

Free Spirit Story

February 2017

The Free Spirit Story begins.....A hard copy is made to ensure a match with the bronze maquette. A resin copy of the maquette is cast. The resin model is compared to the maquette to ensure the angles and altitudes are correct.



March 2017

The steel is delivered in 7.5 metre lengths. The "dolly" is made. The dolly is the steel base for the making of the sculpture but will not be cast. The dolly is on castors and it is an essential element that must be strong enough to manage the weight of the armature and the clay



April 2017

The dolly is covered with ply which has a grid drawn on to it. The grid is a scaled version of the maquette grid. It means three points of reference can be obtained to plot the armature. A laser level is used to provide correct horizontal and vertical axis. The armature is the equivalent of a skeletal support so has to be central in position. Each point is cross referenced to check proportions are correct.



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Once the armature is complete it is clad in preparation for the clay. The images shows plaster and scrim on a steel armature. The plaster has been coated with shellac to prevent the plaster drawing moisture from the clay. The tail is plotted next in aluminium wire. Once this is completed the armature is ready for the clay. The clay is delivered. Each packet weighs 25kg - a total of half a tonne in this delivery

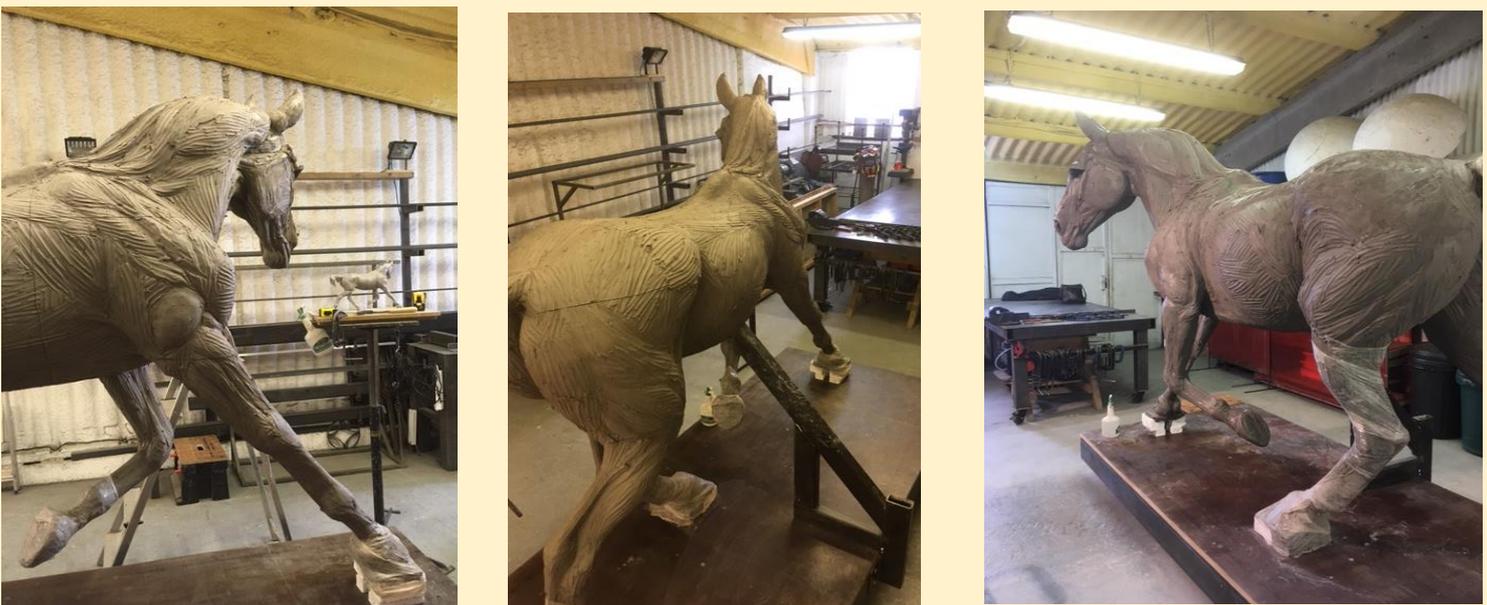


The image shows early stages of blocking out in clay. Half a tonne of clay has been used to date. Another half a tonne has been delivered. The clay has been wrapped. The plastic prevents the clay from drying out so it remains malleable to model. The metal sticking up from the head is a reminder where the polls sits accurately and is removed once the horse head develops.



