Packing a Collection: Furniture Packing, Transport and Storage at the MFA, Boston

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The Museum of Fine Arts, Boston, is in the process of implementing the first phase of a Master Plan which involves the demolition of the east wing of the museum and the building of a new American wing designed by the London-based architect Norman Foster.

The first stage in this project was the removal of all collection material from the east wing and connector galleries and its packing and transportation to an off-site storage facility prior to the demolition and construction phase. This paper will focus on the particular methods, materials and techniques that were used to pack the American and European furniture collections on display and in storage in these parts of the museum. This involved packing the contents of eighteen period rooms, eighteen galleries and four very large storerooms. The total number of pieces of furniture to be packed is estimated to be 2,500, many of which are composed of two or more parts or elements. The offsite storage building has approximately 30,000 square feet of space, with 20,000 square feet being devoted to object warehouse space, which uses several different shelving systems to accommodate the different-sized pallets which hold the furniture. The remaining 10,000 square feet include the loading dock, object examination space and basic spaces for photography and conservation.

The decision was made to design packing systems that would allow for safe transportation but would also allow the pieces to be easily unpacked in the storage facility, if necessary, for examination and study by both museum curators and other scholars. And because of the systems' design, the pieces can be repacked easily for transport back to the museum. The decision was made to incur all the packing cost at the front end of the project. In this way there is no additional expense or time required to repack the furniture when it needs to be transported back to the museum, either when the new building is ready to be filled or if individual pieces are required back at the museum for display in the galleries or for loans. All packing systems were jointly developed by the Collections Manager, Head of Furniture and Frame Conservation and the two art-packing companies working on the project. Prototypes of several different packing systems for each furniture form were made and refined until the final version was approved for use.

The first shelving system employed was a "close packing" system with removable shelves, first designed for use at the Library of Congress. This uses perforated gray powder-coated metal shelves (fig.1) which can be lifted using a special fork lift called an "order picker." The corridor between the shelves is only slightly wider than the depth of the shelf unit and therefore optimizes the storage capacity. During the prototype phase it was found that the metal shelves could flex and twist when handled under load, and wood bracing was therefore added

