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THE TREATMENT AND INSTALLATION OF A MONUMENTAL CEDAR SCULPTURE BY URSULA VON RYDINGSVARD

EMILY HAMILTON

Ursula von Rydingsvard (1942–) is best known for her large-scale, structurally complex sculptures made from cedar beams, which are often displayed outdoors. These works change in dimension due to shifting environmental conditions and may require supportive armatures and ongoing maintenance treatments to prevent pest and environmental damage. This article will address the treatment and installation of *Czara* z *Babelkami* (2006) at the San Francisco Museum of Modern Art as part of the inaugural exhibition in its renovated galleries. The treatment involved close collaboration with the artist's studio to plane and stabilize sections of the work in response to previous dimensional changes. A surface treatment and long-term maintenance plan involving the use of a biocide and wood sealant was also devised with the studio. This collaboration provided valuable insight into the construction of the work, parameters for acceptable changes, and a broader perspective of how this artist's work is treated in other settings. Given the high seismic activity in San Francisco, a structural armature was designed in partnership with an engineer to support the work in case of an earthquake. The armature was designed to stabilize the work while allowing flexibility for further dimensional changes in response to outdoor environmental conditions. Installation on a newly renovated fifth-floor terrace space necessitated extensive planning to move the sections safely with a crane and forklift, serving as a case study of project planning in unknown spaces.

KEYWORDS: Ursula von Rydingsvard, Wood, Outdoor sculpture, Borate, Artist collaboration, Mount

1. INTRODUCTION

The installation of *Czara z Babelkami* (fig. 1) by Ursula von Rydingsvard at the San Francisco Museum of Modern Art (SFMOMA) involved close collaboration with the artist's studio to address structural issues and formulate a long-term maintenance plan. Ursula von Rydingsvard is best known for her large-scale, structurally complex sculptures made from cedar beams. She was born in Germany in 1942 and the early years of her life were spent in Polish refugee camps. Her family relocated to the United States in 1950 and she continues to work in New York City, maintaining a studio with several assistants. Large-scale sculptures in cedar have been her primary focus, though she also works in other media including bronze and resin (Phillips 2011).

2. CONSTRUCTION

The construction of von Rydingsvard's sculptures is both technically methodical and deeply personal, as she often develops imagery from her memories. She uses beams of Western red cedar sourced from British Columbia, carefully milled to fit evenly and create a neutral starting point for her work. She painstakingly cuts, assembles, and adheres the beams, and sometimes rubs powdered graphite into the exterior. The results are intricately textured structures that variously resemble vessels, dwellings, and geological formations (fig. 2).

Many of the artist's sculptures are related to specific memories, and the subject of *Czara z Babelkami* is a sweater that was one of the few items of clothing she had during her time in the refugee camps. As she explained:

> "I had a sweater as a little girl (in the refugee camps in Germany), and it was hand-knit out of unbleached wool from sheep. It had wonderful *babelkami* (popcorn stitches) on it, on the grid that was at the top part of the body. And of course, in no time at all (because it was not as though I had more than one of these . . . it was actually the only sweater I had during all those years) it got worn on the sleeve, around the shoulders and around the belly, so that it was kind of wayward. The grid got disrupted. It went organically wayward. It started flowing. It started falling. So I used that, or a kind of intrigue with that, in part, as a source of my imagery for this enormous bowl." (*Czara z Babelkami* 2016)

Fig. 1. Ursula von Rydingsvard, Artist, *Czara z Babelkami*, 2006, cedar, 513 x 317.5 x 188 cm, San Francisco Museum of Modern Art, 2013.169 (Courtesy of Ursula von Rydingsvard, photograph by Katherine Du Tiel)

Fig. 2. Detail of *Czara z Babelkami* showing intricately textured surfaces (Courtesy of Ursula von Rydingsvard, photograph by James Gouldthorpe)

The structure of the sculpture consists of 15 sections that stack vertically. In each section, a varying number of wooden crossbeams are stacked and adhered with resorcinol glue, an adhesive made of resorcinol-formaldehyde resin and hardener that is commonly used in aircraft and boat construction. Wooden dowels extend through the beams for support. Each section is labeled with a number and an orientation (fig. 3). Two aluminum dowels are placed between adjacent sections for alignment. This sculpture took the studio about one year to make and is nearly 17 ft. tall. In some of her works, von Rydingsvard rubs graphite into the surfaces to create tonal effects. *Czara z Babelkami* was not made with a surface graphite layer, which was an important detail for later evaluating the condition of the wood and devising a maintenance plan.

