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## Basics of Chain Link Fence Construction for Large Predators

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We have been private owners of large predators for many years. After living in a rather extremely wet and moldy climate of Washington State, and now very dry Nevada, we gave up on the wooden cage posts to construct enclosures for our animals.

All our cages always were, and still are, constructed of metal posts and chain link material, which will hopefully assure a longer life for the animals' cages and habitats.

Our latest project was to add two 12 feet tall, 6 and 9 gauge chain link big cat cages, topped with V-arm barb wire. One cage was around 5000 square feet. Another cage is around 2000 square feet, attached to an existing 600 square foot cage. The sliding door operated from the outside will be eventually installed between these two cages.

We buy our material from a local chain link contractor who builds commercial and residential fences, but they also do retail sale of material to 'do it yourself' folks like us. Since tall heavy duty chain link is not the usual residential material, it often has to be special ordered, which can take few weeks, so plan ahead. While you are waiting for the delivery of the fencing, you can start preparing the soil.

This job was done mostly by one person, but in some cases, such as hanging heavy & bulky 6 gauge 12 feet tall fabric, 3 people were needed.



### SOIL PREPARATION

1. The soil around here in the Nevada desert is rocky, hard, dry, and has occasional ditches caused by heavy rains when the soil can't absorb all the water. Mark the cage perimeter with paint or chalk.



2. To level the ground for the cage perimeter fencing, we rented skid steer from the local heavy equipment place (not the bobcat brand), and got to work.



3. A, B  
We also rented auger attachment for the skid steer to dig the holes for the chain link poles. For 12 feet tall cage, the hole for the pole should be at least 3-4 feet deep, depending on the soil. If the soil is very loose, it is better to get deeper. On average, we dig holes every 8-10 feet apart. For smaller and/or touch up jobs, hand held auger comes handy.





4. A, B If your soil is dry, some soil might collapse in the freshly dug hole. Just use post hole digger to get the soil out of the hole.



**BUYING MATERIAL: Fence footage and number of poles**

5. Our cage was tall with no top/roof, only V-arm barb wire at the top.

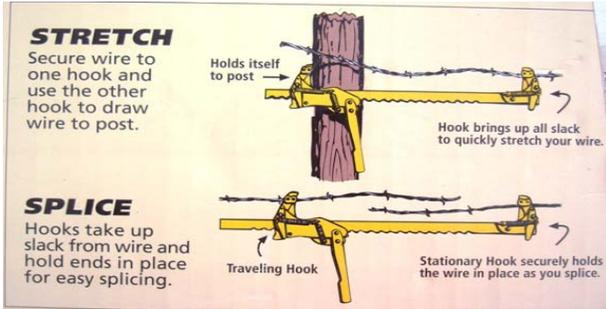
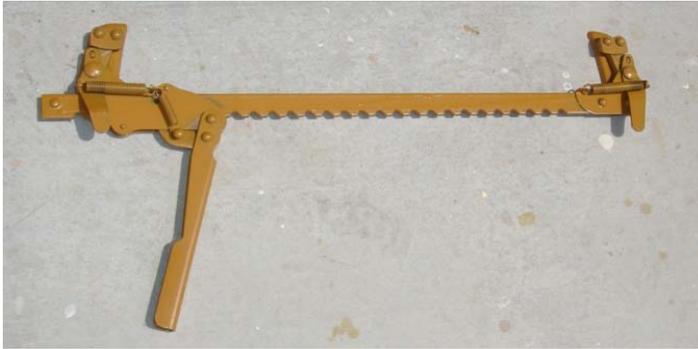
Measure how many feet of chain link fabric you will need and get few extra feet. Depending on the shape of your cage, you will need thicker corner poles (terminal posts) (4 for square or rectangular cage), also 2 for each gate. Like mentioned before, regular 'line posts' are 8-10 feet apart.



6. To get the number of regular line posts needed, divide the total chain link footage for your cage by 8-10, and subtract the number of thicker corner poles used.

