How Preventive Conservation Can Inform a Collections Move: Rehousing the Canadian and European Furniture Collections at the Royal Ontario Museum

Greg Kelley and Melissa Maltby

Journal of the Canadian Association for Conservation (J.CAC), Volume 43
© Canadian Association for Conservation, 2018

This article: © Royal Ontario Museum, 2018.
Reproduced with the permission of the Royal Ontario Museum.

J.CAC is a peer reviewed journal published annually by the Canadian Association for Conservation of Cultural Property (CAC), 1554 Carling Avenue, unit 268, Ottawa, Ontario K1Z 7M4, Canada; Tel.: (613) 231-3977;
E-mail: administrator@cac-accr.ca; Web site: <www.cac-accr.ca>.

The views expressed in this publication are those of the individual authors, and are not necessarily those of the editors or of CAC.

Journal de l'Association canadienne pour la conservation et la restauration (J.ACCR), Volume 43
© l'Association canadienne pour la conservation et restauration, 2018

Cet article : © Musée royal de l'Ontario, 2018.
Reproduit avec la permission du Musée royal de l'Ontario.

Le J.ACCR est un journal révisé par des arbitres qui est publié annuellement par l'Association canadienne pour la conservation et la restauration des biens culturels (ACCR), 1554, avenue Carling, unité 268, Ottawa (Ontario) K1Z 7M4, Canada; Téléphone : (613) 231-3977; Adresse électronique : administrator@cac-accr.ca;
Site Web : <www.cac-accr.ca>.

Les opinions exprimées dans la présente publication sont celles des auteurs et ne reflètent pas nécessairement celles de la rédaction ou de l'ACCR.

How Preventive Conservation Can Inform a Collections Move: Rehousing the Canadian and European Furniture Collections at the Royal Ontario Museum

Greg Kelley and Melissa Maltby

Royal Ontario Museum, 100 Queen's Park, Toronto, Ontario M5S 2C6, Canada; gkelley@gregkelley.com; melissam@rom.on.ca

In 2015, the Royal Ontario Museum undertook the challenge of a large-scale, two-year move of over 26,000 artifacts from temporary storage in the McLaughlin Planetarium to a purpose-renovated facility. Moving such vast and varied collections presented many unique logistical and organizational challenges. An innovative approach to designing the storage facility from the ground up by using 3-D modelling software to pre-visualize the various layouts is described. Designs, materials and rationales for dust covers, custom pallets, moving crates and storage mounts are also discussed. This paper focuses on part of the project – the systematic process of moving and storing over 500 pieces of furniture and wooden objects – as an illustration of how conservation can inform a large collections move.

En 2015, le Musée royal de l'Ontario a entrepris un défi de taille, soit le déménagement sur deux ans, de plus de 26 000 artefacts. Ces objets ont été déplacés du McLaughlin Planetarium, un site d'entreposage temporaire, vers un édifice rénové sur mesure. Déplacer de grandes collections diversifiées impliquait plusieurs défis logistiques et organisationnels. Une approche novatrice sera décrite, soit la conception complète de l'entrepôt en utilisant un programme de modélisation 3-D pour pré-visualiser les différents plans. Sont également présentés les plans de conception, matériaux et raisons motivant l'élaboration des toiles de protection contre la poussière, palettes sur mesure, caisses de transport et des supports d'entreposage. Cet article se penche sur une partie du projet, soit la gestion du déplacement et entreposage de plus de 500 meubles et objets en bois, pour illustrer l'apport de la conservation lors de la planification d'un déménagement de grande envergure des collections muséales.

Manuscript received September 2018; revised manuscript received February 2019.

INTRODUCTION

The sale of the iconic McLaughlin Planetarium by the Royal Ontario Museum (ROM) to the University of Toronto resulted in a large-scale, two-year move of over 26,000 artifacts. These objects, which are the core of the ROM's Canadian and European collections, had been stored in the former planetarium theatre from 2000 to 2017. As the planetarium had only ever been intended to be a temporary storage space, the relocation of the collections to a purpose-renovated facility provided an opportunity to address preventive conservation concerns such as environmental conditions, safe long-term housing, integrated pest management and emergency preparedness. Although the collections include glass, ceramics, arms and armour, metal and lighting, this paper will focus on the systematic process of moving and storing over 500 pieces of furniture and wooden objects. This case study follows the logistical and organizational challenges of a large-scale move, from the initial condition survey and treatment to the design of storage organization and the actual move.

