Lost Wax Method Bronze Casting

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ABSTRACT

Large scale bronze casting is a work intensive process that requires adequately equipped studio space, time, and a set of highly refined skills to complete the eight stages of the process. My goal was to construct a life sized bronze statue of a traditional Athabascan fisherman. I chose to sculpt a classically proportioned Greek style statue, using similar processes and ratios. I looked over photographs that I took in the Vatican museum and several anatomy books. Wendy Croskrey supported my research in large scale bronze casting a project this size. Through experimentation I discovered the importance of using the correct plaster and reinforcing molds properly. The process provided me with many firsts, such as a mold cracking open, plaster not setting, and having to recast a piece. Through hard work and careful consideration I was successful in completing the project.

INTRODUCTION

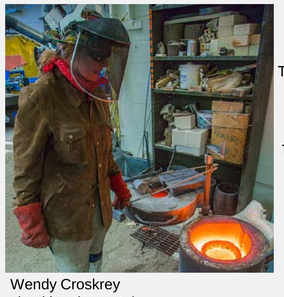
The project can be broken down into eight major stages that are comprised of many smaller individual steps.

Stages

Construction and building of the armature .....1 week
Making and layering on the clay .....1 week
Actual sculpting of clay .....9 weeks
Casting wax duplicate .....1 week
Casting in molding material .....1 weeks
Bronze pouring .....2 weeks
Welding, Metal Chasing, and clean up .....2 weeks
Patina .....2 days

ACKNOWLEDGEMENTS

This project would not have been possible without the skills and time of my advisory, Wendy Croskrey, contributed to every step of the process. I would like to thank the CLA and the Eiteljorg Museum for contributing funds to support this project. Thank you to Wendy Croskrey and Carol Hoefler for helping me with purchasing.



Wendy Croskrey checking the metal

Thank you to Bryson DeRonde, Erick Prowker, and Wendy Croskrey for helping me pour.

Thank you to Todd Paris for use of photographs.

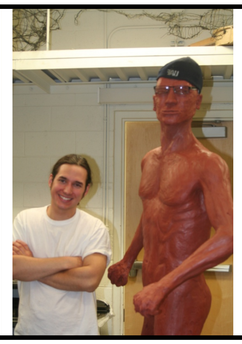
REFERENCES

The Body, Photographs of the Human Form, William A Ewing
Figure and Form, Lu Bro
Drawing From Life, Clint Brown and Cheryl Mclean
Constructive Anatomy, George B. Bridgman

METHODS

Constructing the steel armature to be covered in plaster and clay

Building up a plaster shell to be covered in the oil based clay



Adding on clay and sculpting definition

Making life casts of my ears, face, hands, and feet

Continuing sculpting and experimenting with clothing

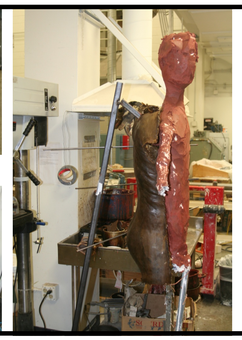
Completing him as nude to be able to add clothing in a different material later

Adding flashing (newspaper litho-plates) to support and separate the silicon and mother mold

Brushing on the silicone to ¼ inch thick required two coats. I tried a spray gun but it did not work

Brushing on the liquid plastic two part mother mold to ¼ inch minimum, two coats used

De-molded the siliconI cast the pieces in wax



Reassembling the wax pieces on the armature, using hot putty knives and wood burners

Re-textureing to match using a metal spoon and clay ribs for smoothing

Attaching the sprues, vents, core pins, and pour cup

Applying silica plaster face coat over Shellac and alcohol mixture

Plaster Silica Molds are poured ready to be loaded in the kiln for burn out firing for three days

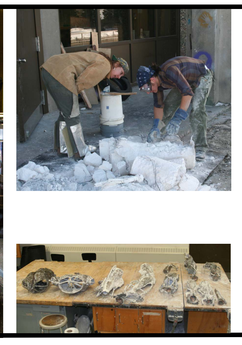
The molds have been are vacuumed out, aluminum foil is placed over the pour cup.

Placing steel rings around the molds and filling with sand for support.

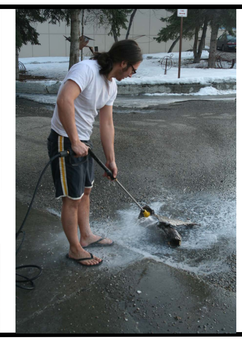
Preheating the metal to go into the furnace. Metal must be preheated before being added to the crucible (moisture touching molten metal can cause an explosion).

A preheated skimmer is used to remove the slag (impurities) that rise to the surface of the molten bronze.

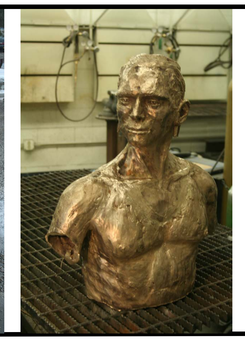
Pouring the molten bronze into the mold, bronze melts at about 1700 F and is poured between 1780 F and 1900 F.



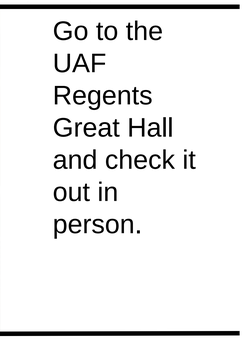
The molds must cool before being broken open; chisels, hammers, grinders, water, pressure washing, sand blasting, and a lot of work is required to remove the molding material.



The pour cups, vents, sprues, and core pins must be removed. The whole piece is wire wheeled and the seams are prepared for welding.



An internal securing structure is added for final installation. The welds must be filed, and the surface retextured to match. A final buffing is done.



The patina is now applied and the whole piece is covered in a protecting coat of wax.

Go to the UAF Regents Great Hall and check it out in person.