

Green Houses/ Polyhouses

A. Technical specifications for naturally ventilated Poly House.

**** Products with BIS standards only are accepted.**

Items	Description / specifications		
Product	Naturally ventilated green house/ Poly house		
Size	The following 4 slabs are proposed in the programme a. 200-560 sq.mts b. 560-1008 sq.mts c. 1008-2080 sq.mts d. 2080-4000 sq.mts and above.		
Orientation	Preferably North South gutter direction		
Width of each bay	8 meters		
Distance between consecutive column pipes	4.0 m		
Ridge (Central) height	Area (m ²)	Plane land (m)	Hilly area (m)
	200-560	6.5	6.25
	560-1008	6.5-7.5	7
	1008 to 4000	6.5-7.5	7 to 7.5
Ridge vent	1.0-1.2 m vertical height and 1.3 to 1.5 m slanting height; roof ventilator should be provided in slanting position.		
Gutter height	4 mt- upto 560sq.mts Poly house and 4.0 - 4.5mt from 1000sq.mt onwards from the ground level (based on area of green house and climatic conditions)		
Gutter slope	1.25-2%		
Longitudinal slope	0-2%		
Gutter material	2 mm thick and 450 mm width GI Sheet with perimeter of 450 mm and with industrial press, 100% leakage proof of galvanized sheet minimum of 275 GSM (grams per sq.mt.) Zinc coating.		
Structural design	Gothic shape with roof and side ventilation. The structure is designed to be enough to with stand wind speed minimum 120 km / hour. It is to provide provision for opening one port at either side for entry of small tractor / power tiller for inter cultural practices.		
Structure	Complete structure made of hot dip galvanized steel tubular pipes with a minimum of 360 GSM (with Zinc coated on continuous procedure to meet the quality requirements or equivalent section confirming). BIS standards having wall thickness 2mm; structural		

Items	Description / specifications
	member should be joined with fasteners (HOT Dip Galvanized nuts and bolts) Properly.
Columns	76mm OD,2mm thick. Hot Dip 360GSM GI.
Trusses of 8 m long preferably without joints for better load bearing.	Bottom cord 60mm OD, 2mm thick, 8 mt. long, Hot Dip 360 GSM GI.
Trusses member/ Arch's	50mm OD with 2mm thickness. Bracing 33mm OD with 2.0mm thickness G.I. Pipe Structural members to be fitted in plated nuts, bolts and washers without welding. (33 mm bracing to increase the strength and to with stand vertical and horizontal pressures.)
Stay/ Hockey pipes	60mm OD with 2mm thickness, fixed in the ground without any joints and welding at a distance of 2.5 m.
Purline	48 mm OD with 2.0mm thickness at ridge gutter arch and 42/43 OD with 2.0 mm thickness for 2 nd purline.
Purline member and other	43 mm,2mm thickness
Horizontal bracings	42mm OD with 2mm thickness horizontal bracing 2 No's must provide each bay in both sides.
Cross Bracing	Every 3 rd column top to 2 nd column bottom of both sides must be connected 42mm OD with 2mm thickness GI pipe to ground the wind load. (In vegetable Poly houses to take the weight of the crop and transfer the wind pressure cross bracings are essential).
Bottom to pillar Bracing	33mm OD with 2mm thickness 1.2m long bracing to be fixed from pillar to bottom.
Foundations	Insert GI Pipes of minimum 76mm OD 3mm thickness with 1mm tapered top 1ft. or more to have foundation depth of not less than100cm or more depth depending upon soil type and prevailing wind condition, grouted with cement concrete mixture of 1:2:3 using telescopic insertion of column. (or) GI Pipes of minimum 60 mm OD & 3mm thickness (@4.20 kg/m)
Fasteners	All nuts and bolts must be of high tensile strength and HOT dip galvanized.
Entrance room Indoor (not required upto 560 sq.mt. from 1000sq. mts it is required.)	One entrance room of size 3x3x2.5 mts. (LxWxH) need to be provided and covered with Poly carbonate UV stabilized transparent with sliding arrangement. Outer hinge door of size 1.5m width and 2.5m height and sliding type.
Cladding material (Poly film)	UV stabilized 200 micron 5 layers co-extruded anti drip/mist, anti dust, diffused/ IR blocking (sulphur resistant for Rose) having minimum 85% level of light transmittance.
Fixing of cladding materials	All ends/ joints of plastic film need to be fixed with two way aluminium (220grams/RM) / GI with 0.6 mm thickness profiles with suitable locking arrangements