CONSERVATION ASSESSMENT AND TREATMENT

The project began with a review of the conservation literature for moving and storage,[1-6] and consultations with colleagues at various institutions. Articles such as Hanlon's "Packing a Collection: Furniture Packing, Transport and Storage at the MFA, Boston"[2] and Hayes' "An Improved Storage System for the Clock Collection"[3] were helpful resources.

Before any move preparations took place, a conservation assessment of the furniture holdings was conducted. It was done in the fall which allowed the conservator to observe the state of the collection under moderate environmental conditions, avoiding seasonal extremes. This survey became the foundation for the furniture move. Over the course of 4 weeks, more than 500 pieces of Canadian and European furniture were assessed. This translated to approximately 25 pieces per day or 3 objects per hour. Each object's condition was reported directly into a customized conservation form in the museum's collections database that included fields such as structural condition (e.g., loose joints, loose members and missing parts), surface condition (e.g., lifting veneer, flaking paint), remarks (e.g., dangerous projections and breakable elements), treatment needs, special handling suggestions and priority levels. This work was accomplished by a conservator doing the assessment and an assistant inputting the information directly into the database on a laptop.

The following colour-coded flagging ribbons were attached to the objects (**Figure 1**) as a quick visual reference to their conservation needs:

Green: "Good to go" with no special move requirements. These objects were deemed stable, in good condition and had no moving parts or delicate features.

Yellow: "Proceed with caution." These objects needed careful handling, had moving parts that required special packing methods or had delicate components that needed special attention when packing.

Red: "Do not move until treated by a conservator." These objects were too unstable to travel and were flagged for conservation treatment before moving.

After assessing 512 furniture-related artifacts, 180 objects or 35% of the collections were found to be unstable.

The conservator was an integral part of the move team, not only for treating objects, but also for sourcing materials, and for consultation and advice. The conservation of furniture is complicated and varied. Furniture is a form made from a variety of materials such as wood, metal, textiles, leather, ivory and paper. Usually it is a combination of these materials.

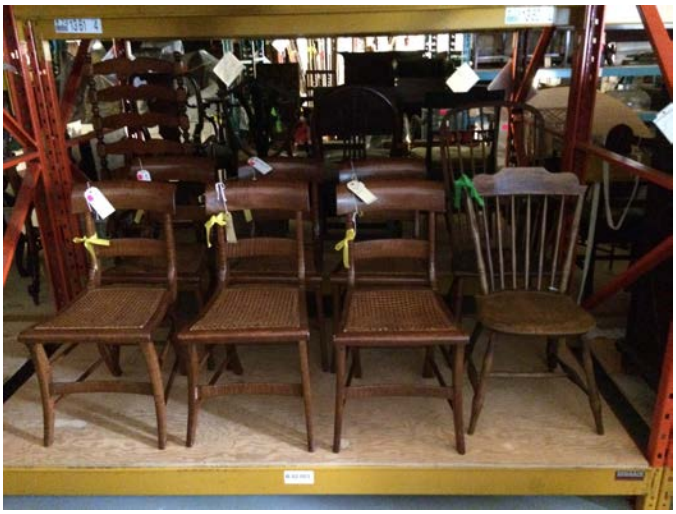

Figure 1. Colour-coded flagging ribbons used to indicate the conservation needs of the furniture collections.

Figure 2. KLETON scissor lift being used in conjunction with ladders on either side.

Adding to the complexity is a range of decorative surfaces such as veneer, transparent coatings, paint, lacquer, gilding and even fur.

Conservation treatments were performed concurrently with the move, and most objects were stabilized directly in situ. Artifacts requiring more intervention were dealt with in the lab. Treatments ranged from stabilizing loose parts and joints to re-adhering loose veneers and flaking paint. It was important to stabilize vulnerable objects to move them safely and rehouse them in the best condition possible for long-term storage. Red tags needed to be exchanged for green or yellow tags before such objects were packed. In the end, most red-tagged objects were treated and only a handful of very complicated projects were deferred for conservation and rehousing at a later date.

In addition to the treatments, all objects were dusted or vacuumed with a HEPA-filter vacuum and a soft brush prior to packing. Any casings, webbing or frass from past infestations were removed and pest management decisions were made so as not to transfer any problems to the new facility. At the ROM, the protocol is to inspect and monitor first. If active pest infestation was suspected, freezing or anoxia treatments were performed prior to moving.

SPACE PLANNING

Once the conservation assessment was completed and before anything was moved, a detailed layout of the new storage facility was created. The goal was not only to move everything safely but also to make the new facility an improved home for the objects. Objects in the new facility were to be shelved by form, geography and date. Single-depth shelving with easily accessible heights eliminated the need for extra help and forklifts. All large and heavy furniture items were to be stored on lower shelves or on pallets on the floor. To help with lifting heavier objects to the upper shelves, a scissor lift was purchased that collections staff could easily use in conjunction with ladders or footstools (**Figure 2**).

