

Packing and Crating of Artwork (working document)

Types of Crates and their uses :

-Standard Crate (upright / ride flat)

The most common crate used by WMAA. Can be used for Paintings and Sculpture, can ride horizontal or vertical. Can be made to accommodate trays or an inner box or a single painting . Opens from the front or the top. Insulated . (fig. 1, 5, 25)

-End load Crate

Generally used to accommodate one or many travel frames within one crate. Looks like a standard crate with the same exterior specs except it opens on the side. Used with large travel frames to minimize the size of the lid . The interior houses a cage which separates the travel frames and has masonite runners to ease inserting and removing travel frames. Generally used for traveling exhibitions and not for storage.

Insulated usually with Ester Foam (fig. 2, 3 –interior cage fig. 27, 28)

-Break –Away or Exploding Crates

Generally used for sculpture, these crates completely disassemble to make packing and unpacking easier, particularly when access to only one side of the piece makes inserting and removing the piece unwieldy or dangerous

Can be insulated with EPS or Ester Foam (fig. 18, 19, 29)

-Skeleton Crate

This type of crate is generally used when a stable object needs to travel locally and size and weight are issues that make a break-away crate unsatisfactory. It can also be used as an inner crate in conjunction with an insulated outer crate. It can also be used to store stable artwork with fragile areas in storage, protecting the surfaces from dust, light and other dangers. This type of crate can be constructed with walls that utilize Corrugulite (see below) This type of crate can also easily be modified to meet the needs of a particular piece.

Not insulated. (fig. 6)

-One Way Crate

Sometimes called a C-Crate. A low cost un-reinforced , usually un-insulated crate. This type of crate is unsuitable for transporting WMAA artwork in most circumstances. It should not be used for artwork in traveling shows. This type of crate could be used for condition report books or tools and supplies that travel with an exhibition.

-Slot Crate

This type of crate was once more common. It works the same way as an end loading crate, but is meant to accommodate individual artworks in the slots instead of travel frames. The artwork generally travels vertically and fits into a series of slots.

Note on Skeleton Crates: Skeleton crates may or may not be constructed with Corrugated walls. If the Artwork is unstable and would benefit from regular visual confirmation of its condition, then covering the structure with clear plastic may be advisable. On the other hand if the Artwork is light sensitive then a form of Corrugated could be the best choice. It comes in translucent and opaque.

General Specs.

- Upright /Ride Flat/End load / Break-Away

-Constructed of ½ in MDO Plywood

-“1 x 4” pine battens glued and stapled

-All pine stamped “ Heat Treated”

-Gasketing (1/4) stapled all around lid or lids.

-Skids secured to bottom of crate with glue and screws.

-Skids can be 2 x 4's for lighter smaller crates. 4 x 4's should be used for larger heavier crates that will require the use of a pallet jack. The bottom of skids should not be painted. (See below)

-Wood Handles should be set at 22-24 inches in height. Handles should be glued and screwed.

-Battens and Skids should be placed so that the crate is stable when being transported on one or more dollies. Skids should be placed in such away as to allow a J-bar or hand truck to be used. This means either skids are inset or there is space between them.

-Removable panels should be secured with bolt plate closure.

-Non-removable joints should be glued and screwed.

Note: the bottoms of the skids should not be painted for two reasons... 1.) The paint will transfer to the floors that the crate is in contact with. 2.) Paint on the bottom of the skids on a very heavy crate can stick to the floor of a tractor trailer and make it harder move...seriously hard to move.

Exterior Specs

Upright / Ride Flat / End load / Breakaway

- The crates are to be painted “Whitney Green” (see fig. 1 and 2)
- Stencil arrows indicating which way up and “Fragile” and “Keep Dry” on 2 sides.
- Attach well placed handles at a height of 22-24 inches wood (glued and screwed)
- Use bolt plates to secure the lid unless there is a compelling reason to use screws
- Top of crate should be flat with no battens if used as an upright painting crate.
- The dimensions and weight are to be written neatly on at least two sides.
- Large ride flat crates should be marked to indicate which side tips up.

**PLEASE NOTE : CRATE DIMENSIONS ARE ALWAYS LISTED
HEIGHT x LENGTH x WIDTH or **H x L x W****

Note on Dimensions: It is very important to list all 3 of the dimensions when measuring an artwork, even when the piece in question is considered 2-D... (this would be the dimension which reflects how far the artwork stands off the wall) or **W**. This measurement is crucial when building a travel frame or determining depths of trays for packing. Although not ideal, it sometimes happens that the artwork is not available for inspection and having all three accurate dimensions is key.

General Interior Specs

Upright / Ride Flat / End load / Breakaway

-Insulation:

-Line crates with 2in Grey Ester Foam on sides, 4 in on riding edge.

Note: Ester Foam can be covered with Marvel Seal for works that appear sensitive to off gassing.

Or

-2in of EPS all around with 2 in. bumpers of Ethafoam

NOTE: if the crate is going to serve as a storage container for the pc after it has returned from a loan, then the insulation material should be EPS.

Point to be considered when determining the size of a crate.

