

Brad Archote's
HOOP HOUSE (COLD FRAME) CONSTRUCTION
Step-By-Step Process

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To begin the process of erecting a hoop green house, you'll need to select a site that will allow for maximum light hours to strike the length of the structure. The site should allow for the hoop house to be set up on an east to west direction, and because of the flexibility of the materials used, the hoop house can be placed over existing garden beds or freshly prepared garden area.

I encourage planting directly in the ground rather than using raised beds or containers. This allows for the plants to survive and do well through fairly cold temperatures even though the leaves above the surface may freeze in extreme weather. The important area is at surface, and if the ground does not freeze, the plants will do well and continue to grow even in the coldest weather.

It's important to cover a sizeable enough area so that an ambient temp will be held throughout and keep the surface area from freezing. If a hoop house is too small, there is not enough mass surface to absorb enough heat to radiate off during cold nights or days. Therefore, I recommend constructing a hoop house that is at least 24' long, which provides enough mass to work really well. The size I prefer to work with is 48' long and approximately 12' 6" to 13' wide. These instructions will be given with a 48' hoop house in mind. However, the process is the same requiring only simple adjustments to accommodate the size hoop house you choose to erect.

1. Once you have your site picked and are ready to set up the hoop house, the first step is to pick a spot and drive one of your 2' pieces of rebar at least 16" to 18" into the ground, leaving at least 6" to 8" sticking up on a slight angle leaning towards the inside of your space. Then, with a 50' tape measure, hook on to your stake and pull the tape in a straight line setting the side edge that reaches to the back edge of the hoop house. Stake that back point just as you staked the first point. Then, every 4 feet, drive a piece of rebar in the ground along your tape line...just as you did your beginning and end stakes. For a 48' hoop house, there will be 13 stakes on each side.
2. Next, take a piece of 20' x 1 ¼", Schedule 40, PVC pipe and slide it over the first stake you drove into the ground. Push the PVC pipe inward making it arch into your first hoop. Get a feel for how much headroom you need, and arch the PVC until you have your desired height. Then, drive another rebar stake into the ground directly across from your original rebar stake. Slip the other end of the PVC onto the second stake and you'll see what your green house will be shaped like.

