMATO KETCHUP MANUFACTURING PROCESS**

Tomatoes are first washed, inspected, sorted (manually) and fed onto the processing line. It is desirable to process the tomatoes of same maturity and colour to get final product of consistent quality. Tomatoes are subjected to heating in hot-break system prior to crushing into tomato juicer. while crushing into juicer, tomato juice and seeds are separated. Tomato juice collected in s.s. Tanks, pumped to standardization tanks followed by pasteurization in scrap surface pasteurizer. Tomato juice is then concentrated under vacuum for manufacturing tomato puree. Tomato puree is the first form of concentrated tomato juice. Tomato puree is processed further to make tomato paste, chutneys, ketchups and sauces. Tomato ketchup and sauce are manufactured by adding required quantity of sugar, salt, spices, preservatives and food grade colour. Thus prepared ketchup/sauces are filled into bottles under vacuum and bottles are then sealed perfectly.



## 1. BASIC DATA SHEET FOR TOMATO KETCHUP PLANT

<b>CIVIL Works- Shed Specifications</b> (Shed Size = 40' x 30' (or) 60' x 20' = 1200 sq. ft)					
Sl. No.	Description	Length (ft)	Width (ft)	Unit	Area (Sq. ft) / Quantity
1	PCC Platform with 1.5' plinth height (Concrete Flooring)			Sq. ft	1200
2	Shed (Iron Gutters, truss and purlin & GI / Asbestos Roof sheets) (22' centre height and 17' wall height)			Sq. ft	1200
3	17' height wall (9 inch thickness) all-round the shed – Cost includes Bricks + Cement+ Sand + Mason Charges				
4	Two Rolling Shutters of size 8' x 8'	8'	8'	Nos	2
5	Six Glazed M.S. Windows of size 5' x 3' with 10mm square guard bars at 150mm c/c including hardware and 4mm glass	5'	3'	Nos	6

<b>Machinery Details</b>					
Sl. No	Item	Machine Details		Motor	
		Make	Capacity (Kg / Hr)	Make	Capacity (HP / KW)
1	Chemical Water Wash Unit				
2	Hot Water Wash Unit				
3	Brushing Unit				
4	Wiping / Drying Unit				
5	Fruit Mill				
6	Pulper				
7	Steam Jacketed Kettle (With Stirrer)				
8	Wood Fired Boiler				
9	Bottle Washing Machine				
10	Vacuum Filling Machine				
11	Crown Corking Machine				
12	Pp Cap Sealer				
13	Laboratory Equipment				
14	Weighing Scale				
15	Sealing Machines				
16	Fire Safety Equipment				

<b>Electrical Equipment</b>			
SI No	Item	Capacity	Quantity
1	Electrical Supply & Transformer		
2	Cables, Wires, Lights & Fans		
3	Generator		

**Total Project Cost = ± Rs 25.00 Lakhs**

**Turmeric Processing*****Harvesting***

The whole plant is removed from the ground taking care not to cut or bruise the rhizomes.

***Sweating***

The leaves are cut off and the roots washed carefully in water. The lateral branches of the rhizomes ("fingers") are cut off from the central "bulb" ("mother"). The "fingers and "mothers" are heaped separately, covered in leaves to sweat for a day.

***Boiling or Curing***

The rhizomes need to be boiled or steamed to soften them, remove the raw odour, reduce the drying time, gelatinise the starch and produce a more uniformly coloured product.

***Drying***

The rhizomes are removed and dried in the sun immediately to prevent over cooking. The final moisture content should be between 8 and 10% (wet basis). When a finger will snap cleanly with a metallic sound it is sufficiently dry.

***Polishing***

The dried rhizomes are polished to remove the rough surface. This can be done by hand or by shaking the rhizomes in a gunny bag filled with stones. Polishing drums are in use in many places. These are very simple power driven drums.

***Adulteration***

Lead chromate is sometimes used to produce a better finish. This should be actively discouraged.

***Grading***

Quality Specifications for turmeric are imposed by the importing country. They refer to the cleanliness of the product rather than on the eating quality. Bulk rhizomes are graded into fingers, bulbs and splits.

***Grinding***

Grinding can be a method of adding value to a product. However, in general it is not advisable to grind spices as they become more vulnerable to spoilage.

Grinding is a very simple process that involves cutting and cutting the rhizomes into small particles, then sifting it through a series of screens of different mesh size, to get a fine powder.

## Packing

Ground rhizomes and rhizome pieces are packed in jute sacks, wooden boxes or lined corrugated cardboard boxes for shipping.

Ground turmeric (powder) should be packaged in moisture proof , air tight polythene packages. The packages should be sealed and labelled with attractive labels.

## Storage

The bulk rhizomes are stored in a cool and dry environment, away from direct sun light.



**STANDING COOKING MODEL**



**MOBILE COOKING MODEL**



**Rotary Dryer /  
Chillies & Turmeric**



**Polishing Machine**



**Powder Machine**

## BASIC DATA SHEET FOR TURMERIC COOKING PLANT

<b>CIVIL Works - Shed Specifications</b> (Shed Size = 40' x 30' (or) 60' x 20' = 1200 sq. ft)					
Sl. No.	Description	Length (ft)	Width (ft)	Unit	Area (Sq. ft) / Quantity
1	PCC Platform with 1.5' plinth height (Concrete Flooring)			Sq. ft	1200
2	Shed (Iron Gutters, truss and purlin & GI / Asbestos Roof sheets) (22' centre height and 17' wall height)			Sq. ft	1200
3	17' height wall (9 inch thickness) all-round the shed – Cost includes Bricks + Cement+ Sand + Mason Charges				
4	Two Rolling Shutters of size 8' x 8'	8'	8'	Nos	2
5	Six Glazed M.S. Windows of size 5' x 3' with 10mm square guard bars at 150mm c/c including hardware and 4mm glass	5'	3'	Nos	6

<b>Machinery Details</b>					
Sl. No	Item	Machine Details		Motor	
		Make	Capacity (Kg / Hr)	Make	Capacity (HP / KW)
1	Rotary Dryer				
2	Slicing Machine				
3	Polishing Machine (Cleaning / Abrasive Machine)				
4	Milling and Grinding Machine				
5	Packaging and Labeling Machines				
6	Charging Vessels – 4 Nos				
7	Fire Wood Boiler – 1 No				
8	Trolley with 4 Tyres				
9	Pipes & Fittings – 1 Set				
10	Material Handling Trolleys – 2 No				
11	Laboratory Equipment				
12	Weighing Scale				
13	Sealing Machines				
14	Fire Safety Equipment				

<b>Electrical Equipment</b>			
Sl No	Item	Capacity	Quantity
1	Electrical Supply & Transformer		
2	Cables, Wires, Lights & Fans		
3	Generator		

**Total Project Cost = ± Rs 25.00 Lakhs**



**Dehydrated Garlic manufacturing process**

The processing operations with Garlic particularly include Garlic grading, bulb breaking, clove separation, size reduction, peeling, clove flaking, dehydration, blending, packaging, storage, grinding etc.

Following products may be prepared from the processing of the Garlic:

- a. Garlic Flex
- b. Garlic Powder
- c. Garlic Tablet
- d. Garlic Paste
- e. Garlic Pickles
- f. Garlic cloves
- g. Garlic Digestive Churn etc.

Before processing the bulb is broken to separate the cloves. Powder and flex are made after flaking, drying and grinding the cloves. For making paste wet cloves are pilled and grind.

The simple and low cost Garlic processing machines include the following machinery.

- a. Garlic Grader
- b. Garlic bulb breaker
- c. Garlic clove flaker
- d. Dry Garlic peel remover (de-skinner)
- e. Fresh Garlic clove peeler

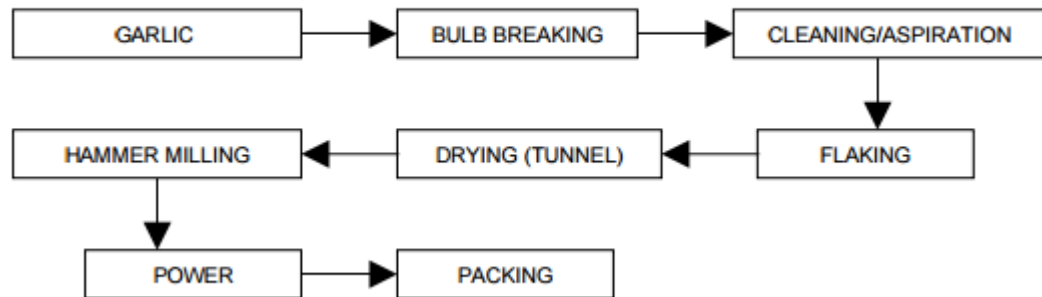
Garlic bulbs are broken into individual cloves by passing between rubber-covered rollers which exert pressure to crack the bulbs without 111lavour the cloves. The loose 'papery shell" is removed by screening and aspiration. The cloves are then sliced or pressed between rolls to form flakes. The slices or flakes are dried in tunnel driers or continuous belt drier. In case of tunnel drying the slices are loaded on wooden trays (5-6 kg. m2 tray area)

Trays are stocked on cars which are conveyed to a2-stage tunnel drier. In the first concurrent flow stage air temperatures from 750 to 900C may be used and in the stage countercurrent flow of air lowers the temperature from 550 to 00. In 10-15 hours product is dried to 5-7 percent moisture, where upon they are scrapped from the trays. The dried slices are transferred to the drying bins. Belt dryer can also be used where slices are automatically sped on a continuous stainless steel perforated belt. The

temperature of the air at the inlet is about 6 per cent in about 6 hours of drying. After drying the pink skin that adheres to the fresh clove can be removed by screening and air aspiration.

Dehydrated garlic can be powdered in an air classifier hammer mill. It is packed in polyethylene bags immediately to prevent absorption of moisture.

### **PROCESS FLOW CHART OF GARLIC POWDER**



### **Onion Dehydration**

Onion is one of the most important commercial vegetable crops grown in INDIA. The outstanding characteristic of onion is its pungency. The dehydrated onions flakes compared with other fresh vegetable are relatively high in food energy, protein content and rich in calcium. Dehydrated onions are widely use in soups, sauces, pizzas, ketchups, and fast-foods.

### **FORMS OF DEHYDRATED ONION:**



#### **Onion Flakes/Kibbled ( 10mm – 30 mm)**

Widely used in varied food preparations wherever alongwith onion flavour & taste, onion's appearance & texture is desired and can be easily used in salads & other preparations / servings after re-dehydration.



#### **Onion Chopped (Size: 3.0 – 5.0 mm)**

Used in dry soups, mixes, specialty ethnic food preparations, canned/dried/frozen vegetable mixes, dry casserole mixes, stuffing mixes, food service & fast food and particularly when large onion pieces are desired.



### **Onion Minced (Size: 1.0 – 3.0 mm)**

Mainly used in preparation of soups, sauces, canned/dried/frozen foods, salad dressings, meat products and other food products whenever onion flavour or taste is required.



### **Onion Granules (Size: 0.1 – 0.5 mm & 0.5 to 1.0 mm)**

Particularly applied in Vegetables & Meat preparations, gravies, sauces, seasoning salad dressings, cheese, crackers etc.



### **Onion Powder**

Free flowering powder is used in soups, sauces, seasoning, and meat products and suitable for varied food preparations, particularly when strong onion flavour and taste is desired.

## **Dehydrated Onion Manufacturing Process**

### **Step 1. Grading & Peeling**

The onion lots are graded as per the size & quality. And then peeled. The Top layer of the raw onion bulbs are removed.

### **Step 2. Washing & Slicing**

The peeled onions are washed by agitation and are then sliced in the slicing machine. Strict hygiene is maintained while washing.

### **Step 3. Drying**

Sliced onions are fed in the imperial dryer for dehydration without effecting the taste and pungency.

### **Step 4. Kibbling & Sorting**

Dehydrated onions are shifted to clean air conditioned rooms and fed into the kibbling machine to obtain the kibbled form. The skins are then removed from the kibbled with blowers. Manual sorting is then carried out to remove further impurities.

### **Step 5. Metal Detector Passing**

The Product is passed through high power magnetic sticks and metal detectors to remove all metal impurities .

### **Step 6. Sizing**

As per the buyer specification, kibbled undergoes milling and sizing process. The produce is separated into chopped, minced and granules vide gyratory screens.

## Step 7. Packing

The finished product are weighed and sealed in moisture proof food grade poly bags. The bags are packed in corrugated boxes or paper bags. The product is now ready for export.

During the entire process only the water content of the onion is removed by steam drying under controlled temperature and environment hence the natural taste of the onion is well preserved.

Row material receipt and quality check	▼
Top and tailing (peeling)	▼
Mechanical peeling + washing with chlorinated water	▼
Further washing with sterile water (10ppm cl-2)	▼
Slicing / cutting	▼
First stage drying in imperial dryer	▼
Second stage drying in hot air continuous belt dryer	▼
Continuous belt air cooling	▼
Skin removing by air aspiration	▼
Colour sorting by color sorting machine	▼
Metal Detection & Rare Earth Magnet Cleaning/Detection	▼
Weighing & Packing	▼



**GARLIC CLOVE SEPARATOR**



**ONION SLICE CUTTING MACHINE**



**GARLIC PEELING MACHINE**



**ELECTRICAL TRAY DRYER**

## BASIC DATA SHEET FOR GARLIC / ONION DEHYDRATION PLANT

CIVIL Works - Shed Specifications (Shed Size = 40' x 30' (or) 60' x 20' = 1200 sq. ft)					
Sl. No.	Description	Length (ft)	Width (ft)	Unit	Area (Sq. ft) / Quantity
1	PCC Platform with 1.5' plinth height (Concrete Flooring)			Sq. ft	1200
2	Shed (Iron Gutters, truss and purlin & GI / Asbestos Roof sheets) (22' centre height and 17' wall height)			Sq. ft	1200
3	17' height wall (9 inch thickness) all-round the shed – Cost includes Bricks + Cement+ Sand + Mason Charges				
4	Two Rolling Shutters of size 8' x 8'	8'	8'	Nos	2
5	Six Glazed M.S. Windows of size 5' x 3' with 10mm square guard bars at 150mm c/c including hardware and 4mm glass	5'	3'	Nos	6

Machinery Details for Garlic Dehydration					
Sl. No	Item	Machine Details		Motor	
		Make	Capacity (Kg / Hr)	Make	Capacity (HP / KW)
<b>Machinery</b>					
1	Garlic Grader (grades the garlic bulbs)				
2	Garlic Bulb Breaker (separates individual cloves from Garlic bulbs)				
3	Garlic Clove Flaker (The loose 'papery shell" is removed by screening and aspiration. The Cloves Are then sliced or pressed between rolls to form flakes)				
4	Garlic Peeling Machine				
5	Air Compressor				
6	Electrical Tray Dryer				
7	Laboratory Equipment				
8	Weighing Scale				
9	Sealing Machines				
10	Fire Safety Equipment				

Machinery Details for Onion Dehydration					
Sl. No	Item	Machine Details		Motor	
		Make	Capacity (Kg / Hr)	Make	Capacity (HP / KW)
1	Onion Peeling Machine				
2	Onion washing tub or machine				
3	Onion Slice Cutting Machine				
4	Electrical Tray Dryer				
5	Laboratory Equipment				
6	Weighing Scale				
7	Sealing Machines				
8	Fire Safety Equipment				

Electrical Equipment			
Sl No	Item	Capacity	Quantity
1	Electrical Supply & Transformer		
2	Cables, Wires, Lights & Fans		
3	Generator		

**Total Project Cost = ± Rs 25.00 Lakhs**

## 10.5

# HONEY PROCESS PLANT

### Demand and Market of Honey:

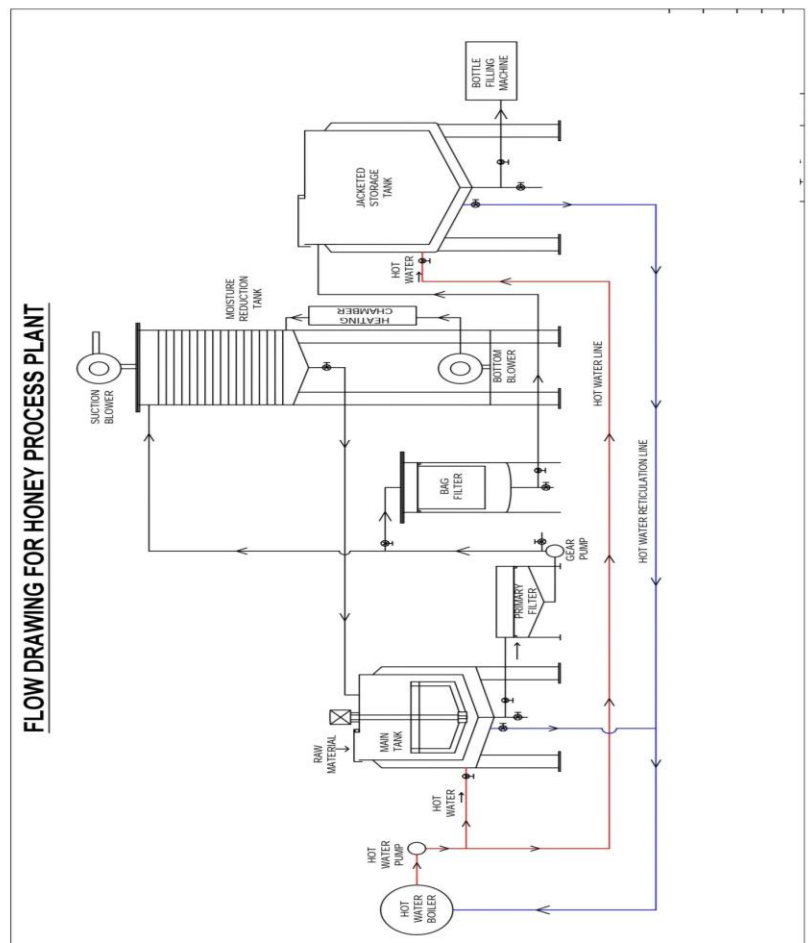
Honey is very helpful and tasteful food. The demand of honey is found all throughout the year. The demand increases in the winter season.