Very Important: Certain concessions sometimes must be made in regard to the dimensions of a crate to accommodate doorways and ceiling heights and elevators or being allowed onto cargo and commercial flights etc. This sometimes is as simple as reducing the height of the skids, or **it could mean riding a painting on its side** or in some circumstances, on a lean within an end load crate. Sometimes as little as an inch can mean hundreds of additional miles and additional handling are added onto the route that a piece travels or that it will have to be unpacked in a less than ideal location.

When considering the details of building a large crate there are times when there has to be a trade-off between designated specs and what is in reality, best for the art work.

When making such decisions, a conservator should be consulted to determine how much stress a particular work can endure.

Points for consideration regarding the interior packing of a crate or box

Who owns the piece? Does WMAA own the work? Could it become part of the permanent collection? How and where will it be stored after it has traveled? Will it be stored in its crate or inner box or travel frame?

If it is owned by the Museum or will be owned by the museum and there is a likelihood that it will be stored in the crate (or if size suggests that it might be stored in an inner box) then it makes sense that the crate be constructed accordingly.

If it seems likely that the crate will be destroyed after transport then non-archival materials can be used for insulation like uncovered Esterfoam.

If it seems likely that the artwork will live in the inner box that is being constructed for transport then it makes sense that the inner box be constructed of materials like Blue Board (museum board) and materials like Etha Foam and lined with materials like Volara , muslin, Dartek, Goretex or Nomex . The construction of the box is also important. **At the present we are steering away from pressure sensitive tapes (tape on a roll with one or 2 sides with a sticky adhesive) as it degrades quickly and messily.**

A better choice of adhesive for the construction of a box that will house the artwork for long periods is jade glue or hot glue.

The material from which the object is constructed should be considered in regard to what packing materials are used in its housing and particularly what material is placed in contact with the artwork.(when in doubt ask a conservator)

It is generally advisable to make the fewest (and most secure) contact points with the piece as possible.

Simplicity of design is important. The more complicated a packing scheme is the more difficult it will be to unpack and re-pack. Detailed packing notes using photographs which will be easily viewable by the art handlers involved should be included and permanently affixed to the interior of the crate so as to prevent them from being misplaced. (an additional copy should be given to the registrar for the file on the artwork to aid in gauging the details of future installations)

Careful consideration should be given to the vibration that will occur during transport and how different methods of transport affect requirements of the crate. For instance: Will the crate go to the airport where the common practice is the use of fork lifts? If so then road vibrations should be considered as well as skids to accommodate fork lifts.

Note: After careful inspection of the material Tyvek it was suggested by a representative of Talas that the re-introduction of plasticizers and anti-staticides had been incorporated into the formula for soft – tyvek which can react with certain materials (like metals) which can cause an unwanted reaction. For this reason WMAA tends to discourage the use of Tyvek. Certain exceptions may apply but warily.

Crate Specific Interior Specs

Tray Pack / Flat Pack

Please Note: This method works best for similar sized (usually small to medium sized) framed works. It is extremely **inadvisable** to mix small works and oversized works together in the same crate.

-Works to be wrapped in Glassine or other appropriate material like Photo-Tex , Silicone Release Paper or Dartek. The package is then wrapped in plastic with all seams sealed.

-Trays are to be constructed of ½ Foam Core or Gator Board with edges sealed, and 2 in. wide ethafoam dividers cut to the proper depth glue in place with hot glue with a 1/8 in. allowance around the Artwork. If the piece is small on a large tray the dividers should be extended to keep the whole package resting flat. (fig. 16, 17)

- Each tray is to have a foam core or gator board cover (which might be the tray above it in a series of trays)

-Etha Foam bumpers may be added to the top tray cover in order to fill out discrepancies in stack height.

- Each tray should be labeled in regard to loading sequence and contents.

Packing of works on paper

Although in opposition to a general rule of packing and handling - and there will be exceptions - almost always pack and wrap framed works on paper FACE UP. This means the taping to the front or face of the framed object. Even if the work appears secure in an over mat things may not be what they seem. Mats can often be elevated above art work or pressure fitted from the bottom and therefore will not necessarily hold in place. Secondary supports are often attached only at the top and will become compromised if the orientation is not correct. All pastel or charcoal, or for that matter, any powdery, friable surface should remain flat and face up. Those glazed with glass should be upright. In time, the use of static dispersive plexi-glass will replace most institutional uses of glass but even among museums this material is not yet in common circulation. Galleries will be the last to change but even so, there will always be instances where glass will be a consideration traveling works on paper. In those cases, the glazing should be taped and should always travel upright. Den glass presents its own conundrum. It cannot be taped because of an opti-coating applied to the surface and yet Den glass is most often employed for the very media that must ride flat. In these cases, try to determine if the glazing **is indeed Den Glass**. “Den-Glass” is a proprietary term. Like “Kleenex” has come to mean all NOSE tissue, Den Glass it has come to refer to all non reflective glass. Try taping a small corner with a stronger pressure sensitive tape and see if the coating is displaced when removed. This may indicate that a lighter tack glass tape or cling film may be applied to the face. In some cases the frame may actually ride FACE DOWN – although this is a direct contradiction of above statements about handling. This would be an highly unusual case where the glass would be so elevated or shimmed from the artwork and the art work itself thoroughly mounted to a support board. In all cases, the traveling of glass intact and framed with the art work presents risk. There are examples of the glazing traveling separately from the art work and then re-framed on site*. For this the absorption of direct vibration and impact on the case and frame becomes paramount. Anything that can be incorporated into the structure and padding of crates should be that that deflects all and any violent impact. Also any undo moving of packed glazed pieces should always be avoided**.

