Condition Reporting – Paintings. Part II: Examination Techniques and a Checklist

Canadian Conservation Institute (CCI) Notes 10/7

Introduction

CCI Note 10/7 follows CCI Note 10/6 *Condition Reporting – Paintings. Part I: Introduction*. CCI Note 10/7 describes the examination of a painting: what to record, how to record it and what tools are required. Sample Reports 1 and 2, provided in CCI Note 10/6, are tailored to be used with this Note. CCI Note 10/11 *Condition Reporting – Paintings. Part III: Glossary* can be used to help choose appropriate terminology to describe painting and frame structure, materials and condition.

Considerations before examination

It is essential to have a basic understanding of the condition of the painting and frame before handling and examining these objects. This can be obtained by referring to previous condition reports and by taking a quick survey of the painting and frame before they are moved or handled. Determine if there is any obvious problem with the paint layer, such as actively flaking paint, or if there are any compromised surface finishes or loose decorative elements on the frame. Any of these could be lost when an object is handled during a condition examination.

The following guidelines should be taken into consideration when preparing to do an examination and condition report:

- Safe handling practices during condition reporting are critical to the preservation of the work of art. CCI Note 10/13 *Basic Handling of Paintings* describes the safe handling of paintings, both framed and unframed. It also gives instructions for preparing padded work surfaces.

- With regards to placing works of art on hard surfaces, CCI Note 10/2 *Making Padded Blocks* gives information on fabricating padded blocks to give cushioned support for frames and paintings when they are set on edge or when framed paintings are placed on a work surface.

- If the painting or frame is too fragile to be moved, the condition reporter can examine the painting or frame in a vertical position (if the work is either on display or hanging on a storage rack) or in a horizontal, face-up position (if the work is being uncrated). A conservation professional should be called immediately to stabilize and secure any weakened areas. Never

place a framed painting face down if either the painting or the frame shows obvious signs of weakness.

- It is not always necessary to remove a painting from its frame for examination and condition reporting. If a comprehensive (baseline condition report) is required, then unframing may be necessary in order to obtain information on tacking margins, the ground layer and the method of attachment of the painting to its auxiliary support. Refer to CCI Note 10/12 *Removing a Painting from its Frame* for unframing instructions.

Examination tools and equipment

The basic tools and equipment required to examine a painting and to prepare a condition report include:

- appropriate lighting (for additional details consult Lighting techniques for examination)
- a clean work surface which is padded with a cushioning material and topped with a layer of polyester (Mylar) or polyethylene sheet
- four padded blocks (e.g. to support an ornamented frame)
- a sturdy easel, if the painting is to be examined in a vertical position
- a cloth measuring tape (to avoid accidental damage from a metal tape measure)
- a magnifier (e.g. handheld or head-mounted)
- a hand-held ultraviolet (UV) light source and UV-protective eyewear
- pliers and screwdrivers for unframing and removing hanging wires, if necessary
- a good digital camera which can take detailed close-up images
- a notepad or condition report form and a pencil or electronic device (e.g. computer, tablet, smartphone) for recording information
- copies of diagrams, images or photographs on which damages can be directly indicated, or clear plastic overlays that can be placed on the diagrams, images or photographs and which can be marked up to indicate damages (note: hardcopy diagrams can be replaced either at the outset by manipulating a digital image using Photoshop or through later transfer of hardcopy to digital image)
- permanent coloured markers for indicating damages on diagrams or plastic overlays (do not use such markers near the artwork)

- a vacuum cleaner with a brush attachment or crevice tool, plus soft bristle brushes for removing dust from the back of frames and stretcher bars to allow for better visibility of surfaces
- close-fitting cotton or latex gloves if the painting and/or frame are susceptible to damage from oil or moisture from the hands (e.g. contemporary or unvarnished paintings, water-gilded frames); otherwise, paintings can be handled with freshly washed, clean, dry hands
- sealable plastic bags with labels to secure and identify anything that may be dislodged or come away from either the painting or the frame during the examination (e.g. loose keys, paper labels, small fragments of surface finish from the frame)

Lighting techniques for examination

A higher light level than recommended for display is required when examining paintings. The surface of the painting should be illuminated so that low contrast and fine details are visible to the examiner. The painting should only be subjected to this illumination for very short periods of time. Exposure to direct sunlight is not recommended because it far exceeds safe lux levels (consult CCI Note 10/4 *Environmental Guidelines for Paintings*).