With the Honey Processing Machine, one can process honey, pack it in bottles and can sell it in the market.

### How to process honey with Honey Processing Machine:

Generally, there are two machines are needed for honey processing. The first one is Filter Press Machine and other one is Vacuum Evaporator Machine. At first you have to pour natural (unprocessed) honey in a clean steel pot. Then you have to filter the beeswax and dirt from honey with Filter Press Machine. Then you have to separate extra water-vapour from honey in indicated temperature with Vacuum Evaporator Machine. At last you have to put it in bottles.

The working of the honey processing unit is based on processing of raw honey which is obtained from honey combs from edible grade honey. The processing helps in effectively removing impurities, wax, pollens and water.



## BASIC DATA SHEET FOR HONEY PROCESS PLANT

<b>CIVIL Works – Shed Specifications</b> (Shed Size = 40' x 30' (or) 60' x 20' = 1200 sq. ft)					
Sl. No.	Description	Length (ft)	Width (ft)	Unit	Area (Sq. ft) / Quantity
1	PCC Platform with 1.5' plinth height (Concrete Flooring)			Sq. ft	1200
2	Shed (Iron Gutters, truss and purlin & GI / Asbestos Roof sheets) (22' centre height and 17' wall height)			Sq. ft	1200
3	17' height wall (9 inch thickness) all-round the shed – Cost includes Bricks + Cement+ Sand + Mason Charges				
4	Two Rolling Shutters of size 8' x 8'	8'	8'	Nos	2
5	Six Glazed M.S. Windows of size 5' x 3' with 10mm square guard bars at 150mm c/c including hardware and 4mm glass	5'	3'	Nos	6

<b>Machinery Details</b>					
Sl. No	Item	Machine Details		Motor	
		Make	Capacity (Kg / Hr)	Make	Capacity (HP / KW)
<b>Machinery</b>					
1	Main Tank				
2	Primary Filter				
3	Gear Pump With Motor				
4	Bag Filter				
5	Electrical Tray Dryer				
6	Moisture Reduction Tank				
7	Pipes & Fittings				
8	Laboratory Equipment				
9	Weighing Scale				
10	Sealing Machines				
11	Fire Safety Equipment				

<b>Electrical Equipment</b>			
SI No	Item	Capacity	Quantity
1	Electrical Supply & Transformer		
2	Cables, Wires, Lights & Fans		
3	Generator		

**Total Project Cost = ± Rs 25.00 Lakhs**

## **PAPAYA TOOTY FRUITY PROCESSING PLANT**

Tooty Fruity is made from unripe papaya fruit and contains good amount of sugar. The countries with the largest papaya production are India and Brazil followed by Nigeria, Indonesia, and Mexico.

Tooty Fruity is made by impregnating fruits with flavour & taste along with attractive colour. It is useful in the preparation of other food items such as toppings. It provides attractiveness as well as nutritive value to many food items. Mostly used for toppings for breads, ice cream, fruit bar, pulao, cakes, pastries, custard shrikhand & fruit salads etc. Tooty Fruity is a mass consumption added to sweets, paan Masala also.

### **TOOTY FRUITY MANUFACTURING PROCESS:**

Fresh papaya is washed and peeled, then pulping is done by mixing sugar so as to bring sweet taste. Raw materials required are unripe but fully grown bigger sized papaya and sugar. Heating is done. Citric acid, colours & preservatives are mixed. Dehydration is done. Big structure is cut into pickles and packed in pouches for selling.

Moisture content of the product at the time of packing should not exceed 6%.

### **MACHINERY REQUIRED FOR TOOTY FRUITY MANUFACTURING PROJECT:**

1. Baby boiler and accessories
2. Stainless steel soaking tanks
3. Papaya cubing machine
4. Stainless steel working tools
5. Tray drier with 48 trays
6. Sealing machines
7. Weighing scale
8. Laboratory equipment



**BASIC DATA SHEET FOR PAPAYA TOOTY FRUITY PROCESSING PLANT**

<b>CIVIL Works - Shed Specifications</b> (Shed Size = 40' x 30' (or) 60' x 20' = 1200 sq. ft)					
<b>Sl. No.</b>	<b>Description</b>	<b>Length (ft)</b>	<b>Width (ft)</b>	<b>Unit</b>	<b>Area (Sq. ft) / Quantity</b>
1	PCC Platform with 1.5' plinth height (Concrete Flooring)			Sq. ft	1200
2	Shed (Iron Gutters, truss and purlin & GI / Asbestos Roof sheets) (22' centre height and 17' wall height)			Sq. ft	1200
3	17' height wall (9 inch thickness) all-round the shed – Cost includes Bricks + Cement+ Sand + Mason Charges				
4	Two Rolling Shutters of size 8' x 8'	8'	8'	Nos	2
5	Six Glazed M.S. Windows of size 5' x 3' with 10mm square guard bars at 150mm c/c including hardware and 4mm glass	5'	3'	Nos	6

<b>Machinery Details</b>					
<b>Sl. No</b>	<b>Item</b>	<b>Machine Details</b>		<b>Motor</b>	
		<b>Make</b>	<b>Capacity (Kg / Hr)</b>	<b>Make</b>	<b>Capacity (HP / KW)</b>
<b>Machinery</b>					
1	Papaya Peeler				
2	Vegetable Dicing & Cubing Machine				
3	Steam Jacketted Kettle				
4	Baby Steam Boiler				
5	Band Sealer				
6	Laboratory Equipment				
7	Weighing Scale				
8	Sealing Machines				
9	Fire Safety Equipment				

<b>Electrical Equipment</b>			
<b>SI No</b>	<b>Item</b>	<b>Capacity</b>	<b>Quantity</b>
1	Electrical Supply & Transformer		
2	Cables, Wires, Lights & Fans		
3	Generator		

**Total Project Cost = ± Rs 25.00 Lakhs**

**Drying of Red Chillies:**

During the dry season, sun drying is usually adequate to dry the produce. The simplest and cheapest method is to lay the produce on mats in the sun. However, there are problems associated with this method. Dust and dirt are blown onto the crop and unexpected rain storms can re-wet the crop. During the wet season or times of high humidity, which often coincides with the harvest of the spices sun drying cannot be used effectively.

Hence, a dryer can avoid these problems.

Machinery used in the Red Chilly drying process are:

1. Washing tubs / Washing machine
2. Elevator
3. Rotary Dryer

**Over drying:** Care needs to be taken to prevent over drying of the crops. The final moisture content should be 10% wet basis.

**Grading:** In some cases the crop needs to be graded, eg high quality packaged products. Chilli is graded by colour and size this is done by hand. The brighter the red colour, the better the product.



## BASIC DATA SHEET FOR RED CHILLY DRYER

<b>CIVIL Works - Shed Specifications</b> (Shed Size = 40' x 30' (or) 60' x 20' = 1200 sq. ft)					
Sl. No.	Description	Length (ft)	Width (ft)	Unit	Area (Sq. ft) / Quantity
1	PCC Platform with 1.5' plinth height (Concrete Flooring)			Sq. ft	1200
2	Shed (Iron Gutters, truss and purlin & GI / Asbestos Roof sheets) (22' centre height and 17' wall height)			Sq. ft	1200
3	17' height wall (9 inch thickness) all-round the shed – Cost includes Bricks + Cement+ Sand + Mason Charges				
4	Two Rolling Shutters of size 8' x 8'	8'	8'	Nos	2
5	Six Glazed M.S. Windows of size 5' x 3' with 10mm square guard bars at 150mm c/c including hardware and 4mm glass	5'	3'	Nos	6

<b>Machinery Details</b>					
Sl. No	Item	Machine Details		Motor	
		Make	Capacity (Kg / Hr)	Make	Capacity (HP / KW)
<b>Machinery</b>					
1	Washing tubs / Washing machine				
2	Elevators				
3	Rotary Dryer with one of the following capacities				
	a) Capacity – 2000 Ltrs.				
	b) Capacity – 4000 Ltrs.				
	c) Capacity – 10,000 Ltrs.				
	d) Capacity – 16,000 Ltrs.				
6	Laboratory Equipment				
7	Weighing Scale				
8	Sealing Machines				
9	Fire Safety Equipment				

<b>Electrical Equipment</b>			
Sl No	Item	Capacity	Quantity
1	Electrical Supply & Transformer		
2	Cables, Wires, Lights & Fans		
3	Generator		

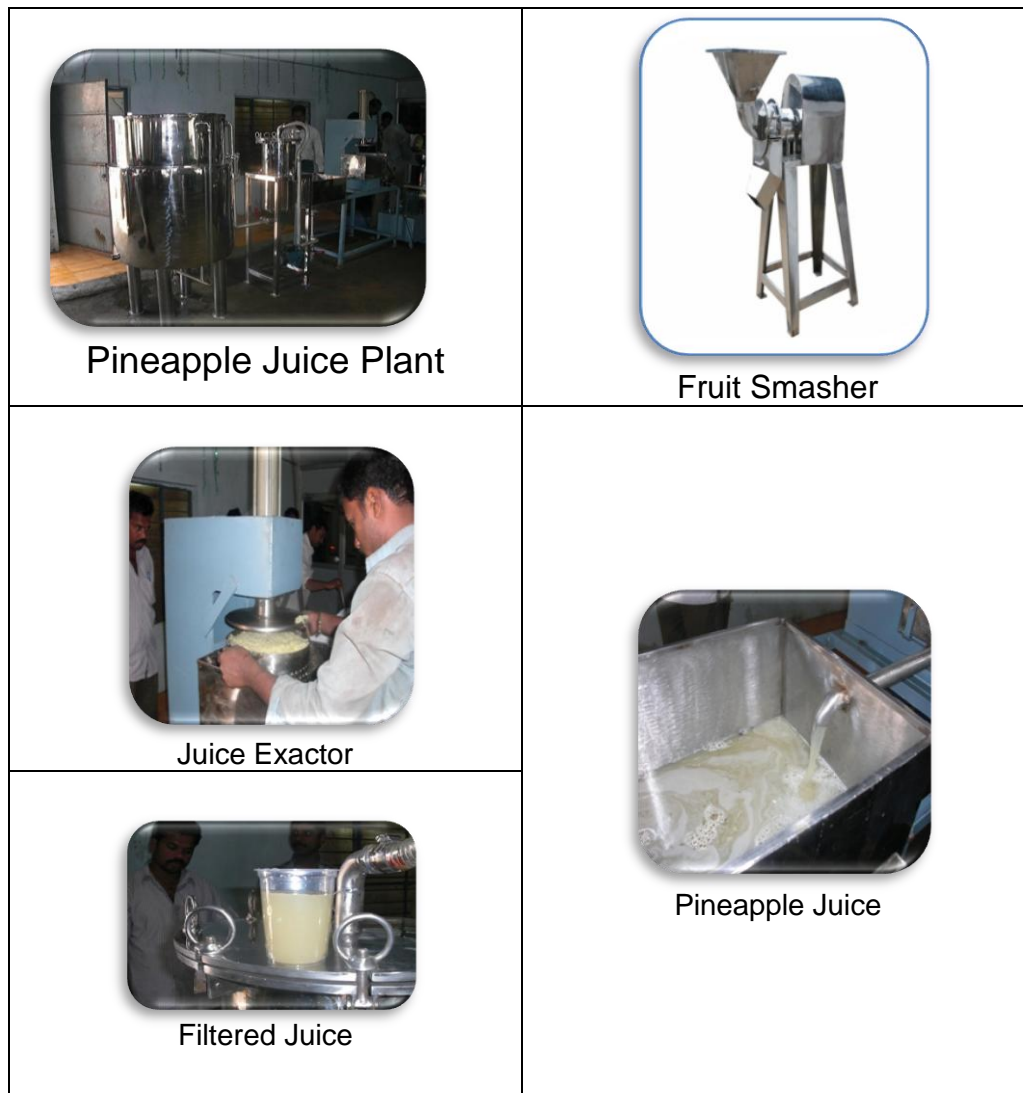
**Total Project Cost = ± Rs 25.00 Lakhs**

## PINEAPPLE JUICE PLANT

### **PINEAPPLE PROCESSING:**

The manufacturing process of pineapple products viz. Slices and Juice involves many steps and different sub-processes. Ripe and matured pineapples are washed, graded and peeled. Then they are crushed in the crusher to obtain juice.

In case of slices, after peeling, uniform slices are made on the slicer. Juice is then taken to vessels and boiled and certain preservatives are added. It is finally taken to storage tanks and packed in bottles on vacuum filling machine. In case of slices, they are dipped in sugar syrup for about 3 to 4 hours. Then the slices are taken to lacquered cans and cans are sterilized. While canning, sugar syrup is added. Cans are cooled quickly and after sealing and labeling, they are stored. The average yield is around 80%.



## BASIC DATA SHEET FOR PINEAPPLE JUICE PLANT

<b>CIVIL Works - Shed Specifications</b> (Shed Size = 40' x 30' (or) 60' x 20' = 1200 sq. ft)					
Sl. No.	Description	Length (ft)	Width (ft)	Unit	Area (Sq. ft) / Quantity
1	PCC Platform with 1.5' plinth height (Concrete Flooring)			Sq. ft	1200
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5	Six Glazed M.S. Windows of size 5' x 3' with 10mm square guard bars at 150mm c/c including hardware and 4mm glass	5'	3'	Nos	6

<b>Machinery Details</b>					
Sl. No	Item	Machine Details		Motor	
		Make	Capacity (Kg / Hr)	Make	Capacity (HP / KW)
<b>Machinery</b>					
1	<b>Cutting Table</b>				
2	Fruit Pulper (SS 304)				
3	Fruit Mill (SS 304)				
4	Juice extractor (SS 304)				
5	Hydraulic Juice Press				
6	Open Pan Steam Jacketed with stirrer				
7	Storage Tanks (SS 304) – Capacity: 100 Ltrs				
8	SS Pump				
9	Filter system (Bag Filters)				
10	Pasteurizer				
11	Storage Tanks (SS 304) – Capacity: 500 Kg				
12	Diesel Fired Boiler				

13	Pipes & valves				
14	Cooling Tower				
15	Packing Machine (Pet Bottle) a) Bottle Washer b) Filling Machine c) Capping Machine				
16	Laboratory Equipment				
17	Weighing Scale				
18	Sealing Machines				
19	Fire Safety Equipment				

<b>Electrical Equipment</b>			
<b>SI No</b>	<b>Item</b>	<b>Capacity</b>	<b>Quantity</b>
1	Electrical Supply & Transformer		
2	Cables, Wires, Lights & Fans		
3	Generator		

**Total Project Cost = ± Rs 25.00 Lakhs**

## CHECK LIST

<b>S. No.</b>	<b>DESCRIPTION</b>	<b>PAGE NO</b>
1.	Application Form along with Appraisal Report	
2.	Basic Data Sheet with Complete Technical Aspects	
3.	Detailed Project Report MIDH Guidelines	
4.	Bank Sanction Letter along with appraisal Report	
5.	Approval from Gram Panchayat / Municipality / Town Planning	
6.	SSI Registration Certificate	
7.	Fire Department Approval	
8.	PAN Card Copy of the unit	
9.	Electricity Approval	
10.	DMC Approval	
11.	Promoter's Affidavit as per Prescribed Format	
12.	Land Document	
13.	Land Conversion Certificate	
14.	Certificate from Civil Design Engineer	
15.	Certificate from Bank for Non-Availing Subsidy from any other State/Central Govt. Department.	
16.	Insurance of the Fixed Assets	

**APPLICATION FOR AVAILING ASSISTANCE / SUBSIDY UNDER MIDH**

**(COMPONENT: PRIMARY / MINIMAL PROCESSING UNIT)**

**Name of the Scheme: Post Harvest Management**

- 1 Name of the Farmer :
- 2 Father / Husband Name :
- 3 Caste (SC/ST/BC/OC) :
- 4 Address: :
- Phone / Cell No.: :
- 5 Land records with Extent in Acres / Ha. :  
(Copy of Pass Book / Adangal)
- 6 Source of Irrigation (Open well / Bore well / Canal) :
- 7 Name of the Financing Bank, Loan Amount Proposed :
- 8 Whether any Govt. Subsidy availed previously :
- 9 Any other relevant information :

Declaration

I, \_\_\_\_\_

declare that the particulars furnished above are true to the best of my knowledge and I promise that the benefit obtained from State MIDH Cell will be used for the purpose for which it is given and in case of misuse I am liable for any action deemed to be fit by Govt. of A.P., including recovery of the subsidy amount with 12% interest to the Government.