Essentially the traveling of works on paper can be less problematic than other media. It tends to be stable, usually moderate and sometimes uniform in size. As with anything, there are no hard and fast rules but generally:

1. Always travel face up or upright
2. Never assume how a piece may be attached to its secondary support (backing board)
3. Replace glass before traveling if at all possible
4. And if not possible, try to tape it. Ride it UPRIGHT.
5. If a work is very large and framed under plexi-glass and there is concern that the plexi-glass will rest heavily against the artwork risking damage, it is advisable to travel the piece upright, taking into account the method with which the artwork is mounted.

*This presents its own set of challenges in packing un framed and therefore vulnerable works on paper.

**Hand carries have become somewhat notorious as they lead to more vibration, motion and jarring as the tendency to fit them into trunks, overhead bins and other compartments seems to be unavoidable.

Travel Frames

Travel Frames are a secure method of transporting framed or unframed paintings and use OZ –Clips to hold the artwork in place.

Note on OZ-Clips: OZ-Clips are a type of hardware that can hold framed or unframed artwork into a travel frame. It consists of a hinge with two arms which can fold out to support the artwork and be folded in for when the work is on view. OZ- Clips are made of brass and on occasion fail with heavy works if care is not taken in relation to placement and number of OZ-Clips used.

For a small to mid sized painting 4 OZ-Clips should suffice as long as they are placed correctly (fig. 24)

For larger-heavier works 6 should suffice (fig. 24) although sometimes more are necessary.

WMAA places foam below the work as a preventative measure to guard against OZ-Clip failure (more on this below)

Also note that it is sometimes necessary to built up the surface beneath an OZ-Clip in order for it to have the clearance to unfold. This can be accomplished using thin strips of wood or masonite.

-Travel Frame General Specs

-The actual frame of the travel frame should be ¾ inch pine joined to create a four sided L shaped channel (not slatted)around the perimeter of the artwork with cross braces joined in the center or at regular intervals to provide rigidity. Furthermore Corrugate should be affixed to the negative space between the wood (see fig. 4, 5) on the front and back.

-Allow for inside dimensions of 3 inches beyond frame edges (painting edges if unframed) for OZ-Clips.

-Use wing nuts and lock washers to fasten OZ-Clips to travel frames. **WMAA does not recommend the use of T-nuts with travel frames.**

-Allow approximately 2-3 inches above face of artwork if the work is flat. If work is not flat allow above the highest point in the works face while lying flat.

Note: Built up artworks or extremely large works could require more depth.

-Attach metal flip down handles to outside of travel frame.

- For oversized travel frames, handles should be attached at approximately 22 inches from the bottom.

-Lids are to be constructed for travel frames unless there is a compelling reason not to.

-If an existing travel frame does not have a lid place a grid of twill tape across face of the travel frame and secure with 9/16 wafer head screws. Attach twill to sides or back of the travel frame as appropriate. Try to avoid screwing into the riding edge.

-Place a block or series of blocks 2in x depth of riding edge side of travel frame usually covered in Volara and when necessary, covered in Dartek. The pads should be placed 1/8 inch below the bottom edge of the artwork. This is the above mentioned preventative measure against OZ-Clip failure (see image) This method also makes unpacking large works on a lean safer and easier.

Important : Seal outside of travel frame in plastic completely with sealed cut outs for Handles.

-Skeleton Crate General Specs.

-The cage is to be constructed of 1x 4 pine

-Cage is usually enclosed with Corrugate unless there is specific reason not to be .

-Artwork to be held in place with braces, guillotine braces or tie downs.

Note: Can be very useful for local transport in which weight and size are an issue.

Also suitable for storage of stable objects.

Skeleton Crates can work as an inner box when weight is a factor.

Sliding Trays

Trays constructed of ½ inch or ¾ inch MDO can be used when it is useful to be able to remove an object completely from the crate in the absence of good points to lift the object from the crate while still inside, or to generally minimize the handling of the piece. Trays also provide an easier way to insert or remove an object into or out of a crate. Tray should slide (on low friction surfaces like masonite) easily in and out of crate and have a track to hold it in place. Trays supported by foam should have enough foam of the proper density to avoid compression (fig. 13)

Pallets

Pallets are frequently used for storing heavy, bulky objects so that they can be moved using a pallet jack and to keep them up off the floor. When pallets are used for heavy objects, they should be topped with slick(er) surface like MDO or masonite to make removing the object easier.