Items	Description / specifications
	along with curtain top. Fixing of cladding material shall be done between 11.00 AM to 3.00 PM
Spring insert	Zig zag spring high carbon steel with spring action wire, galvanized of 2-3 mm diameter must be inserted to fix shade net/ Polyfilm/ insect proof net into aluminium / GI profile.
Curtains and insect screens (mono x mono is nylon fibre, inter locked, woven mesh, more life)	<p>i) UV stabilized 200 micron 5 layers co-extruded transparent plastic film should be provided as curtains on all sides having manual operated crank mechanism.</p> <p>ii) 40 mesh (115 to 120gsm) nylon /shade insect proof nets (UV stabilized), of 4.5 mts height above all four sides upto gutter height (crop specific).</p> <p>iii) 50% Mono x Mono shade net of 125 GSM, should be fixed at side ventilators below the curtains. Rollup side GI pipes with uniform thickness throughout the side length of GH are suggested to ensure smooth functioning of the curtain.</p>
Shadenet	UV stabilized mono x mono 50 % (115 to 120gsm) shading net has to be provided horizontally at gutter height, below the UV sheet – inside the greenhouse with manually operated mechanism for expanding and retracting. The area covered by shade net should be equal to the net cultivable area of green house without sagging.
Side apron	UV stabilized HDPE woven fabric, not less than 200 GSM thick for a height of 60cm and 40 cm buried below ground vertically and 20cm horizontally. (HDPE woven fabric of 200 GSM will have more stability and with stand the pressure of upward as well as horizontal wind better than the polythene film)
Erection of Trellies	For cultivation of Capsicum, Tomato and Cucumber, GI wire of 80 GSM of 4 mm (8 guage) along the gable & 2.5 mm (12 guage) along the gutter with 16 lines per gable to be fixed over the beds in horizontal/ vertical direction.
Rain water harvesting	Provision of PVC pipe of min 5” diameter with the lateral and ground support pipe with bend should be made, from gutter to ground for collecting rain water from the roof top. Drainage gutter and end caps to be provided.

* Hard surface path of 1 mt. wide is to be provided to facilitate the movement in the poly house

B. After sales services (the firm have to provide)

Warranty	Warranty for 5 years from the date of installation for structure excluding poly film and net and for poly film 3 years warranty for all material and installation defects on pro-rata basis
Training	Free training for operation and maintenance for one year.
Testing	Testing of both structural and plastic materials used in the green house should be tested by the NTH & CIPET or any other agencies for quality assurance (not older than 6 months report).

C. MI Component

Indicative Quantity of Material of Drip/Fogging System in Polyhouse/ Net House (as per the crop requirements)

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Sl.No	Description of Items	Unit
A	Drip System	
1	Main and Sub-main Line PVC 63 mm x 4 kg/cm ²	Meter
2	Main Line PVC 75 mm x 4 kg/cm ²	Meter
3	16mm LLDPE Lateral line CL-2	Meter
4	Inline 16mm PCND, 1.3 to 2.4LPH @ 20-40 cm CL2	Meter
5	Ball Valve 63 mm (Moulded Seal, Plain)	Nos.
6	Ball Valve 75 mm (Moulded Seal, Plain)	Nos.
7	Sub-main Flush Valve 40mm	Nos.
8	Sub-main Line for Flushing 40 mm X 6 kg	Meter
B	Fogging Machine	
1	Main and Sub-main Line PVC 50 mm x 6 kg/cm ²	Meter
2	Main and Sub-main Line PVC 63 mm x 6 kg/cm ²	Meter
3	16mm LLDPE Lateral line	Meter
4	4 way Fogger Assembly with HP LPD	Nos.
5	Ball Valve 50mm (Teflon Seal, Plain)	Nos.
6	Ball Valve 63mm (Teflon Seal, Plain)	Nos.
7	Sub-main Flush Valve 40mm	Nos.
8	GI Wire 2mm thick	Meter