Enclosures: 1. Affidavit  
2. Pattadar Pass Book  
3. Detailed Project Estimate by Civil Engineer  
(Regd. No. along with Seal)

**Signature of the Farmer / Entrepreneur.**

Recommendations of the Horticulture Officer : \_\_\_\_\_

**Horticulture Engineer**

**Horticulture Officer**

**Asst. Director of Horticulture.**



## Preliminary Inspection Report for PRIMARY / MINIMAL PROCESSING UNIT

- Date of Inspection :
- A Component :
- B Details of Project** :
- (i) Name of the project :
- (ii) Address for communication :  
with telephone No. :
- C Project Location with Address** :
- (i). Survey No :
- (ii). Village :
- (iii). Mandal :
- D Constitution (Individual/ Joint :  
Individual/Partnership Firm/ :  
Company. :
- E (i) Proposed Activity :  
(ii) Type :  
(iii) Proposed type of cooling :  
system :
- F Name of the Promoter :
- G Present physical status of the project :**
- I. Construction started or not :
- (i) Land development :  
status/boundary/road :
- (ii) Connecting road to the plot :
- (iii) Stage of cold store building :  
civil/pre engineered as on :  
inspection date :
- (iv) Type of produce to be :  
stored :

Promoter      Horticulture Engineer      Horticulture Officer      Asst. Director of Horticulture

**FORMAT TO CONDUCT FINAL AND JOINT INSPECTION FOR PRIMARY / MINIMAL PROCESSING UNITS BY THE COMMITTEE UNDER POST HARVEST MANAGEMENT COMPONENT OF MIDH, A.P.**

**1) GENERAL INFORMATION**

- 1) Name of the Unit with full address :  
(Sy. No. / Area / Village / District)
- 2) Date of Issue of Administrative Sanction :
- 3) Name of CEO of Company / Managing Director :
- 4) Constitution: Individual / Group of Individuals / :  
Society / Partnership Firm / Pvt. Ltd. Company / :  
Public Ltd. Company :
- 5) Date of Inspection of the Project :
- 6) Name & Designation of the Committee members :  
(a)  
(b)  
(c)  
(d)
- 7) Name of the Bank (with Full address & :  
Phone & Fax No.) :  
**a)** Subsidy reserve fund account no. :
- 8) Date of start of the project :
- 9) Date of Completion of the project :
- 10) a) Date & amount of Sanction of Term Loan :  
b) Repayment Period :
- 11) Land Details  
i. Whether land is in the name of promoter: Yes / No  
ii. Whether land is a Regd. Lease land for : Yes / No  
Minimum 10 years in favour of applicant  
(in case of lease)

**Name & Signature  
of Applicant**

**Name & Signature  
of Expert**

**Name & Signature  
of Inspecting Officer  
(Bank)**

**Name & Signature  
of ADH concerned**

**Name & Signature  
of Senior Officer  
from MIDH**

II.

CIVIL Works		As per DPR			As per Jt. Inspection	
Sl. No.	Description	Length (ft)	Width (ft)	Unit		
1	PCC Platform with 1.5' plinth height (Concrete Flooring)			Sq. ft		
2	Shed (Iron Gutters, truss and purlin & GI / Asbestos Roof sheets) (22' centre height and 17' wall height)			Sq. ft		
3	17' height wall (9 inch thickness) all-round the shed – Cost includes Bricks + Cement+ Sand + Mason Charges					
4	Two Rolling Shutters of size 8' x 8'	8'	8'	Nos		
5	Six Glazed M.S. Windows of size 5' x 3' with 10mm square guard bars at 150mm c/c including hardware and 4mm glass	5'	3'	Nos		

Machinery Details					
Sl. No	Item	As per DPR		As per Jt. Inspection	
		Make	Capacity (Kg / Hr)	Make	Capacity (HP / KW)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10	Weighing Scale				
11	Sealing Machines				
12	Fire Safety Equipment				

Electrical Equipment			
Sl No	Item	As per DPR	As per Jt. Inspection
1	Electrical Supply & Transformer		
2	Cables, Wires, Lights & Fans		
3	Generator		

Sl. No.	Particulars	Project Cost		Actual investment as per the joint inspection team		Remarks
		As per project report	As appraised by Banker	5	6	
1	2	3	4	5	6	7
<b>1</b>	<b>Means of Finance</b>					
1.	Capital					
2.	Term Loan from Bank					
3.	Subsidy / Margin Money/ Un-Secured Loans					
	<b>Total:</b>					

Note: A certificate from CA may be obtained

**Certificates:**

- 1) This is to certify that Sri./ Smt. \_\_\_\_\_ has established the Primary Processing Unit as per project report.
- 2) This is to certify that Sri./ Smt. \_\_\_\_\_ is eligible to avail subsidy of Rs. \_\_\_\_\_/- and the same may be released to M/s. \_\_\_\_\_ as final installment.

Name & Signature  
of Applicant

Name & Signature  
of Expert

Name & Signature  
of Inspecting Officer  
(Bank)

Name & Signature  
of ADH concerned

Name & Signature  
of Senior Officer  
from MIDH

**FORMAT**  
**(On Letter head of the CA)**

To

**The Mission Director & Commissioner of Horticulture,  
Govt. of Andhra Pradesh,  
GUNTUR.**

We have examined the books of accounts and other relevant records maintained by M/s. / Shri / Smt. \_\_\_\_\_ (Name of the Beneficiary) at its office situated at \_\_\_\_\_ (Address of project) for \_\_\_\_\_ (Project activity). These accounts are maintained by the Company's management, partners of the firm / proprietor of the concerned / grower / NGO / and our responsibility is to verify the truth and fairness of these records and verification of amount expended for acquisition / construction of fixed assets / establishment and other expenditure.

We conducted our work in accordance with the Audits and Accounting Standards generally accepted in India. Those Standards require that we plan and perform our verification to obtain reasonable assurance about whether these accounts are true and fair are free of material misstatement. A verification included examining on 100% basis, evidence audit includes examining, on a test basis assessing the accounting principles used and significant estimates made by the grower, as well as evaluating the overall financial statement presentation. We believe that our audit provides reasonable basis of our opinion.

**We verify that**

- a) We have obtained all the information and explanation that to the best of our knowledge and belief were necessary for the purpose of our verification.
- b) In our opinion, proper books of accounts as required by law have been kept by the Company / firm / sole proprietorship concern / grower / NGO for the financial period \_\_\_\_\_ and these books of account represent true and fair view of the transaction entered into by the Company / firm / sole proprietorship concern / grower / NGO.
- c) In our opinion, the Company / firm / sole proprietorship concern / grower / NGO has incurred a capital expenditure amounting to Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_ only) for acquisition / construction of fixed assets and the same is being reflected properly in the books of accounts. The valuation made of major components of the project and whole project is tabulated as follows:

**Establishment of Project:**

S. No.	Component	Proposed Expenditure as per LOI	Cost as appraised by Bank before term loan sanction	Cost assessed by CA	Remarks
1					
2					
3					
	TOTAL				

Total : \_\_\_\_\_

**MEANS OF FINANCE**

S. No.	Item	Project Cost as per DPR	Project Cost as per Appraisal Report	Actual Cost
1	Promoter's Equity			
2	Term Loan			
3	Unsecured Loan			
4	Grant from NHM			
5	Others			
	TOTAL			

**We recommend Rs. .... as the cost of the whole project.**

**Signature and Seal of C.A.  
with Membership No.**

**Date:**

## FORMAT

(Forwarding letter of Bank for Conducting JIT )  
Name & Full Address of the FI/Bank (on letter head)

To  
The Mission Director & Commissioner of Horticulture,  
Govt. of Andhra Pradesh,  
Public Gardens, Nampally,  
GUNTUR

**Subject : Request for Joint Inspection of the project**

Sir,

MIDH, A.P., had released Rs. .... as credit linked back-ended subsidy in respect of project of \_\_\_\_\_ Village \_\_\_\_\_ District \_\_\_\_\_ State Vide letter no ..... As per instruction, the subsidy amount has been kept in Subsidy Reserve Fund account of the bank and interest benefit is being passed on to the beneficiary. Now project is complete as per original proposal and we have also disbursed full Term loan sanctioned for the above mentioned project. In addition to documents submitted by bank at the time of claim of subsidy such as copy of the Appraisal Note, Term Loan sanction letter, copy of Record of Right, following documents required for Joint Inspection are being submitted with the request to conduct Joint Inspection of the project to decide final subsidy claim.

S. No	Particulars	Enclosed or Not
1	Details of date-wise release of term loan	
2	Completion certificate by Bank/FIs	
3	Undertaking from promoter (as prescribed by NHM)	
4	Extract of subsidy reserve fund account of bank in which estimated subsidy has been kept	

It is certified that the original of above documents and documents submitted at the time of subsidy claim by bank pertaining to the projects are kept in Bank/FI, which can be shown at the time of random monitoring by the Department or any agency authorized by the Department.

(Seal and Signature of the Bank's Officer )

Name : \_\_\_\_\_

Name of the Bank :

Address :

Phone/Fax/Mobile No.: \_\_\_\_\_

Place : \_\_\_\_\_

Date : \_\_\_\_\_

# SEED INFRASTRUCTURE & PROCESSING UNITS

COMPONENT	UNIT COST (Rs. in lakhs)	Assistance (Rs. in lakhs)
<b>SEED INFRASTRUCTURE</b> ( for handling, processing, packing, storage etc. of seeds meant for use as seed material for cultivation of horticulture crops)	<b>200.00</b>	100% of cost to Public Sector & 50% of cost of project to Private Sector as Credit Linked Back ended Subsidy.



## **11. SEED PROCESSING UNITS**

### **INTRODUCTION**

Seed has been an important agricultural commodity since the first crop plant was domesticated by pre-historic man. For thousands of years, man cleaned seed of his food crops by winnowing. This is still an important process, but it is no longer adequate to supply the kind of seed needed by farmer.

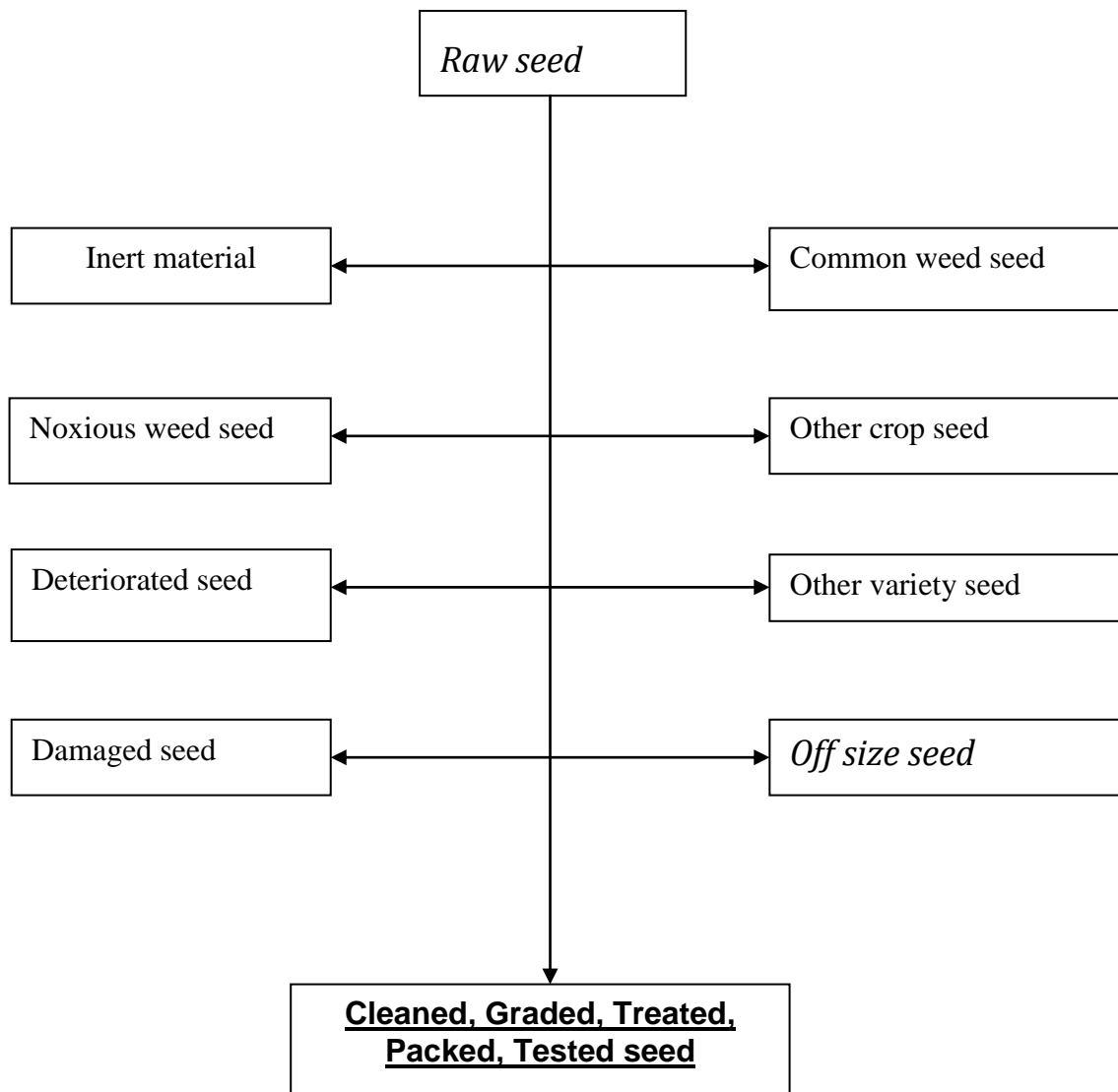
Seed processing is a vital part of the seed production needed to move the improved genetic materials of the plant breeder into commercial channels for feeding the rapidly expanding world population. The farmer must get the quality seed that is free from all undesired materials because farmer's entire crop depends on it.

Seed can seldom be planted in the condition in which it comes from the growers. In fact, many seed lots contain weed or crop seed or inert material that make them unfit for sale without processing. Crop seed also frequently have stems, awns, clusters or other structures, which prevent from flowing through the drill freely.

Seed processing is that segment of the seed industry responsible for upgrading seed (Fig. 1), improving planting condition of seed, and applying chemical protectants to the seed.

Advantages of seed processing:

1. Make possible more uniform planting rates by proper sizing
2. Improve seed marketing by improving seed quality
3. Prevent spread of weed seed
4. Prevent crops from disease by applying chemical protectants
5. Reduces seed losses by drying
6. Facilitate uniform marketing by providing storage from harvest time until the seed is needed for planting.



**Fig. 1.** *Undesirable materials removed during processing of seed*

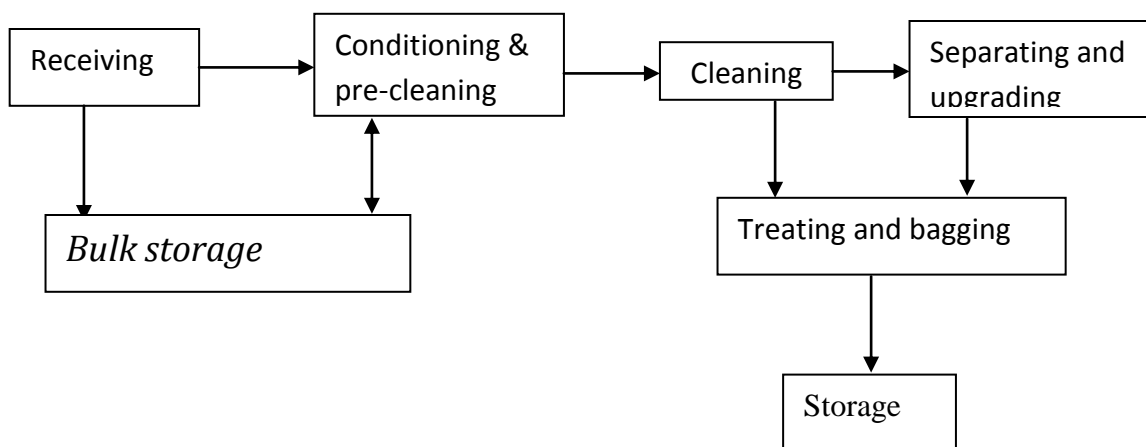
An important factor to consider is the moisture content of the seed prior to processing. Seed with moisture content above 15% are subject to excessive damage in the processing line. In this case natural or artificial drying may be necessary.

Physical characteristics used to separate seed include size, length, weight, shape, surface texture, colour, affinity for liquids and electrical conductivity.

Seed processing can broadly be divided into various steps (Fig. 2). As the seed is received into the processing plant, it goes either directly into the cleaning process or into storage to await processing. Drying may be necessary. As processing begins, the first phase (conditioning and pre-cleaning) consists of scalping, debearding, shelling or any other operation necessary to make the seed flow

easily. The second phase (cleaning and grading) includes the removal of inert materials, weed seed, other crop seed, and broken seed that are larger or smaller than the crop seed and obtain the seed mass in the uniform size range of perforations of top and bottom screen.

After the desired purity is obtained, seed enters the final processing phase of separation based on specific characteristics like length, weight etc and treating and packaging. Processed seed is stored for later sale.



**Fig. 2. Basic flow and essential steps in seed**

## **Essential Requirements for success of Seed Company**

Following are essential requirements for setting up and successful operation of a seed company:

- I. Farm**
- II. Processing plant**
- III. Electricity**
- IV. Buildings**
- V. Raw materials**
- VI. Man power**
- VII. Marketing**

### **2.5.1 Farm**

Farm is needed for undertaking production of certified seeds. In Indian conditions, contract growing of seed has become fairly acceptable and venture being profitable, farmers are coming forward to undertake seed production for reliable companies.

As has already been previously indicated, the proposed locality is having excellent irrigation facility and farmers are already aware of seed production programmes of OSSC, there is no problem in

identifying experienced and progressive farmers willing to undertake seed production for the company. In the initial year, response has been very encouraging.

Owners of the company have their own farm, which would exclusively support production of foundation seed from breeder seed, if intended or planned at later date.

### **2.5.2 Processing plant**

Seed processing plant will be equipped with all the machines needed for successful cleaning, grading operations. Similarly, seed storage is needed to store the seed during the period from receipt of seed at the plant till it is supplied to the dealer/farmer for sale.

Cleaner is the basic machine in a seed processing plant. Capacity of plant is accordingly known by the capacity of cleaners. The capacity of seed cleaners is specified in terms of wheat seed. While handling paddy, the capacity of machine reduces to half and hence the company would plan to establish a plant with sufficient capacity to process double the quantity of planned paddy production within the available processing period.

Considering the seed production plan, the company requires seed processing plant of 2 ton per hour capacity to handle present requirements as well as to handle future processing needs.

### **2.5.3 Electricity**

Electricity is available from Orissa state electricity board. However, standby DG set would also be installed to take care of processing need in the event of power failure.

### **2.5.4 Buildings**

Seed processing plant building, seed stores, reject store and office accommodation is needed to perform the processing and storage works successfully.

### **2.5.5 Raw material**

Raw material for the certified seed production programme is foundation seed, which would be available from KVKs/University/SSC/NSC without any problem.