For the design of both moving and storage layouts, three-dimensional modelling software was used to build virtual environments with real dimensions. Many 3-D modelling programs are available with both paid and free versions. SketchUp Pro (**Figure 3**) was chosen for this project because it was already being used by the museum's design department. The software took several days to learn in-house, using online resources such as YouTube tutorials as aids in the learning process. Designing the storage layout for 500 furniture objects took one person approximately 3 weeks. The freedom to design and customize everything virtually beforehand meant that objects were moved only once into their predetermined locations. Extra shelving space was incorporated into the design to accommodate future acquisitions.

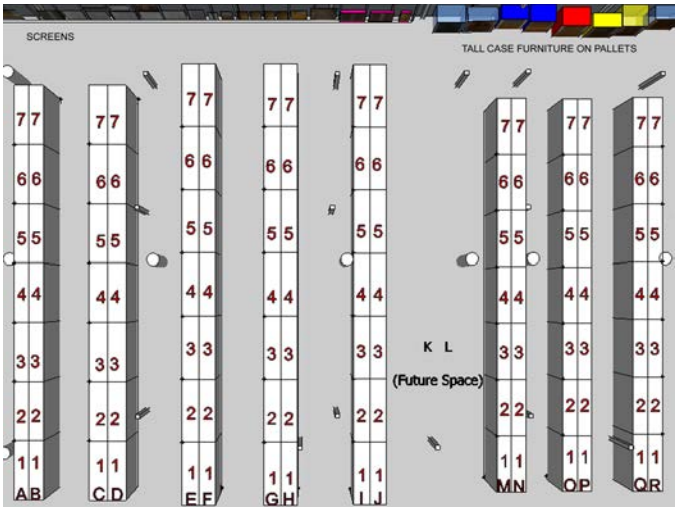

Figure 3. SketchUp layout showing aerial view of a section of shelving including pillar placement as well a section of the art screens.

Figure 4. Concept (left) versus actual (right) for storage of chairs (above) and tables (below).

The Virtual Design

All object measurements already in the database were confirmed for accuracy, and new objects were measured. Once measurements were collected and photographs taken, virtual cubes representing each object were created in SketchUp by inputting the dimensions on the X, Y and Z axes. This software uses real dimensions so does not require any scaling down. The newly renovated storage area was also measured,

comparing "as-built" measurements against the architectural plans. Double-checking "as-built" against "as-designed" was essential as discrepancies were found in some of the measurements.

Once created, the cubes were faced with a photo of each object and placed on the virtual shelves to give a visual representation of the artifacts in the storage layout (**Figure 4**). Although the distance between objects on the shelves and pallets varied, it was found that objects could generally be placed approximately 3–6 inches (7.5–15 cm) apart. The same process was followed for wall-mounted art screens that were used to house objects such as doors, stained glass windows, wall ornaments, mantels, headboards and footboards. Once the shelving layouts were finalized and each object had a virtual home – including anticipated space for objects currently on display in the ROM's galleries that might return to storage in the future – the shelving was purchased and installed.

In the end, a full 3-D environment of the entire building was drawn, including emergency exits and stairwells, which could be used for current and future space planning. SketchUp was further used to preplan the truck loads allowing the move team to be more efficient and organized on hectic move days (**Figure 5**).