Light from electric sources provides acceptable illumination, but choose bulbs that have a low heat output: fluorescent tubes with UV filters or white light-emitting diode (LED) bulbs are good. Avoid incandescent bulbs, if possible, because they become extremely hot and can adversely affect a painting or frame. A surprisingly short exposure to even low levels of heat will cause potentially damaging movement in a canvas support. Place your hand between the source of illumination and the painting, about a finger's length from the painting. If your hand begins to feel warm, then move the light source away from the painting. Remember never to direct a light source for any length of time on a painting and never to leave a painting unsupervised when an examination light is focused on the artwork.

There are three main lighting techniques used for examination. Different aspects of a painting's condition can be revealed by:

- normal, or incident, light;
- raking, or oblique, light; or
- transmitted light.

Normal, or incident, light is used to assess the general condition of a painting, particularly the presence of surface dirt, discoloured varnish and cracked or lifting paint.

Raking light is achieved by placing a light source to one side of the painting at a low or oblique angle to the surface so that the light glances across the painting. This lighting shows surface texture and

irregularities, such as lifting paint or undulations in the canvas. The angle of the light can be adjusted to ensure optimum exposure of irregularities. To take full advantage of this lighting technique, the painting can be removed from its frame and placed on an easel. Much information can be obtained by holding a flashlight at an oblique angle to the painting, even while it is on display or if it must remain in its frame. If there is loose paint, the examination may be effectively carried out with the painting in a horizontal position.

Transmitted light results from placing the light source behind the painting and viewing from the front. Light is transmitted through cracks, tears, paint losses and thinly painted areas, making them easier to detect. Examination under transmitted light is best carried out in a darkened room with a single light source placed behind the painting. Keep in mind that the exposed canvas will be very sensitive to heat from the light source: always use cool lights for this purpose. Hold the painting vertically on edge on a padded surface, or support it vertically on an easel. Do not place your light source any closer than 70 cm from the back of the painting.

Specialized light sources

Fine art conservators frequently use light in the non-visible portion of the spectrum to carry out specialized examinations. For example, UV fluorescence can reveal varnish layers and surface restorations. Handheld UV light-emitting devices can be obtained through a number of sources at a reasonable cost.

For visibility of fluorescence, the object under examination must be in a darkened room. UV light is damaging to the eyes, and any examination using this spectrum of light must be done wearing UV-filtering protective eyewear. As UV radiation does not penetrate well, it is usually the top layer (varnish) and more recent inpainting and retouches to damages that can be seen, especially if these are above the varnish layer. If there is a heavy dirt layer, this will impede the penetration of the UV radiation, and no information about varnish or other layers on or close to the surface of the painting will be obtained. In this case, the examination using UVlight might be better carried out after treatment to remove the dirt layer from the painting surface.

Fluorescence of materials changes (increases) as the materials age. While recently applied retouches, above or below the surface of a varnish layer, may be visible, as these age, their fluorescence increases and they become less distinct from the surrounding fluorescent materials. In this case, examination using the infrared portion of the light spectrum can be helpful. Infrared radiation can capture information such as the presence of older retouches, changes to composition and otherwise invisible underdrawings. Unlike UV radiation, light in the infrared spectrum can penetrate more deeply and through more opaque layers. As this spectrum is invisible to the naked eye, the reflectance must be captured photographically with IR-sensitive film and a camera with filters that remove visible light. A light source which emits in an appropriate wavelength must also be used to illuminate the object (halogen, tungsten or incandescent bulbs). Electronic recording devices which use video cameras equipped with IR-sensitive electronic image converters can also generate infrared images (Mairinger 2000).