The sculpture was first shown in Madison Square Park in New York City. It was then moved to the residence of a private owner in Long Island and the work was later gifted to SFMOMA in 2013.

3. CONDITION AND STUDIO CONTACT

The 2016 installation was the first occasion for SFMOMA to exhibit this sculpture, and since we had not worked with it before, we conducted an initial review in summer 2015. We observed that the surfaces had weathered and changed in color from brown to gray, and wanted to review this with the artist to understand the acceptable parameters for change in her work. I reached out to the studio through Galerie Lelong and learned that the shift in color was not an aesthetic concern, as the artist liked the weathered appearance. This contact opened the door to more extensive conversation about condition, installation, and long-term care. The studio is closely involved with the installation and maintenance of her works and had directly overseen the two previous installations of this work. Sean Weeks-Earp, the studio manager, expressed concerns about the condition of the work based on this experience.

Fig. 3. Detail of *Czara z Babelkami*. Top side of section shows number, orientation, and crossbeams (Courtesy of Ursula von Rydingsvard, photograph by Emily Hamilton)

Sean shared that the studio had previously treated the work. Cracks and gaps had been shimmed from the outside with thin sections of cedar, improving the outside appearance of the work but potentially masking larger weaknesses. He was also concerned that the sections had warped and were no longer planar. This would cause small but visible gaps between the sections and put uneven pressure on the wood.

4. TREATMENT

To address these issues, we arranged for Sean to spend two weeks working together with our staff in November 2015. Our plan was that Sean would lead the project, with assistance from two to three SFMOMA preparators each day at an off-site storage facility. My role was to coordinate the project logistics, work with Sean on the details of the treatment plan, and manage the documentation of the project. Sean and I had some initial conversations about the treatment plan before his arrival, but it was difficult to fully assess the issues until we were together in front of the work.

One of the surprises was the sheer scope of work. Upon close review, we learned that the previous mount design had caused major structural problems. That design involved inserting steel rods through the lowest five sections, which locked the sections together and caused significant damage as the wood expanded and contracted with environmental fluctuations. These were not apparent in our previous review because the sections had been stacked in storage, making it impossible to see the tops or insides (figs. 4a, 4b).

These structural cracks had to be stabilized before the leveling of the sections could take place, so we undertook the most challenging component of the project first. To address the cracks, we considered two options. The first was to inject adhesive into the gaps, bridging spaces of up to half an inch with adhesive. However, we were concerned about how strong those bonds could really be, so we opted for a more dramatic but hopefully more effective plan—to complete the breaks by sawing the sections in two, remove the shims from the previous treatment, and re-adhere the pieces after drawing them as close together as possible with clamps. Thankfully, most of the cracks had occurred along the joins between the wood, so completing the separation largely involved sawing through the adhesive line.

Another point of discussion was the choice of adhesives. Sean had previous experience using Sikaflex 291 and Gorilla Glue, both polyurethane adhesives, on similar treatment projects. Though satisfied to use these products, he was open to suggestions for other adhesives as long as we could source them quickly. I was reluctant to use these two adhesives, particularly Gorilla Glue, due to ingrained biases against the instability, irreversibility, and inflexibility of polyurethanes. However, my experience with large outdoor wooden pieces was limited, and since this is a very different type of application than we generally encounter at SFMOMA, we reached out to other colleagues who are scientists, architectural conservators, or work with large wood objects such as totem poles.

Based on the advice received, we decided to use a flexible epoxy system made by Advanced Repair Technology. This system was recommended for its strength, durability, and flexibility, which would allow the wood to expand and contract. With this system, the surfaces of the wood were primed with a product called Prime-A-Trate, a bonding agent that sinks deeply into the wood. After allowing the primer to sit for 10 minutes, the epoxy Flex-tec HV is ejected from a gun than premixes two components (figs. 5a, 5b). The epoxy cures fully within 24 hours. We added new cedar shims where substantial gaps were present and overall these sections were much more stable after treatment.