Inner Crates

There are times when an object warrants the extra security of an inner crate. When an object is extremely heavy or large and the packing that is necessary requires more stability than can be offered from an interior box. An inner crate also spreads the weight over more evenly over the whole of the riding edge allowing the foam to work more effectively. (fig. 7)

An inner crate is almost always constructed of ½ in MDO that is glued and stapled and screwed together. Inner crates have on occasion been constructed of ¾ in MDO.

Inner Boxes

Inner boxes have been previously covered in the section titled:

Points for consideration regarding the interior packing of a crate or box.

Again, they should be constructed out of materials appropriate to their long term use if the work is going to live in its inner box then it should be constructed of Blue board or some similar archival material and constructed with out pressure sensitive tape and using more stable types of foam. If the box is being constructed for travel (and will only be in the inner box for short periods of time) and will return to a home location that doesn't require a box (like the yellow cabinets) then materials like ½ in Gator board should be appropriate as well as the use of materials like Ester Foam and sparing use of pressure sensitive tape. (fig. 8-12)

It is important to be clear (as can be) about whether the artwork is going to stay in the box after travel.

3-D works

3-D works tend to be the most difficult challenge in regard to our work with the permanent collection. They are the most easily (and frequently) damaged and often are more difficult to restore. Because since the 20th Century the doors have opened up to artists in regard to materials at their disposal, works in our collection can be made from literally anything. For this reason extra care is needed when selecting materials that will be placed against or near 3-D artwork. I have discussed this in regard to inner boxes and crates and the same applies to larger 3-D objects (see **Points for consideration regarding the interior packing of a crate or box**) There are a few techniques that differ in regard to the packing of larger 3-D objects where stability of the object in transit are concerned. (fig. 20)

IMPORTANT NOTE : It is worth mentioning more than once the importance of clear, concise, and detailed packing instructions (with images if possible) inside the crate, positioned so that they are easily available for reference to the art handlers working with the piece this is particularly true in the case of 3-D works.

NOTE; Any of the following methods can be used in any combination with each other, but it is important to keep in mind that simplicity of packing is paramount and other solutions on a piece by piece basis are often necessary.

Guillotine Bracing:

This type of bracing is an extremely secure method in which the object is held in place with a tray cut to the inner dimensions of the crate that slides on runners and is cut in half and then cut so that it conforms to the contours of the artwork. The two halves slide in and lock into place securely holding the artwork at that point. The contour point that comes into contact with the artwork should be lined with a shock absorbing foam (Volara or Etha Foam covered in Volara) and is usually lined with Dartek or some slick material to avoid rubbing or burnishing that can occur due to vibration that happens during transit. Generally a number of points (the most stable and least conspicuous) are held in place this way. (fig. 6) It is important that registration marks are included on each brace so that everything goes back to it's intended spot within the crate in it's proper orientation. Images are also extremely useful in this regard.

Removable Braces:

Removable braces are another method of securing 3-D artwork within a crate. These braces can be brought to rest up against an object within the crate to provide stability. They can be held in place with screws, or more securely with bolt plates. The brace itself is usually constructed of a 2x 4 that has Etha Foam hot glued to it and has Volara heat joined to it and is then covered in Dartek. This method provides support when it is not possible or inadvisable to use a guillotine, or when support is necessary at only one point per brace. This method usually incorporates a number of braces per object. It is important that registration marks are included on each brace so that everything goes back to it's intended spot within the crate in it's proper orientation. Images are also extremely useful in this regard.

Tie Downs:

This method is useful when an object has flexible materials that can move around during transit and can possibly harm the object or if it makes sense to secure an aspect of an object to the crate itself. Tie downs in inner boxes are sometimes constructed of Twill Tape. Tie Downs in crates are usually made of cotton webbing that is held in place with a fast-tex (plastic) buckle. The Tie Down is usually lined with Volara where it comes in contact with the artwork. It can be attached to the inside wall or floor of the crate directly (in which case notes should be made on the outside of the crate to alert art handlers of its presence) or to braces inside the crate . (fig.11,20)

Bumpers:

There are times when an object can be securely held in place using bumpers made of foam usually covered in Volara and frequently covered in Dartek. Generally the Artwork has bumpers securing the base to make sure it cannot move and then bumpers are attached to the inside walls and top of the crate to ensure there isn't movement.

Cavity Pack:

The method referred to as a Cavity pack is usually used in relation to small delicate objects packed into an inner box or in some circumstances inner crate. This method is most commonly used in relation with glass or ceramics. The inner box or crate is usually filled completely with layers of Ester or Etha Foam and the top layer is removed and put to the side. The remaining layers are treated as a single piece and are carved to the contours of the piece, so that the artwork rests snugly (but still can be removed with out force) in the cavity. The walls of the cavity are then lined with a soft non-abrasive material such as Muslin, Volara, Goretex or Nomex. (fig. 14,15)

Brief Description of Packing Materials

Blue Board Blue Board which is sometimes referred to as Museum Board is an acid free corrugated card-board like material used in archival settings. It is usually blue-ish gray in color (but other colors are available such as cream) and can be used to make boxes and trays and portfolios.