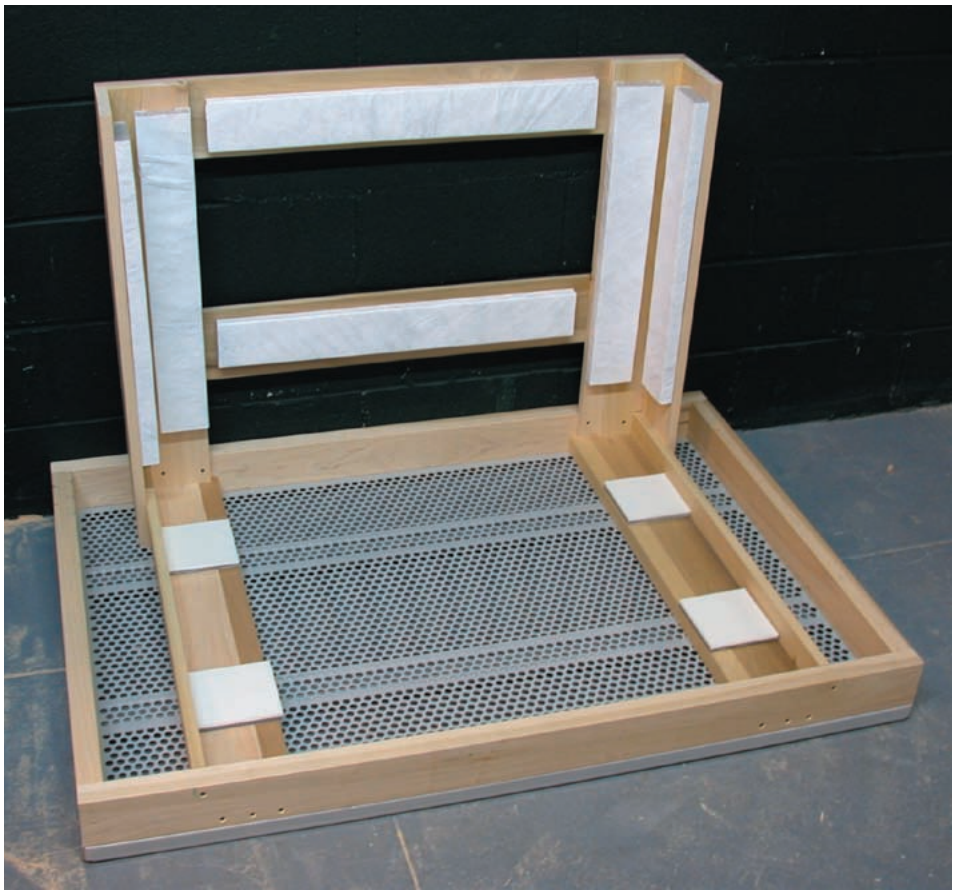

Figure 1. Metal shelf with poplar framework.

Figure 2. Case furniture strapped in place.

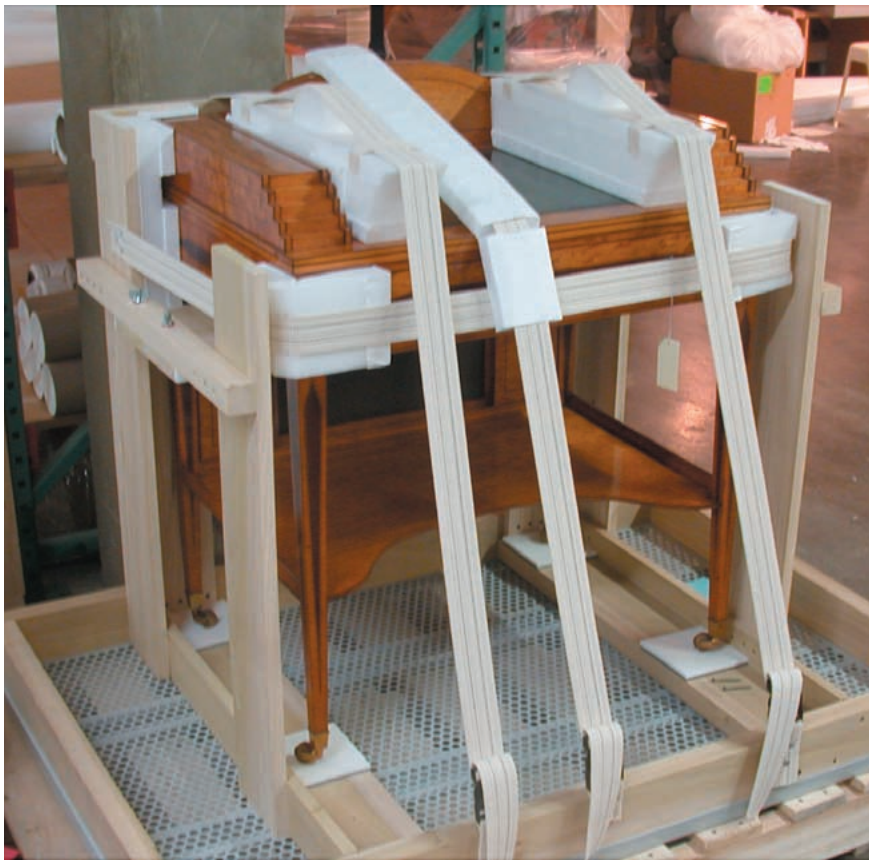

Figure 3. Side supports to raise furniture.

at the perimeter to produce stiff platforms for case furniture to rest on. A rear framework was also constructed for the furniture to rest against and which would hold the straps used to secure the furniture down to the shelf. These shelves could be used for all case furniture up to 48″ in width. Poplar was selected as the only wood material that would be used in packing because of its low level of offgassing of organic acids. Different inert foam materials were used to pad the wooden frame. Pads were made of Ethafoam of different densities and surfaced with a layer of Volara foam which was finally covered with a sheet of soft wrap Tyvek. This foam construction was adhered to the wooden frame using low temperature melt glue delivered from a hot glue gun. After the backing wood was padded, the case piece could be placed onto the shelf (fig. 2), with acid-free corrugated board squares under each foot, which allowed the furniture to be slid back against the padded back support. Padded cotton straps were then used with plastic clip buckles to hold the furniture down onto the shelf and back to the back support structure. The straps, which hold the furniture back to the support structure, can also serve as bracing to prevent the movement and opening of drawers or doors. All moveable hardware was wrapped with tissue to pad it during transport. Finials and other removable parts were wrapped in tissue and stored in the uppermost drawer of the lower case. The straps threaded into the buckles allowed the appropriate amount of tension to be applied to hold the furniture securely in place and also allowed it to be easily unstrapped when it arrived at the offsite storage building. An important aspect to the design of the packing system is that it allows the