We were satisfied with this adhesive choice, but after the treatment was completed I was interested to see an article by Rian Deurenberg-Wilkinson (2015) addressing adhesives for outdoor wooden sculpture. Her study identified a polyurethane product manufactured by 3M as the best choice for these kinds of applications based on weather resistance, flexibility, gap-filling capability, and longevity. For future study, I would be interested to learn how the Flex-tec product would fare in the tests run for

Fig. 4a. Crack caused by previous mount as viewed from above; 4b. View from the side (Courtesy of Ursula von Rydingsvard, photographs by Emily Hamilton)

her study. We observed that some of the earlier repairs on our sculpture that were done with Gorilla Glue have already failed, but other polyurethanes may be appropriate.

After stabilizing the cracked lower sections, we then began to level the warped sections to make them planar. To do this, we relied on Sean's knowledge and previous experience. He created what he called a "caveman's CNC milling machine" from spare parts that the storage facility had on site (fig. 6). He leveled each piece by identifying high and low points with a laser level and then scored the surface with a circular saw to delineate how deeply to plane the surfaces (fig. 7).

Fig. 5a. Brush application of Prime-A-Trate to separated sections; 5b. Application of Flex-tec HV epoxy (Courtesy of Ursula von Rydingsvard, photographs by Emily Hamilton)

Fig. 6. Sean Weeks-Earp identifies high and low points in a section using a laser level and customized setup (Courtesy of Ursula von Rydingsvard, photograph by James Gouldthorpe)

SFMOMA preparators then planed each piece to his specifications on both sides, removing no more than a quarter of an inch from any given area and reducing the overall height of the sculpture by less than 1 inch (fig. 8). Areas where the crossbeams had been damaged by the previous mount were routed out and replaced with new cedar beams (fig. 9). As part of the treatment, two additional holes for dowels were drilled between sections, making a total of four aligning aluminum dowels. This was done to increase stability in the event of seismic activity, as recommended by the engineer retained to design a new mount for the sculpture (see section 6).

Fig. 7. Sean Weeks-Earp marks the depth of material to remove using a circular saw (Courtesy of Ursula von Rydingsvard, photograph by James Gouldthorpe)

Fig. 8. Planing of a section to the determined measurements (Courtesy of Ursula von Rydingsvard, photograph by James Gouldthorpe)

Finally, during the course of the treatment we observed small areas of rotting wood in the two uppermost sections. These developed in proximity to where a screen was placed in between the two sections to catch leaves and other debris. Though the screen was an effective barrier, it was not cleared regularly and damp leaves held moisture against the wood. The rotting wood was removed and the areas were treated with Abatron LiquidWood, which gives structural strength to compromised wood, and WoodEpox, an adhesive putty filler. This type of damage is preventable through routine clearing of screens and removal of debris.

Fig. 9. Routing out a crossbeam that was damaged by the previous mount. The damaged area was then replaced with a new cedar crossbeam (Courtesy of Ursula von Rydingsvard, Photograph by James Gouldthorpe)

5. MAINTENANCE

One concern we had about this process was whether warping would continue to happen and if we would need to anticipate this scale of treatment again. We were curious if this kind of treatment was necessary for all similar works, or if there was something that could be done to prevent it. Sean noted that in his experience, regular maintenance application of a wood sealant often prevented warping, and for this sculpture the maintenance had lapsed in previous years. He was not aware of any sculptures that have had to be planed more than once, and gave several examples of works that have been installed outside for decades without ever requiring this. He identified the von Rydingsvard sculpture at the Nelson Atkins Museum in Kansas City as one that has been maintained particularly well over several decades, and stressed that with regular maintenance these sculptures can last a very long time (Weeks-Earp, pers. comm.).

The studio is keenly involved in the maintenance of von Rydingsvard's outdoor sculptures. They composed detailed written instructions that they share upon request. They also follow up directly with private owners to ask if maintenance is performed and make themselves available to do it. The maintenance that the studio recommends includes regularly cleaning the sculpture of debris, applying a biocide to reduce biological growth and pests, and applying a sealant.