Other raw materials, like certification and packing material is available in the market, which would be purchased with printing in the name of the company.

### **2.5.6 Manpower**

Adequate labour force is available around the area to work on the processing plant. This would rather be an opportunity for employment to rural youth in this backward rural area. Expert support will be

available from OSSCA and other state agencies. Company also plans to employ agricultural graduate for internal quality checks.

### **2.5.7 Marketing**

Company is using its own outlet for sale. Experiences of previous year indicate that company was able to sale about 40% of produce through own sale counter. Subsequent queries from farmers are encouraging. Rest of the material was sold through dealer or to NSC. Company plans to increase its dealer's network throughout the locality and also have suitable tie-ups with state/central agencies for sale of seed and anticipates that there would be no problem with sale of seeds.

## **Seed Processing Plant and Buildings**

Seed, as a component of the production phase in the grain industry can be considered as a mini industry that requires integration of production processing; storage, and marketing. Although only a small part of the total system, the seed has a strong influence on the viability of the industry, because as the most basic input, the seed sets the upper limits of productivity, product quality, and price.

Seed processing plant is designed based on the characteristics of seed grain and the impurities present in it, which need to be separated. Capacity of plant is known by the capacity of the seed cleaner which is the basic machine in the seed processing plant. Other machines, which work on the principle of separating the material, based on difference in characteristics of good seed and impurities are included in the plant. Capacity of such machines are kept matching with that of cleaner to have effective utilization.

### **3.1 Processing Machines**

Brief descriptions of the processing machines used in a seed processing plant are given hereunder.

#### **3.1.1 Scalper**

Paddy seed contains contaminants of various kinds as it comes into the processing plant especially if it has not been harvested and threshed mechanically. To get the seed into condition to flow easily through the processing operations, to improve capacity and separating precision during processing, and to prevent loss of quality, seed is usually prepared for processing by sending them through one or more special machines or processes. A scalper can be used to rough clean seed when trash content is high.

The scalper basically consists of a vibrating or rotating screen or sieve. The screen perforations are large enough to allow the rough seed to pass through readily while large inert material is scalped off and removed from the seed lot.

### **3.1.2 Air screen cleaner**

The air screen cleaner is the basic machine in almost all seed processing plants. The air screen cleaner uses three cleaning principles viz aspiration, scalping and grading. A common air screen cleaner for processing seed uses two air blasts and two screens. The first air system removes dust and light chaff before the seed reaches the first screen. The first screen allows the good seed to drop onto the second screen. The large foreign material rides over the first screen and is discarded. The second screen is a grading screen.

### **3.1.3 Specific gravity separator**

Seed of same size and general shape can often be separated because they differ in specific gravity. This difference is very useful in removing light immature seed or heavy sand and rocks to improve the purity and germination of crop seed.

### **3.1.4 Indented cylinder**

Seed of the same width and thickness can sometimes be separated by taking advantages of difference of length. Indented cylinder can do very precise separation by using length difference. The indented cylinder separator is a rotating almost horizontal cylinder with a movable horizontal separating trough mounted inside it. Thousand of half round indents line the inside surface of cylinder.

### **3.1.5 Elevator**

**Single leg bucket elevator consisting of receiving hopper, boot, bucket, belt, boot pulley, leg, head pulley, motor, drive and discharge spout will be used for conveying seed from one machine to another machine. It will lift the seed from the ground vertically upward and discharge it from top to the different machines. This type of elevating machines requires less power and floor area.**

## **3.2 Design Criteria of Processing Machines**

Generally the manufacturers specify capacities of processing equipments in terms of wheat only. Capacity of seed processing equipment and machinery in terms of paddy has been assumed to be 50% as compared to wheat. Working efficiency of processing equipment has been assumed to be 80% of the rated through put capacity.

Seed processing is a seasonal work. Seed requires drying, cleaning and packaging in an accelerated and continuous manner so as to complete processing load within the limited period available to enable seed maintaining its viability. Moisture content of the harvest at the time of receipt is usually 9 to 12% (wb) during both rabi and kharif seasons and hence will not require drying facilities.

Maximum seed volume to be handled at the proposed seed processing complex during the rabi will be 3120 quintals whereas during kharif season will be of the order of 3680 quintal as per proposed

production plan given in Table 4. Hence, the cleaning cum grading capacity of the processing plant will be determined on the basis of 3680 quintals load. This amount of seed is to be processed during the period of 20 days. Seed processing during both the seasons will be conducted in 2 shifts per day basis with processing plant operating 16 hours a day.

Based on above assumptions, processing load and period available for processing, average seed cleaning-grading capacity (on paddy basis) works out to be 2 tonnes per hour. The details of various processing machines required in the project are given in Table 5.

Electrical energy will be made available by state electricity board. One standby diesel generating set of 45 kVA rating has been proposed for meeting exigencies in the event of power shedding/failure. The estimated cost is given in Table 6.

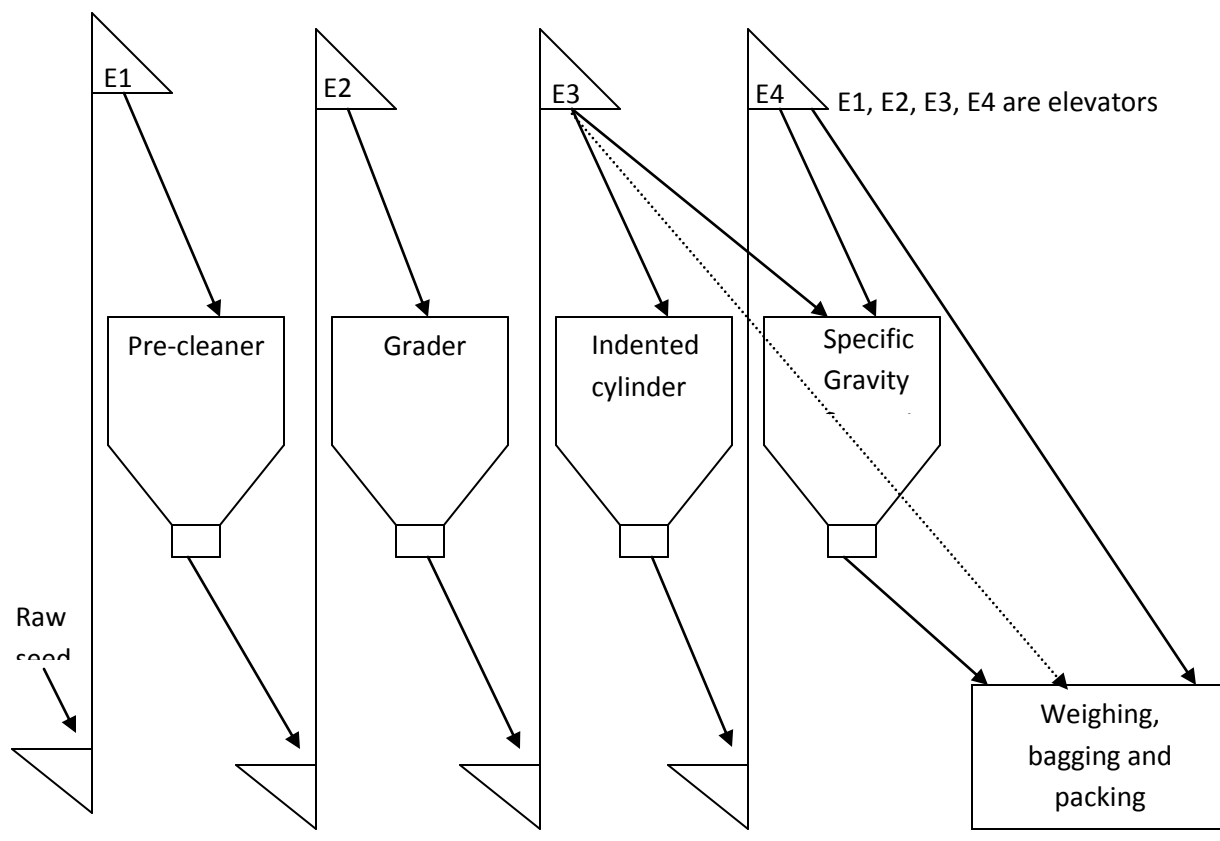
### **Processing machines required in the seed processing plant**

<b>S. No.</b>	<b><i>Name of machines</i></b>	<b>Capacity</b>	<b>Qty.</b>
1.	Pre-cleaner	4TPH	1 No.
3.	Seed Cleaner	4TPH	1 No.
4.	Indent Cylinder	4 TPH	1 No.
5.	Specific gravity separator	4 TPH	1 No.
6.	Elevator up to 5 m height	4TPH	4 No.
8.	Vacuum cleaner		1 No.
9.	Electronic moisture meter (Wet type)	-	1 No.
10.	Bag closer heavy duty	Nil	2 No.
11.	Weighing machine	500 kg	1 No. 1 No.
12.	Diesel generating set	100 KVA	1 No.
	<b>Total (X)</b>		
13.	Spares parts for 3 Years @ 5% of amount (X)		
14.	Installation, testing, commissioning of Machines @ 10% of amount (X)		
15.	Laboratory equipments like germinator, hot air oven, weighing balance, divider etc		
16.	Sum of S. No. 1 to 15		
17.	Contingencies @ 3%		

### 3.3 Layout and Process Flow Operations

Process flow operation enables processing of seed through suitable machines. Elevators are provided with bypassing arrangements to bypass certain machines, if use of any machine is not needed in subsequent operation in particular seed lot. For example, all the lots may not need use of indented cylinder grader or specific gravity separator and hence in such case the elevator direct the seed to the next process by bypassing these units.

Layout of the plant will be made in a way to ensure minimum travel both vertical and horizontal to avoid injury to seed. Layout plan and process flow chart are given in Figs. 4 and 5.

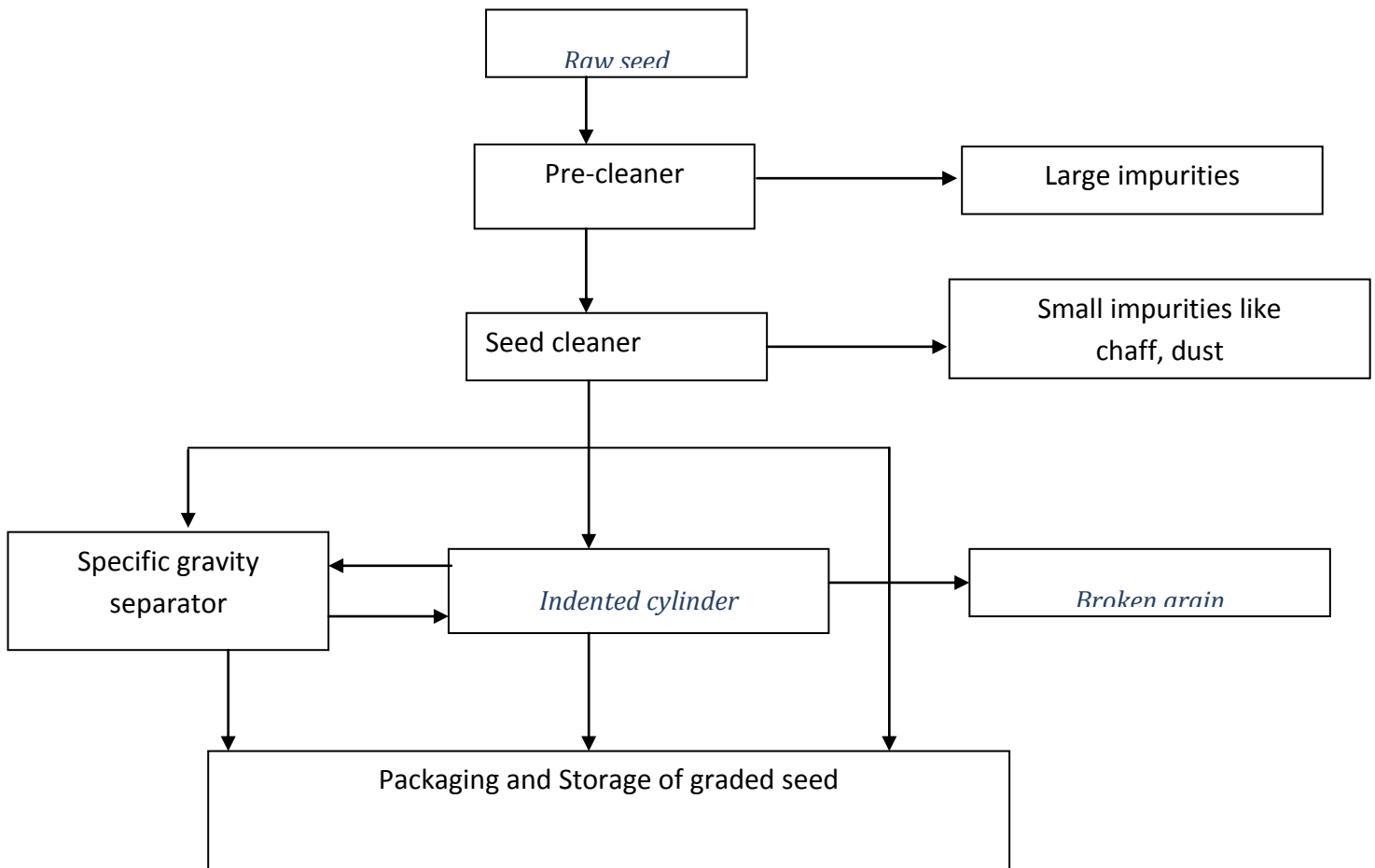


**Fig. 4** Layout of seed processing machines

As shown in Fig. 4, raw seed will be fed to the pre-cleaner by elevator (E1). This machine will remove large size undesired materials from the seed. The partially cleaned seed will be fed to the cleaner cum grader with elevator (E2). Here, the small undersized materials including undersized seeds will be separated on the basis of size difference and weight difference. The cleaned and sized seed will be fed to the indented cylinder by elevator (E3) whereby the broken and short seeds will be separated. The graded seed will be fed to the specific gravity



separator by elevator (E4) for removing light seed. If it is not required then it will be bypassed. The processed seed will be packed, weighed and stitched with the help of weighing and stitching machine.



**Fig. 5 Process flow chart of seed processing**

### 3.4 Packaging

After processing, the seed is packed. Bagging is usually the slowest and most costly operation in a seed processing plant. Bagging requires filling the bag to an exact weight, closing and labelling the bag. These operations are done either with hand or with manually operated machines, like weighing scale and bag closer.

Bagger-weighers are simple machines and are very accurate, easy to adjust and can fill 5 to 6 or more bags per minute. Bag-sewing machines are precision, high-speed machines.

The label is attached to the seed bag, or it is printed directly on to the container or bag. The label contains all-important information about the seed.

Complete processing records need to be maintained to trace the seed from the time it is received at the plant until it is sold with full details of operations. A processing plant record system include following records:

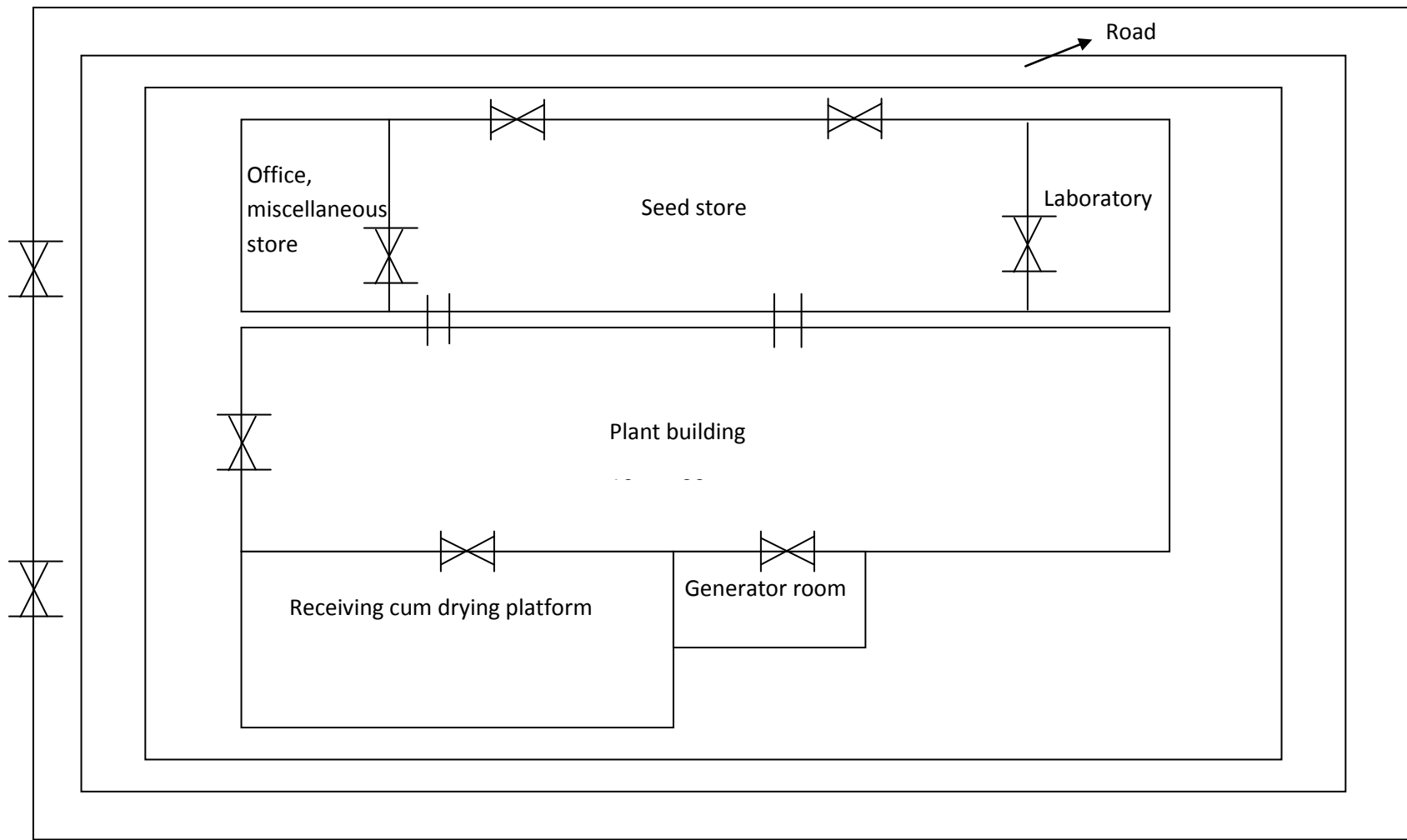
- i. Receiving
- ii. Drying/storage
- iii. Processing, treating and packaging
- iv. Testing
- v. Storage
- vi. Inventory
- vii. Sale

### **3.5 Seed storage**

Good seed storage is an important phase of processing and is essential to successful seed marketing. Proper storage preserves seed viability, from harvest to sale, and protects the producer, the processor and the user.

