

STUPPY, INC.

GREENHOUSE DESIGN  
MANUFACTURING &

# GREENHOUSE TECHNICAL SPECIFICATIONS



## GRANT WRITING TIPS

The thought of having to write a grant can seem like the most overwhelming task you have been faced with as a teacher. We have tried to compile a few tips that we have come across. If you have any to add, please do so. We hope that you will find this information beneficial to your project.

- Read the grantor's guidelines and instructions carefully. Do not try to make the grantor's program fit what you want to do.
- Ideas should be innovative, creative and educational. Try proposing a project that puts a fresh spin on an existing idea.
- Keep your goals realistic. It is important to have an evaluation plan. Grantors want to know if the projects they fund are successful.
- Clarity in communicating your ideas is very important. Have someone who is not involved in the project read and critique your draft application.
- If your project is rejected, ask the grantor or reviewer for comments. These comments can offer invaluable tips for improving your future grant applications. Never forget to write thank you notes—even if your project is not funded initially.

### Components of a Proposal

Most grantors expect to see the following components in a grant proposal:

1. **Summary.** Included a brief summary of the project for which you are requesting funding. You should describe your project in three to four sentences.
2. **Introduction.** What qualifications do you have to administer the program/funds for which you are asking. Introduce your organization
3. **Statement of Need.** Use facts to describe the needs your organization has that the proposed project will address.
4. **Objectives.** Describe the major ways the project is expected to impact your goals and the organization's needs.
5. **Methods.** How are you going to accomplish the objectives of the program?
6. **Evaluation.** What methods will you have in place to monitor the success of your program?
7. **Future Funding.** How will your organization continue this program when the grant ends?
8. **Budget.** Clearly list costs borne by the grant. Be as accurate as possible.



**Stuppy, Inc.**  
**CS3 Greenhouse Specifications**

**I. SECTION 13123 – GREENHOUSE SYSTEMS**

**A. PART 1 – GENERAL**

**1.1 Documents**

- a. Drawing \_\_\_\_\_
- b. Drawing \_\_\_\_\_
- c. Drawing \_\_\_\_\_

**1.2 Description**

- a. The greenhouse shall be a CS3 manufactured by Stuppy Greenhouse Manufacturing, Incorporated in North Kansas City, Missouri.
- b. The greenhouse shall be furnished and installed according to specifications and drawings.
- c. Greenhouse dimensions are \_\_\_\_ feet wide by \_\_\_\_\_ feet long.
- d. No equipment or materials should be ordered or fabricated prior to approval of shop drawings.
- e. If another model of greenhouse is substituted, the manufacturer shall apply for permission to quote 14 days prior to bid date and submit sufficient shop drawings to the owner (architect) for written approval prior to bid.

**1.3 Plans and Submittals**

- a. Design Criteria
  - 1. Greenhouse frame shall be designed to meet local building code.
  - 2. Provide structural prints and calculations sealed by a registered professional engineer in the state of \_\_\_\_\_.
  - 3. Provide complete shop drawings, including the placement of equipment, covering, and doors.

**1.4 Erection of Greenhouse**

- a. A qualified greenhouse specialty greenhouse contractor approved in writing by the manufacturer shall erect the greenhouse.
- b. The greenhouse contractor shall have at least five (5) year's experience in building greenhouses of the type specified.
- c. The General Contractor shall have all site conditions correct and ready prior to greenhouse erection.
- d. No masonry, foundation. or footer installation shall be done prior to approval of greenhouse plans.

## **PART II – MATERIALS AND EQUIPMENT**

### **2.1 Structure**

- a. Approved manufacture is Stuppy Greenhouse Manufacturing, Incorporated – 1212 Clay, North Kansas City, and Missouri 64116 – (800) 733-5025.
- b. The greenhouse will be a CS3 with column and truss spacing as designated by local code.
- c. Sidewall height shall be \_\_\_\_-feet.