The studio's guidelines were immensely helpful to SFMOMA in formulating a maintenance plan, though we diverged from their specific product recommendations. The studio recommends Storm Stain, a biocide containing zinc naphthenate. SFMOMA decided not to use this product because Storm Stain is known to have a strong lingering smell. Since the sculpture was installed in an outdoor café space where people would be sitting near it, we needed to find a product that would be less intrusive. For our initial treatment before installation, we decided to use Boracare, a borate-based pest control product. After rinsing the surfaces thoroughly with water to remove dust and debris, we applied 10 gallons of this product, diluted 1:1 in warm water and applied with a pump sprayer overall (fig. 10). We also inserted

Fig. 10. Rinsing the sculpture with water prior to Boracare application (Courtesy of Ursula von Rydingsvard, photograph by Rowan Geiger)

Bor-8 rods, a solid borate product, into the old mount holes. This product dissolves into the wood as the moisture content rises and slowly disperses the borates over time. The studio recommends using TWP sealant, but because of California's VOC (volatile organic compound) laws, the product couldn't be shipped to us. Instead, we used X-100 Natural Seal Wood Protective in clear, which has been used in other outdoor wood applications in the cultural heritage sector. We applied four gallons of this product to the sculpture using a pump sprayer and brushes, but will likely use more the next time we do this treatment to achieve more complete coverage.

The schedule for product application varies depending on climate and object history, as the sculptures generally need more regular application in their first few years. We anticipate applying a biocide to ours on an annual basis and a sealant as needed, depending on when the surfaces no longer repel water.

Since *Czara z Babelkami* was not made with graphite on the surfaces, maintaining a graphite layer is not part of the maintenance of this work. The studio has experience in treatment of graphite layers and should be contacted for specific guidance for works where this is a factor.

6. SEISMIC STABILITY

Given SFMOMA's location in San Francisco, a mount that would stabilize the sculpture in the event of an earthquake was critical not only for the art, but also for the safety of visitors and staff. Paul Rodler, a seismic engineer, was retained to design an appropriate mounting system. This design went through several iterations in response to feedback from the artist's studio about what has and hasn't worked well for her other sculptures. The studio stressed their preference for passive supports that allow the wood to expand and contract. Mounts that have attempted to lock sections in position, such as the previous mount used on SFMOMA's sculpture, have generally caused more harm than good.

We eventually decided on a mount that incorporated a large x-shaped steel base with a central beam welded to the middle (fig. 11). The beam was designed with two sections that could be bolted together, making it easier to transport the separate elements. Pressure-fit posts extend on four sides from the central beam, which will prevent the sculpture from moving significantly in an earthquake but allow for normal dimensional changes (fig. 12).

7. INSTALLATION

The installation of large sculptures is always a team effort involving people with differing roles and areas of expertise. This installation involved three distinct groups: SFMOMA, who coordinated the logistics related to our building; Sheedy Drayage Co., the crane company; and Atthowe Fine Arts services, a local company that served as the installation manager and coordinated transit. There were a number of unknowns with this sculpture since we hadn't installed it before, and an additional factor was that given the building construction, we were using a new crane path. This led to much discussion of the best course of movement, and many meetings later, we finally settled on a plan that balanced safety of the art and need for efficiency.

We partially assembled the sculpture on the street near the crane, placing the lowest section on its mount and a support of high-density polyethylene (HDPE) sheet with channels cut to encourage drainage. Sections were moved using steel beams that were temporarily attached to the tops of the sculptures to distribute the weight (fig. 13). After the lower units were assembled, the crane brought it as a unit to its final position in the fifth-floor terrace. We brought the remaining sections up on stacked pallets and assembled the remainder of the sculpture on the terrace using the crane (fig. 14). This would not have been possible without a highly precise crane that could respond as needed to align the sections.