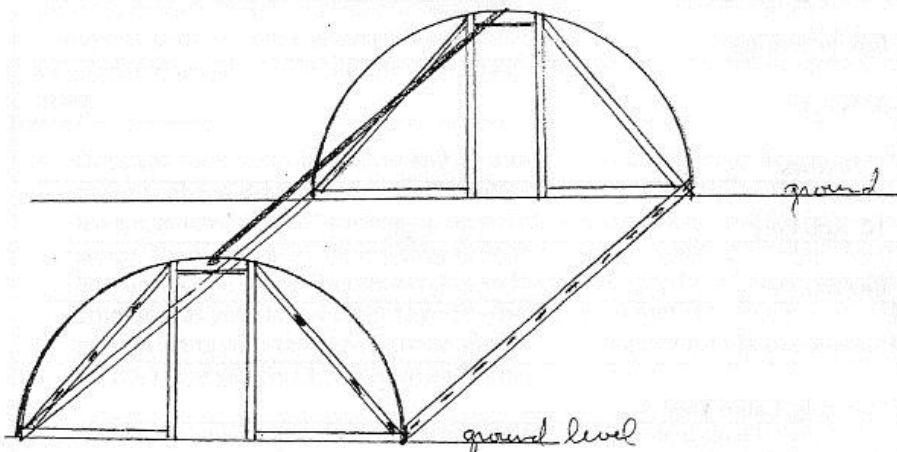
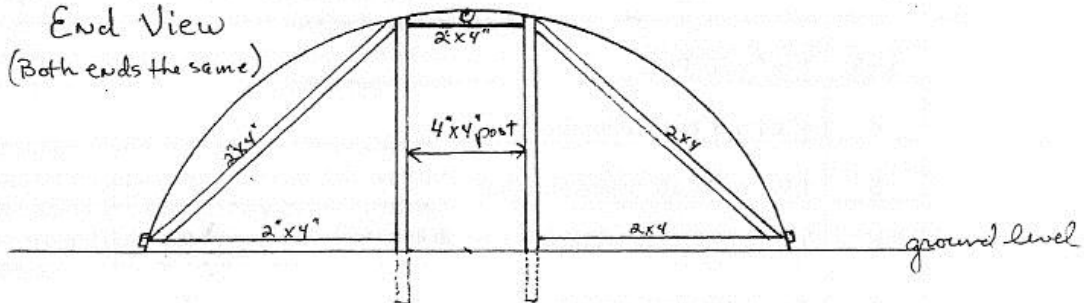
3. Now that your first hoop is in place, hook your tape measure to the second side of your first hoop and pull the tape in a straight line setting the line that reaches to the back edge of the hoop-house on the second side. Measure your width from the first end rebar stake and drive your other end stake into the ground leaning slightly inward just as you've done with the previous stakes. And, just as you did on the first side, drive a rebar stake into the ground every 4' along the edge of your tape. Slip a 20' PVC hoop onto one of your end stakes on one side and push it into an arch to slip the other end onto the end stake directly across from it. Now you have both end hoops in place to allow the lay-out to continue.
4. With the end arches in place, use a level or plumb bob to set the hoop straight upright and mark the middle on the ground between the staked out ends of your arched PVC. Measure at least 30" wide centered on the middle mark so that there is a 30" door to allow easy movement into the hoop-house with a wheelbarrow or other cart. Mark where the door way will be and dig a hole with a post hole digger (etc.) on each side of the door opening marked with the holes allowing the post to be 30" apart. Dig the posthole at least 18" deep or more. Set one of the 4x4 posts into one of the holes and stand straight up (post will be taller than the arched hoop).
5. Use a level to stand the post straight upright and hold to the PVC arch and scribe the post so that when cut on that mark, the post will fit just under the PVC arch. Cut the post and set into the hole leveling it again making sure the post will be upright and allow the door to be approximately 30" wide at the bottom. Screw the PVC arch to the leveled post from the top with the 3" screws and fill and pack the dirt into the hole around the post, tapping it firmly in the ground. Repeat with second post and make sure the door is wide enough for your needs. Proceed to opposite end of hoop-house and do the same process, creating a second doorway to allow venting on warm, sunny days. This will be needed as temps can get really hot even on cold winter days.
6. Now that your two posts are set on each end, measure across the area between the post approximately 6' high or as tall as you want the door to be. Cut measured piece from an 8' 2x4 and secure the header to the posts over the doorway with 3" screws. Now the doorway/vents are framed in, giving stability to the end arches.
7. Proceed with setting each 20' PVC arch in place all the way down the length of hoop house just as you did with each of your end arches. You'll have 2 ½, 20' lengths of PVC pipe left that you'll lay on the ground down the center length of the hoop house. You'll need to attach the PVC sections together (using glue or a 1" screw) to make a rib running down the length of the hoop house. Now, lift the rib to secure it to the roof of the hoop house. Secure one end of the PVC to the first header above the doorway by screwing through the PVC to fasten the pipe securely in place. Proceed down the length of the hoop house securing the PVC pipe to each hoop with zip-ties to allow the support rib to hold each arch in place. Once we have all of the arches secure at the 4 foot intervals, secure the other end of this 48' rib to the other end by screwing it to the header above the far end doorway with one or more 3" screws. The end of the rib will be a few inches too long. Trim this off so it's flush with your end arch. Pull zip-ties snugly and then add a second zip-tie in crisscross fashion at each position to ensure the hoops will stay in place. A screw can be used at each spot to affix the

arches to the inner rib. However, make sure the screw doesn't come through the top of the arch hoops or it will rip the cover material.

8. Along the bottom of the hoops on the outside, 2-4 inches above the ground, secure the 5/4" treated, 16' boards to each arch using the 3" screws, 2 screws at each hoop. Allow them to poke through a bit to have the board firmly fixed to the plastic pipe at each joint. Continue with each board, end to end, and even if they don't meet exactly on a hoop, simply use a screw to attach the boards, end to end, using a 3" screw. At the ends of the hoop house, make sure that the 5/4" boards are flush with the outside of the plastic hoop. If not, trim the last board off to make it flush with a circular saw, chain saw, or sawz-all.
9. Return to one end of the hoop house that was framed earlier to install remaining pieces of wood, which allow sides and cover to be securely fastened. Along the bottom near the ground, set one 10' 2 x 4 board so that one end of it is flush with the inside of your doorway post and the other extends out beyond the edge of your end arch. Next, mark the angle of the arch on your 2 x 4 so that you can match it exactly to the edge of your board when you trim it off. Trim the 2 x 4 at the angle of the arch. Afix the board to the corner of your hoop house with 3" screws, one going into the hoop itself and the other going into the front edge of the 5/4 " board. Finish attaching this piece by using 2, 3" screws to fasten it to the outside of the bottom of your upright post.
10. Next, measure a piece of 2"x4" board to go from the top of the door post down to the inside of the 2"x4" that you just secured at the bottom between the doorway and the corner of your end arch, marking the angle that it needs to be in order to be flush with the door post. Cut and secure this piece in place to the post and to the bottom 2"x4" at the point where it meets the hoop.
11. Next, go to the other side of your doorway and replicate the process you've just completed on the first side of this doorway.
12. Now, go to the opposite end of the hoop house and secure your other doorway in the same way that you just secured your first doorway.
13. Using any number of tools such as a hand saw, a jig saw, power saw, any type of cutter that will work, etc., cut your white poly fastener into 8" strips. Next, remove the male insert in order to attach the female track to the wooden board at the outside bottom of your hoops. Begin by securing the first piece of 8" female track flush with the outside end of the 5/4" bottom board. Secure each piece of track all the way to the other end of the hoop house spacing them approximately 16" apart. However, since the important thing here is to have a piece of track flush with each end, it may mean that your 8" pieces are not *exactly* 16" apart. Just space them as evenly and as close to 16" apart as possible making sure to have a piece of track flush with each of your end arches. Use at least 3, 1" screws to secure each length of poly fastener to the wood. The poly fastener needs to be applied in the same way along the ends of the hoop house on the angled piece of framing having one poly fastener piece centered at the top attached to the header above the doorway.