### **2.2 Components**

- a. Primary Structural Steel Members
  1. All steel members shall comply with ASTM A500 dimensional tolerances.
  2. Steel will meet Allied Tube and “Gatorshield” specifications for corrosion resistance.
  3. Columns shall be fabricated from 4 inch by 2 inch steel or 4 inch by 4inch steel with minimum yield strength of 50,000 psi.
  4. Truss top cords will be fabricated from 3 inch by 2-inch steel with minimum yield strengths of 50,000 psi.
  5. Truss bottom cords will be fabricated from 3 inch by 2-inch steel with minimum yield strengths of 50,000 psi.
  6. Id strengths of 50,000 psi.
  7. Truss webbing will be fabricated from steel with minimum yield strengths of 50,000 psi. Truss webbing will be attached to top and bottom cords with aluminum connections to enhance corrosion resistance. (Standard is 1.5” square tubing)
  8. Roof purlins will be 3 inch by 2-inch steel. Purlins will have a bolted connection to trusses.
  9. Endwalls will be framed with 3 inch by 2-inch rectangular steel tubing with minimum yield strength of 50,000 psi.
  10. Gutters are to be extruded aluminum
  11. No wood members are required or allowed to complete structure.
  11. No rolled form pipe or round columns allowed.

### **2.3 Doors and Door Frames**

- a. Doors to be 42 inches wide by 84 inches tall steel insulated ADA approved doors. A minimum of two doors to be equipped with both lever lock and panic bar LHL-5.
- b. Lock sets are to be included in hardware package
- c. Doors are to comply with ANSI A250.B, Level 3.
- d. All doors should be furnished with appropriate framing and hardware.

## 2.4 Ventilation Equipment

- a. Horizontal Air Flow Fans – Acme HAF20A fans. Quantity of \_\_\_\_ to be installed.
- b. Exhaust Fans – Cool Air \_\_\_\_\_ - Quantity of \_\_\_\_\_
  1. Fans must include automatic shutters, inlet/outlet guards, slant wall housings and belt tighteners.
  2. Exhaust fans and horizontal air flow fans are to be manufactured by Acme Engineering, Inc.
  3. Exhaust fans are to have aluminum fan blades.
  4. Steel propeller fans are not acceptable.
- c. Inlet Vents and Vent Operators
  1. A single run of vents shall be made up of a top rail and bottom rail of extruded aluminum and bolted together in accordance with manufacturer instructions. All vents shall have provisions made at the hinge point to prevent creeping of the vents. Vent size to be \_\_\_\_\_"tall and \_\_\_\_\_' long. Vent opener to be manufactured by Wadsworth Controls.
  2. Motorized Inlet Shutter  
\_\_\_\_\_inlet shutters are to be provided, Shutter's to be installed in the upper gable of structure. Motor and linkage to operate shutters (s) is to be included. Shutters and motor/linkages are to be manufactured by American Coolair.

## 2.5 Heating Equipment

- a. Greenhouse is to be equipped with \_\_\_\_\_ Modine power vented heaters Quantity of \_\_\_\_ sized appropriately for size of greenhouse and location.
- b. Heaters are to have stainless steel burners and exchangers.
- c. Heaters with aluminum heat exchangers are not acceptable.
- d. Double walled stacking is to be included as well as appropriate heater hangers to mount the heaters.

## 2.6 Cooling Equipment

- a. Evaporative pad system will consist of pads made of cross-fluted cellulose paper; aluminum distribution and return system complete with pump and return tank.
- b. Distribution and return system to be Stuppy Swamp Thing® system as manufactured by Stuppy Greenhouse Mfg., Inc.
- c. Size of system to be determined upon size of greenhouse.
- d. No wood support stringers are allowed.

## **2.7 Environmental Controls**

- a. Automatic control system capable with a minimum of two stages of heating, set point, and four stages of cooling. Controller to be equipped with decondinsate sensor. Controller is to be complete with contractor panel and wiring diagram.
- b. Thermostat control is not acceptable.