The storage is provided for seed from the time of harvest until planting time. Storage is provided for seed that may be carried over until the planting season in the next or a subsequent year.

The rate of deterioration of crop seed in storage increases as seed moisture content increases. Mature seeds are hygroscopic and hence their moisture contents vary with the relative humidity of the atmosphere. Moisture absorption or desorption of seed is a relatively slow process. Moisture content and temperature are important factors in seed storage. Dry cool conditions are best for seed storage.



**Fig. 7** Building layout plan

## BASIC DATA SHEET FOR SEED PROCESSING UNIT

S.No.	Particulars	Quantity	Amount (Rs. lakhs)	Justification
<b>A.</b>	<b>Equipment / machinery/ infrastructure facilities</b>			
1	Air Screen Cleaner-cum-Grader	1		For removing the dockage, under size seeds, separating the unwanted seeds components from the seed mass and grading
2	Length Separator	1		For separating the seeds according to width and thickness
3	Seed Drying Unit /Seed Dryer	1		For removing moisture from seeds
4	Seed moisture meter			For measuring the moisture of seeds
5	Seed Treater	1		For treating the seeds
6	Other connected equipments / accessories/different sizes sieve	-		For sieving the seeds
7	Seed Testing Laboratory Equipments (Gamete divider, Seed Grader, Diachonoscope, etc.)	-		For testing the seeds
8	Plate farm balance - 200 kg	1		For weighing of seeds
9	Electronic Balance - 5 kg	1		For weighing seeds to fill in to packets
10	Seed storage bins	15		To store the seed in airtight containers
11	Packing machine/ Bag Closer/ packing material	1		For packing of seed
12	Room (20'x10')	1		For installation of equipments
13	Godown (20'x20')	1		To store the seed in storage bins
14	Drying plat farm (20'x20')	1		To dry seed in large quantity
15	<b>Others equipments</b>			
	<b>Total (A)</b>			
<b>B</b>	<b>Operational Cost</b> (Expenses involved in processing, packaging and handling of seed, chemicals, glassware, TA/POL/ hiring of vehicle, repair, skilled & unskilled labours, two iron display boards, plates, stationary, photocopies, photography, report preparation etc.)			
	<b>Total (B)</b>			
	<b>Grand Total (A+B)</b>	200.00		

## CHECK LIST

<b>S. No.</b>	<b>DESCRIPTION</b>	<b>PAGE NO</b>
1.	Application Form along with Appraisal Report	
2.	Basic Data Sheet with Complete Technical Aspects	
3.	Detailed Project Report MIDH Guidelines	
4.	Bank Sanction Letter along with appraisal Report	
5.	Approval from Gram Panchayat / Municipality / Town Planning	
6.	SSI Registration Certificate	
7.	Fire Department Approval	
8.	PAN Card Copy of the unit	
9.	Electricity Approval	
10.	DMC Approval	
11.	Promoter's Affidavit as per Prescribed Format	
12.	Land Document	
13.	Land Conversion Certificate	
14.	Certificate from Civil Design Engineer	
15.	Certificate from Bank for Non-Availing Subsidy from any other State/Central Govt. Department.	
16.	Insurance of the Fixed Assets	

**APPLICATION FOR AVAILING ASSISTANCE / SUBSIDY UNDER MIDH**

**(COMPONENT: SEED PROCESSING UNIT)**

**Name of the Scheme: Post Harvest Management**

- 1 Name of the Farmer :
- 2 Father / Husband Name :
- 3 Caste (SC/ST/BC/OC) :
- 4 Address: :
- Phone / Cell No.: :
- 5 Land records with Extent in Acres / Ha. :  
(Copy of Pass Book / Adangal)
- 6 Source of Irrigation (Open well / Bore well / Canal) :
- 7 Name of the Financing Bank, Loan Amount Proposed :
- 8 Whether any Govt. Subsidy availed previously :
- 9 Any other relevant information :

Declaration

I, \_\_\_\_\_

declare that the particulars furnished above are true to the best of my knowledge and I promise that the benefit obtained from State MIDH Cell will be used for the purpose for which it is given and in case of misuse I am liable for any action deemed to be fit by Govt. of A.P., including recovery of the subsidy amount with 12% interest to the Government.

Enclosures: 1. Affidavit  
2. Pattadar Pass Book  
3. Detailed Project Estimate by Civil Engineer  
(Regd. No. along with Seal)

**Signature of the Farmer / Entrepreneur.**

Recommendations of the Horticulture Officer : \_\_\_\_\_

**Horticulture Engineer**

**Horticulture Officer**

**Asst. Director of Horticulture.**

## PRELIMINARY INSPECTION REPORT FOR SEED PROCESSING UNIT

- Date of Inspection :
- A Component :
- B Details of Project** :
- (iii) Name of the project :
- (iv) Address for communication :  
with telephone No. :
- C Project Location with Address** :
- (i). Survey No :
- (ii). Village :
- (iii). Mandal :
- D Constitution (Individual/ Joint :  
Individual/Partnership Firm/ :  
Company. :
- E (i) Proposed Activity :  
(ii) Type :  
(iii) Proposed type of cooling :  
system :
- F Name of the Promoter :
- G Present physical status of the project :**
- I. Construction started or not :
- (v) Land development :  
status/boundary/road :
- (vi) Connecting road to the plot :
- (vii) Stage of cold store building :  
civil/pre engineered as on :  
inspection date :
- (viii) Type of produce to be :  
processed

Promoter      Horticulture Engineer      Horticulture Officer      Asst. Director of Horticulture

**FORMAT TO CONDUCT FINAL AND JOINT INSPECTION FOR SEED PROCESSING  
UNITS BY THE COMMITTEE UNDER POST HARVEST MANAGEMENT COMPONENT OF  
MIDH, A.P.**

**2) GENERAL INFORMATION**

- 1) Name of the Unit with full address :  
(Sy. No. / Area / Village / District)
- 2) Date of Issue of Administrative Sanction :
- 3) Name of CEO of Company / Managing Director :
- 4) Constitution: Individual / Group of Individuals / :  
Society / Partnership Firm / Pvt. Ltd. Company / :  
Public Ltd. Company :
- 5) Date of Inspection of the Project :
- 6) Name & Designation of the Committee members :  
(a)  
(b)  
(c)  
(d)
- 7) Name of the Bank (with Full address & :  
Phone & Fax No.) :  
**a)** Subsidy reserve fund account no. :
- 8) Date of start of the project :
- 9) Date of Completion of the project :
- 10) a) Date & amount of Sanction of Term Loan :  
b) Repayment Period :
- 11) Land Details  
i. Whether land is in the name of promoter: Yes / No  
ii. Whether land is a Regd. Lease land for : Yes / No  
Minimum 10 years in favour of applicant  
(in case of lease)

**Name & Signature  
of Applicant**

**Name & Signature  
of Expert**

**Name & Signature  
of Inspecting Officer  
(Bank)**

**Name & Signature  
of ADH concerned**

**Name & Signature  
of Senior Officer  
from MIDH**



## MACHINERY / EQUIPMENT DETAILS

S.No.	Particulars	As per DPR	As per Jt. Inspection
<b>A.</b>	<b>Equipment / machinery/ infrastructure facilities</b>		
1	Air Screen Cleaner-cum-Grader		
2	Length Separator		
3	Seed Drying Unit /Seed Dryer		
4	Seed moisture meter		
5	Seed Treater		
6	Other connected equipments / accessories/different sizes sieve		
7	Seed Testing Laboratory Equipments (Gamete divider, Seed Grader, Diachonoscope, etc.)		
8	Plate farm balance - 200 kg		
9	Electronic Balance - 5 kg		
10	Seed storage bins		
11	Packing machine/ Bag Closer/ packing material		
12	Room (20'x10')		
13	Godown (20'x20')		
14	Drying plat farm (20'x20')		
15	<b>Others equipments</b>		

Name & Signature  
of Applicant

Name & Signature  
of Expert

Name & Signature  
of Inspecting Officer  
(Bank)

Name & Signature  
of ADH concerned

Name & Signature  
of Senior Officer  
from MIDH

**FORMAT**  
**(On Letter head of the CA)**

To

**The Mission Director & Commissioner of Horticulture,  
Govt. of Andhra Pradesh,  
GUNTUR.**

We have examined the books of accounts and other relevant records maintained by M/s. / Shri / Smt. \_\_\_\_\_ (Name of the Beneficiary) at its office situated at \_\_\_\_\_ (Address of project) for \_\_\_\_\_ (Project activity). These accounts are maintained by the Company's management, partners of the firm / proprietor of the concerned / grower / NGO / and our responsibility is to verify the truth and fairness of these records and verification of amount expended for acquisition / construction of fixed assets / establishment and other expenditure.

We conducted our work in accordance with the Audits and Accounting Standards generally accepted in India. Those Standards require that we plan and perform our verification to obtain reasonable assurance about whether these accounts are true and fair are free of material misstatement. A verification included examining on 100% basis, evidence audit includes examining, on a test basis assessing the accounting principles used and significant estimates made by the grower, as well as evaluating the overall financial statement presentation. We believe that our audit provides reasonable basis of our opinion.

**We verify that**

- a) We have obtained all the information and explanation that to the best of our knowledge and belief were necessary for the purpose of our verification.
- b) In our opinion, proper books of accounts as required by law have been kept by the Company / firm / sole proprietorship concern / grower / NGO for the financial period \_\_\_\_\_ and these books of account represent true and fair view of the transaction entered into by the Company / firm / sole proprietorship concern / grower / NGO.
- c) In our opinion, the Company / firm / sole proprietorship concern / grower / NGO has incurred a capital expenditure amounting to Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_ only) for acquisition / construction of fixed assets and the same is being reflected properly in the books of accounts. The valuation made of major components of the project and whole project is tabulated as follows:

**Establishment of Project:**

S. No.	Component	Proposed Expenditure as per LOI	Cost as appraised by Bank before term loan sanction	Cost assessed by CA	Remarks
1					
2					
3					
	TOTAL				

Total : \_\_\_\_\_

**MEANS OF FINANCE**

S. No.	Item	Project Cost as per DPR	Project Cost as per Appraisal Report	Actual Cost
1	Promoter's Equity			
2	Term Loan			
3	Unsecured Loan			
4	Grant from NHM			
5	Others			
	TOTAL			

**We recommend Rs. .... as the cost of the whole project.**

**Signature and Seal of C.A.  
with Membership No.**

**Date:**

## FORMAT

(Forwarding letter of Bank for Conducting JIT )  
Name & Full Address of the FI/Bank (on letter head)

To  
The Mission Director & Commissioner of Horticulture,  
Govt. of Andhra Pradesh,  
Public Gardens, Nampally,  
GUNTUR

**Subject : Request for Joint Inspection of the project**

Sir,

MIDH, A.P., had released Rs. .... as credit linked back-ended subsidy in respect of project of \_\_\_\_\_ Village \_\_\_\_\_ District \_\_\_\_\_ State Vide letter no ..... As per instruction, the subsidy amount has been kept in Subsidy Reserve Fund account of the bank and interest benefit is being passed on to the beneficiary. Now project is complete as per original proposal and we have also disbursed full Term loan sanctioned for the above mentioned project. In addition to documents submitted by bank at the time of claim of subsidy such as copy of the Appraisal Note, Term Loan sanction letter, copy of Record of Right, following documents required for Joint Inspection are being submitted with the request to conduct Joint Inspection of the project to decide final subsidy claim.

S. No	Particulars	Enclosed or Not
1	Details of date-wise release of term loan	
2	Completion certificate by Bank/FIs	
3	Undertaking from promoter (as prescribed by NHM)	
4	Extract of subsidy reserve fund account of bank in which estimated subsidy has been kept	

It is certified that the original of above documents and documents submitted at the time of subsidy claim by bank pertaining to the projects are kept in Bank/FI, which can be shown at the time of random monitoring by the Department or any agency authorized by the Department.

(Seal and Signature of the Bank's Officer )

Name : \_\_\_\_\_

Name of the Bank :

Address :

Phone/Fax/Mobile No.: \_\_\_\_\_

Place : \_\_\_\_\_

Date : \_\_\_\_\_

## 12. MARKETING INFRASTRUCTURE

Sl. No.	Component	Project (Unit) Cost (Rs.in lakhs)	Pattern of Assistance
a)	Functional Infrastructure along with Pre-Cooling Unit and Pack House	48.50	Credit Linked Back-ended subsidy @ 40% in general areas & 55% in case of Hilly & Scheduled areas per beneficiary.
b)	Wholesale Market	10000.00 and above	Credit Linked Back-ended subsidy @ 25% in general case & 33.33% in the case of hilly, backward States. Subsidy will be calculated only upto project cost of Rs.10000.00 lakhs.
c)	Rural Primary Market / Apni Mandies	25.00	Credit Linked Back-ended 40% of the capital cost of project
d)	Mobile Cool Chamber	0.30	50% of unit cost.

## 12. a) FUNCTIONAL INFRASTRUCTURE ALONG WITH PRE-COOLING UNIT AND PACK HOUSE

To encourage Farmer Producer Organizations (FPOs) and to ensure quality of the produce, handling losses, transport losses Functional Infrastructures along with Pre-Cooling Unit and Pack Houses are designed. The assistance is being provided as per the following details:

Project Cost as per MIDH			Norms of Assistance	
S. No.	Item	Amount (Rs. in lakhs)	%	(Rs. In lakhs)
1	Functional Infrastructure / Collection Centre	15.00	40	6.00
2	Pack House	8.00	50	4.00
3	Van 6 Tons Capacity	13.00	35	4.55
4	Pre-cooling Chambers (12 Tons Capacity - 2 Chambers of 6 Tons )	12.50	35	4.375
<b>TOTAL</b>		<b>48.50</b>		<b>18.925</b>

(Rupees Eighteen Lakhs Ninety Two Thousand and Five Hundred only)

### The component-wise details are to be as follows:

I. Basic data Sheet for Functional Infrastructure (Size 80' x 40' x 22' center ht x 17' wall ht)					
S. No.	Description	Length (ft)	Width (ft)	Area (sq ft) / Quantity	Unit
<b>GENERAL</b>					
1	Handling Capacity				MTs
2	Products to be handled				
	a)				MTs
	b)				MTs
	c)				MTs
	d)				MTs
	e)				MTs
3	Total Area				Sq.Mtr/Acre

4	Roof Details				
5	Outer Walls & Flooring Details				
6	Lighting – Internal & External				
7	Lay-out Drawings				
<b>CIVIL WORKS</b>					
1	PCC Platform with 1.5 ft plinth height (Concrete Flooring)	80	40	3200	Sq. ft
2	Shed (Iron Gutters, truss and purlin & GI Roof sheets) (22 ft center height and 17 ft wall height)	80	40	3200	Sq. ft
3	5 ft height wall (6 inch thickness with plastering) al round the shed – Cost include Bricks + Cement+ Sand + Mason Charges	240	6 inch		Lump Sum
<b>Mechanical Works</b>					
1	Perforated Plastic Crates			500	Nos
2	Wooden Pallets (New Hard Wood Pallet 48" X 40" X 4-1/2" - Four way entry pallets)			10	Nos
3	Hand pallet truck (2 ton capacity)			1	Nos
4	Desapping Tables ( 3 tier - bamboo made) - Capacity of each one is 1800 Mangos i.e 200 mangos per tier			3	Nos
5	Silpaulin Sheets (Washing sheets - HDPE) (Of plastic of not less than 5' length and 2.6' ft width)			4	Nos
6	Weighing Platform Scale (300 Kg Capacity)			1	Nos
7	Other assets - Small office table, three chairs, almairah, Wooden showels				Lump Sum
8	Electrical Supply & Transformer				Lump Sum
<b>Non-Market Items</b>					
1	Toilets etc.				
2	Retiring Rooms				
3	Canteen				
4	Parking Area for Lorries & Tractors				
5	Office				
6	Washing Area & facilities for workers				

**II. Basic data sheet for Pack House  
Size 60' x 20'**

S. No.	Description	Length (ft)	Width (ft)	Area (sq ft) / Quantity	Unit
	<b>CIVIL Works - Packing Hall</b>				
1	PCC Platform with 1.5 ft plinth height (Cement Concrete Flooring)				Sq. ft
2	Shed (Iron Gutters, truss and purlin & GI Roof sheets) (22 ft center height and 17 ft wall height)				Sq. ft
3	17 ft height wall (9 inch thickness) all round the shed – Cost includes Bricks + Cement+ Sand + Mason Charges				Lump Sum
4	Two Rolling Shutters of size 8' x 8'	8'	8'	Nos	2
5	Six Glazed M.S. Windows of size 5' x 3' with 10mm square guard bars at 150mm c/c including hardware and 4mm glass	5'	3'	Nos	6
	<b>Mechanical Works</b>				
1	Packing / grading Tables (4'X8' of GI or SS material, with 100mm side protection to stop roll off and with provision to drain water)			2	Nos
2	Silpaulin Sheet (Washing sheets - HDPE) (Of plastic of not less than 5' length and 2.6' ft width)			4	Nos
3	Weighing Platform Scale - To weigh upto 300 kgs with an accuracy of + or - 0.1 Kg with at least 400X 600mm plat form			1	Nos
4	Chemical Treatment Washing Tubs (Cement)			6	Nos
5	Dhapoli Harvesters			24	Nos
6	Perforated Plastic Crates			500	Nos
7	Wooden Pallets (New Hard Wood Pallet 48" X 40" X 4-1/2" - Four way entry pallets)			10	Nos
8	Hand pallet truck (2 ton capacity)			1	Nos
9	Packing Machine			1	Nos
10	Other assets - Small office table, three chairs, almairah, Wooden showels				Lump Sum
11	Electrical Wiring, Bulbs and Fans				Lump Sum



<b>III. Basic data sheet for Van 6 Ton Capacity</b>		
<b>Sl. No</b>	<b>Item Description</b>	<b>Technical Specifications</b>
1.	Van 6 Ton Capacity	
2.	Tare weight	kgs
3.	Gross weight	Kgs
4.	Name of Manufacturer	
5.	Year of manufacture	
6.	Any design enhancement	Describe design changes is any
7.	Truck Type	ISUZU, EICHER etc.