The length of the vertical poles depends on how deep your hole is. In our case, it was 12 feet above ground, plus 3 feet in the ground, total 15 feet tall poles bought.

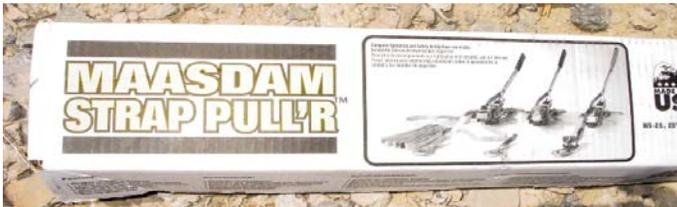
For 12 feet tall cage, we recommend 3 levels of so called 'top rail' post, at the top, middle and bottom. To get the correct number of feet of top rail post, multiply the chain link linear footage needed by 3.



### Tools

7.A, B, C

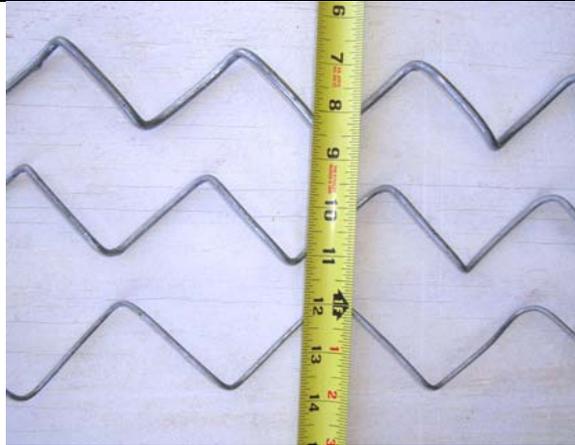
In addition to the regular garage tools most real men have: shovel, hammer, wheelbarrow, string, chalk line, pipe cutter, carpenter level, wrench, hacksaw, pliers, drill, ladder, etc, you will need barbed wire stretcher to attach and stretch barbed wire at the top.



8.A, B, C

Another needed tool is strap puller to stretch the chain link fabric once attached to the posts.





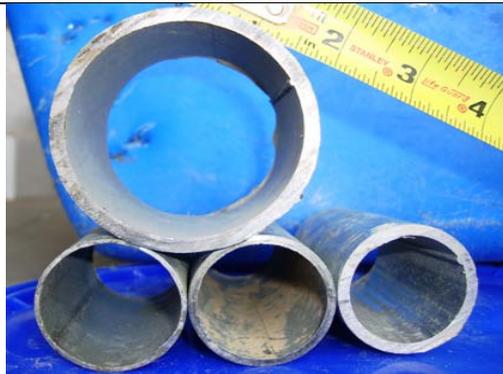
**Deciding on the strength of chain link fabric**

9.  
 The 11 gauge chain link is OK for smaller cats and for the roofs for topped cages. When dealing with lions and tigers, we recommend 6 or 9 gauge for the enclosure walls. The smaller the number, the thicker the wire and the stronger and heavier the chain link fabric gets.  
 In the picture on the left, the top wire is 6 gauge, middle is 9 gauge, and bottom is 11 gauge wire, used for chain link fabric.



**Deciding on the diameter of poles**

10. Other than deciding on the length of the poles, taking the depth of the hole into the consideration, the diameter is another important factor. The poles with the biggest diameter are usually used as corner posts and door posts, the medium diameter is the regular line posts to attach the chain link fabric, and the smallest diameter is used as top, middle, bottom rail. Some builders use medium line posts as the bottom rail for extra strength



**Deciding on the thickness of material for the poles**

11, A, B  
 While the same diameter poles might look the same on the outside, it is important to consider the thickness of the metal used to make the poles.

The dog kennels and poles available at hard ware stores are usually the thin metal light weight poles. For tigers and lions we used the heavy weight (full weight) and middle weight thick poles.

See the difference in the material thickness in the pictures on the left.