Describing damages

When describing damages, note the nature and extent of the damage.

Nature

Describe the nature of any defects or damage using a standardized terminology. There are generally accepted terminologies for describing damages and condition issues for paintings. A standardized technical vocabulary eliminates confusion of interpretation and also allows for the possibility of a systematic search of condition survey documents using common terminology. CCI Note 10/11 *Condition Reporting – Paintings. Part III: Glossary*offers a list of terms. There are also many web-based glossaries that provide images to illustrate condition issues. The reader is directed to several of these in the Bibliography. If no word in the glossary describes exactly what is observed, the damage should be reported as clearly and as accurately as possible in the examiner's own words. Unless the cause of the damage is known beyond a doubt, definite statements should be modified by words such as "appears," "seems" or "may," followed by a question mark (e.g. "brown liquid residue, appears to be coffee?").

Extent

Specify the extent of the damage immediately before or following the description of the damage (e.g. "3.5 cm long tear," or "four small paint losses in bottom right quadrant"). Give measurements for the length of tears and the diameter of holes and paint losses.

Locating damages

Report the size and location of damages and deterioration as accurately as possible. There are several acceptable ways to report size and location.

Height X width coordinates

Give the location using coordinates measured first in the height (or vertical) axis – either from the top edge (T) or from the bottom (B), whichever is closest to the damage, and then measured in the width (or horizontal) axis – from the left (L) or from the right (R), again, whichever is closest to the damage. These figures should always accompany the description of the nature and extent of the damage and should be given in centimetres to the nearest millimetre (or in inches to the nearest fraction), as in the following examples:

- The paint loss located in the bottom right corner could be characterized as follows: A 2.8 cm x 1.9 cm paint loss located at 3.2 cm B x 8.1 cm R.

- If the damage is very small, it is enough to indicate the locations of one vertical point and one horizontal point with a description such as “small/tiny paint loss.”

- If there is a cluster of losses and those losses are too numerous to locate with individual measurements, the general area should be measured (as shown by the dotted box around the loss in the lower right corner in Figure 1). A description should be provided, such as “numerous paint losses have occurred in an area measuring 3.2 cm B x 6.0 cm B and 8.1 cmR x 10.0 cm R.”

Complex damage, such as a tear, can be measured in different ways. Based on Figure 1, an example of using coordinates to describe the location of tear damage would be as follows:

- The examiner can simply indicate the beginning of the tear: Tear begins at 12 cm T x 7.3 cm L and extends diagonally up toward the top edge for 11 cm.

- Measurements could also indicate the beginning and the end of the tear damage: 11 cm long tear begins at 12 cm T x 7.3 cmL and ends at 4.0 cm T x 14.8 cm L.