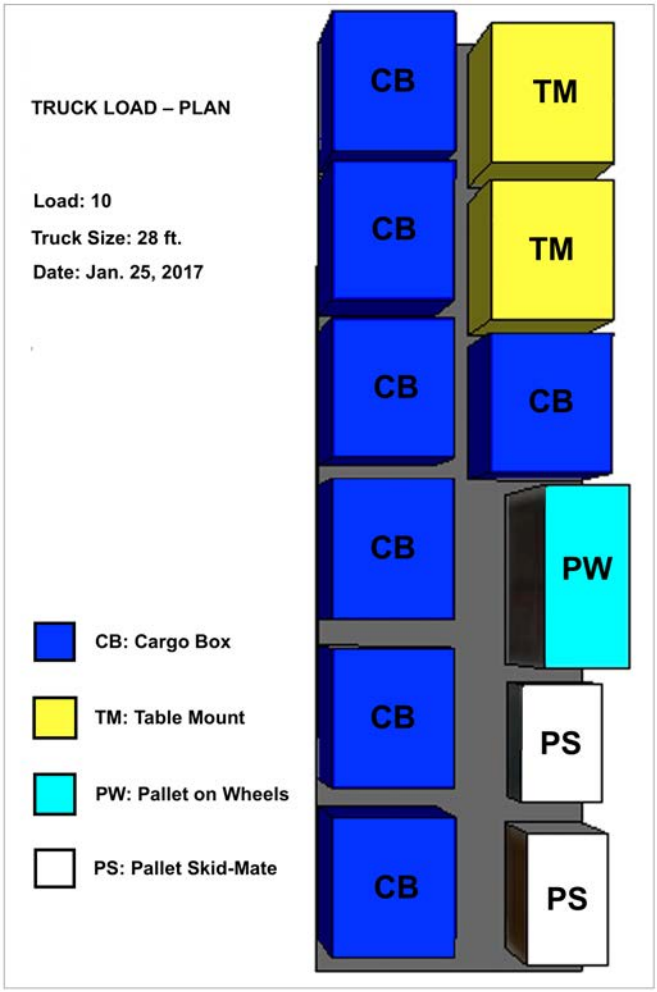

Figure 5. An example of a truck load plan designed in SketchUp in advance of transport.

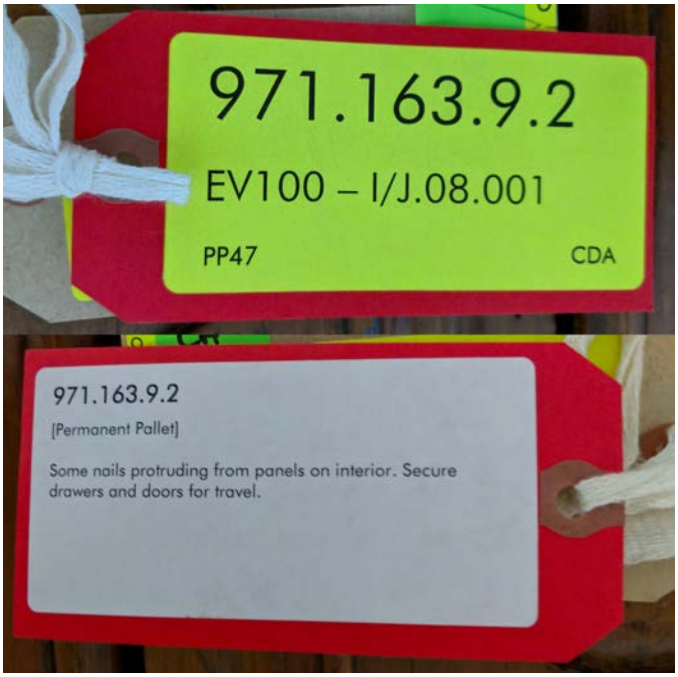

Figure 6. An example of a move tag indicating on the front (top): accession number (971.163.9.2), room number (EV100), aisle letters (I/J), bank number (08), level number (001), pallet number (PP47) and collection (CDA for Canadian); and on the back (bottom): accession number, pallet type (Permanent Pallet), and special handling and packing instructions.

MOVE PLANNING

Tracking

Tracking during the move was a crucial part of the project. The museum did not have a barcoding system in place at the time of the move, so a number of different tracking methods were tried. Once the storage layout was complete, move tags were tied to objects noting their accession numbers, new locations, handling notes and special packing instructions (**Figure 6**). These tags allowed for quick reference to the accession numbers used for tracking. All objects were boxed and palletized, and the move team used paper lists to track all shipments – every box got a content list, every pallet got a box list, every truck load got a shipment list. Whoever packed a box or pallet filled out an accompanying tracking list manually. This information was regularly inputted into the museum's collections database as the move went along, keeping every location record current.

Logistics

Once palletized, objects were moved to a staging area or swing space within the museum to await shipment. This swing space was essential because it doubled as a temporary storage space as well as an additional packing zone.

Palletizing the loads mitigated risks associated with moving and allowed the flexibility to balance care with economy in choosing a commercial mover. After discussions weighing the pros and cons of using large moving vans for an *en masse* move versus smaller trucks for multiple loads, it was decided

Figure 7. The contents of a truck load in the intake room at the new storage facility.

that the most efficient and safest way to move the collection was to hire a 28-foot, climate-controlled, air-ride suspension truck with a dedicated driver and helper. In addition, objects were packed and palletized for transit instead of using blankets that can hold dirt and grime, catch on loose pieces and thus potentially lead to damage.