Figure 4. Chair carriers.

furniture to be easily unstrapped, and because of the pads under the feet, the case pieces can be slid forward, which removes all padding from contact with the furniture during its storage period. As the furniture will be stored for a minimum of four to five years, there was concern that padding in contact with finished surfaces could adhere and mar the surface finish if left in contact for a long length of time. Case pieces or tables over 48″ were packed using the same generic system but with the reinforced metal shelf replaced by a conventional pallet, also constructed from poplar. At the off-site storage facility, these larger pallets are handled with a fork lift and stored on open shelf units.

An adaptation of this system was used for furniture with delicate feet or legs and involved the construction of side panels in addition to the back support (fig. 3). This allowed delicate pieces to be slightly raised, to remove any weight on the feet or legs; a padded board was passed under the structurally stable part of the furniture, such as the underside of the rails of a table or a case piece, and then secured to the side panels using bolts and thumbscrews. Again, once the piece had been transported, the thumbscrews could be loosened to lower the piece, which could then be moved forward again to remove any padding material from contact with the furniture. In a few cases some tables were packed upside down and rode with the table top in contact with Tyvek-covered foam attached to the metal shelf or pallet. In these cases the furniture was turned right side up after transport, before it was placed on its storage shelf.

Other forms which required special systems were tall case clocks. The "Ridg-u-stak" system was used to construct tall vertical corners attached to a poplar pallet with an interior wood structure which after suitable padding allowed the vertical

Figure 5. Foam pad for chair foot.

Figure 6. Padded battens holding seat back.

packing of four tall cases in one "Ridg-u-stak" pallet. The hoods, clock mechanisms, weights and pendulums were then packed separately in smaller units so that similar-sized pieces from different clocks were all packed together as a way of optimizing the space requirements during storage. Although every effort was made to keep multiple part objects together, tall case clocks illustrate well the fact that parts from one clock may be stored in several locations. The importance of having a registrar to monitor object locations and a suitable database for tracing locations is therefore essential.

Chairs were packed using generic reusable carriers (fig. 4) which were adaptable depending on the style and footprint of each individual chair. Twelve slat crate double-chair carriers were constructed from poplar. Each foot of the chair sits on a padded foam square with two raised sides (fig. 5). These pads were secured to the bottom of the crate with Velcro. This allowed for the pads to be specifically placed, accommodating the exact position of the feet for any given chair. The back of the chair was then sandwiched between two padded battens which were adjustable and rode in slots at the sides and which could be secured in the correct position using thumbscrews (fig. 6). A cushioned strap attached to the center of the sliding battens was passed over the top of the crest rail and buckled together, which prevents any vertical motion during transportation (fig. 7). Finally, an additional batten could be used to provide a large foam cushion to rest on the seat if the chair had a drop-in seat (fig. 8). This generic system can be customized to accommodate particular, delicate issues of gilded or painted surfaces or delicate upholstery. Both side chairs and armchairs can be accommodated using these carriers. These double carriers also have a removable central partition which allows wider chairs or two-seat sofas to be packed. Once the chairs have been transported to off-site storage, they can be easily and quickly "uncrated" and placed on open shelves ,and the carriers can return to the museum to be repacked.

Figure 7. Foam and strap over crest rail.

Figure 8. Additional batten and foam cushion resting on seat.

A similar but much larger carrier was made using the "Ridg-u-stak" system attached to a wood pallet base. Using long battens (in this case 2″ x 4″ padded timber), sofas and settees could be easily held securely, with minor customizing as necessary to accommodate different sofa/settee forms. Again, once they arrived at off-site storage, they would be "unpacked" and placed on open shelving. These carriers have also been used for very large simple form tables.