Corrulite Corrulite is a rigid, translucent (or opaque) corrugated plastic that is used primarily as a covering for travel frames

Archival Coroplast Coroplast® is an inert extruded twinwall polypropylene. Available in a neutral translucent color, product is virgin polypropylene, manufactured specifically for archival applications. Unlike the conventional Coroplast® products, this material has not been corona treated, and the anti-static and ultra-violet inhibitor additives have been omitted. At regular temperatures, Coroplast® is resistant to oils, solvents, and water. Coroplast® can be easily fabricated and lends itself to die cutting, sewing, sawing, scoring, folding, drilling, stapling, nailing, and spot or heat welding.

Cross-Link Foam This closed-cell polyethylene foam, which is off-white in color and is related to Etha-Foam and Volara. It is commonly used for packing sensitive objects for long term storage. It can be cut easily with a band saw, knife or hot knife. It has a smooth, non-abrasive surface, so it can be used in cases where foam bracing are required to come into contact with art objects. Although manufactured in a variety of densities, the most common are 2lb and 4 lb types. The two draw backs to this material are its high cost and environmental concerns. It is considered the most stable of foams due to consistent control of additives and it's longevity in regard to degradation.

Dartek Dartek is a transparent, highly refined plastic wrap that is thin slick and strong. Dartek is a nylon film has no surface coatings and is softer than Mylar or Glassine and can absorb up to 10% of it's weight in moisture.

Ester Foam Polyurethane-ester type foam (softer gray colored foam) Ester Foam's properties include vibration resistance as well as insulation for humidity and temperature control, when used as the lining for traveling cases. Ester foam contains additives to prevent photolytical and oxidative degradation. However, this foam does break down over time and especially when exposed to light. These additives cause Esterfoam to off gas pollutants that can damage certain objects. Therefore this foam is not suitable for storage crates or long term exposure.

Etha Foam (DOW brand name) Polyethelylene foam (denser white foam) Etha Foam comes in a variety of densities: 1.7lb, 2.2lb, 4lb, 6lb, 9lb. The most common type of foam. Used in cushioning of travel frames, and on bracking and guillotine bracing of 3-D artwork as well as a number of other applications. It is very important to note that the formulas for the production of this type of foam have been changing significantly in recent years and the exact effects are not completely known. While still relatively stable, it is not adviseable to place Etha Foam in direct contact with an art object for two reasons, it's abrasive qualities as well as it's chemical make up. A softer, more stable barrier between the artwork and the Etha Foam is suggested like Volara and Dartek.

EPS (Extruded Polystyrene) EPS is a hard-surfaced commercial foam. It is chemically stable, inexpensive, and suitable for storage. It is used as an insulation / liner for crates. It's disadvantage is that it can crumble with heavy use.

Foamcore Foamcore is used primarily for trays and lightweight boxes intended for travel. Foamcore is a lightweight foam covered with paper which is easily cut to size on a table saw, free standing vertical cutter or a mat knife. The two thicknesses that we most commonly use are 3/16 in. or 1/2 in. The 1/2 in. Foamcore is more suitable for the construction of inner boxes and for trays/ dividers.

Gasket 1 inch wide by 1/4 inch rubber strip that is applied around the outer edges of a crate lid (the underside) to create a water tight seal between the lid and box. The gasket seals a crate to create a micro climate inside, protecting the art from drastic changes in temperature and humidity.

Gator Board Gator board is used in the construction of boxes for paintings and sculpture. GatorBoard offers a slightly more rigid surface than foamcore yet retains the light-weight quality which is preferred in the construction of inner boxes. The Gator Board that WMAA uses is usually 1/2 inch (although a range of thicknesses are available) thick and comes in sheets that are 4 x 8 ft. and is composed of polystyrene and is covered in heavy paper (usually brown but sometimes white)

Glassine Galssine is an archival paper product used to wrap or interleaf between paintings prints and textiles. It is acid free and has a slick surface.

Gore-Tex Gore-tex is a barrier laminate polyester felt that works well for art humidification and is excellent for wrapping objects and lining cavities. It is an archival lining material with an elastic quality and slick surface, it stand out for precious metals and other objects with fragile or delicate surfaces. Gore-tex possesses most of the qualities of Nomex but may be used when the risk of snags presents itself due to it's slicker (more vinyl) surface. It has the ability to stretch in one direction and makes a good choice for wrinkle free lining, however it is expensive .

Jade Glue Jade Glue is an archival adhesive. It is a ph neutral general purpose PVA glue. A resin based, internally plasticized polyvinyl acetate emulsion that contains no solvents. It is fast drying, very long lasting and forms a transparent, flexible film. It is thermoplastic and can be also used to form a heat set adhesive.

Marvelseal Marvelseal is An aluminized nylon and polyethelene barrier film that will resist the passage of vapors together with other atmospheric gases and pollutants. It can be used to line travel crates when objects are going to be stored in them for long periods of time. It can be used in any number of applications when a protective barrier needs to be established.

Muslin Muslin is a thin cotton canvas material used in lining foam cavities or wrapping some sculpture. While not always a appropriate choice, it has the advantage of being a time tested packing material.