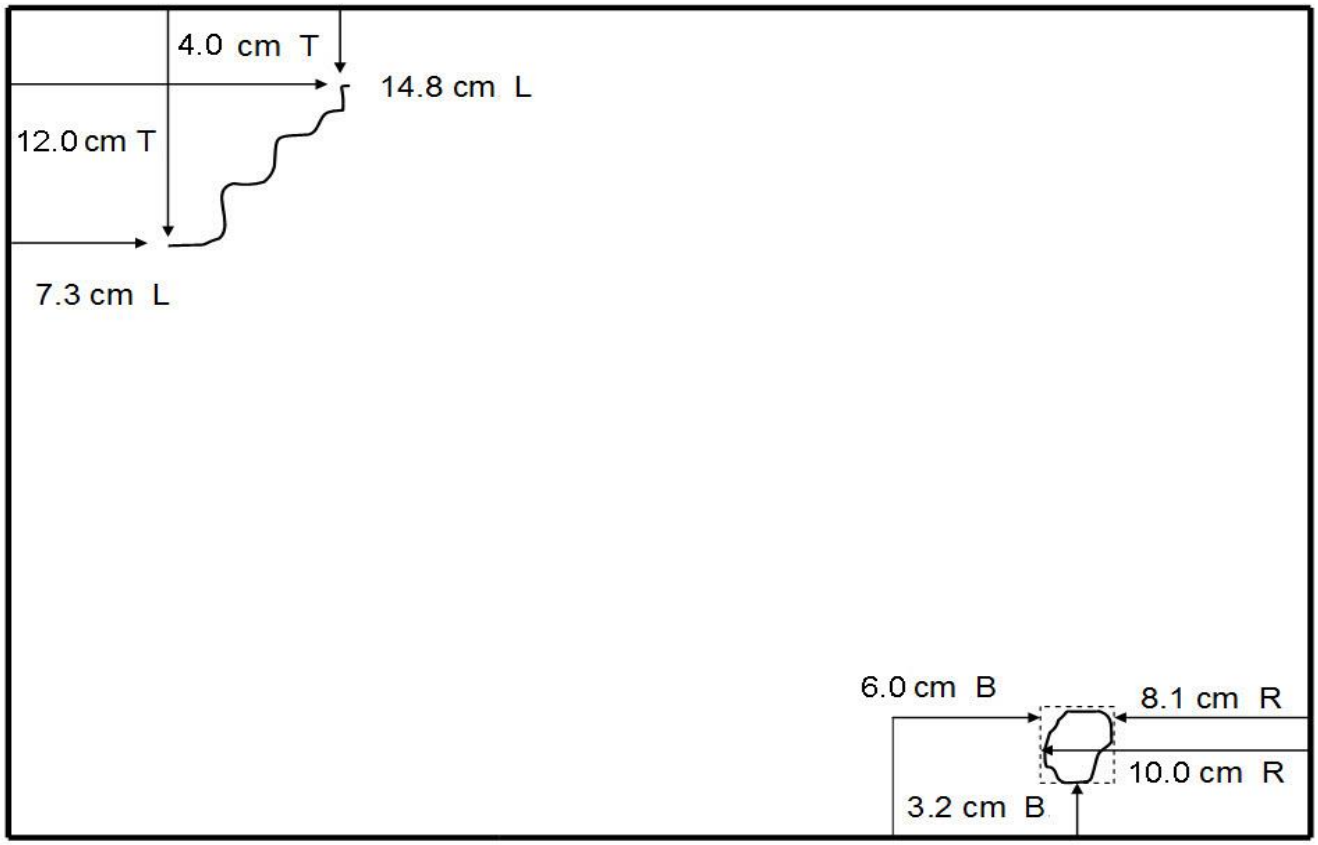

Figure 1. Describing the location of damage using height and width coordinates.

Sight edge measurements

If a painting remains in the frame during examination, measurements are taken from the inside edge of the frame. These measurements are described as “sight edge measurements” and should be clearly indicated as such.

Measurements using quadrants

When a painting is large or the damages are extensive, it is useful to divide the painting into quadrants. Damages can be reported as coordinates located in these sections, although exact height and width measurements should still be included. An oversized painting can be subdivided into a nine-part grid. Sections are described as top left, centre left, bottom left, bottom centre, centre, top centre, top right, centre right and bottom right.

Measurements using photographs or drawings

Detailed photographs of damaged areas, provided they contain enough detail to clearly identify the nature and extent of damage, are a valuable asset to the condition report. Although they are less precise, drawings of damages can be made on an image of the painting or on a clear overlay placed over the photographic image. Documenting with a drawing is often done on more detailed reports, in conjunction with noting coordinate measurements.

Measurements using narrative combined with size of damage

Size and location can be reported using a narrative description combined with measurements, e.g. “3 cm tear at proper left ear of subject,” or “at the base of the large tree.”

A checklist for examination and condition reporting

The following checklist is a guide to assist with the thorough examination of paintings. It is not the only possible format. The points are intended as prompts. Not all points will apply to every painting. As well, the list does not encompass all possible structures and conditions. Sample Report 1, “Baseline Condition Report: Paintings and Their Frames,” in CCI Note 10/6 *Condition Reporting – Paintings. Part I: Introduction* has been designed to follow this checklist. For help understanding some of the condition terminology, refer to CCI Notes 10/17 *Know Your Paintings – Structure, Materials and Aspects of Deterioration* and 10/11 *Condition Reporting – Paintings. Part III: Glossary*.