May 2017

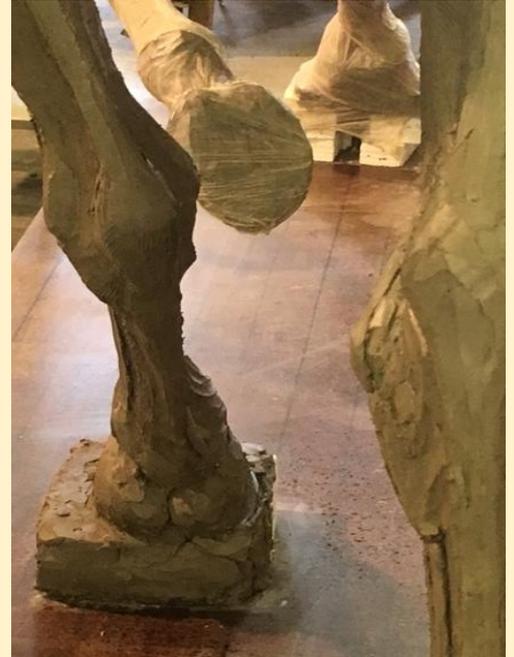
750 kilograms of clay have been used and there is still quite a way to go



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June 2017

The sculpture is changing shape everyday. The close up texture shows the change from using hands to modelling tools

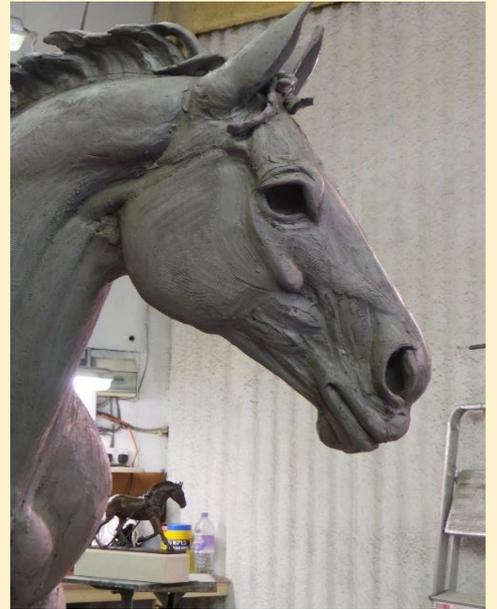
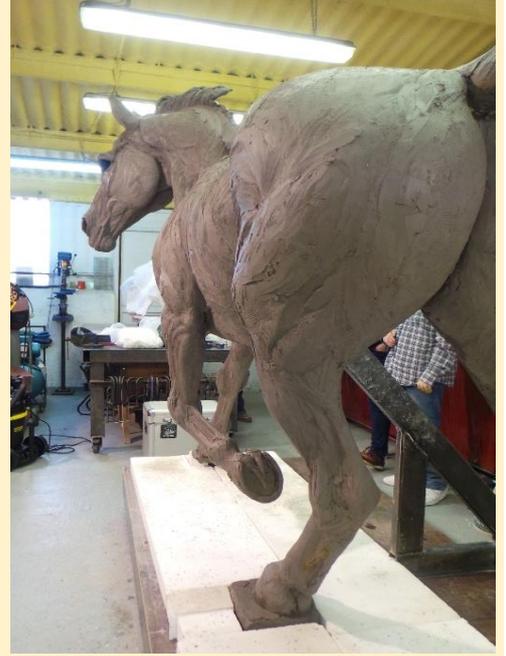


The tools show callipers and modelling tools that are in constant use



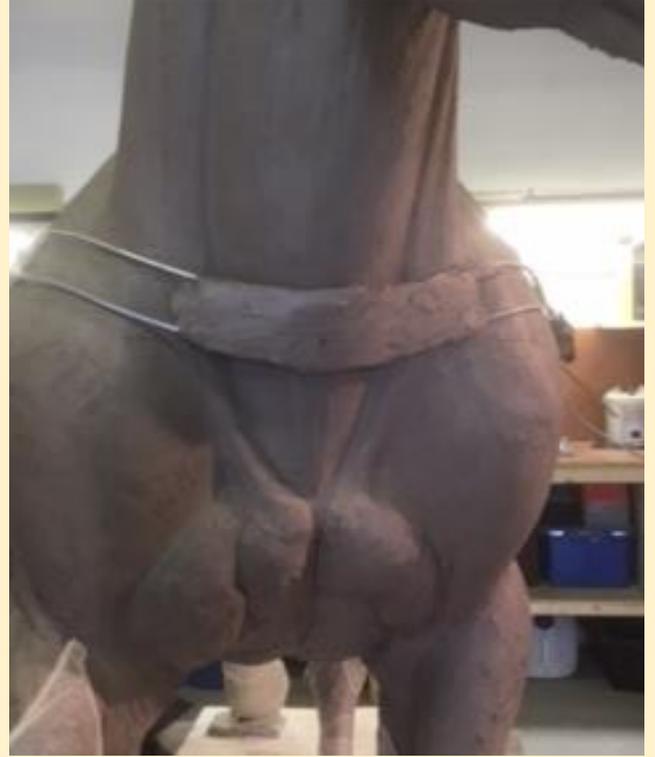
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July & August 2017