9	Sub-main Line for Flushing 40 mm X 6 kg	Meter
C	Filtration Unit	Nos.
1	Disc filter 25 m3/hr	Nos.
2	Disc filter 40 m3/hr	Nos.
3	Sand filter 10 m3/hr	Nos.
4	Sand filter 25m3/hr	Nos.
5	Sand filter 40 m3/hr	Nos.
6	Manifold GI + GMV	Nos.
7	Ventury Assembly Complete	Nos.
8	Air Release Valve Assembly 1"	Nos.

Note:

1. For any additional/optional item that is fitted/provided in structure by firm with the consent of farmer that shall not be part of cost norms*.
2. The list above under MI component is tentative. However, the actual material to be used at site may vary as per structural design requirement and this will be binding to the firm.

**** The above specifications are indicative only and Commissioner of Horticulture, Government of Telangana may add or delete or modify any term & condition as per requirement and in public interest and as recommended by the committees constituted by Govt. of Telangana.**

D. Payment terms:

The mode of payment to farmers and empanelled companies shall be in following 3 stages

I stage – 35% payment after foundation and delivery of material (includes 25% farmer share+10% subsidy amount)

II stage – 50% payment after installation and inspection of Greenhouse

III stage – 15% payment after 3rd party verification

E. Penalties:- Penalty will be imposed for the below mentioned reasons other than departmental failures at following rates.

Time of completion for installation of polyhouses

- a. Polyhouses of area upto 1.00 acre – 60 days from the date of TPA
- b. Polyhouses of area 1.00-3.00 acre – 90 days from the date of TPA

S.No	Item	Penalty in Rs.
1.	Delay in erection of Poly house	Upto 2% of project cost at the time of final payment made to the farmer
2.	Erection of Poly House Structure with faulty design	The structure should be re-laid by the concerned contractor / firm on their own cost within a period of 30 days from the date of complaint received from the farmer/department. A penalty of Rs.70/- per square meter shall be paid to the farmer by the concerned contractor /firm. If the firm does not respond then the penalty shall be recovered from the firm and necessary action shall be initiated against the firm.
3.	Supply of Sub-standard Material	The material shall be replaced as per the technical specifications by the concerned contractor / firm on their own cost within a period of 30 days from the date of complaint received from the farmer/department. A penalty of Rs.140/- per square meter shall be paid to the farmer by the concerned contractor /firm. If the firm does not respond than the penalty shall be recovered from the firm and necessary action shall be initiated against the firm.
4.	Deficiency in After Sales Service	The firm/ contractor shall attend to the complaint within 15 days from the date of complaint received from the farmer/ department. A penalty of Rs.5000/- shall be paid to the farmer by the contractor /firm. If the firm does not respond than the penalty shall be recovered and necessary action shall be initiated against the firm.
5	Agronomic/ agril. Engineering support	Firm shall provide agronomic/ agriculture engineering support invariably to farmer for a period of 3 years

Net Houses

A. Technical specifications for Flat Roof Net House with Cable Purlin

**** Products with BIS standards only are accepted.**

S.No	Particulars	Description
1	Area in Sq.m	2025 & 3965
2	Length of the structure	As per design
3	Width of the structure	As per design
4	Grid	8m x 5m
5	Straight corridors	2.5 m on all sides for area calculation