Smaller truckload sizes made each load more manageable for packing and unloading. In addition, using trucks with interior sizes that matched the new storage facility's intake room (**Figure 7**) ensured that objects were not left sitting on the truck or the dock. Twice a week, two loads of 12 standard-size, 48 x 40 inch (122 x 102 cm) pallets were moved. The staggered shipping dates gave time to prepare and pack in between shipments and allowed for the reuse of pallets, boxes and packing materials.

PREPARING OBJECTS FOR MOVING

Once spaces were planned and logistics decided, objects were prepared for moving and rehousing. Preparations for the furniture collection started by separating the objects into categories: upholstered furniture was covered, cane and gut seating were protected, furniture on rockers was stabilized, tables were supported, and tall case clocks were separated into components.

Upholstered Furniture

After the initial conservation assessment, it was determined that upholstered furniture should be covered during the move as well as for long-term storage to protect the textiles and leather against ultraviolet radiation, visible light and dust. Various dust cover materials were researched, including unbleached cotton muslin, black-dyed woven fabrics and Tyvek nonwoven polyethylene.[7] Cotton muslin and black-dyed fabrics were not chosen because they are neither water resistant nor lint free.

Tyvek SoftWrap 14M was chosen because it blocks light, is highly water resistant and does not shed fibres that could contribute to dust. In addition, it is soft and fabric-like, lightweight, archival and breathable. Tyvek 1443R[6] and Tyvek 1422A[7] could also be used. The Tyvek was washed and dried on a low-heat setting. Since larger pieces of Tyvek melted and balled in the dryer, sizes were limited to 60 x 80 inches (150 x 200 cm). After washing, patterns were created to fit just the upholstered areas of the furniture to avoid any differential

Figure 8. Tyvek covers for loose cushions, drop-in seats, stuff-over seats and full chairs.

Figure 9. Pinning together a full Tyvek chair cover.

Figure 10. Polyethylene foam (Ethafoam) was custom shaped as padding to protect cane seats during transit (left) and as wedges to stabilize rockers (right).

fading of the exposed wood. Partial covers were made for loose cushions, drop-in seats and stuff-over seats, and full covers for chairs and sofas (**Figure 8**).

The Tyvek furniture covers were machine sewn using undyed 100% polyester thread. Seams were kept on the outside to prevent any abrasion caused by rubbing. The smooth side of the Tyvek faced out to repel dust, except in special circumstances where the surface of the furniture could catch on the flock side.

In certain cases, for example with deteriorated leathers and silks, pieces of polyester film (Melinex 516) were carefully stitched onto the inside of the Tyvek as a barrier. In other instances, covers were made to extend beyond damaged areas, so they would not directly touch any loose or damaged threads.

Full chair and sofa covers were fitted (**Figure 9**), so the shape of the object was recognizable. A label was attached to the front of each cover, which included a photo of the object and its accession number.

Cane and Gut Seats

Cane and gut seats are extremely fragile and can be easily pierced when handling. To prevent damage, each seat was fitted with a reusable polyethylene foam (Ethafoam) pad (**Figure 10 left**).

Rocking Chairs

For rocking chairs, simple wedges of polyethylene foam were added underneath the rockers and secured with twill tape to prevent the chairs from rocking during transit (**Figure 10 right**). The twill tape was removed as soon as each object arrived at the new storage facility. Twill tape can imprint on soft finishes; its use without an interleaf should be avoided.

PACKING, MOVING AND REHOUSING

Cargo Boxes

Smaller furniture objects, such as chairs and small tables, were moved in reusable cargo boxes with lids (**Figure 11**). These boxes are designed to fit on standard-size pallets. The interiors of the boxes were lined and divided with 2-inch (5 cm) polyethylene foam to fit a variety of objects. The dividers were organized into different customized configurations; for example:

- sections for separate objects such as chairs – up to 4 chairs could fit in one box (**Figure 12**);
- grids to support objects on their strongest load-bearing components, such as tables on their aprons (**Figure 13**);

Figure 11. Reusable strapped and labelled cargo boxes on pallets.

Figure 12. Two chairs and a stool packed inside a single cargo box.

- blocks to support central columns of pedestal tables to take weight off legs; and
- higher dividers for taller objects, so lids do not touch objects.

Within the box, objects were protected with polyethylene sheeting and were sometimes secured with buckled straps lined with Volara. To prevent any further movement, voids around the objects were filled with reusable "pillows" of S-shaped polystyrene peanuts in heat-sealed polyethylene bags, which were made in-house. Nylon straps stapled to the pallets were buckled together to secure the boxes during transit. The outside of each box was labelled with a content list that was tracked in the database. During the course of the move, 14 boxes were reused an average of 8 to 10 times, customizing each box interior as needed.

