

## Quasimoto

The inspiration for this ferro cement sculpture is this image taken from the 1939 "Hunchback of Notre Dame" movie. My wife Diana's father, Charlie Gemora, designed and supervised the building of the movie set for the 1923 version of the movie starring Lon Chaney as well as produced the sculptures that ornament the facade of the building. The 1939 movie re-used the same Set and Charlie designed the suit and did the makeup for Charles Laughton, although Charlie never got credit for it. Diana has an article describing how Charlie designed a thread mechanism from Laughton's left eyelid to the fake right eyelid so that they would both blink together and look realistic. This is typical of Charlie's work.



These are the tools used for forming the the galvanized expanded metal lath (used for plastering buildings) into an armature for holding the mortar. Note that when cut, this lath has razor sharp edges and cuts are always a danger - thus the Band Aids. A rubber mallet, a wood mallet and wood madrel held in a vise help with shaping. A good metal shears is a necessity. Needle nose pliers, regular pliers, wire cutters and tie wire complete the tools. Metal hammers are not used because they flatten the lath and cause it loses it's strength.



The metal lath expands more in one direction than the other and this needs to be taken into consideration. For the torso the expansion direction chosen was vertical but in retrospect it should have been around the circumference to make the bends at the top easier to execute.



The lath is fastened together with small galvanized wire bent into a "U" shape, pushed through the pieces of lath to be fastened together and then pulled up and twisted with pliers to tighten it up. The wire will separate after a few turns or it can be cut with side cutters. Here the base diameter has been wired together to keep it together while shaping. The armature begins with a rough shape that is gradually refined. This shows the wood mandrel held in a vise used for shaping.



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In these images the armature is progressively taking shape. The overlaps are cut and the edges are wired together. The torso is about finished.



The skull is formed from a separate piece of lath and fitted to the finished torso. The torso neck opening gets patched and trimmed. The edges of the neck opening are turned up into the skull portion and the two pieces are wired together. The turned up edges of the torso are pushed against the inside of the skull to make a smooth opening - in case hands need to go inside.



Once the head is finished and fastend to the torso, all of the sharp edges need to be bent into the armature to avoid cuts - to protect both fingers and the sponges that will be used for applying the mortar. Check the profile all over to get a smooth armature. Roughness is difficult to fix later, so the exterior of the armature needs to be as close to the way you want it as possible.

Additional reinforcement is added at the bottom edge by bending the lath 1/2" to the inside and then forming and fastening a piece of #12 galvanized wire in place (not included in the tools image).

The finished lath form is then fitted with a plastic bag and packed tightly with packing material, paper in this case, making it ready for applying mortar.



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The first image below shows the tools used for applying the mortar to the armature. This includes rubber gloves, a dust mask or other means of protecting your lungs, an apron, eye protection, a rubber blade, water spritzer, mixing pan, stir stick and rubber sponges. The sponges are made of 1-1/2" foam rubber with a smooth rubber coating on one side and are used for applying and smoothing the mortar. They are cut to shape and the edge undercut for finger gripping using a bench grinder. Foam shops sell this stuff.

RapidSet mortar mix (brown bag) is used for the base coats, which can be purchased at Home Depot or other hardware stores. This mortar sets in about 15 minutes and does not shrink like ordinary mortar. A 1/8" thick coating will prevent the metal lath from oxidizing. A thin coating is all that is needed.

The mortar is mixed in small batches due to the short working time. Add water slowly to make a stiff but smooth mix and try to keep each mix about the same consistency. Mortar is applied from the bottom up and smoothed with the sponge. Any openings remaining after the first coat can be filled later. The bottom area will be done after the side mortar sets. It was covered with wet towels and plastic and let set overnight to gain strength to avoid breakage.



The base outline is marked on the table and mortar is placed inside the outline with several 1/8" thick stones embedded in it to support the armature off the table. The piece is set into this ring of mortar with stones and mortar is then applied around the bottom. After the mortar sets (about an hour), the inner stuffing is removed and the inner edges are cut smooth with a knife. A piece of PVC plastic with my logo and date is mortared inside. A thin mix of mortar is applied with a paintbrush with no handle (not shown in tools) to cover any exposed metal lath. The bottom web is also thickened with mortar.



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The tools used for working the top layer of cement include containers for mixing the cement and measuring spoons and syringe (not shown), stirring stick, spritzer bottle, rubber sponges and blade, shaped scraper blades, hand sanding tools, diamond polishing disks and a variable speed grinder. I use a Variac voltage controller for adjusting speed.

Any high spots on the base structure are ground down with the angle grinder and low spots and holes are filled with mortar and left to set. This completes the base structure.