Nomex Nomex is used as a wrap or lining material for packing more fragile objects such as garments, textiles , fine metals , ceramics , glass objects, wood objects, and a variety of other media. Permeable to air and water, chemically inert, non dusting, flame resistant and extra soft draping quality make Nomex well suited to highly sensitive wrapping jobs. Durability, water and humidity resistance, protection against off gassing as well as mold and mildew make this product a good choice for lining cavities for long term storage. Finally its ability to stretch in one direction while holding fast in the other allows seamless, wrinkle free cavity linings.

OZ-Clip OZ –Clips are hinged brass plates used to secure a painting into a travel frame. OZ-Clips are designed for easy removal and repacking (more on these in the section on travel frames)

Photo-Tex (sometimes called Silver Safe) Photo Tex is a non reactive, ultra smooth fiber paper. It is very stable and non buffered. Phototex is generally used with photography and was developed for use with silver objects however it's properties lend themselves to other applications as well.

Polyethelene Polyethelene, which is better known as plastic is the most basic and most often used packing material WMAA uses clean, unwrinkled virgin Polyethelene (.004 mil.) that comes in rolls of 12 ft x 100ft as it is more highly refined than most plastic wraps and is free of surface talc and other surface treatments.

Polyester Batting (sometimes referred to as Richfab) Polyester batting is used in relation to extra fragile objects. It is very soft and extra fluffy (about 4 inches thick when un compressed) It can be covered to make “pillows” when irregular areas in extremely fragile objects require “give” or other types of padding are not suitable. It can be used as interleaving between textile objects. It usually requires covering with a slicker material to prevent snags.

Silicone Release Paper Silicone Release Paper is white in color and has silicone impregnated on both sides. Almost nothing sticks to Silicone release paper which is its main advantage. It can be held in place with Silicone Release Tape. It can be used in circumstances where adhesion is a concern.

Simalfa Adhesive Simalfa Adhesive is the pink water based glue used to adhere Esterfoam linings to the inside of crates. It creates an unusually strong bond.

Sono Tube Sono tubes are a heavy weight cardboard tube designed for construction applications, but (if covered with a barrier) are suitable for rolling large paintings. Sono tubes are available in various diameters and lengths.

Teflon Teflon is a material with a stretchable non abrasive surface. It stretches in all directions. However it can puncture easily, and as a result is appropriate only for light delicate objects (without pointed edges)

Volara Volara is a closed cell material with highly stable properties (acid free) and a relatively soft non-abrasive surface it is also flexible and can conform easily to a wide range of contours. Volara also can be heat fused directly to Ethafaom with out the use of other adhesives. Volara can be made in colors but WMAA uses white to show dirt and to allow easy detection of paint rub off. Volara is available in thicknesses of 1/8 and 1/4 in. Volara is an extremely versatile packing material which is considered an industry standard.



(fig. 1) Example of a Standard (ride flat) WMAA crate painted Whitney Green .



(fig 2.)
Example of a Standard WMAA
End load crate painted Whitney
Green



(fig. 3)
Example of WMAA End Load Crate loaded with Travel Frames. Note cage structure of interior.



(fig. 4)



(fig. 5)

(fig. 4-5)
WMAA Standard (upright) crate (pre-Whitney Green) with Travel Frame. Note the Corrugate on the outside of the travel frame and registration mark on the lid.



(fig. 6)
WMAA Skeleton Crate with Corrugate and guillotine bracing. Note how braces “lock”
into place when lids are screwed into place.

(fig.7)
WMAA standard crate with inner crate to house sculpture. Note: Artwork is placed on a well designed sliding tray.



(fig. 8)
Standard crate with inner crate to house boxes and sculpture. Note: This crate is made to house one complete sculpture, the boxes are constructed using archival materials inside.

(fig. 9)

Examples of storage boxes made for Calder's Circus. Note: Boxes are made of Museum Board (archival quality). Images are placed for easy reference.



(fig. 10)



(fig. 11)



(fig. 12)

(fig. 9-12)

Further examples of Calder Circus housing . Note use of Muslin and tie-downs to secure art work



(fig.13)

This crate utilizes guillotine braces, a lot of attention was put into the bracing system.

There are two issues with this crate when it's put into use, however...

The artwork is very heavy (300 lbs) and all of the weight is resting on two foam strips (which are dense 9 lb foam) which in spite of its dense nature, can compress over time, and then the entire work can sink and as the work sinks the braces no longer make contact with the intended points which can cause damage in the long term. (it should be noted that the crate was designed for transit and not necessarily for long term storage)

This issue is more pronounced in other crates in the collection, but worth mentioning as something to be aware of as many crates designed for transit become the long term homes for artworks in the collection.

The other (more pressing) issue about this crate is that in practice this crate is incredibly awkward. It's tall, very heavy and narrow on both sides which makes it very difficult to put on a dolly, and not very stable once you get it there.