### Big Hardware Parts

12. A, B, C

Tension bars (far left) need to be the height of the actual above the ground fence (2 for each gate, one for each gate post and 2 for each corner ,post or posts where the ground is uneven, and drops or rises enough to possibly allow the escape of the animal under the fence).

V-barb wire arm (middle), one for each line post. Note it has a hole at the bottom for top rail to go thru.

Barb wire rolls: the amount depends on how many strands you want to run around the top of the cage perimeter. We run 4 strands inside the V arm and 3 on the outside, (7 strands total). To get the final linear footage of barb wire needed, we multiplied the linear footage of chain link by 7.

Some of us like to use Corner V-barb wire arm for corners and gate posts. These do not have the hole at the bottom, instead, the top rail is attached by rail end and rail end band (see below in Small Hardware Parts description)



### Small Hardware Parts

13.

These too come in regular and heavy strengths.

From left t right: end rail clamp, line rail clamp, fence wire tie, tension band, top rail sleeve, gate latch (more on gate hanging hardware later).



14.

Corner post hardware: rail end band around it, attached to the rail end at the end of the top rail. It is used to attach top, middle and bottom horizontal rails to the big corner and door posts.



15. A, B

Line rail clamps are used to attach middle and bottom rails to the regular line posts.

Fence wire ties are used to attach chain link fabric to the rails and posts.



16.

Picture shows the use of tension bands to attach the chain link to the posts and to the door frame.

It also demonstrates the attachment of the middle rail and above the door rail to the gate posts using rail end and rail end band.



17. A, B, C

Top rail sleeve is used to attach two top rails (left)  
Below:  
Some lighter top rails are available as Swedge top rail, meaning, no top rail sleeve is needed, as one end is thinner than the other end.



18. A, B

Heavy gate latch is attached to the gate. Use one to two per door for extra security.



19.

Carriage bolts and nuts come in different sizes to attach tension bands, chain link, rail end bands and rail ends together, and to attach door hinges and latches. Plan one for each tension and rail end band, as well as for each gate frame and post hinges (usually the longer carriage bolts). Plan two for each line rail clamp. In our experience, these bolts tend to get lost, so we always have an extra box, so we don't have to keep running to the hardware store.



20.  
We sometimes use screws to attach the V-bar wire arm to the top of the poles for extra security and strength, so plan at least one for each V-barb wire arm, and like with carriage bolts, have an extra box handy just in case.  
Also for extra security, gate latches might need a screw through them so they can't pivot on the pipes and allow the animals to kick the door open.



21.  
Plan 100-120 pound of concrete mix per each post hole, depending on the depth and width of your holes.



22.  
We bought a small plastic cement mixer from the hardware store (renting a cement mixer is also an option).



**BULDING THE CAGE**  
23.A, B  
Electric concrete mixer helps with efficiency mixing the concrete.





24.A, B

The long poles are carried to be put into the dug holes, and poured with concrete mix. It is easier to add the various fitting to the posts now from above, than later by forcing them around the post's diameter (picture below).



25. A,B

Attaching strings to the corner poles to assure the top rail will be attached in the straight line. Post and pipe "corner level" makes setting posts in the concrete easier (picture below).



26.

Work continues on the cage frame, attaching the top rail to the posts, thru the V-barb wire arm



27. Attaching top rail sleeve to the top rail, following the string attached to poles, which is used as a guide to make sure all is in the straight line.



28. A, B: Once the cage frame was finished, with all the poles and top, middle and bottom rails in place, it was time to hang the chain link, using ladders and different tie downs and winch straps to get it up to the 12 feet height.



29. A, B  
Attaching the tension bar to the 6 gauge chain link fabric. Tension bar can also be attached after the fabric is already hanging from the frame. Fabric should be attached to the frame from the inside.





30. A, B  
Attaching 6 gauge chain link with the help of tie down straps and winch or rope.



31. A, B  
Strap puller is used to stretch the chain link fabric.



32.  
Attaching 4 feet long pipe to extend the length of the V-barb wire arm inside the cage



33. We put our snake tongs to a good use to hang the barb wire to the V-barb wire arm  
Below: inside the cage corner detail



34.A, B  
Using barb wire stretcher to stretch the barb wire.