## **2.8 Covering Material**

- a. Roof, sides, and ends to be covered with double walled polycarbonate. GE Lexan Thermoclear 8MM.
- c. Polycarbonate panels are to be of virgin resin. Regrind is not acceptable.
- d. Polycarbonate panels must carry a minimum warranty of 5 years against yellowing.

### 3.1

## **PART III – EXECUTION**

### **3.2 Warranty**

- a. Greenhouse shall have a warranty period of one year for defects of structural and glazing installation. Equipment in the greenhouse will carry the manufacturer's standard warranty for parts. Covering's will also carry the manufacturer's standard warranty.

### **3.2 Instruction**

- a. Approved representative of the greenhouse manufacturer to visit the job site a minimum of one time during construction to meet with building erectors and once after construction to meet with the owner.
- b. If school is constructing greenhouse or trailer drop option is not selected, it is recommended to have a representative visit the job site prior to start of construction to assist in the identification of materials.

## **PART 1 – GENERAL**

### **1.1 Description**

- a. The greenhouse shall be furnished and installed according to specifications and drawings.
- b. Greenhouse dimensions are \_\_\_\_ feet wide by \_\_\_\_ feet long.
- c. Greenhouse is to have an 8 foot sidewall height and a low profile roof line with a ridge height of 16'3".
- d. Bow and truss spacing is to be 6' on center.
- e. Greenhouse roof is to have five (5) runs of 2" square tubing.
- f. No equipment or materials should be ordered or fabricated prior to approval of shop drawings.

### **1.2 Plans and Submittals**

- a. Design Criteria
  1. Greenhouse frame shall be designed to meet local building code.
  2. Provide structural prints and calculations sealed by a registered professional engineer in the state of Arkansas.
  3. Provide complete shop drawings, including the placement of equipment, and doors.

### **1.3 Erection of Greenhouse**

- a. A qualified greenhouse specialty greenhouse contractor approved in writing by the manufacturer shall erect the greenhouse.
- b. The greenhouse contractor shall have at least five- (5) year's experience in building greenhouses of the type specified.
- c. The General Contractor shall have all site conditions correct and ready prior to greenhouse erection.
- d. No masonry, foundation, or footer installation shall be made prior to approval of greenhouse plans.

## **PART II – MATERIALS AND EQUIPMENT**

### **2.1 Components**

- a. Primary Structural Steel Members
  1. All steel members shall comply with ASTM A500 dimensional tolerances.
  2. Steel will meet Allied Tube and Conduit "Gatorshield" specifications for corrosion resistance.
  3. Columns shall be fabricated from 2.875" o.d. 13-gauge high strength alloy steel with minimum yield strength of 60,000 psi.
  4. Truss top cords will be fabricated from 1.90" o.d. steel with minimum yield strengths of 50,000 psi.

5. Truss bottom cords will be fabricated from 1.66" o.d. steel with minimum yield strengths of 50,000 psi.
6. Truss webbing will be fabricated from 1.315" steel with minimum yield strengths of 50,000 psi. Truss webbing will be attached to top and bottom cords with aluminum connections to enhance corrosion resistance.
7. Truss to column connections will be made with Stuppy Rainbow Plus® connections that are hot dipped galvanized after fabrication.
8. Truss will be 1.315" o.d. steel with swedged ends for continuous connections. Purlins will have a bolted connection to trusses.
9. Roof purlins will be 2 inch by 2-inch steel. Purlins will have a bolted connection to trusses.
10. Gutters are to be concealed ASTM B221 extruded aluminum, sized in accordance with SMACNA Architectural Metal Manual, Chapter 1 using 100-year storm.
11. Endwalls will be framed with 3 inch by 2-inch 15 gauge steel tubing with minimum yield strength of 50,000 psi.
12. No roll form or sheet metal parts are to be used.
13. No wood members are required or allowed to complete structure.