<b>IV. Basic data Sheet for Pre-Cooling Unit of 12 MT Capacity</b>					
<b>S. No.</b>	<b>Description</b>	<b>Length (ft)</b>	<b>Width (ft)</b>	<b>Area (sq ft) / Quantity</b>	<b>Unit</b>
	<b>CIVIL Works - Shed</b>				
1	PCC Platform with 1.5 ft plinth height (Concrete Flooring)				Sq. ft
2	Shed (Iron Gutters, truss and purlin & GI Roof sheets) (15 ft center height and 13 ft wall height)				Sq. ft
	<b>Insulation</b>				
3	PUF 80 mm Panels for Walls				Sq.m
4	PUF 80 mm Panels for Ceiling				Sq.m
5	PUF 80 Slabs for Flooring				Sq.m
6	Doors - Hinged Doors				Nos
	<b>Machinery</b>				
7	Condensing Units (Outdoor Units)				Nos
8	Evaporator Units (Indoor Units)				Nos
9	Temp & Humidity Controls, Sensors & Display Units				
10	Humidifiers				Nos
	<b>Electrical</b>				
11	Electrical Control Panel, Wiring and other accessories				Lump Sum
12	Lightening Conductor				
13	Generator 10 KVA				
14	Fire Safety Equipment				Lump Sum

## CHECK LIST

<b>S. No.</b>	<b>DESCRIPTION</b>	<b>PAGE NO</b>
1.	Application Form along with Appraisal Report	
2.	Basic Data Sheet with Complete Technical Aspects	
3.	Approval from Gram Panchayat / Municipality / Town Planning	
4.	DMC Approval	
5.	Promoter's Affidavit as per Prescribed Format	
6.	Land Document	

**APPLICATION FOR AVAILING ASSISTANCE / SUBSIDY UNDER MIDH**

**(COMPONENT: FUNCTIONAL INFRASTRUCTURE ALONG WITH PRE-COOLING UNIT AND  
PACK HOUSE)**

**Name of the Scheme: Post Harvest Management**

- 1 Name of the Farmer :
- 2 Father / Husband Name :
- 3 Caste (SC/ST/BC/OC) :
- 4 Address: :
- Phone / Cell No.: :
- 5 Land records with Extent in Acres / Ha. :  
(Copy of Pass Book / Adangal)
- 6 Source of Irrigation (Open well / Bore well / Canal) :
- 7 Name of the Financing Bank, Loan Amount Proposed :
- 8 Whether any Govt. Subsidy availed previously :
- 9 Any other relevant information :

**Declaration**

I, \_\_\_\_\_

declare that the particulars furnished above are true to the best of my knowledge and I promise that the benefit obtained from State MIDH Cell will be used for the purpose for which it is given and in case of misuse I am liable for any action deemed to be fit by Govt. of A.P., including recovery of the subsidy amount with 12% interest to the Government.

**Enclosures:** 1. Affidavit  
2. Pattadar Pass Book  
3. Detailed Project Estimate by Civil Engineer  
(Regd. No. along with Seal)

**Signature of the Farmer / Entrepreneur.**

Recommendations of the Horticulture Officer : \_\_\_\_\_

**Horticulture Engineer**

**Horticulture Officer**

**Asst. Director of Horticulture.**

**PRELIMINARY INSPECTION REPORT FOR FUNCTIONAL INFRASTRUCTURE ALONG WITH  
PRE-COOLING UNIT AND PACK HOUSE**

- Date of Inspection :
- A Component :
- B Details of Project** :
- (v) Name of the project :
- (vi) Address for communication :  
with telephone No. :
- C Project Location with Address** :
- (i). Survey No :
- (ii). Village :
- (iii). Mandal :
- D Constitution (Individual/ Joint :  
Individual/Partnership Firm/ :  
Company. :
- E (i) Proposed Activity :  
(ii) Type :  
(iii) Proposed type of cooling :  
system :
- F Name of the Promoter :
- G Present physical status of the project :**
- I. Construction started or not :
- (ix) Land development :  
status/boundary/road :
- (x) Connecting road to the plot :
- (xi) Stage of cold store building :  
civil/pre engineered as on :  
inspection date :
- (xii) Type of produce to be :  
stored :

Promoter      Horticulture Engineer      Horticulture Officer      Asst. Director of Horticulture

**FORMAT TO CONDUCT FINAL AND JOINT INSPECTION FOR FUNCTIONAL  
INFRASTRUCTURE ALONG WITH PRE-COOLING UNIT AND PACK HOUSE BY THE  
COMMITTEE UNDER POST HARVEST MANAGEMENT COMPONENT OF MIDH, A.P.**

**1) GENERAL INFORMATION**

- 1) Name of the Unit with full address :  
(Sy. No. / Area / Village / District)
- 2) Date of Issue of Administrative Sanction :
- 3) Name of CEO of Company / Managing Director :
- 4) Constitution: Individual / Group of Individuals / :  
Society / Partnership Firm / Pvt. Ltd. Company / :  
Public Ltd. Company :
- 5) Date of Inspection of the Project :
- 6) Name & Designation of the Committee members :  
(a)  
(b)  
(c)  
(d)
- 7) Name of the Bank (with Full address & :  
Phone & Fax No.) :  
**a)** Subsidy reserve fund account no. :
- 8) Date of start of the project :
- 9) Date of Completion of the project :
- 10) a) Date & amount of Sanction of Term Loan :  
b) Repayment Period :
- 11) Land Details
- i. Whether land is in the name of promoter: Yes / No
- ii. Whether land is a Regd. Lease land for : Yes / No  
Minimum 10 years in favour of applicant  
(in case of lease)

**Name & Signature  
of Applicant**

**Name & Signature  
of Expert**

**Name & Signature  
of Inspecting Officer  
(Bank)**

**Name & Signature  
of ADH concerned**

**Name & Signature  
of Senior Officer  
from MIDH**

<b>I. Data Sheet for Pack House under Functional Infrastructure</b>					
<b>S. No.</b>	<b>Description</b>	<b>As per DPR</b>		<b>As per Jt. Inspection</b>	
	<b>CIVIL Works - Packing Hall</b>				
1	PCC Platform with 1.5 ft plinth height (Cement Concrete Flooring)				
2	Shed (Iron Gutters, truss and purlin & GI Roof sheets) (22 ft center height and 17 ft wall height)				
3	17 ft height wall (9 inch thickness) all round the shed – Cost includes Bricks + Cement+ Sand + Mason Charges				
4	Two Rolling Shutters of size 8' x 8'				
5	Six Glazed M.S. Windows of size 5' x 3' with 10mm square guard bars at 150mm c/c including hardware and 4mm glass				
	<b>Mechanical Works</b>				
1	Packing / grading Tables (4'X8' of GI or SS material, with 100mm side protection to stop roll off and with provision to drain water)				
2	Silpaulin Sheet (Washing sheets - HDPE) (Of plastic of not less than 5' length and 2.6' ft width)				
3	Weighing Platform Scale - To weigh upto 300 kgs with an accuracy of + or - 0.1 Kg with at least 400X 600mm plat form				
4	Chemical Treatment Washing Tubs (Cement)				
5	Dhapoli Harvesters				
6	Perforated Plastic Crates				
7	Wooden Pallets (New Hard Wood Pallet 48" X 40" X 4-1/2" - Four way entry pallets)				
8	Hand pallet truck (2 ton capacity)				
9	Packing Machine				
10	Other assets - Small office table, three chairs, almairah, Wooden showels				
11	Electrical Wiring, Bulbs and Fans				

Name & Signature  
of Applicant

Name & Signature  
of Expert

Name & Signature  
of Inspecting Officer  
(Bank)

Name & Signature  
of ADH concerned

Name & Signature  
of Senior Officer  
from MIDH

<b>II. Data sheet for Van 6 Ton Capacity under Functional Infrastructure</b>			
<b>Sl. No</b>	<b>Item Description</b>	<b>As per DPR</b>	<b>As per Jt. Inspection</b>
8.	Van 6 Ton Capacity		
9.	Tare weight		
10.	Gross weight		
11.	Name of Manufacturer		
12.	Year of manufacture		
13.	Any design enhancement		
14.	Truck Type		

<b>III. Data Sheet for Pre-Cooling Unit of 12 MT Capacity under Functional Infrastructure</b>			
<b>S. No.</b>	<b>Description</b>	<b>As per DPR</b>	<b>As per Jt. Inspection</b>
	<b>CIVIL Works - Shed</b>		
1	PCC Platform with 1.5 ft plinth height (Concrete Flooring)		
2	Shed (Iron Gutters, truss and purlin & GI Roof sheets) (15 ft center height and 13 ft wall height)		
	<b>Insulation</b>		
3	PUF 80 mm Panels for Walls		
4	PUF 80 mm Panels for Ceiling		
5	PUF 80 Slabs for Flooring		
6	Doors - Hinged Doors		
	<b>Machinery</b>		
7	Condensing Units (Outdoor Units)		
8	Evaporator Units (Indoor Units)		
9	Temp & Humidity Controls, Sensors & Display Units		
10	Humidifiers		
	<b>Electrical</b>		
11	Electrical Control Panel, Wiring and other accessories		
12	Lightening Conductor		
13	Generator 10 KVA		
14	Fire Safety Equipment		

Name & Signature  
of Applicant

Name & Signature  
of Expert

Name & Signature  
of Inspecting Officer  
(Bank)

Name & Signature  
of ADH concerned

Name & Signature  
of Senior Officer  
from MIDH

**FORMAT**  
**(On Letter head of the CA)**

To

**The Mission Director & Commissioner of Horticulture,  
Govt. of Andhra Pradesh,  
GUNTUR.**

We have examined the books of accounts and other relevant records maintained by M/s. / Shri / Smt. \_\_\_\_\_ (Name of the Beneficiary) at its office situated at \_\_\_\_\_ (Address of project) for \_\_\_\_\_ (Project activity). These accounts are maintained by the Company's management, partners of the firm / proprietor of the concerned / grower / NGO / and our responsibility is to verify the truth and fairness of these records and verification of amount expended for acquisition / construction of fixed assets / establishment and other expenditure.

We conducted our work in accordance with the Audits and Accounting Standards generally accepted in India. Those Standards require that we plan and perform our verification to obtain reasonable assurance about whether these accounts are true and fair are free of material misstatement. A verification included examining on 100% basis, evidence audit includes examining, on a test basis assessing the accounting principles used and significant estimates made by the grower, as well as evaluating the overall financial statement presentation. We believe that our audit provides reasonable basis of our opinion.

**We verify that**

- a) We have obtained all the information and explanation that to the best of our knowledge and belief were necessary for the purpose of our verification.
- b) In our opinion, proper books of accounts as required by law have been kept by the Company / firm / sole proprietorship concern / grower / NGO for the financial period \_\_\_\_\_ and these books of account represent true and fair view of the transaction entered into by the Company / firm / sole proprietorship concern / grower / NGO.
- c) In our opinion, the Company / firm / sole proprietorship concern / grower / NGO has incurred a capital expenditure amounting to Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_ only) for acquisition / construction of fixed assets and the same is being reflected properly in the books of accounts. The valuation made of major components of the project and whole project is tabulated as follows:



**Establishment of Project:**

S. No.	Component	Proposed Expenditure as per LOI	Cost as appraised by Bank before term loan sanction	Cost assessed by CA	Remarks
1					
2					
3					
	TOTAL				

Total : \_\_\_\_\_

**MEANS OF FINANCE**

S. No.	Item	Project Cost as per DPR	Project Cost as per Appraisal Report	Actual Cost
1	Promoter's Equity			
2	Term Loan			
3	Unsecured Loan			
4	Grant from NHM			
5	Others			
	TOTAL			

**We recommend Rs. .... as the cost of the whole project.**

**Signature and Seal of C.A.  
with Membership No.**

**Date:**

## FORMAT

(Forwarding letter of Bank for Conducting JIT )  
Name & Full Address of the FI/Bank (on letter head)

To  
The Mission Director & Commissioner of Horticulture,  
Govt. of Andhra Pradesh,  
Public Gardens, Nampally,  
GUNTUR

**Subject : Request for Joint Inspection of the project**

Sir,

MIDH, A.P., had released Rs. .... as credit linked back-ended subsidy in respect of project of \_\_\_\_\_ Village \_\_\_\_\_ District \_\_\_\_\_ State Vide letter no ..... As per instruction, the subsidy amount has been kept in Subsidy Reserve Fund account of the bank and interest benefit is being passed on to the beneficiary. Now project is complete as per original proposal and we have also disbursed full Term loan sanctioned for the above mentioned project. In addition to documents submitted by bank at the time of claim of subsidy such as copy of the Appraisal Note, Term Loan sanction letter, copy of Record of Right, following documents required for Joint Inspection are being submitted with the request to conduct Joint Inspection of the project to decide final subsidy claim.

S. No	Particulars	Enclosed or Not
1	Details of date-wise release of term loan	
2	Completion certificate by Bank/FIs	
3	Undertaking from promoter (as prescribed by NHM)	
4	Extract of subsidy reserve fund account of bank in which estimated subsidy has been kept	

It is certified that the original of above documents and documents submitted at the time of subsidy claim by bank pertaining to the projects are kept in Bank/FI, which can be shown at the time of random monitoring by the Department or any agency authorized by the Department.

(Seal and Signature of the Bank's Officer )

Name : \_\_\_\_\_

Name of the Bank :

Address :

Phone/Fax/Mobile No.: \_\_\_\_\_

Place : \_\_\_\_\_

Date : \_\_\_\_\_

## 12. b) WHOLESALE MARKET

In order to have forward and backward linkages in marketing, which will enhance productivity and quality of produce and improve farmers income and for efficient marketing of horticulture commodities, the National Horticulture Mission provides for setting up marketing infrastructure. While the establishment of Modern wholesale markets, development of rural primary markets/ Apni Mandis formed a part of the NHM scheme when it was launched during 2005-06, the concept of Terminal Market was introduced during 2006-07. With the introduction of Terminal Market concept, which envisages a Public Private Partnership mode of implementation under which marketing infrastructure will be developed in cooperative/ private/ joint sector with the participation of wholesalers, retailers and farmers, it has been felt necessary to formulate guidelines for setting up of wholesale markets etc. for which assistance is being provided as per the following details:

Sl. No.	Item	Estimated cost	Norms of Assistance
1	Establishment of Marketing Infrastructure for horticultural produce in Govt./Private/Cooperative  Modern Wholesale markets	Rs. 10000.00 lakhs and above	Credit linked back-ended subsidy @ 25% of the capital cost of project in general case and 33.33% in the case of hilly, backward States. However, subsidy will be calculated only upto project cost of Rs. 10,000.00 lakhs.
	Rural Markets	Rs.15.00 lakh	Credit linked back-ended subsidy @ 25% of the capital cost of project
	Apni Mandis	Rs.15.00 lakh	Credit linked back-ended subsidy @ 25% of the capital cost of project
	Extension, quality awareness and markets led extension activities for fresh processed products	Project based	100% Assistance.

### Main features of Modern Wholesale Market

- 1) The Modern Wholesale Market will be set up in those States that undertake reforms in their laws dealing with agricultural marketing to provide direct marketing and permit the setting up of markets in private and cooperative sectors.
- 2) The Modern Wholesale Market would operate on a Hub-and-Spoke Format wherein the main Market (the hub) would be linked to a number of Collection Centres (CC) (the spokes).

- 3) The spokes would be conveniently located at key production centers to allow easy farmers access and the catchment area of each spoke would be based on meeting the convenient needs of farmers, operational efficiently and effective capital utilization of the investment.
- 4) The Modern Wholesale Market would establish backward linkages with farmers through the collection centers and forward linkages through wholesalers, distribution centres, retails cash and carry stores, processing units and exporters.
- 5) Collection Centres in the villages would integrate producers and retailers, processing units and exporters into the market system.
- 6) An electronic auction system would be established to ensure transparency in price fixation and competition.
- 7) The scheme will attract and facilitate private sector investment in the agribusiness sector, by assisting the key stakeholders-entrepreneurs, producers, processing industry and exporters.
- 8) Producers, farmers and their associations and other market functionaries from part of the country may use the infrastructure and facilities of the Modern Wholesale Market directly or through the collection centres.
- 9) The Modern Wholesale Market would provide one-stop solution in terms of providing logistics support including transport services and cool chain facility.

The modern wholesale markets have been categorized based on number of collection centers and cost of project as under:

**Category A- Market having 20 or more collection centers costing upto 100 crores.**

**Category B- Market having 1-19 collection centres costing upto 60 crores.**

**Category C- Market without collection centers costing upto 30 crores.**

For the calculation of subsidy the cost of infrastructure for non-marketing services should be excluded from the total project cost as appraised by the Financial Institution. The developer of the market should operate the market for a minimum period of 15 years and not divert the asset for any other purpose or change the land use before that period. As regards the cost of land, the same shall be governed as per operational guidelines of NHM. If land is on rental basis or provided by state Government the same shall not become part of project cost.