S.No.	Item	Indicative Specifications
1.	Grid Size (Spacing)	8 x 5 m
2.	Centre Height	4.0 m in case of flat structure.
3.	Main Column	1. All outer columns 90 mm OD/SHS 60x60, 2.5 mm thick, height of pole 4 m 2. Inner column 60 mm OD/ SHS 50x50, 2mm thick, height of pole 4 m.
4.	Balcony	Width 2.5 m, Supported with RHS 40x20, 2 mm. Provisions for fixing the Insect Net all around structure shall be made on these members.
5.	Structure cable wires	5mm or 6 mm dia (with 1/19 or 7/19 construction) main cables across and along all the gables on top of the structure.
6.	Clamps	Clamps- triple wire connector, 6mm thick wire cable clamp.
7.	Nut Bolts	All nuts & bolts should be hot dip galvanized and as per the requirement
8.	Accessories	as per the requirement
9.	Insect Proof Net	40 Mesh (120 GSM) (white colour) UV stabilized Insect proof net on all sides made from virgin raw materials upto a vertical height of 3m (Slant Height of 3.6 m above Ground level)
		Roll up rod with worm gear on two opposite sides (East and West sides of the structure) within the top 1.2 m for opening and closing of shade net.
10.	Monofilament Shade net	35% shade factor – monofilament net on top (approx. shade % is 35%) 120 GSM/ white/black/green-black color/5.2m.
		35% shade net - monofilament on upper portions of sides top 1 m vertical height, (Slant length 1.2m), 90 gsm, white colour
11.	Second layer of Net	35% shade, Tape type white Coloured with 90 GSM, within 50 cm below top layer
12.	Retraction unit	For manual spreading and removing of second layer of shade net made of pulleys and PP rope of 8 mm UV stabilized (at 4 parts for 0.5 acre).
13.	Trellis	4 mm thick (7/19 or 1/19) double layer in a zig-zag fashion main

S.No.	Item	Indicative Specifications
	system	cable at both gable ends/sides 5 mm thick base cable internally and 2.5 mm thick, GI Wire above the beds (two strands per bed). All poles are connected from top with 5 mm cable and 4 mm spotting wire is connected with all poles. Trellising system has to be connected to balcony foundation.
14.	Entrance & Anti room	Entrance - G.I. frame with 40 mesh insect net, 2.50 m x 2.00 m (Anti room of size 4m (L) x 2.5m (W) x 2.0m (H) with two no. of doors (1.2 m x 2.0 m size) opening diagonally covered with insect net (with 75 mm PCC flooring). (Door is independent of main structure). One side slope of 1m for the roof covered with polyfilm. Provision of all drop lock.
15.	Tractor entry	It is a separate structured frame entry with a minimum entry width of 2.7m and minimum height of 2.7m with stainless steel hinges. Framed flaps fixed with all drop locked entry. Door frames with required sizes shall be made openable horizontally/vertically.
16.	Flooring	Human entry room with 75 mm PCC flooring with dimensions of 4m x 3m
Civil Works		
1.	Foundation	Outer anchor(lip-C profile): 1.80 m depth, 40 cm diameter, PCC of CC ratio (1:2:4) Outer column foundation: 45(L) x 45 (W) x 30 (D) cm, PCC bed with CC ratio (1:2:4)
2.	Balcony/ Hockey foundation	3 mm lip-C profile, hot dip galvanized, 1.2 m length.
Micro Irrigation system		
1	Micro Irrigation system	Same as polyhouses

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Note:

1. All the GI material should be of 360 GSM including nuts and bolts.
2. All the GI cables and ropes with a minimum of 70 GSM
3. Farmer has a choice to go for second layer of Net with 40% indoor quality thermal screen. Additional Cost for this shall be borne by the farmer @ Rs.90/- per sq.m of thermal screen With automated retraction unit @ Rs.1.00 lakh per unit.
4. For any additional/optional item that is fitted/provided in structure by firm with the consent of farmer that shall not be part of cost norms*.
5. The list above under MI component is tentative. However, the actual material to be used at site may vary as per structural design requirement and this will be binding to the firm.

c. After sales services (the firm have to provide)

Warranty	3 years warranty from the date of installation for structure including net
Training	Free training for operation and maintenance for one year.
Testing	All plastic materials used in the net house should be tested by the CIPET for quality assurance (not older than 6 months report)

The firm has to provide the after sales service on the following items on free of cost.