1. Identification of the work

Record the following:

- artist (if known) or attribution
- title
- medium and technique
- signature and date
- dimensions (painting height X width)
- frame or no frame present
- frame dimensions (height X width X depth)
- backing board or no backing present
- glazing or no glazing present
- accession number
- owner or custodian

2. Painting condition status

This text box should feature prominently on the report, where it can be seen at a glance. It should provide a brief summary of the condition (excellent, good, fair, poor or very poor) and indicate whether or not the painting can be safely handled, displayed or loaned in its present condition. Statements appearing in this box will immediately alert others about the status of the artwork. Recommendations regarding treatment and treatment urgency will appear at the end of the report, under “Recommendations.”

Record the following:

- Can the painting be safely handled?
- Is the painting in suitable condition for display?
- Is the painting in suitable condition for loan?
- What is the condition summary? (Choose either excellent, good, fair, poor or very poor.)

- Comments (general remarks or observations, such as “requires surface cleaning and reframing”)

The list above was adapted from Sample Report 1, CCI Note 10/6 *Condition Reporting – Paintings. Part I: Introduction*.

3. Frame condition status

Information provided here will identify whether or not the frame can be handled, displayed or loaned with the painting. It will give a quick “check box” summary of condition.

Record the following:

- Can the frame be safely handled?
- Is the frame in suitable condition for display?
- Is the frame in suitable condition for loan?
- What is the condition summary? (Choose either excellent, good, fair, poor or very poor.)
- Comments (general remarks or observations, such as “surface has missing and loose decorative elements”)

The list above was adapted from Sample Report 1, CCI Note 10/6 *Condition Reporting – Paintings. Part I: Introduction*.

4. Additional information

This section can be used to document information from labels on the back of the painting or on the back of the frame (owner, artist or exhibition labels) as well as any inscriptions on the stretcher or strainer bars.

5. Paint and ground layers

Description of paint and ground layers

- What is the paint medium (e.g. oil, acrylic, tempera, mixed media)?
- How was the paint applied (e.g. thinly, thickly)?
- Is there impasto?

- Is there evidence of a ground layer?
- Is the ground layer evident within the image or just at the tacking margins?

Condition of paint and ground layers

Note that many of the following conditions require incident, raking and transmitted light as well as low-level magnification in order to be clearly identified.

- Is there an overall crack pattern, or are cracks limited to specific areas? (Identifiable using incident and transmitted light.)
- Are there differences in the crack pattern (e.g. thin, wide with ground or underlying paint layers revealed, spiral, diagonal)?
- Do cracks go through the paint layer only and leave the ground layer intact, or do they go through both the paint and ground layers? (Identifiable using transmitted light; if light does not penetrate through the cracks while the painting is illuminated from the verso, then likely the cracks are only in the paint layer.)
- Is the paint lifting or curling up at the edges of cracks (i.e. flaking)? (Identifiable using incident and raking light.)
- Are the layers well adhered to each other and to the ground, or is there cleavage or separation? (Identifiable using incident and raking light.)
- Are the paint and ground layers stable along the painting's edges, or are they brittle and crumbling? (Identifiable using incident and raking light.)
- Is the paint raised in ridges (i.e. tented) along the canvas threads or across the wood grain in a panel?
- Are there signs of water damage? This would be evident from paint and ground loss, cleaving and flaking of paint and ground on the face of the work, and water staining on the verso.
- If there is water damage, is there any sign of mould either on the paint surface or on exposed canvas at sites of paint loss?*
- Are there scratches or abrasions?
- Are there paint losses? (Identifiable using incident and transmitted light.)
- Do these losses involve both paint and ground layers? (Identifiable using incident and transmitted light.)