### **The main objectives of setting up Wholesale Markets Complex**

- 1) To link the farmers to the markets by shortening the supply chain of perishables and enhance their efficiency and thus increase farmer's income.
- 2) Provide professionally managed competitive alternative marketing structures that provide multiple choices to farmers for sale of their agricultural produce.
- 3) To accelerate development of marketing and post harvest infrastructure including cool chain infrastructure in the county through private sector investment.
- 4) To bring transparency in the market transactions and price fixation for agricultural produce and through provision of backward linkages to enable the farmers to realize higher price and thus higher income to the farmers.

## Eligibility

The Modern Wholesale Market project would be built, owned and operated by individuals, Group of farmers/Growers/Consumers, Partnership/Proprietary firms, Companies, Marketing Boards, Corporations, Co-operatives, Producers Organizations and self help groups. The Private Enterprise could also be a consortium of entrepreneurs from, inter-alia, agri-business, cold chain logistics, warehousing, agri-infrastructure and related background.

## Commodities

The commodities to be marketed by the Modern Wholesale Market will include all perishables, inter-alia, fruits, vegetables, flowers, aromatics, herbs, meat, poultry etc. Non-perishables can also be handled in the Modern Wholesale Market. However, the proportion of Non-Perishables shall not exceed 15% of the total through put of the market. Similarly, proportion of non-horticultural products within the perishable commodities shall not exceed 15% of the total through put of the market.

## Location

The State Government will approve the number and indicative location of the Modern Wholesale Market based on the demand, economic viability, commercial considerations etc.

## Core facilities and essential services to be provided at the Wholesale Markets:

1. Electronic auction facility	7. Price displays / bulletin Service	13. Banking services including settlement to transactions
2. Storage and Cold storage Facility.	8. Quality testing facility	14. Vehicle fuelling services
3. Temperature controlled Warehouse	9. Material handling\equipment (palletisation and plastic crates)	15. Waste Wand refuse treatment and disposal
4. Ripening Chamber	10. Movement and parking facility for vehicles	16. Basic lodging services
5. Sorting, grading, washing and packing lines	11. Futures trading facility	
6. Labeling of produce	12. Transport services (including cool chain)	

In addition to the above, the modern wholesale market will provide the following User facilities and services free of charge to the users:

1. Price information display screens both at the central and the collection centers for perishable Agricultural Produce
2. Advisory on inputs, prices, quality for Perishable Horticulture Produce

Non Market Services - "Non Market Services" means the provision of the following indicative user facilities and services at the wholesale market:

1. Business Centre services	6. Locker rental	11. Vehicle rental services
2. Catering services	7. Logistic Centers	12. Vending services
3. Freight consolidators / forwarders or agent services	8. Messenger Services	13. Leisure service facilities
4. General retail shops	9. Porter service	14. Shopping Complex
5. Hotels and Motels services including reservation services	10. Restaurants, and other refreshment services	15. Processing facilities

In addition to the above which are non chargeable, the market will provide the following User facilities and services at nominal rates to the users:

1. Food items	3. Infrastructure / Facilities for Public telephones	5. Vehicle parking lot
2. Infrastructure / Facilities for Post Offices	4. Infrastructure / Facilities for access to internet	

Facilities and services to be provided at the collection center for Perishable Agricultural produce handled by the PE

1. ashing, grading, sorting, weighing facilities	3. Plastic Crates	5. Banking services including settlement of payment if possible.
2. Transport services to main market complex	4. Facility for collection and aggregation of produce	

The funds will be released as per the criteria applicable for availing credit linked back ended subsidy. The State authorities will have to monitor the implementation and furnish quarterly progress reports of utilization of central assistance.

## Basic Data Sheet for Wholesale Flower Market

SI No	Item	Item Description	Unit	Quantity
1	Land	Land	Acre	
2	Bore well & Motor	Bore well & Motor		
2	Civil work in Ground Floor for Constructing Shops of Block-A and Block-B	<ol style="list-style-type: none"> <li>1. Earthwork for Foundation</li> <li>2. Sand Filling in foundations and basement</li> <li>3. Concrete work</li> <li>4. Brick Work</li> <li>5. RCC (for columns, beams and slab)</li> <li>6. Plastering</li> <li>7. Flooring with cement concrete</li> <li>8. Supplying and fixing Teak Wood / Country wood Doors, Windows and iron rolling shutters</li> <li>9. Colour washing</li> <li>10. Construction of water storage tank</li> <li>11. Electricity, water supply and sanitary fittings</li> <li>12. Brick masonry compound wall</li> <li>13. Common amenities</li> <li>14. Miscellaneous items and</li> <li>15. Supervision Charges</li> </ol>		Lump Sum as given by Valuer
3	Civil work in First Floor for Constructing Shops in Block-A and Block-B to store the flowers stock and accommodation for farmers and traders	<ol style="list-style-type: none"> <li>1. Brick Masonry in cement mortar</li> <li>2. R.C.C (for columns, beams and slab)</li> <li>3. Plastering in cement mortar</li> <li>4. Flooring with cement concrete</li> <li>5. Supplying and fixing Teak Wood / Country wood Doors, Windows and iron rolling shutters</li> <li>6. Colour washing</li> <li>7. Electricity, water supply and sanitary fittings</li> <li>8. Common amenities</li> <li>9. Miscellaneous items and</li> <li>10. Supervision Charges</li> </ol>		Lump Sum as given by Valuer
4	Civil work in Second Floor for Constructing Community Hall and Auction Hall in Block-A and Block-B	<ol style="list-style-type: none"> <li>1. Brick Masonry in cement mortar</li> <li>2. R.C.C (for columns, beams and slab)</li> <li>3. Plastering in cement mortar</li> <li>4. Flooring with tiles</li> <li>5. Supplying and fixing Teak Wood / Country wood Doors, Windows and iron rolling shutters</li> <li>6. Colour washing</li> <li>7. Electricity, water supply and sanitary fittings</li> <li>8. Common amenities</li> <li>9. Miscellaneous items and</li> <li>10. Supervision Charges</li> </ol>		Lump Sum as given by Valuer

	Electrical	Electrical Line & Transformer, Common Lighting facilities like poles and wires for Open areas		Lump sum
		Generator (125 KVA)		2
		Solar Power Systems for Common Lighting and for all shops		Lump sum
5	Civil (Side walls, Slab) - Civil work in Second Floor for Constructing Cold rooms in Block-A (for storing 15 MT of flowers)			Lump sum
	Insulation	PUF 80mm panels for walls and slabs for floor		
		PUF Erection Charges		
	Machinery	Out door Units		
		Indoor Units		
		Humidifiers		
	Weighing Machines	Weighing Machines (2 quintals) - 2 Nos		2
Electrical	Electrical Panels, wiring etc			
	Generator Labour Charges for electrical work			
6	Civil (Side walls, Slab) - Civil work in Second Floor for Constructing Cold rooms in Block-B (for storing 15 MT of flowers)			Lump sum
	Insulation	PUF 80mm panels for walls and slabs for floor		
		PUF Erection Charges		
	Machinery	Out door Units		
		Indoor Units		
		Humidifiers		
	Weighing Machines	Weighing Machines (2 quintals) - 2 Nos		2
Electrical	Electrical Panels, wiring etc			
	Generator Labour Charges for electrical work			
7	Price Display Board (Digital)	53 Units * 20000	Nos	53
8	Material Handling Equipment - Crates & Crates Mover	250 * 53 * Rs 250 & 1 per shop (100000 * 53)		
9	Weighing machines 300 kg			53
10	Fire			
11	Dust Bins for Dumping Waste (42 * 2 = 84)			
12	Transportation Vehicle (6 MT) - Tractor with Hydraulic Trolley			
13	Computers and Furniture in office room			
14	Miscellaneous & Unforeseen			



15	Maintenance Corpus fund (Margin Money)			
16	Non-Marketing Services	Rest Rooms		
		Toilets		
		ATM Room		
		Pesticide & Seed supply Services		
		Vehicle Parking		
		Transport Supply Facilities		
		Police		
		Post Office		
		Internet Access		
		Banking Facilities (At 1.5 km Andhra bank)		
		Labour (Porter Services) for loading & Unloading		
Petrol Bunk				

## CHECK LIST

<b>S. No.</b>	<b>DESCRIPTION</b>	<b>PAGE NO</b>
1.	Application Form along with Appraisal Report	
2.	Basic Data Sheet with Complete Technical Aspects	
3.	Detailed Project Report MIDH Guidelines	
4.	Partnership Deed ( MoU )	
5.	Land Document ( Sale Deed / Lease Deed / Pattadar Pass Book copy )	
6.	Firm Registration Certificate	
7.	Bank Sanction Letter along with appraisal Report	
8.	Approval from Gram Panchayat / Municipality / Town Planning	
9.	Land Conversion Certificate	
10.	SSI Registration Certificate	
11.	Fire Department Approval with drawings	
12.	PAN Card Copy of the unit	
13.	Electricity Approval	
14.	KYC documents of all the Partners	
15.	DMC Approval	
16.	Promoter's Affidavit as per Prescribed Format	
17.	Certificate from Civil Design Engineer	
18.	Certificate from Bank for Non-Availing Subsidy from any other State/Central Govt. Department.	
19.	Insurance of the Fixed Assets	

**APPLICATION FOR AVAILING ASSISTANCE / SUBSIDY UNDER MIDH**

**(COMPONENT: WHOLESALE MARKET)**

**Name of the Scheme: Post Harvest Management**

- 1 Name of the Farmer :
- 2 Father / Husband Name :
- 3 Caste (SC/ST/BC/OC) :
- 4 Address: :
- Phone / Cell No.: :
- 5 Land records with Extent in Acres / Ha. :  
(Copy of Pass Book / Adangal)
- 6 Source of Irrigation (Open well / Bore well / Canal) :
- 7 Name of the Financing Bank, Loan Amount Proposed :
- 8 Whether any Govt. Subsidy availed previously :
- 9 Any other relevant information :

Declaration

I, \_\_\_\_\_

declare that the particulars furnished above are true to the best of my knowledge and I promise that the benefit obtained from State MIDH Cell will be used for the purpose for which it is given and in case of misuse I am liable for any action deemed to be fit by Govt. of A.P., including recovery of the subsidy amount with 12% interest to the Government.

Enclosures: 1. Affidavit  
2. Pattadar Pass Book  
3. Detailed Project Estimate by Civil Engineer  
(Regd. No. along with Seal)

**Signature of the Farmer / Entrepreneur.**

Recommendations of the Horticulture Officer : \_\_\_\_\_

**Horticulture Engineer**

**Horticulture Officer**

**Asst. Director of Horticulture.**

## PRELIMINARY INSPECTION REPORT FOR WHOLESALE MARKET

- Date of Inspection :
- A Component :
- B Details of Project** :
- (vii) Name of the project :
- (viii) Address for communication :  
with telephone No. :
- C Project Location with Address** :
- (i). Survey No :
- (ii). Village :
- (iii). Mandal :
- D Constitution (Individual/ Joint :  
Individual/Partnership Firm/ :  
Company. :
- E (i) Proposed Activity :  
(ii) Type :  
(iii) Proposed type of cooling :  
system :
- F Name of the Promoter :
- G Present physical status of the project :**
- I. Construction started or not :
- (i) Land development :  
status/boundary/road :
- (ii) Connecting road to the plot :
- (iii) Stage of unit building civil / :  
pre-engineered as on :  
inspection date :
- (iv) Type of produce to be :  
stored :

Promoter      Horticulture Engineer      Horticulture Officer      Asst. Director of Horticulture

**FORMAT TO CONDUCT FINAL AND JOINT INSPECTION FOR WHOLESALE MARKET  
BY THE COMMITTEE UNDER POST HARVEST MANAGEMENT COMPONENT OF MIDH,  
A.P.**

**2) GENERAL INFORMATION**

- 7) Name of the Unit with full address :  
(Sy. No. / Area / Village / District)
- 8) Date of Issue of Administrative Sanction :
- 9) Name of CEO of Company / Managing Director :
- 10) Constitution: Individual / Group of Individuals / :  
Society / Partnership Firm / Pvt. Ltd. Company / :  
Public Ltd. Company :
- 11) Date of Inspection of the Project :
- 12) Name & Designation of the Committee members :  
(a)  
(b)  
(c)  
(d)
- 11) Name of the Bank (with Full address & :  
Phone & Fax No.) :
- a) Subsidy reserve fund account no. :
- 12) Date of start of the project :
- 13) Date of Completion of the project :
- 14) a) Date & amount of Sanction of Term Loan :  
b) Repayment Period :
- 12) Land Details
- i. Whether land is in the name of promoter: Yes / No
- ii. Whether land is a Regd. Lease land for : Yes / No  
Minimum 10 years in favour of applicant  
(in case of lease)

**Name & Signature  
of Applicant**

**Name & Signature  
of Expert**

**Name & Signature  
of Inspecting Officer  
(Bank)**

**Name & Signature  
of ADH concerned**

**Name & Signature  
of Senior Officer  
from MIDH**

<b>Data Sheet for Wholesale Market</b>				
<b>SI No</b>	<b>Item</b>	<b>Item Description</b>	<b>As per DPR</b>	<b>As per Jt. Inspection</b>
1	Land	Land		
2	Bore well & Motor	Bore well & Motor		
2	Civil work in Ground Floor for Constructing Shops of Block-A and Block-B	<ol style="list-style-type: none"> <li>1. Earthwork for Foundation</li> <li>2. Sand Filling in foundations and basement</li> <li>3. Concrete work</li> <li>4. Brick Work</li> <li>5. RCC (for columns, beams and slab)</li> <li>6. Plastering</li> <li>7. Flooring with cement concrete</li> <li>8. Supplying and fixing Teak Wood / Country wood Doors, Windows and iron rolling shutters</li> <li>9. Colour washing</li> <li>10. Construction of water storage tank</li> <li>11. Electricity, water supply and sanitary fittings</li> <li>12. Brick masonry compound wall</li> <li>13. Common amenities</li> <li>14. Miscellaneous items and</li> <li>15. Supervision Charges</li> </ol>		
3	Civil work in First Floor for Constructing Shops in Block-A and Block-B to store the flowers stock and accommodation for farmers and traders	<ol style="list-style-type: none"> <li>1. Brick Masonry in cement mortar</li> <li>2. R.C.C (for columns, beams and slab)</li> <li>3. Plastering in cement mortar</li> <li>4. Flooring with cement concrete</li> <li>5. Supplying and fixing Teak Wood / Country wood Doors, Windows and iron rolling shutters</li> <li>6. Colour washing</li> <li>7. Electricity, water supply and sanitary fittings</li> <li>8. Common amenities</li> <li>9. Miscellaneous items and</li> <li>10. Supervision Charges</li> </ol>		
4	Civil work in Second Floor for Constructing Community Hall and Auction Hall in Block-A and Block-B	<ol style="list-style-type: none"> <li>1. Brick Masonry in cement mortar</li> <li>2. R.C.C (for columns, beams and slab)</li> <li>3. Plastering in cement mortar</li> <li>4. Flooring with tiles</li> <li>5. Supplying and fixing Teak Wood / Country wood Doors, Windows and iron rolling shutters</li> <li>6. Colour washing</li> <li>7. Electricity, water supply and sanitary fittings</li> <li>8. Common amenities</li> <li>9. Miscellaneous items and</li> <li>10. Supervision Charges</li> </ol>		

	Electrical	Electrical Line & Transformer, Common Lighting facilities like poles and wires for Open areas		
		Generator (125 KVA)		
		Solar Power Systems for Common Lighting and for all shops		
5	Civil (Side walls, Slab) - Civil work in Second Floor for Constructing Cold rooms in Block-A (for storing 15 MT of flowers)			
	Insulation	PUF 80mm panels for walls and slabs for floor		
		PUF Erection Charges		
	Machinery	Out door Units		
		Indoor Units		
		Humidifiers		
	Weighing Machines	Weighing Machines (2 quintals) - 2 Nos		
	Electrical	Electrical Panels, wiring etc		
Generator				
Labour Charges for electrical work				
6	Civil (Side walls, Slab) - Civil work in Second Floor for constructing Cold rooms in Block-B (for storing 15 MT of flowers)			
	Insulation	PUF 80mm panels for walls and slabs for floor		
		PUF Erection Charges		
	Machinery	Out door Units		
		Indoor Units		
		Humidifiers		
	Weighing Machines	Weighing Machines (2 quintals) - 2 Nos		
	Electrical	Electrical Panels, wiring etc		
Generator				
Labour Charges for electrical work				
7	Price Display Board (Digital)			
8	Material Handling Equipment - Crates & Crates Mover			
9	Weighing machines 300 kg			
10	Fire Safety Equipment			
11	Dust Bins for Dumping Waste			
12	Transportation Vehicle (6 MT) - Tractor with Hydraulic Trolley			
13	Computers and Furniture in office room			

Name & Signature  
of Applicant

Name & Signature  
of Expert

Name & Signature  
of Inspecting Officer  
(Bank)

Name & Signature  
of ADH concerned

Name & Signature  
of Senior Officer  
from MIDH

**FORMAT**  
**(On Letter head of the CA)**

To

**The Mission Director & Commissioner of Horticulture,  
Govt. of Andhra Pradesh,  
GUNTUR.**

We have examined the books of accounts and other relevant records maintained by M/s. / Shri / Smt. \_\_\_\_\_ (Name of the Beneficiary) at its office situated at \_\_\_\_\_ (Address of project) for \_\_\_\_\_ (Project activity). These accounts are maintained by the Company's management, partners of the firm / proprietor of the concerned / grower / NGO / and our responsibility is to verify the truth and fairness of these records and verification of amount expended for acquisition / construction of fixed assets / establishment and other expenditure.