With all the seated furniture, a major issue and concern was the condition of the upholstery. All chairs or sofas with delicate original upholstery were first covered with acid-free tissue and then lightly wrapped with washed soft-wrap Tyvek that was lightly held in position using cotton twill tape (fig. 9). A brown paper pattern was made from a standard side chair which allowed the Tyvek to be cut out and then wrapped around the seats (fig. 10). All advice and ideas for the protection of the upholstery were provided by the museum's textile conservation division, who recommended washing the Tyvek to soften it before use. A very large number of pieces which had previously been in storage had very worn and degraded upholstery, and this system not only protected the upholstery from dust and light but in many cases held degraded upholstery together and kept it contained and safe from falling off during transportation.

Although three of the four storage areas in the east wing of the museum were climate controlled, one large storage room and all the galleries and period rooms, which held the furniture collection, were not. As the new storage building is

Figure 9. Wrapping of chair with soft wrap Tyvek.

tightly controlled at a relative humidity (RH) of 50%, and because a large part of the move was going to take place over the winter months, there was concern about how to safely move furniture from the museum galleries, whose climate was at times in the mid 20% RH, to the 50% RH of the off-site storage facility. Previous monitoring, with temperature/RH dataloggers, of encapsulated objects in polyethylene bags or sheeting during the movement of furniture and other sensitive material from the RH-controlled J. Paul Getty Museum in Malibu to the RH-controlled new Getty Center in Brentwood, during extremely low periods of ambient relative humidity, suggested that for short periods polyethylene is a very effective moisture barrier. Further tests were carried out at the MFA by taking an upholstered chair from one of the galleries that was at 28% RH and placing it, together with an RH datalogger, in a 2 mil polyethylene bag. The bagged chair was then moved to the furniture conservation lab, which is controlled at 50% RH, and the internal RH was monitored. Although the upholstery component of the chair obviously added a buffering capacity, the RH within the bag took in excess of two months to move from 28% RH to 50% RH. This clearly showed that the polyethylene acts as a very good moisture barrier, and large polyethylene bags were therefore used to encapsulate all furniture being moved, to allow the furniture to slowly acclimatize to its new ambient relative humidity.

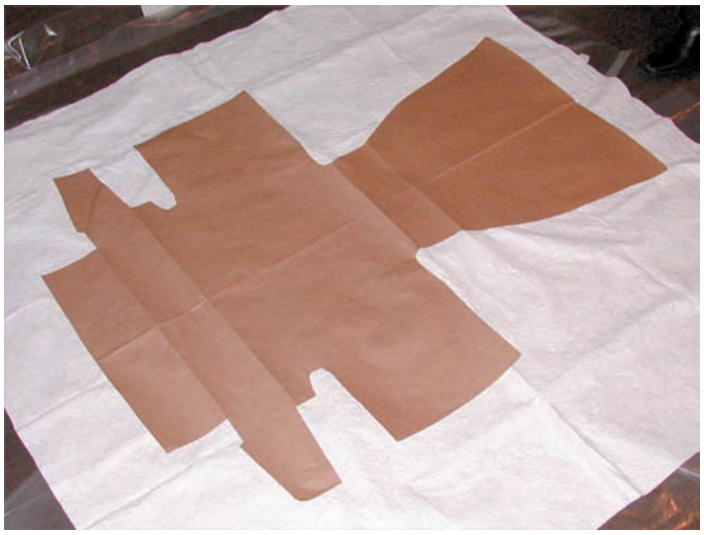

Figure 10. Brown paper pattern.

Summary

The packing systems developed during this project allowed the safe transportation and storage to an off-site storage facility of a large part of the museum's furniture collection.

Many new systems were developed for packing different furniture forms, and we be continue to experiment to assess if any aspects of these packing systems can be adapted for use in the transportation of furniture for loans.

Materials Sources

University Products, www.universityproducts.com: Ethafoam, Volara, acid-free tissue

ITW Nexus, www.plastic-buckles.com: Trovato 2″ buckles

Uline Shipping Supply Specialists, www.uline.com: plastic bags

New Haven Moving Equipment, www.newhaven-usa.com: straps, plastic bags

Holt and Bugbee, www.holtandbugbee.com: poplar

Ted Thorsen Company, www.tedthorsen.com: Ridg-u-stak

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