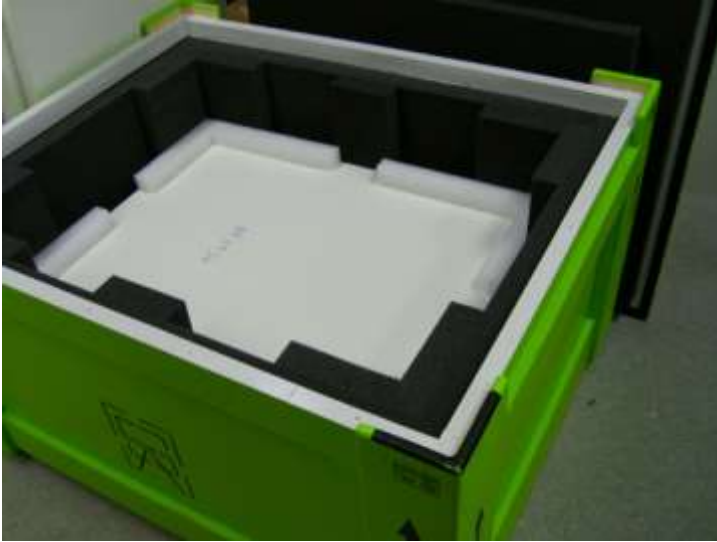
This is an interesting crate for discussion, as it has both very good and awkward points about it.



(fig.14)
Example of a cavity pack in an inner box. The element is packed in Ethafaom and Nomex.



(fig.15)
An involved cavity pack of bird specimens done for the Museum of Natural History. Photo supplied by Surroundart.



(fig. 16)
Example of WMAA tray pack
in a ride flat crate.



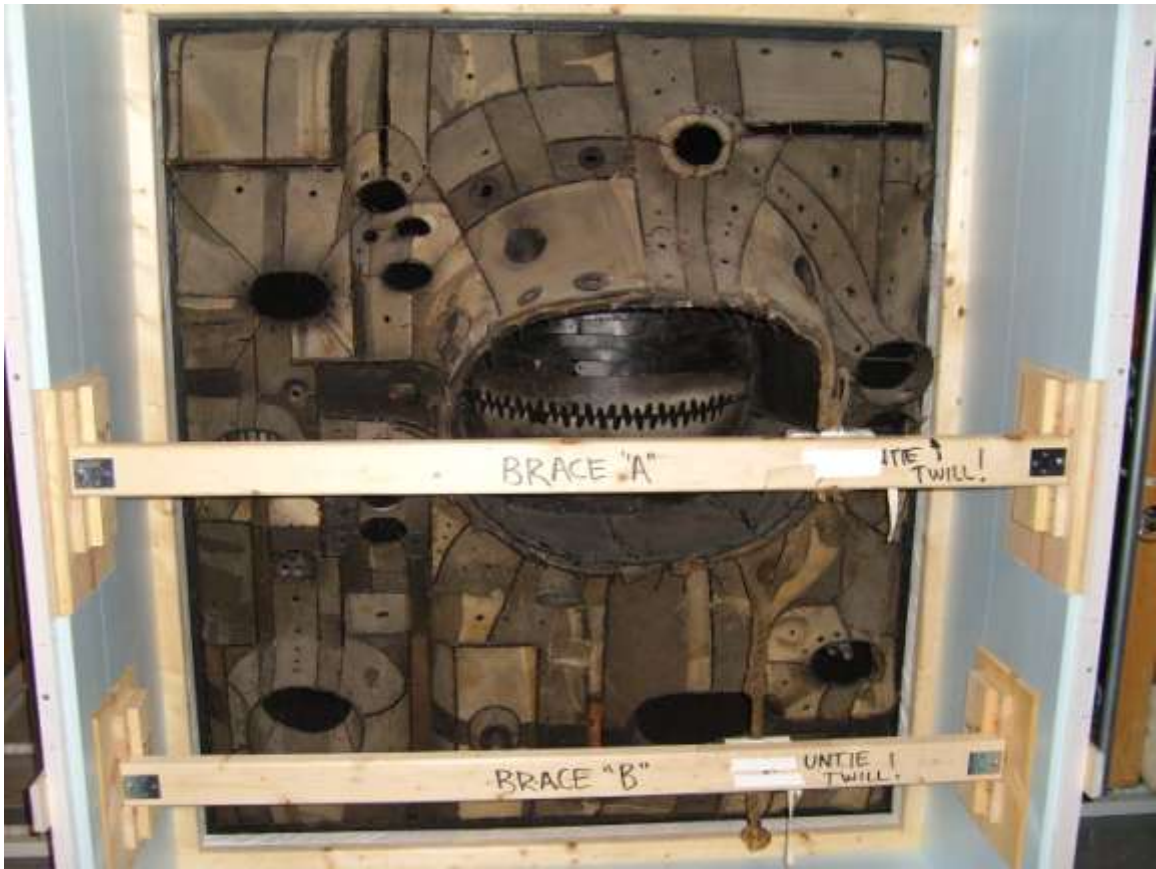
(fig. 17)



(fig. 18)
Example of WMAA break-away crate.



(fig. 19)
Note Ethafoam is covered in Volara and then Dartek at contact points.



(fig.20)

Another example of braces. In this circumstance the braces are used to support the sculptural elements that extend from the surface of this framed work. Note the use of tie-downs to stabilize hanging elements when crate is in transit.