We conducted our work in accordance with the Audits and Accounting Standards generally accepted in India. Those Standards require that we plan and perform our verification to obtain reasonable assurance about whether these accounts are true and fair are free of material misstatement. A verification included examining on 100% basis, evidence audit includes examining, on a test basis assessing the accounting principles used and significant estimates made by the grower, as well as evaluating the overall financial statement presentation. We believe that our audit provides reasonable basis of our opinion.

**We verify that**

- a) We have obtained all the information and explanation that to the best of our knowledge and belief were necessary for the purpose of our verification.
- b) In our opinion, proper books of accounts as required by law have been kept by the Company / firm / sole proprietorship concern / grower / NGO for the financial period \_\_\_\_\_ and these books of account represent true and fair view of the transaction entered into by the Company / firm / sole proprietorship concern / grower / NGO.
- c) In our opinion, the Company / firm / sole proprietorship concern / grower / NGO has incurred a capital expenditure amounting to Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_ only) for acquisition / construction of fixed assets and the same is being reflected properly in the books of accounts. The valuation made of major components of the project and whole project is tabulated as follows:



**Establishment of Project:**

S. No.	Component	Proposed Expenditure as per LOI	Cost as appraised by Bank before term loan sanction	Cost assessed by CA	Remarks
1					
2					
3					
	TOTAL				

Total : \_\_\_\_\_

**MEANS OF FINANCE**

S. No.	Item	Project Cost as per DPR	Project Cost as per Appraisal Report	Actual Cost
1	Promoter's Equity			
2	Term Loan			
3	Unsecured Loan			
4	Grant from NHM			
5	Others			
	TOTAL			

**We recommend Rs. .... as the cost of the whole project.**

**Signature and Seal of C.A.  
with Membership No.**

**Date:**

## FORMAT

(Forwarding letter of Bank for Conducting JIT )  
Name & Full Address of the FI/Bank (on letter head)

To  
The Mission Director & Commissioner of Horticulture,  
Govt. of Andhra Pradesh,  
Public Gardens, Nampally,  
GUNTUR

**Subject : Request for Joint Inspection of the project**

Sir,

MIDH, A.P., had released Rs. .... as credit linked back-ended subsidy in respect of project of \_\_\_\_\_ Village \_\_\_\_\_ District \_\_\_\_\_ State Vide letter no ..... As per instruction, the subsidy amount has been kept in Subsidy Reserve Fund account of the bank and interest benefit is being passed on to the beneficiary. Now project is complete as per original proposal and we have also disbursed full Term loan sanctioned for the above mentioned project. In addition to documents submitted by bank at the time of claim of subsidy such as copy of the Appraisal Note, Term Loan sanction letter, copy of Record of Right, following documents required for Joint Inspection are being submitted with the request to conduct Joint Inspection of the project to decide final subsidy claim.

S. No	Particulars	Enclosed or Not
1	Details of date-wise release of term loan	
2	Completion certificate by Bank/FIs	
3	Undertaking from promoter (as prescribed by NHM)	
4	Extract of subsidy reserve fund account of bank in which estimated subsidy has been kept	

It is certified that the original of above documents and documents submitted at the time of subsidy claim by bank pertaining to the projects are kept in Bank/FI, which can be shown at the time of random monitoring by the Department or any agency authorized by the Department.

(Seal and Signature of the Bank's Officer )

Name : \_\_\_\_\_

Name of the Bank :

Address :

Phone/Fax/Mobile No.: \_\_\_\_\_

Place : \_\_\_\_\_

Date : \_\_\_\_\_

## **12. c. Rural Primary Markets/Apni Mandies**

The horticulture crops namely fruits, vegetables and flowers etc. are perishable in nature and need immediate disposal for providing remunerative prices to the farmers. For efficient marketing facilities to orchardist at the local level, NHM provides Credit linked back-ended subsidy @ 25% of the capital cost of project to panchayats, societies, private entrepreneurs and local bodies for establishment of Rural Primary Markets and Apni Mandies. The identified items of infrastructure for Rural Primary Markets/Apni Mandies are as under.

<b>Rural Primary Markets/Apni Mandies</b>
1. Office building
2. Auction/drying platforms - two to three per market
3. Water supply & sanitary arrangements as per requirement.
4. Grading equipment
5. Weighing equipment
6. Wastage disposal system
7. Boundary wall and internal roads

## CHECK LIST

<b>S. No.</b>	<b>DESCRIPTION</b>	<b>PAGE NO</b>
1.	Application Form along with Appraisal Report	
2.	Basic Data Sheet with Complete Technical Aspects	
3.	Detailed Project Report MIDH Guidelines	
4.	Partnership Deed ( MoU )	
5.	Land Document ( Sale Deed / Lease Deed / Pattadar Pass Book copy )	
6.	Firm Registration Certificate	
7.	Bank Sanction Letter along with appraisal Report	
8.	Approval from Gram Panchayat / Municipality / Town Planning	
9.	Land Conversion Certificate	
10.	SSI Registration Certificate	
11.	Fire Department Approval with drawings	
12.	PAN Card Copy of the unit	
13.	Electricity Approval	
14.	KYC documents of all the Partners	
15.	DMC Approval	
16.	Promoter's Affidavit as per Prescribed Format	
17.	Certificate from Bank for Non-Availing Subsidy from any other State/Central Govt. Department.	
18.	Insurance of the Fixed Assets	

**Format for submission of Application for Rural Primary Market and Apni Mandies.**

1. Name of the Rural Primary Market/ Apni Mandi.
  
2. Ownership of Market.
  
3. Location
  - a) District
  - b) Tahsil
  
4. a) Whether the market is located in Tribal/ Hilly area (Attach documentary proof)
- b) Whether the market has availed financial Assistance for development from Central Sector Projects, full details of assistance Received.
- c) Frequency at which the market is operating i.e. daily, bi-weekly, etc. If seasonal, then give number of days the market function during the season.
- d) Whether the market is regulated.
  - i) If so, the name of the Market Committee under which it is functioning.
  - ii) If not regulated, the name of the local body managing it.
- e) Whether the market is served by roads linking with the regulated market.
  
5. Present annual arrivals ( Last financial year )

Sl. No.	Name of the Facility	No. / Area & Capacity	Cost per unit	Total Cost
A	Office-cum-Godown			
B	Auction/Drying platform			
C	Water & Sanitary arrangements			
D	Grading & weighing equipments			
E	Boundary wall			
	<b>Total cost of the Project</b>			

11. Sources of financing the project.

1. Contribution from promoters/ own fund
2. Contribution from state/ Marketing board
3. Central assistance

Total

\_\_\_\_\_

\_\_\_\_\_

If additional funds are required over and above of Central Assistance, the sources from which these would be met i.e. own funds, State marketing Board, Bank, Loan, contribution of promoter, contribution from members of society and panchayat etc. may be indicated with documentary proof.

12. Financial position of the Market Committee under which the rural primary market is functioning or to which it will be linked.

**Last financial year**

**(Rs. in lakhs)**

Year	Opening Balance	Income during the year	Total	Expenditure during the year	Closing balance (surplus or deficit)
1	2	3	4	5	6

13. Rate of market fee levied, if any.

Signature

Chairman

Committee / local body

Place:

Date:

Signature of SHM

Place:

Date:

Note:-

1. A lay out plan of the market according to the scale indicating therein in the facilities Already available and proposed to be provided in the market may be enclosed.
2. Copy of the UC of the market which has already received Central Assistance under the erstwhile scheme of CA for which UC has been furnished.

## PRELIMINARY INSPECTION REPORT FOR RURAL PRIMARY MARKET / APNI MANDIS

- Date of Inspection :
- A Component :
- B Details of Project** :
- (ix) Name of the project :
- (x) Address for communication with telephone No. :
- C Project Location with Address** :
- (i). Survey No :
- (ii). Village :
- (iii). Mandal :
- D Constitution (Individual/ Joint Individual/Partnership Firm/ Company. :
- E (i) Proposed Activity :
- (ii) Type :
- (iii) Proposed type of cooling system :
- F Name of the Promoter :
- G Present physical status of the project :**
- I. Construction started or not :
- (v) Land development status/boundary/road :
- (vi) Connecting road to the plot :
- (vii) Stage of unit building civil / pre-engineered as on inspection date :
- (viii) Type of produce to be stored :

Promoter      Horticulture Engineer      Horticulture Officer      Asst. Director of Horticulture

**FORMAT TO CONDUCT FINAL AND JOINT INSPECTION FOR RURAL PRIMARY  
MARKET / APNI MANDIS BY THE COMMITTEE UNDER POST HARVEST  
MANAGEMENT COMPONENT OF MIDH, A.P.**

**3) GENERAL INFORMATION**

- 1) Name of the Unit with full address :  
(Sy. No. / Area / Village / District)
- 2) Date of Issue of Administrative Sanction :
- 3) Name of CEO of Company / Managing Director :
- 4) Constitution: Individual / Group of Individuals / :  
Society / Partnership Firm / Pvt. Ltd. Company / :  
Public Ltd. Company :
- 5) Date of Inspection of the Project :
- 6) Name & Designation of the Committee members :  
(a)  
(b)  
(c)  
(d)
- 15) Name of the Bank (with Full address & :  
Phone & Fax No.) :  
**a)** Subsidy reserve fund account no. :
- 16) Date of start of the project :
- 17) Date of Completion of the project :
- 18) a) Date & amount of Sanction of Term Loan :  
b) Repayment Period :
- 13) Land Details
- i. Whether land is in the name of promoter: Yes / No
- ii. Whether land is a Regd. Lease land for : Yes / No  
Minimum 10 years in favour of applicant  
(in case of lease)

**Name & Signature  
of Applicant**

**Name & Signature  
of Expert**

**Name & Signature  
of Inspecting Officer  
(Bank)**

**Name & Signature  
of ADH concerned**

**Name & Signature  
of Senior Officer  
from MIDH**



## FORMAT

(Forwarding letter of Bank for Conducting JIT )  
Name & Full Address of the FI/Bank (on letter head)

To  
The Mission Director & Commissioner of Horticulture,  
Govt. of Andhra Pradesh,  
Public Gardens, Nampally,  
GUNTUR

**Subject : Request for Joint Inspection of the project**

Sir,

MIDH, A.P., had released Rs. .... as credit linked back-ended subsidy in respect of project of \_\_\_\_\_ Village \_\_\_\_\_ District \_\_\_\_\_ State Vide letter no ..... As per instruction, the subsidy amount has been kept in Subsidy Reserve Fund account of the bank and interest benefit is being passed on to the beneficiary. Now project is complete as per original proposal and we have also disbursed full Term loan sanctioned for the above mentioned project. In addition to documents submitted by bank at the time of claim of subsidy such as copy of the Appraisal Note, Term Loan sanction letter, copy of Record of Right, following documents required for Joint Inspection are being submitted with the request to conduct Joint Inspection of the project to decide final subsidy claim.

S. No	Particulars	Enclosed or Not
1	Details of date-wise release of term loan	
2	Completion certificate by Bank/FIs	
3	Undertaking from promoter (as prescribed by NHM)	
4	Extract of subsidy reserve fund account of bank in which estimated subsidy has been kept	

It is certified that the original of above documents and documents submitted at the time of subsidy claim by bank pertaining to the projects are kept in Bank/FI, which can be shown at the time of random monitoring by the Department or any agency authorized by the Department.

(Seal and Signature of the Bank's Officer )

Name : \_\_\_\_\_

Name of the Bank :

Address :

Phone/Fax/Mobile No.: \_\_\_\_\_

Place : \_\_\_\_\_

Date : \_\_\_\_\_

## 12. d. STATIC / MOBILE VENDING CART / PLATFORM WITH COOL CHAMBER

PATTERN OF ASSISTANCE: Unit Cost Rs.30,000/- per unit

Subsidy @ 50% of the unit cost.

### Mobile Cool Chamber

- The insulated box was designed such that it could hold 8 plastic crates of size 540x360x295 mm in two layer of four each
- Capacity of storage was 100 kg of fruits with 80% filling of each plastic crates
- Costs around Rs. 18,000-20,000/-



Low cost unit saves the fruits from exposure to sunlight and preserves the quality.

**APPLICATION FOR AVAILING ASSISTANCE / SUBSIDY UNDER MIDH**

**(COMPONENT: STATIC / MOBILE VENDING CART / PLATFORM WITH COOL CHAMBER)**

**Name of the Scheme: Post Harvest Management**

- 1 Name of the Farmer :
- 2 Father / Husband Name :
- 3 Caste (SC/ST/BC/OC) :
- 4 Address: :
- Phone / Cell No.: :
- 8 Whether any Govt. Subsidy  
availed previously :
- 9 Any other relevant information :

**Declaration**

I, \_\_\_\_\_

declare that the particulars furnished above are true to the best of my knowledge and I promise that the benefit obtained from State MIDH Cell will be used for the purpose for which it is given and in case of misuse I am liable for any action deemed to be fit by Govt. of A.P., including recovery of the subsidy amount with 12% interest to the Government.

**Enclosures:** 1. Affidavit  
2. Pattadar Pass Book

**Signature of the Farmer / Entrepreneur.**

Recommendations of the Horticulture Officer : \_\_\_\_\_

**Horticulture Engineer**

**Horticulture Officer**

**Asst. Director of Horticulture.**

**PRELIMINARY INSPECTION REPORT FOR STATIC / MOBILE VENDING CART /  
PLATFORM WITH COOL CHAMBER**

- Date of Inspection :
- A Component :
- B Details of the unit** :
- (i) Name of the beneficiary :
- (ii) Address for communication with telephone No. :
- C Project Location with Address** :
- (i). Survey No :
- (ii). Village :
- (iii). Mandal :
- D Constitution (Individual / Joint Individual. :
- E (i) Proposed Activity :
- (ii) Type :
- (iii) Proposed type of cooling System :
- F Name of the Promoter :
- G Present physical status of the unit :**

Promoter      Horticulture Engineer      Horticulture Officer      Asst. Director of Horticulture

**FORMAT TO CONDUCT FINAL AND JOINT INSPECTION FOR STATIC / MOBILE  
VENDING CART / PLATFORM WITH COOL CHAMBER BY THE COMMITTEE UNDER  
POST HARVEST MANAGEMENT COMPONENT OF MIDH, A.P.**

**1) GENERAL INFORMATION**

- 1) Name of the Unit with full address :  
(Sy. No. / Area / Village / District)
- 2) Date of Issue of Administrative Sanction :
- 3) Name of the beneficiary :
- 4) Constitution: Individual / Group of Individuals :
- 5) Date of Inspection of the Unit :
- 6) Name & Designation of the Committee members :
- (a)
- (b)
- (c)
- (d)
- 7) Name of the Bank (with Full address & :  
Phone & Fax No.) :
- 8) Date of start of the unit :
- 9) Date of Completion of the unit :

**Name & Signature  
of Applicant**

**Name & Signature  
of Expert**

**Name & Signature  
of Inspecting Officer  
(Bank)**

**Name & Signature  
of ADH concerned**

**Name & Signature  
of Senior Officer  
from MIDH**

**AFFIDAVIT (Rs. 100/- Stamp Paper )**

I / We \_\_\_\_\_ (Name of the Promoter / Director ) son of \_\_\_\_\_ ( Father's Name) resident of \_\_\_\_\_ (residence address) do hereby solemnly affirm and declare here under.

- 1) That I am the director of \_\_\_\_\_,( name of the beneficiary ) having its registered office at \_\_\_\_\_, ( office address of beneficiary ) and am fully aware of the facts relating to the setting up the project at \_\_\_\_\_ ( location of the project ) for \_\_\_\_\_ ( activities to be undertaken by project ) and the application made to MIDH for availing assistance under Developmental Schemes - \_\_\_\_\_
- 2) That the terms and conditions of the scheme of MIDH under which an application has been made by the applicant have been properly read and understood by me and I affirm that the project / proposal / scheme comply with the terms and condition of MIDH and the application has been made in the correct applicable scheme.
- 3) That the proposed activities to be undertaken by the project / proposal / scheme are covered under the above scheme of MIDH and no part of the scheme / infrastructure of the project is designed or assigned to be used for any activity other than the activities specified in the application at present or in the near future.
- 4) That the information provided in the application for availing assistance under developmental schemes - \_\_\_\_\_ is true and correct to the best of my knowledge and belief. The estimates of the cost of project / proposal / scheme, financial viability and operating results have been worked out / computed as per the rule and generally accepted principles and norms in this regard.
- 5) No Subsidy / grant-in-aid has been availed by the promoters / directors / partners / proprietors for this new project and component thereof from central Govt. or any of its agencies.

- 6) I / We also solemnly affirm that the proposed activity in the application for availing assistance under development schemes - \_\_\_\_\_ is a completely new activity and not a pre – existing activity or any component thereof and further I assure that the unit will be utilized for the same activity for which the assistance is sought from the MIDH through State MIDH Cell of Andhra Pradesh for the economic period of 15 years. In case, if the unit is misused I am liable for any action deemed to be fit by the Govt. of Andhra Pradesh including recovery of the assistance amount extended. The information furnished in the application dated \_\_\_\_\_ is true to the best of my knowledge and belief and nothing material has been concealed.
- 7) In case of concealment of any facts in this regard, the MIDH would have right to cancel my application out right at any stage.
- 8) I will display a sign board depicting “Department of Horticulture“ (MIDH, Assisted Project).
- 9) The release of subsidy is subject to actual expenditure, receipts, inspection, MIDH norms etc., In case of any discrepancy / dispute the decision of the Mission Director & Director of Horticulture is final.
- 10) I agree and resolve that the department reserves the right to modify, add or delete any term/ condition without assigning any reason thereof and shall also have right to pre and post inspect / monitor the project and verify the related records at any time during the economic life of the project by the concerned officers.

#### DEPONENT VERIFICATION

Verified on solemn affirmation at \_\_\_\_\_ that the content of the above affidavit are true to the best of my knowledge and belief and nothing material has been concealed.

DEPONENT / COMPETENT AUTHORITY

(to be Signed by Notary with seal )