Pallets

Larger pieces of furniture were moved and stored on pallets at ground level within the shelving units (**Figure 14**), mitigating the risk of objects falling off pallets when being moved by forklifts to higher shelving. Pallets kept objects 6 inches (15 cm) off the ground to reduce the risk of potential flood damage.

Instead of buying ready-made pallets, custom-made pallets were used. Custom pallets allowed pallet sizes to match the objects and the storage space available. The pallets were built in-house using 3/4 inch (1.9 cm) marine-grade plywood, good side up. Because of the open nature of the new storage space, the acidic off-gassing of the plywood and its adhesives was not expected to cause damage. Marine grade plywood was selected because of the relative stability of the phenol formaldehyde adhesive.

Pelican Skid-Mate feet – air-dampened cushioning devices that come in different colour-coded, load-bearing capacities and protect against vibration and shock – were chosen for pallet feet (**Figure 15**). The feet were attached with Skid-Mate spacers and pan-head carriage bolts. To choose the correct weight categories, a sample of furniture was weighed. Tan feet were selected for smaller furniture objects that one person could handle (under 100 lb. or 45 kg). Mid-sized furniture

Figure 13. Table resting on polyethylene foam grid mount within a cargo box.

requiring two people to lift (100–200 lb. or 45–90 kg) was placed on pallets with green feet. Yellow feet were attached to pallets for larger pieces that needed pallet jacks (200–300 lb. or 90–135 kg). Polyethylene Skid-Mate feet were chosen over wooden runners, since they are designed to be used with pallet jacks from all sides, are easy to assemble, and are water and pest resistant.

For wider furniture like sideboards and sofas, stainless steel, locking, non-flattening casters were used instead of Skid-Mate feet. For furniture that was overly long or heavy, pallets were reinforced on the underside using plywood offcuts. Six casters instead of four were used for these extra-long pallets (**Figure 16**).

Figure 14. Furniture collections on custom-built pallets within shelving units.

Figure 15. Plywood pallets with colour-coded Skid-Mate feet.

Figure 16. Furniture on pallets with either casters or Skid-Mate feet were easily maneuvered and stored under shelving units.

When aisle space was limited and manoeuvring pallets by pallet jack was difficult, small boards with wheels – nicknamed "skidboards" (**Figure 17**) – were used. These skidboards were temporarily inserted under the pallets, by lifting the pallets, either by hand or by pallet jack.

For moving larger palletized furniture safely, several wrapping techniques were used:

- knobs, handles and projections were protected with polyethylene foam (**Figure 17**);
- objects were covered with 2 mm polyethylene sheeting;
- outside edges were padded with reusable corrugated plastic (Coroplast) corners lined with polyethylene foam;
- backs of furniture were bulked out with polyethylene foam allowing objects to sit flush against truck wall during transit; and
- objects were wrapped with stretch wrap to secure padding and loose parts, such as drawers.

Figure 18 provides an example of a fully wrapped and palletized chest of drawers. The use of transparent materials kept objects visible during moving and unpacking.

Special Mounts on Pallets

Larger tables with robust legs were moved on pallets, and smaller tables without stretchers were moved on simple polyethylene foam grids inside cargo boxes as discussed earlier. Tables with delicate stretchered legs or splayed legs required a special solution. It was felt that inverting tables and shipping them on their tops could result in surface damage and

Figure 17. Chest of drawers with polyethylene foam coverings on drawer handles on a pallet with Skid-Mate feet supported by "skidboards."

Figure 18. An example of a fully wrapped and palletized chest of drawers with reinforced corners ready for shipment.

Figure 19. An example of a custom table mount screwed directly onto a pallet.

Figure 20. Tilt-top table in custom mount supporting the central column.

was not suitable. To mitigate the risk of damage and minimize handling, reusable travel mounts (**Figure 19**) were created to support the tables by their strongest load-bearing component, such as the apron or centre column. Once the tables arrived at the new facility, they were removed from the mounts for storage.

For tables and chairs with casters, wheels were secured to prevent any movement during transit by using 2-inch (5 cm) polyethylene foam blocks drilled with holes to cup the casters. Drop-leaf tables were padded with polyethylene foam between the leaves and legs, and secured with stretch wrap to stop the leaves from flapping during transit. Tilt-top tables were travelled in custom mounts supporting the central columns to reduce the pressure on the splayed legs and casters during shipping (**Figure 20**).