14. The end pieces of covering can be any grade of plastic (at least 6 mil), which can be removed just like the main cover during the heat of spring/summer. Of course, the better grade plastic one uses on the sides, the longer the plastic will last. Using the white poly fastener on the ends to secure the main cover poses a problem in the way the sidepieces need to be installed. The side plastic can't be installed over the poly fastener, as the channel of the poly fastener won't accept and fit two overlapping layers of plastic sheeting. The method here is to secure the end plastic to the wooden framing and wrap it over the back side and staple to the inside of the wooden framing as it is wrapped over the shape of the end hoop. Do this to the opposite end at this time covering door openings and pulling the plastic as tightly and evenly with no wrinkles. Staple the plastic all around the framing and also to the doorframe all around its shape. This is where the plastic will be cut to allow the door to open and be covered at the same time. With the end plastic installed, the white poly fastener can be installed on the end framing over the side plastic.
15. It's highly preferable to install the main cover on a sunny day with very little to any wind. Having a group of people - at least six - to assist is ideal. Unwrap the cover and let it lay out in the sun for a few minutes to warm up. When that's done, have at least two people, one at each end, begin to pull the cover onto the hoop frame work, pulling the cover from the ground on one side and over the hoops and to the ground on the other side. Have a couple people on the second side ready to catch hold of the cover as it comes over the hoop house...two people to stay on the original side to hold it in place there...and people on each end holding the cover in place on each end of the hoop house. The backside should have at least 3 or 4 people to hold it down once pulled over the frame. Now the people on each end can get hold of the cover directly in the middle over the doors where there is a section of poly fastener. Pulling tightly against each other to eliminate wrinkles, pull the ends over the poly fastener to allow another set of hands to insert the male strip of the poly fastener into the female. Using the roller tool, snap the insert in place.
16. Next, beginning at a bottom corner of the hoop house, have two people begin working to insert the male part of the poly fasteners into the affixed (to the bottom board) female tracks down the side of the hoop house. At the same time, a pair of people should work directly across from the first two people pulling against each other to remove wrinkles and continue this process... working toward the far end...thereby securing the cover all the way down the greenhouse length. Now the ends can also be fastened with every section of poly fastener being clipped which fastens the cover completely around its edge.
17. The last step is to put the door catches on.
18. This completes the process of installing your PVC hoop house.

End View
(Both ends the same)



Cold Frame Construction Supply List			
15.5	1 ¼ " x 20' PVC	8.45	130.98
4	4' x 4' x 8' treated lumber	6.46	25.84
3	1 ¼ " x 6" x 16' treated lumber	6.70	20.10
5	2 x 4 x 8' treated lumber	2.82	14.10
4	2 x 4 x 10' treated lumber	3.64	14.56
3	5/8" x 20' treated lumber	10.47	31.41
2	Pack Hinges	3.29	6.58
1	Box ¼' Staples	2.59	2.59
1 lb	3" Screws	2.44	2.44
1 lb	1" Screws	1.29	1.29
25'	10' Roll Poly	.41	10.25
1	Bag Zip Ties	9.00	9.00
40'	Polyfasteners (\$10 shipping included)	1.80	82.00
	Sheeting, Cable Ties	26.29	26.29
1	Mid-grade Cold Frame Cover	130.50	130.50
	TOTAL		\$507.93

RESOURCE LIST

GREENHOUSE MEGA STORE (www.greenhousemegastore.com)

Mid-grade cold frame cover, shade cloth, supplies, kits, garden-related equipment

NORTHERN GREENHOUSE SALES (www.northerngreenhousesales.com)

Hi-grade poly vinyl cold frame cover, fastening supplies

NITRON INDUSTRIES (www.gardeniq.com)

PH (501) 750-1777, Supplier of organic soil supplements, NW Arkansas

SHAKLEE DEALER IN YOUR AREA

Things like Basic-H, used to amend the soil and as insecticidal soap

BAKER CREEK HEIRLOOM SEEDS (www.rareseeds.com)

PH (417) 924-8917, in Southern Missouri

JOHNNY'S SELECT SEEDS (www.johnnysseeds.com)

Maine

PINETREE GARDEN SEEDS (www.superseeds.com)

PH (207) 926-3400