### **2.3 Doors and Door Frames**

- a. Doors to be 42 inches wide by 84 inches tall steel insulated ADA approved doors. Two doors to be included.
- b. Lock sets are to be included in hardware package
- c. Doors are to comply with ANSI A250.B, Level 3.
- d. Hardware is to be furnished and installed by greenhouse supplier/contractor
- e. All doors should be finished with appropriate framing around openings.

### **2.4 Ventilation Equipment**

- a. Horizontal Air Flow Fans – Quantity of \_\_\_\_ to be installed.
- b. Exhaust Fan – Quantity of \_\_\_\_ to be installed.
  1. Fans must include automatic shutters, inlet/outlet guards, and belt tighteners.
  2. Exhaust fans are to be manufactured by American Coolair.
  3. Horizontal air flow fans are to be manufactured by Acme Engineering, Inc.
  4. Exhaust fans are to have aluminum fan blades.
  5. Steel propeller fans are not acceptable.
  6. Ventilation equipment to be properly sized to meet the required CFM amounts.
- c. Motorized Inlet Shutter
  1. Shutter to be installed in upper gable of structure. Motor and linkage to operate shutter (s) is to be included.



d. Inlet Vents and Vent Operators

1. A single run of vents shall be made up of a top rail and bottom rail of extruded aluminum and bolted together in accordance with manufacturer instructions. All vents shall have provisions made at the hinge point to prevent creeping of the vents. Vent size is to be \_\_\_\_\_
2. Vent opener is to be included.

**2.5 Heating Equipment**

- a. Greenhouse is to be equipped with \_\_\_\_\_ power vented Modine heaters.
- b. Heaters are to have stainless steel burners and exchangers.
- c. Heaters with aluminum heater exchangers are not acceptable.
- d. Double walled stacking is to be included as well as appropriate heater hangers to mount the heaters.

**2.6 Cooling Equipment**

- a. Evaporative pad system will consist of pads made of cross-fluted cellulose paper; self contained, PVC evaporative cooling system. This type of system eliminates having a tank of the floor.
- b. Distribution and return system to be is to be included.
- c. No wood support stringers are allowed.

**2.7 Environmental Controls**

- a. Automatic control system capable with a minimum of two stages of heating, set point, and four stages of cooling. Controller to be equipped with decondinsate sensor. Controller is to be complete with contractor panel and wiring diagram.
- b. Thermostat control is not acceptable.

**2.8 Covering Material**

- a. Roof, sides, and ends to be covered with double/single walled polycarbonate.
- b. Polycarbonate panels are to be of virgin resin. Re grind is not acceptable.
- c. Polycarbonate panels must carry a minimum warranty of 5 years against yellowing.
- d. Double walled polycarbonate must meet the following specifications:
  - i. Material to be of an 8MM thickness

**2.10 Shade Cloth**

- a. Exteriors shade cloth size \_\_\_\_\_ by \_\_\_\_\_, \_\_\_\_\_% of shade to cover roof of greenhouse.
- b. Cord and attachment package is to be included.

## **PART III – EXECUTION**

### **3.1 Erection**

- a. Erector shall be an experienced crew at installing manufacturer's product.
- b. Greenhouse shall be erected in accordance with manufacturer's drawings and instructions.
- c. Equipment shall be installed with manufacturer's installation instructions and recognized industry practices to insure intended function.
- d. The greenhouse contractor will install equipment in place.
  - i. All mechanical connections (electrical and plumbing) will be others.

### **3.1 Warranty**

- a. Greenhouse shall have a warranty period of one year for defects of structural and glazing. Equipment in the greenhouse will carry the manufacturer's standard warranty for parts.

### **3.2 Instruction**

- a. Approved representative of the greenhouse manufacturer to visit the job site a minimum of two times at the beginning, and end of construction to meet with building erectors and owners