Tall case clocks were an interesting challenge. The bodies of the clocks were shipped horizontally on their backs in reusable travel frames (**Figure 21**), and the works and bonnets were packed in reusable boxes (**Figure 22**). After moving, the clocks were fully reassembled for storage. Most tall case clocks have a hole in the back where they were once attached to the wall in a home. With this in mind, pallets were designed with a backing board made from two sheets of plywood glued together. Using the original hole in each clock case, the clocks were screwed to the backing board using a single pan-head screw and washer lined with Volara polyethylene foam (**Figure 23 left**). Pairs of clocks were placed back-to-back on shared custom pallets with Skid-Mate feet (**Figure 23 right**).

Once the furniture was rehoused in the new facility, individual objects were covered with acid-free tissue and polyethylene sheeting to protect them from dust.

Figure 21. Tall case clock bodies on their horizontal travel pallets.

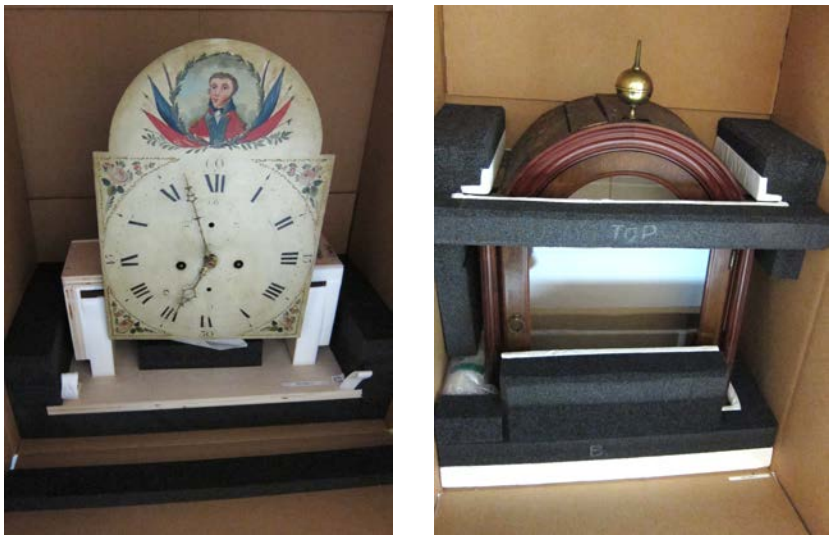

Figure 22. Tall case clock works (left) and bonnet (right) packed inside boxes.

Figure 23. Tall case clocks were screwed to a backing board using clock's original hole (left) when installed on storage pallets (right).

CONCLUSION

Preparation and planning were key to the success of this project. The conservation assessment was an essential first step, demonstrating that approximately 35% of the collections was unstable and highlighting priority objects for treatment. The assessment informed the standards and procedures for handling and safe rehousing. Additionally, it provided a guide for a more thoughtful layout design. Researching the conservation literature for other museums' experiences offered moving and storage strategies that were adopted and improved. Ultimately, the custom pallets, lined cargo boxes and travel mounts were simple in design, easily made and reusable.

As a result of the move, the furniture collections are now well protected in a new purpose-renovated facility where risks are better managed. Upgraded climate control, a dedicated dry-storage room and an intake room for future acquisitions facilitate long-term care. Storage of objects on single-depth shelving with accessible heights and wider aisles improves the availability and visibility of the collections for museum staff and researchers. Rehousing provided an opportunity for enhanced emergency preparedness by guaranteeing that all objects are raised off the ground on pallets, safely stored on shelves and covered to protect against possible water damage. In addition, issues of dissociation were resolved.

A systematic approach ensured that the collections database records were regularly updated, and that objects were carefully tracked, safely transported and rehoused in their correct locations. The importance of moving the furniture in small batches was fully appreciated after the experience – no major damage was sustained, and no object was lost. The methods used to move and rehouse the ROM's Canadian and European furniture collections can be easily adopted by other cultural institutions and illustrate how preventive conservation can inform a collections move.

ACKNOWLEDGEMENTS

The authors would like to thank the following people for their extraordinary work on this project: Carol Baum, Jennifer Kinnaird, Cheryl Copson, Gloria Gerson, Nicholas Clemens, Nicolas Cadiac, Stephen Fisher, John Puccini, Chris Paulocik, Marianne Webb, ROM Conservation Department, ROM Preparators Department and the ROM's dedicated volunteers.