The top coat mixture I decided to use is 1 part RapidSet cement (purple bag - which is hard to find) to 2 parts Whiting (marble dust or calcium carbonate) because a sample of pure cement proved to be difficult to finish. For this piece I estimated that it would take 10 cups of material so I made a batch of 15 cups - 5 cement and 10 Whiting for a ¼ inch thick layer to allow ample material for shaping.

The ingredients are measured and recorded. The dry ingredients are mixed in a plastic bucket with a drill motor powered paint mixer (protect your lungs). The mixture of cement and Whiting is a flesh color. Diana and I decided to make the piece a light green-grey because the movie was shot in black and white. Burnt umber, green and black cement pigments were used for coloring, added in measured increments. Each addition of color was mixed into the dry batch and a small wet sample was checked until the desired color was reached.

The cement is mixed ½ cup at a time because of the fast setting time. The exact amount of water used is measured with the syringe so that every batch has the same consistency. Each batch needs to be mixed the same also. This is done because variations in the water content or mixing will cause color changes. The cement is mixed to the consistency of soft clay so that it can be worked with the fingers.

The cement is applied with a rubber sponge and rubber blade from the bottom up to avoid falling off. A stick with a nail cut 1/4" is used to measure the depth of the cement. The rubber sponge is used to smooth the surface as much as possible.



Lay on the entire surface and be sure to squiggle the edges of one batch into the edge of the previous batch to avoid lines, especially the last batch. Before the cement sets do as much shaping and smoothing as possible. Once the cement begins to set use scrapers and open mesh sanding cloth (used for wallboard) to get a finished surface. Additional cement can be added where needed, but be sure to squiggle the edges as much as possible, otherwise lines will appear in the finish. I use sandpaper over a wood stick for tight corners. This process took about 4 hours. Diana stopped by at the end to inspect the progress and take a few pictures. She also provided a few pointers for fixing the face. It was covered with damp towels and plastic and let to set overnight.



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After setting overnight, more sanding and smoothing was done using 220 and 400 grit wet sandpaper and then finished with wet 800 grit diamond disk. In order to dry burnish the finish with 1000 grit diamond disk at slow speed, the piece was set in the sun for a day or two to be sure it was dry. It turned a nice tan color - not the green-grey color we had expected. Oh, well, that could be fixed.

Here I ran into major problems. The burnishing would not work. The cement/whiting mixture was much too soft, as well as being very porous and absorbing huge amounts of water. This is not good for an outdoor piece so this piece will not be good for outdoors. I tried several alternative fixes on small patches but nothing would work.

So the only way to save this piece was to chip and grind off the entire soft top layer or apply an additional layer of harder cement, which is what I finally decided to do because it was much easier to accomplish and less prone to total damage.

First the bottom edge was ground down so that the new layer would have strength and not chip. Rather than use pure RapidSet because it is so difficult to finish, I decided to use equal parts RapidSet cement and 200 mesh ground silica (very toxic to breath) that I had bought for the foundry but was not being used. The ground silica does not absorb moisture, so this seemed like a good alternative. I made a new dry batch of 10 cups for a 3/16 inch coating and colored it to suit as before. This time I applied the mix in larger batches. And again Diana helped me with the face, which actually came out much better than the first time. When as much as could be done was done when wet, it was covered with damp towels and plastic and let set overnight.

The initial finish sanding worked through a couple of spots into the soft underlayer because the top coat was too thin. These areas were chipped out and filled with the topping mix and let to set overnight.



The next day the patched areas were re-finished and the entire piece was smoothed with wet 800 grit diamond pad. The red color is from the diamond pad.

Up to this point the wet grinding work was done without a splash shield to protect the work area and it got totally messed up, as usual. After cleaning up most of the mess, I decided to finally solve this problem once and for all, so a circular shower curtain holder was made from small conduit bent into a circle and supported from above. I should have built this thing 15 years ago and saved myself a lot of cleaning.

The yellow construction hat has a flexible air duct connected from outside to provide clean forced air while working. It usually has ear muffs attached, but I didn't take the time to put them on so I used a separate set. The angle grinder used for polishing is quite noisy.



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Again, the final sanding before dry burnishing was done with wet 1000 grit diamond pad. Then the piece was left set in the sun for a couple of days to dry.

The final surface polishing was done with dry 1000 grit diamond pad. This took several days at the pace I was working. Polishing the facial depressions was a challenge. This was done using a stainless steel tool made in a lathe to burnish these areas and then they were polished with a hard cotton bobbin and white rouge. The stainless steel darkened the area, but Diana really likes the color change.

After washing with alcohol to remove any dust or dirt the sculpture was spray painted with clear gloss acrylic to eliminate dulling and whitening of the cement surface over time.

These are images of the completed sculpture.



While creating this sculpture, I encountered a lot of unanticipated work, but I had fun making art.