

Barry X Ball: Technical Aspects of Crafting “Perfect Forms.”

DECEMBER 2, 2015 *By* intsculpturectr *in* IN THE STUDIO, MATERIALS & PROCESS *Tags:* JAN GARDEN CASTRO 2
COMMENTS



Perfect Forms – Horizontal Handwork

Barry X Ball’s jammed schedule includes the unveiling of a huge commission in Europe in November, but he took time out to show me his huge studio and to discuss his reimagining of Umberto Boccioni’s 1913 *Unique Forms of Continuity in Space*, which Ball has named *Perfect Forms*. “First I 3-D scanned one of the posthumous bronzes in Switzerland. Then we re-sculpted every curve to make it the Ferrari of Boccionis. It took about two years to re-sculpt it using ZBrush and other programs.” Barry X Ball’s work has been in numerous exhibitions, including a major show in Venice in conjunction with the 2011 Venice Biennale. He is also busy overseeing the creation of a new state-of-the-art 17,000-square-foot studio complex in Brooklyn scheduled to be completed in 2016. It will be the only comprehensive high-tech stone sculpture studio in the world dedicated to one artist’s work. Ball and architect Andrew Berman (recent PS1 additions, the Sculpture Center, etc.,) have designed a unique building and garden with a strong aesthetic that will contain everything for creating advanced stone sculptures: a digital sculpting studio, massive-scale CNC cutting / milling machines, gallery, metal shop, wood shop, hand-carving studios, a sandblasting room, twin 20-ton bridge cranes, good work facilities for 20+ assistants, roof gardens, art storage, an outdoor stone yard, and more. This supplements Ball’s also-new satellite facility in New Haven which houses, according to Ball, “one of the largest, most accurate multi-axis CNC stone mills ever produced.” This six-axis CNC machine with diamond tooling is about 30 x 20 x 15 feet in size and includes a water filtration system to carry away the stone dust.[\[i\]](#)



Computer Controlled Stone Milling Machine – Installation

At Ball's current Williamsburg studio, I learned more about his stone-crafting processes and viewed many new sculptures in varied states of completion. My main mission, however, was to witness the parts of the process of making one sculpture. Ball has fifteen assistants, each with special skills sets, and he has already given me six folders filled with some of the twenty versions of his sculpture *Perfect Forms* along with dozens of sculpture folders, many of which appear on his website barryxball.com. The *Perfect Forms* folders show work in different scales from 21" to 325" tall and in materials including gold and mirror-polished stainless steel. At the studio, he showed me *Perfect Forms* made from rare Belgian black marble that had been completed the day before my visit.

Here are the basic steps:

Step 1. Select the art work. *Perfect Forms* is Barry X Ball's reinterpretation of Boccioni's 1913 sculpture. Boccioni was dragged to death by a horse in 1916 during World War I – before his art was cast into bronze. Later bronze casts of Boccioni's sculpture are at MoMA, The Metropolitan Museum, the Tate, etc. Ball chose one of these posthumous bronzes from a collection in Switzerland for his 360-degree digital scan (a non-contact process).

Step 2. Computer modeling. For over two years, Ball and his team of artists and computer engineers adjust the 3-D scans to heighten the movement, the majesty, and the other characteristics of the original work. They make rapid prototyped models to cross-check their



digital work. Further refinement of the digital sculpture is done based on analysis of these physical models. Once this refinement is complete, the sculpture is ready to be realized in a more permanent, costly material.