1. Any type of technical defect.
2. Leakage in MI system.
3. Tightening of nut, bolts/fasteners.
4. Rusted fasteners/nut-bolts/steel parts

D. Penalties:- Penalty will be imposed for the below mentioned reasons other than departmental failures at following rates.

S.No	Item	Penalty in Rs.
1.	a. Delay in erection of Net House b. Erection of Structure with faulty design c. Supply of Sub-standard Material	2% of project cost at the time of final payment made to the farmer

E. Payment terms:

The mode of payment to empanelled companies shall be in following 2 stages
I Stage - 50% release on the total cost (including non-subsidy collected from farmer) after completion of foundation & delivery of material at site and inspection by JIT.

II Stages - 50% release after JIT inspection along with the Third party and after receiving JIT Report & 3rd party verification report and successful completion certificate from the farmer

F. Subsidy norms of the State Government

Sl.No	Slabs (Sq. Mt)	Unit cost per Sq. Mt. (Rs)	Subsidy per Sq. Mt. (75%) (Rs.)	Subsidy per Sq. Mt. (95%) (Rs.)
1	Upto 2025	538	403.50	511.10
2	2025-3965	488	366.00	463.60

All the terms and conditions along with the price schedules and approved structural designs as above form part of this agreement will be implemented as per the instructions of Commissioner of Horticulture, Hyderabad issued from time to time.

Implementation Guidelines

Non- Negotiables for Implementation of the Programme:

- All farmers are eligible for the programme.
- Ratio under SCP & TSP shall be followed as per State norms.
- Owner ship of the land should be with the applicant for availing the subsidy.
- Quantified irrigation source and electrification are mandatory.
- 3rd party verification before payment of final release is a mandatory.
- NABCONS is the appointed agency for 3rd party verification.
- Application received first will be given seniority.

ELIGIBILITY CRITERIA FOR APPLICANT:

- Minors are not eligible.
- Farmer means a person having land ownership in one's name. For this he has to submit Land Records.
- Original *Title deed and Pattadar Pass Book* Land verification report by *MRO*. All the documents submitted shall be latest not more than three months old. (attested copies)
- Farmer includes farmer's family, means husband, wife and their minor children. Inspecting authority shall confirm the family duly after verification
- New Farmers have to be given priority for issuing administrative sanction.
- Government employees and their dependent families are not eligible to avail the scheme

Training:

- Selected beneficiaries shall undergo training of minimum three days i.e. training-cum-workshop on Construction and Maintenance of Poly houses/ shadenet houses, Cultivation of high value crops.
- A certificate to this effect shall be issued by HTIs. Training certificate is mandatory before release of assistance.

Basic Requirements for Execution of Precision Farming Components:-

- Approach road connectivity is a must.
- Soil suitability for erection and construction of structure and as well as drainage.
- Wind breaks in the farmers site is must.
- The site selected for execution of project should be free from shade.
- The site should be at a higher level than the surrounding land with adequate drainage facility.
- pH of the irrigation water should be in the range of 5.5 to 7.0 and EC less than 1 milli mhos/cm,
- Soil used for propagating material / media should be in the range of 5.5 to 6.5 pH and EC less than 1 milli mhos/cm.
- In case of high EC farmers has to take necessary measures to maintain the EC as per the crop requirement. If EC & PH are not within the limits Poly house cultivation is not possible.
- The structure should withstand to the minimum wind velocity of 80.6 miles per/hr or 120 km / hour or 36 Meter per second for polyhouse component.
- Soil and water analysis reports from reputed labs are also to be enclosed to the proposal.(mandatory)
- Farmer/Firm is responsible for the execution of any component under the projects.
- A display board depicting “Department of Horticulture, Government of Telangana” shall be displayed at the site with name, survey no., Village, Mandal, sanction proceedings number, date, poly house extent (area), name of the firm and address, year of construction of Poly house.
- Subsidy will be released through online transfer to the farmer/ empanelled firm/Bank after joint inspection by the committee members.
- 3rd party verification will be done independently along with JIT for 50% release.