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September 2017



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October 2017

October saw the project reach a huge milestone as the clay sculpture was completed and ready for mould



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The mould process beginsA layer of Silicon rubber is initially sprayed over the entire sculpture. The mould divisions are worked out and seam lines drawn on in marker pen. A bead of silicon is applied on the seam lines. Shim is cut and applied into the beaded seam lines. Further applications of rubber are applied and circular rubber discs attached at strategic points to act as both additional supporting strength and location points. A nylon mesh material is applied with more rubber layers over the entire horse and worked up to 'walls' over the seams. The next stage is to make the resin jackets over each section. The horse has been divided into 30 sections and some sections will be further subdivided at the resin stage.



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The silicon rubber (pale lilac in colour) is covered in a fibreglass jacket. The jacket holds the silicon rubber securely in the correct shape once de-moulded from the clay sculpture. The circular cut outs in the silicon rubber will act as location points once the fibreglass is applied. Once covered in fibreglass the 1/2 disc cut outs will have a hole drilled and both sides of each section will be bolted together. The 1/2 disc will ensure the bolts do not squeeze the rubber at these points thus not distorting the shape. Several 'sections' of rubber have been further subdivided, for example the near side of the neck to accommodate the mane - it assists the next 'wax' stage. The final image shows the rubber sections after the horse is de-moulded. They are fully cleaned and dried and then replaced in their respective jackets and the mould will be bolted together ready for the next stage. Whilst the rubbers are cleaned and dried the jackets are taken to a extraction tent to allow the seams to be cut neatly and cleanly.

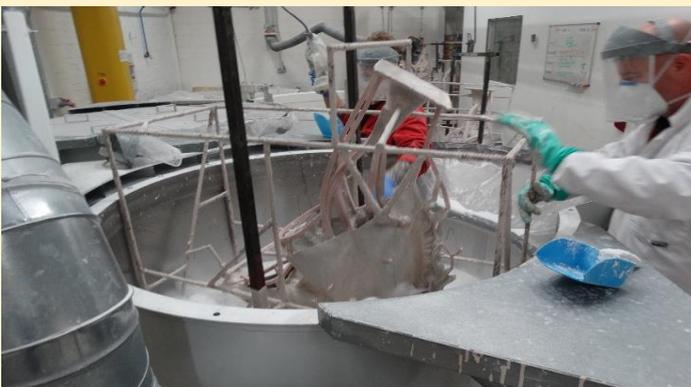


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Once the moulds are finished a wax replica of each section is produced. The inner surface of the mould is covered with an even thin coating of molten wax to fill in the finest details and subsequent layers are added to build up the wax pattern to the desired thickness. The two sides of the head are bolted together and molten wax is poured in and swished around to create a joint. When the wax cools and the mould is removed, a wax positive of the section of the clay sculpture emerges. The hollow wax copy is then "chased": a heated metal tool is used to rub out the marks that show the parting line or flashing where the pieces of the mould came together. The wax is dressed to hide any imperfections. A network of wax rods, called sprues and gates, are attached to serve as a type of channel system, which will feed the molten metal to all of the areas of the sculpture, as well as allow gases and air to escape. A wax funnel (called a pouring cup) is attached to the gates for use during pouring.



The wax positive is dipped in a slurry mixture and then stucco in the ceramic shell department at Pangolin Foundry to create a hard shell. This is repeated multiple times with the shell allowed to dry in between each layer producing a thick ceramic shell. The first layer captures the detail and subsequent layers adds support to the overall strength of the shell. Once all of the coats have dried, the ceramic shell is then sent to be "dewaxed". The ceramic shell is placed in a kiln and fired. The shell bakes and the wax is melted (lost) from the shell. This creates a hollow ceramic shell mould-- thus the term "lost wax." Each stage must be repeated for every section of the mould and the pieces will be re-joined later, after the sculpture is cast in bronze.



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The ceramic shell mould is pre-heated in the kiln and moved to the casting bed where it is placed in sand.



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The solid blocks of bronze are heated to a temperature of approximately 2250 degrees Fahrenheit to create liquid bronze. The liquid bronze is stirred and prepared for the pour. The bronze is poured from the crucible into the ceramic mould



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When the ceramic shells are all full with the poured bronze, they are then left to cool for several hours. The negative space within the ceramic shells have now become positive bronze casting.



The ceramic layer will then be fettled. The ceramic shell is broken off to separate the bronze metal from the shell. The bronze that will then be metal worked.