Perfect Forms (rendering) – Belgian Black Marble – Original Scale



Perfect Forms – Original Scale Layout

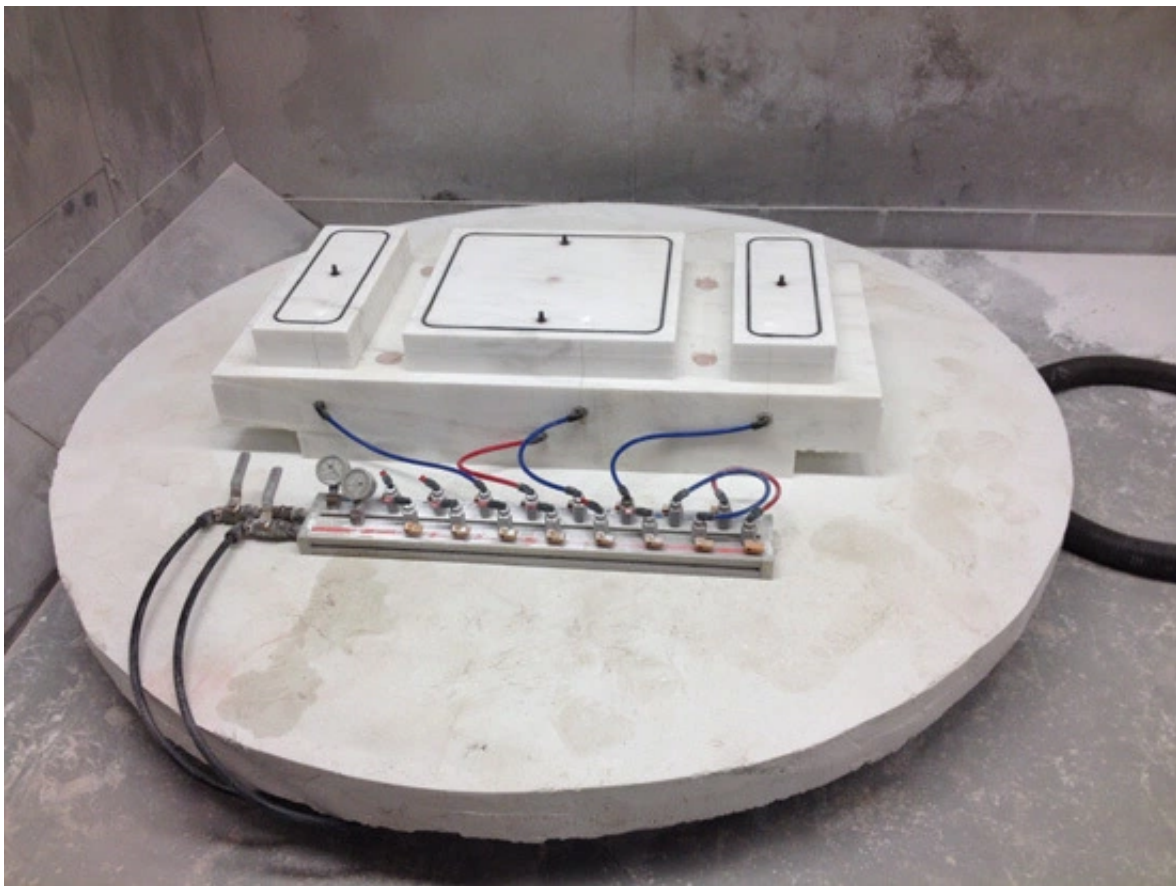
Step 3. Select the stone. This work's Belgian black marble was quarried in Wallonia, southern Belgium outside of Brussels. It is the only black marble in the world with no venation, according to Ball. A two-ton block has been used to create the final 700-pound sculpture, meaning that 3300 pounds of marble gets vaporized during the carving process.

Step 4. Cut the block into the rough dimensions of the sculpture.

Step 5. Lay out the figure on the block.

Step 6. Mill the bottom of the stone block and add holes for mounting and alignment on the CNC machine.

Step 7. Insert stainless steel threaded inserts that will later be used to mount the sculpture onto its permanent base.



Precision Rotary Table with Vacuum Block

Step 8. Create a vacuum jig out of stone for the rotary table of the CNC machine.

Step 9. Mount and align the sculpture block on the vacuum jig within the CNC machine.