MATERIALS AND EQUIPMENT

Bulk cargo container (double wall Gaylord Box with lid, 48 x 40 x 36 in.); Cam buckle tie-downs (endless style, polyester webbing straps, 1 in x 10 ft.); Perforated polyethylene foam rolls; Poly Bags on a Roll (polyethylene heat-sealable bags); Polyethylene sheeting (clear, 1 mil); Stretch wrap, cast; Tabletop impulse sealer with cutter (for heat sealing bags): Uline Canada, 3333 James Snow Parkway N, Milton, Ontario L9T 8L1, Canada; Tel.: 1-800-295-5510; Website: <www.uline.ca>

Casters: Algood Caster Innovations, 110 Delta Park Boulevard, Brampton, Ontario L6T 5E7, Canada; Tel.: 1-800-254-6633; Website: <www.algood-casters.com/>

Coroplast fluted plastic sheets; Polyethylene foam (Ethafoam, Volara); Twill tape; Tyvek SoftWrap (14M, 60 in. x 100 yd roll): Carr McLean, 461 Horner Avenue, Toronto, Ontario M8W 4X2, Canada; Tel.: 1-800-268-2123; Website: <www.carrmclean.ca>

Flagging tape; Laser labels, removable (4 x 2 in.); Packing list envelopes, clear, top loading (7 1⁄2 x 5 1⁄2in.): Uline Canada, 3333 James Snow Parkway N, Milton, Ontario L9T 8L1, Canada; Tel.: 1-800-295-5510; Website: <www.uline.ca>

KLETON Hydraulic Scissor Lift Table (#193065, 24 x 48 in.); Polystyrene packing peanuts (S-shaped, anti-static): Staples online store; Website: <www.staples.ca/>

Melinex 516: Conservation Support Systems, P.O. Box 91746, Santa Barbara, California 93190-1746, USA; Tel.: 805-682-9843; Website: <https://conservationsupportsystems.com>

Pallets (heat-treated new wood, 48 x 40 in.); Pelican Skid-Mate Feet: Uline Canada, 3333 James Snow Parkway N, Milton, Ontario L9T 8L1, Canada; Tel.: 1-800-295-5510; Website: <www.uline.ca>

Plywood, Baltic birch, good one side (3/4 in., 5 x 5 ft.), marine grade, good one side (3/4 in., 4 x 8 ft.): New Canadians Lumber, 804 Dupont Street, Toronto, Ontario M6G 1Z6, Canada; Tel.: 416-531-2401; Website: <http://newcanadians.hhstores.ca>

Shelving (wide-span with galvanized shelf panel decking, 28 in. and 36 in. depths, 108 in. and 114 in. widths); Art racks (wall-mounted with bottom shelves): Spacesaver Solutions, 115 Englehard Drive, Aurora, Ontario L4G 3V1, Canada; Tel.: 1-877-726-3933; Website: <http://spacesaver.ca/>

SketchUp Pro software: Trimble Inc.; Website: <www.sketchup.com/products/sketchup-pro>

REFERENCES

1 Elkin, Lisa and Chris Norris (eds.), *Preventive Conservation: Collection Storage* (Washington, DC: The Society for the Preservation of Natural History Collections, American Institute for Conservation of Historic & Artistic Works, Smithsonian Institution and George Washington University Museum Studies Program, 2018), <http://resources.conservation-us.org/collection-storage/>. Accessed February 2019.

2 Hanlon, Gordon, "Packing a Collection: Furniture Packing, Transport and Storage at the MFA, Boston," in: *Postprints, Wooden Artifacts Group*, 32th Annual Meeting of the American Institute for Conservation, Portland, Oregon, 9–14 June 2004 (Washington, DC: American Institute for Conservation of Historic and Artistic Works, 2004), <http://www.wag-aic.org/2004/hanlon_04.pdf>. Accessed August 2015.

3 Hayes, Timothy, "An Improved Storage System for the Clock Collection," *V&A ConservationJournal*, vol. 32, July 1999, pp. 8–11, <http://www.vam.ac.uk/content/journals/conservation-journal/issue-32/an-improved-storage-system-for-the-clock-collection/>. Accessed August 2015.

4 Rivers, Shyne and Nick Umney, *Conservation of Furniture* (Oxford: Butterworth-Heinemann, 2003), pp. 273–279.

5 National Museum of the American Indian (NMAI), "Moving the Collections," in: NMAI website, <https://americanindian.si.edu/explore/collections/moving/>. Accessed August 2015.

6 Tétreault, Jean, *Products Used in Preventive Conservation*, Technical Bulletin no. 32 (Ottawa: Canadian Conservation Institute, 2018), <www.canada.ca/en/conservation-institute/services/conservation-preservation-publications/technical-bulletins/products-used-preventive-conservation.html>. Accessed March 2018.

7 Kerr, Nancy, Linda Capjack and Robert Fedosejevs, "Ability of Textile Covers to Protect Artifacts from Ultraviolet Radiation," *Journal of the American Institute for Conservation*, vol. 39, no. 3, 2000, pp. 345–353.