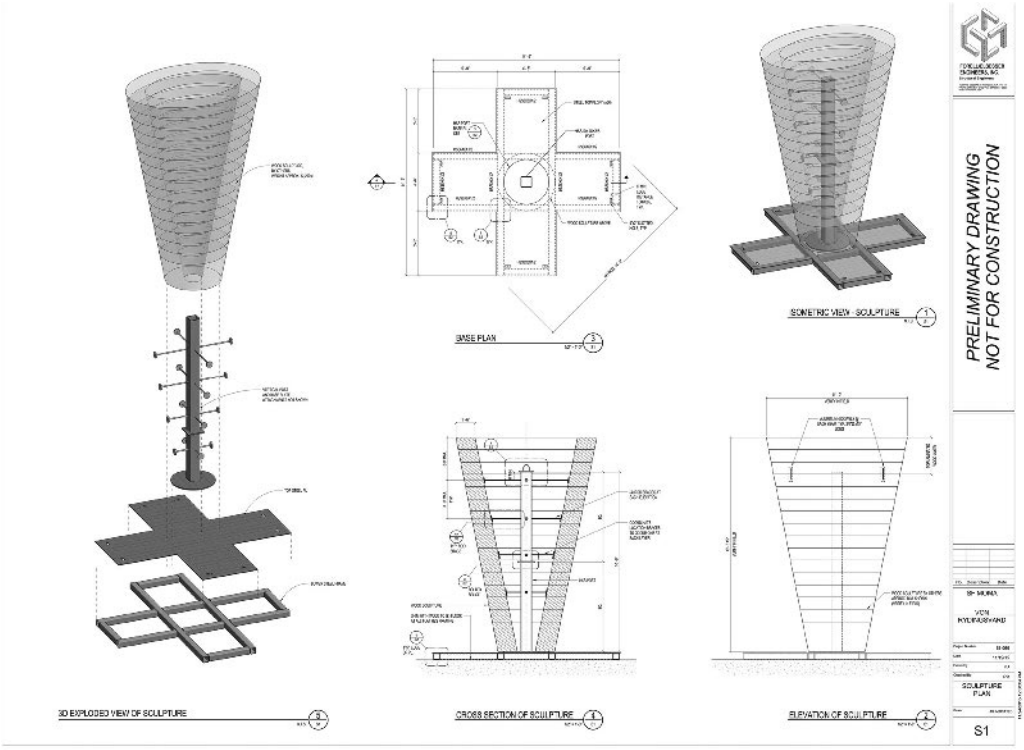

Fig. 11. Rendering of the mount design (Courtesy of Forell/Elsesser Engineers, Inc.)

Fig. 12. The pressure-fit posts as installed (Courtesy of Ursula von Rydingsvard, photograph by AJ Bucknall)

Fig. 13. Assembly of sections onto new mount, lifting the sections from steel beams that were temporarily attached (Courtesy of Ursula von Rydingsvard, photograph by Emily Hamilton)

Fig. 14. Assembly of the upper portion of the sculpture on the terrace (Courtesy of Ursula von Rydingsvard, photograph by Emily Hamilton)

Fig. 15. Ursula von Rydingsvard with *Czara z Babelkami,* 2016 (Courtesy of Ursula von Rydingsvard, photograph by Katherine Du Tiel)

We added plastic snakes to the interior of the sculpture as a bird deterrent and also placed a screen between the top two sections to catch debris. The base of the mount was covered with gravel and up-lighting from the base was added at the studio's suggestion.

8. CONCLUSION

Working with artists is at the very core of our practice at SFMOMA, and in this instance, the involvement of the studio was absolutely essential to identify and manage condition issues. Ursula von Rydingsvard was recently able to visit the museum and see the work installed, creating the opportunity for further dialogue about the sculpture and how it is installed. She was pleased with the current appearance of the work and the installation overall, though she suggested recessing the lighting so that the fixtures are less visible. She also suggested changing the rocks that cover the mount to a darker material that would have greater contrast with the sculpture. We look forward to building upon the relationship that this project initiated, which we know will enrich our understanding as we care for this work over time.

ACKNOWLEDGMENTS

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SOURCES OF MATERIALS

ART Flex-tec HV and Prime-A-Trate
Advanced Repair Technology, Inc.
PO Box 510
Cherry Valley, NY 13320
866-859-ARTS
http://www.advancedrepair.com/

Boracare
Do My Own Pest Control
4260 Communications Dr.
Norcross, GA 30093
866-581-7378
http://www.domyownpestcontrol.com/

Bor-8 rods, ½ in. x 2 in.
System Three Resins, Inc.
3500 West Valley Highway North, Suite 105
Auburn, WA 98001-2436
253-333-8118
https://www.systemthree.com/

LiquidWood and WoodEpox
Abatron, Inc.
5501 95th Ave.
Kenosha, WI 53144
262-653-2000
http://www.abatron.com/

X-100 Natural Seal Wood Preservative, clear
Western Log Home Supply
2501 S. Louis Ave.
Sioux Falls, SD 57109
970-315-2660
http://www.westernloghomesupply.com

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