35. A, B  
Finished top of the cages with barb wire attached, showing the use of corner V-barb wire arms above the door.  
The black short 'sticks' are the optional hot wire attachments. The black pipe is the mister and drip system (cage corner below)





## DOORS

36.

We are not welders, so our doors were made by the chain link company using our size specifications.

Doors should have at least one horizontal bar, even two if the doors are tall.

We hang the doors to the gate hinge pole, and then align the second gate pole with the gate latch, and pour concrete in the pole hole.



37. A, B, C, D

Tall gates with 2 horizontal bars on the left, shorter door with one horizontal bar below.





### Gate Hanging Hardware

38. A, B

Adjustable industrial arm hinge, the one pictured, also only allows the door open in one direction, inside, as is required by law in some states. Use 2-3 per door.



39. Residential gate post and gate frame hinge

When attaching hardware to hang doors, make sure the bottom bolt points up (see picture left), and top bolt points down (see below left); that way the door can not be just lifted off the hinges.

Bottom hinge



Top hinge



40. A, B, C  
Post gate hinge nut and bolt and residential gate frame hinge.

When attaching hardware to hang doors, make sure the bottom bolt points up (see picture left), and top bolt points down (see below); that way the door can not be just lifted off the hinges.



41. A, B  
As an extra precaution, we use pad locks on our cages. We also use chain around hinges and latches. In case the gate hardware screws/bolts get loose, the chain will still hold the door in place.





42. If you are using residential or nut & bolt gate hinges, another way to assure the doors only open inside is to attach a metal bar or pole on the outside of the door frame. This metal bar will act as a stop for the door to open to the outside.

Attach it higher than the tallest person in the facility, so you don't bump your head every time you enter the cage.



43.A, B

Another trick for the door to open only one way is to pour a concrete pad, or install stepping stones higher than the door's bottom. This will be like a door block preventing the door from opening to the outside.

Below: we pour concrete pads inside the cages, by the door, for easy cleaning. It also prevents animals to dig under the door.



## FINISHED HABITATS

44. Some people put an extra wide service gate, we didn't, as our animals are leash trained and hands on.

We brought some 'cat furniture' inside the future habitat before we attached the chain link fabric. Some furniture was built inside the cage/habitat.



45. With nice landscaping, you get the pleasing combination of botanical and zoological garden at your own backyard.

**SAFETY DETAILS**



46. It is a good idea to have warning signs on your double entry and cage gates.



For extra security, gate latches had a screw inserted through them, so they can't pivot on the pipes and allow the animals to kick the door open.



47. A, B  
If digging animals might be a problem, put chain link fabric at the bottom alongside the perimeter





### Double Entry

48. Our two new cages share the double entry area. It is huge 12 feet tall, and in the emergency situation can be used as another cage, if we were willing to sacrifice our landscaping and patio furniture.



49.

We used service type wide door to access the shared double entry area. This gate too has warning signs and chain near hinges for extra security.



### Perimeter Fence

50. A, B

Any large predator cage should be surrounded by perimeter fence that is at least 4 feet away from the cage, and at least 8 feet tall. Ours has V-barb wire arm and hot wire at the top and bottom.





On the left, regular quality 11 gauge chain link with smaller squares; on the right, economy version 11.5 gauge with bigger squares/holes.

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### **Over The counter Fencing**

51. The over the counter chain link is OK for smaller cats or for roofs, but not good for big animals. It is usually 11.5 or 12 gauge, or so called economy grade. The squares are also bigger, 7x7 cm (2 3/4 inches), as opposed to 'non economy' fabric which is 6x6 centimeters (little over 2 1/4 inches). The bigger squares make the chain link rolls lighter and great for roof, use, but the bigger squares/holes make it easier for a kid to put their arm thru.

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