(fig. 21)

View from the back to illustrate tie down.



(fig. 22)

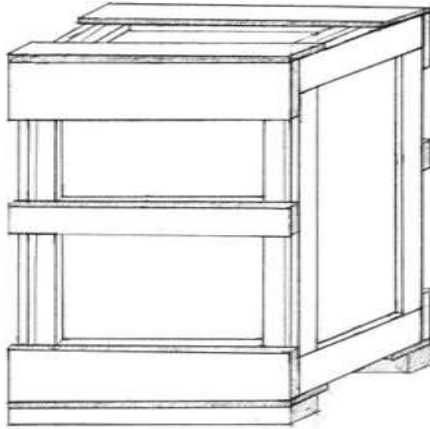
Example of a rolled painting on a Sono Tube in an insulated crate.
Photo supplied by Surroundart.



(fig.23)

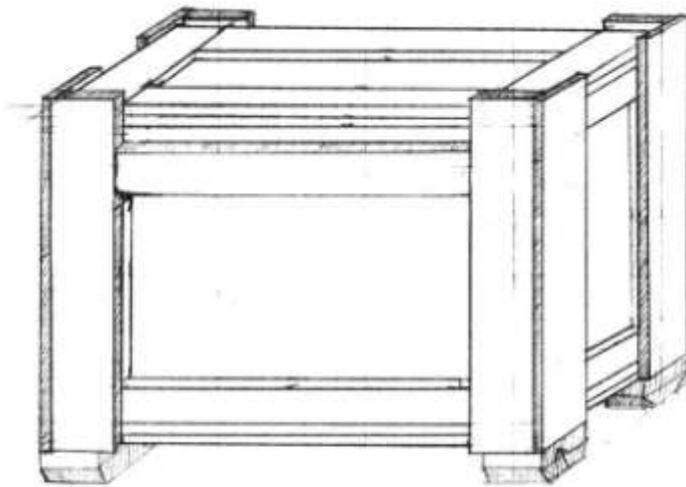
Example of Marvalseal as a crate liner.
Note: the crate is not finished.
Photo supplied by Surroundart

(fig. 25)
Drawings by Surroundart
External drawing of Side Load Crate.



Regular Top Side Load Crate

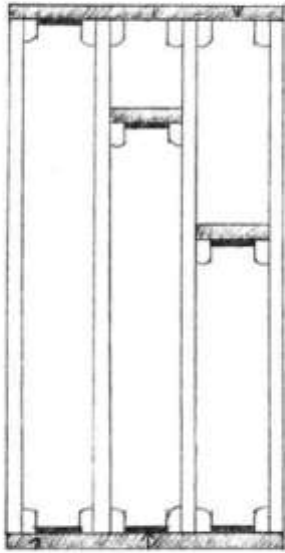
(fig. 26)
External drawing of Top Load Crate.



Regular Top Load Crate

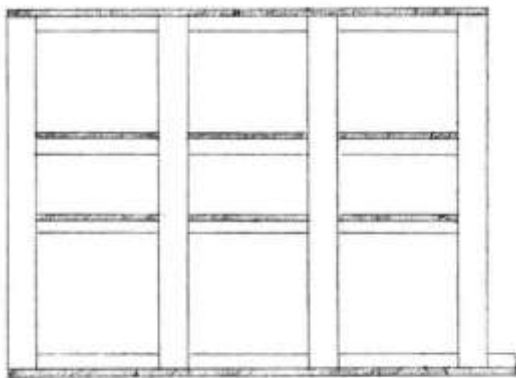
(fig.27)

Drawing of internal cage of an End-Load Crate. (note: outer shell is not pictured)



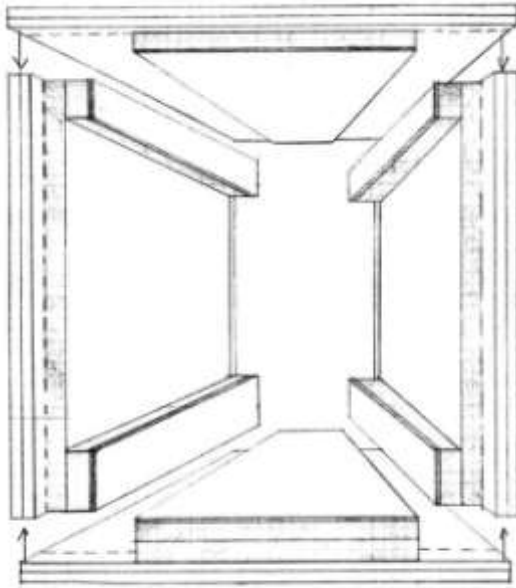
End Load Cage, end view

(fig.28)
Side view of inner cage of End Load Crate. (note: outer shell of crate not pictured.)



End Load Cage, Side View

(fig. 29)



End Load Crate panels fitting together

Note: these drawings are of the type that crating companies use in order to relate what is to be built to their crate makers. These drawings have been included because they tend to show some of the most common crates pared down to the most basic mechanisms.