Step 10. CNC-cut the stone with diamond and carbide tooling, cooled by water. Over about four days, the rough form emerges.

Step 11. Slower milling work, over a couple of months. If needed, reinforce any fault lines, fissures, or cracks by boring holes and inserting high strength fiberglass rods, which have an expansion co-efficient equivalent to stone. Ball notes, "If you choose only "perfect" stones that have to be consistent, they are generally boring. I often respond to the stone and alter a sculpture to best utilize its natural features."

Step 12. Mount the milled sculpture in a crate specially engineered to safely cradle it.

Step 13. Transport the sculpture to New York for further handwork and finishing.

Step 14. Use specially designed armatures to lay the artwork on its side so the bottom can be finished.

Step 15. Create a permanent **ABS** (acrylonitrile butadiene styrene) plastic base layer to cushion the bottom of the stone.

Step 16. Attach the ABS to the bottom of the stone with UHB (ultra-high bond) adhesive.

Step 17. Flip the sculpture upright and work on it vertically.

Step 18. Refine the surface of the sculpture with a variety of hand and power tools. At this stage the hand carvers remove the milling lines left by the CNC machine. They also refine all the edges and details.

Step 19. Polish the surface. A team of three to four people polish the sculpture for over 3000 hours, bringing it up to a glassy, mirror finish.

Step 21. Wash the sculpture.

Step 22. Mask the polish and use ultra-fine sandblasting on all un-polished surfaces to make the surface matte, silky, and non-directional. Eliminate all evidence of traditional handwork.

Step 23. Remove the masking and wash the sculpture to remove any sand or grit.

Step 24. Impregnate the sculpture with resin to protect the stone, prevent oily fingerprints, and make it more dust and dirt-resistant.

Step 24. Remove the excess resin with cotton wadding and cloth.



Perfect Forms Original Scale – Figure Emerging from Block



Perfect Forms Original Scale – Roughing Pass Complete

Step 25. Mount the sculpture on its permanent base.

Step 26. The sculpture is finished.

One studio room contains second and third generation models for other iterations of *Perfect Forms*. For Ball, *Perfect Forms* achieves a fourth dimension “where Boccioni would have wanted it to go in his dreams.” The gleaming form towers above me, yet cascades around itself. Its gleaming curves and angles form a modern masterpiece – the handwork far exceeds what even Bernini and Borromini devoted to their masterworks.

Ball is generous as an artist, and he loves to talk about his influences and his processes. I reveal here a rendering of his solid gold portrait head of Prince Albert II – Barry X Ball flies to Monaco in November for the unveiling of the

finished work, to be permanently installed at the Palace, on The Sovereign Prince’s Day. He has an even bigger gold commission flowing his way. Needless to say, a unique gold sculpture like this is worth more than its weight in gold.



Prince Albert II of Monaco Portrait Sculpture Rendering

By Jan Garden Castro (<http://blog.sculpture.org/jan-garden-castro/>)

[i] All factual data is from Castro conversations and emails with Barry X Ball in 2015. See also Castro review of *Out of Hand: Materializing the Postdigital* and the [video link](http://www.madmuseum.org/audio/15-barry-x-ball-%E2%80%9Cperfect-forms%E2%80%9D) (<http://www.madmuseum.org/audio/15-barry-x-ball-%E2%80%9Cperfect-forms%E2%80%9D>) with a gold version of *Perfect Forms*

See more about Barry X Ball processes [here](http://blog.sculpture.org/2014/04/21/out-of-hand/) (<http://blog.sculpture.org/2014/04/21/out-of-hand/>) and [here](http://barryxball.com/about_med.php) (http://barryxball.com/about_med.php)

2 responses

ALAN BINSTOCK says:

December 7, 2015 at 12:38 pm

tHANKS FOR SHARING THIS ARTICLE

KARENTOMPKINSNY says:

December 17, 2015 at 11:23 am

This is fascinating! Thank you.

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