- Are there areas of obvious restoration (i.e. retouches)?
- If there is no varnish layer, does the painting surface look dirty or dusty? Is there any extraneous matter on the surface?
- If the painting is on a metal support that is prone to corrosion (e.g. copper), are there discoloured spots on the paint surface?
- If the painting is removed from its frame, is there a noticeable difference in the colour of the paint under the frame edge (rabbet) that might indicate discolouration of the medium or fading of colours?

* If any mould is detected or suspected, the examiner must immediately take health and safety precautions when handling the work of art, as mould represents a significant health hazard. Mould spores can also spread to contaminate adjacent objects. The artwork, if contaminated by mould, must be isolated from other objects (in storage) or removed from display and sealed in an airtight wrapping material (sealed polyethylene bag) to prevent spread of mould spores and to control the emission of volatile organic compounds (VOCs) from the mould. When handling the contaminated object, the examiner must wear personal protective equipment (PPE). Surfaces or equipment that may have come into contact with the object must be cleaned with a disinfectant solution. Procedures for dealing with mouldy objects can be found in CCI Technical Bulletin 26 *Mould Prevention and Collection Recovery: Guidelines for Heritage Collections*.

6. Surface coating

Description of surface coating

Paintings are often given a surface coating of varnish based on synthetic resins (modern or contemporary paintings) or natural resins (19th century and earlier). This coating is most noticeable when very glossy. Old varnish coatings often become dull with time and, with an accumulation of surface dirt, can become difficult to detect. If you are unsure whether the painting has been varnished or not, simply state “unsure.”

Condition of surface coating

When describing the condition of a coating note the following:

- Does the surface appear glossy or matte?
- Does the surface appear opaque or milky? Is this condition present on the entire surface or is it localized?
- Does the surface appear streaky or inconsistently applied?

- Does the surface appear to be cracked? When varnishes crack, the pattern is sometimes described as “crazing,” meaning many tiny, interconnected cracks. This can happen as natural varnishes age, especially those that are inherently brittle.
- Does the surface appear yellowed (do areas that should be blue look green, and white areas, yellow)?
- Is there noticeable surface dirt or other extraneous matter?

7. Primary support

Paintings are executed on rigid or flexible supports. The following checklist includes considerations for both types.

Description of paintings on rigid supports

- What type of material was used as the support (wood panel, plywood, hardboard [e.g. Masonite], metal sheet, artist’s board, ceramic, glass, stone, etc.)?
- If composite or artist’s board was used, describe its construction (e.g. canvas attached to cardboard, primed cardboard, illustration board).

Condition: rigid supports

- Is the rigid support warped, bent or buckled (i.e. defects in plane)?
- Is the wood support (e.g. wood panels) checked or split?
- If the support consists of separate sections, are the joints structurally sound? Have there been any previous repairs?
- Are there any breaks or losses (as can occur in hardboard)? Are there bends or dents (as can occur in metal sheet)?
- If a composite artist’s board is used, are the corners separating or torn?
- If canvas is attached to the support, is the attachment uniform or has it become detached in certain areas?
- Is there any sign of water damage? If so, check carefully for the presence of mould on the support system.
- Is there other mechanical or physical damage?
- Is there biological damage (e.g. tunneling by insects)?**

- Is the back of the rigid support stained or dirty?
- Are there signs of restoration (e.g. cradles on the backs of panels, new filler in joints, glue repairs)?

** If there are signs of active infestation (e.g. presence of wood dust or frass), the object should be sealed in an airtight wrapping of polyethylene to confirm the presence of infestation and to prevent the escape and spread of adult insects. For more information on dealing with pests within a museum collection, please refer to CCI Technical Bulletin 29 *Combatting Pests of Cultural Property*.

Description of paintings on fabric supports

- Identify the fabric, if possible (e.g. linen, jute, cotton).
- What is the weave type and weight of the fabric (e.g. heavy canvas, plain weave [i.e. tabby weave])?
- What is the thread count? A thread count indicates how many threads are located in both warp and weft directions. Threads are normally counted, using magnification, over an area of 2.5 cm^2. The higher the thread count, the finer the canvas.
- Are there any seams in the fabric? If so, where are they located?
- Is there a selvedge?
- How is the canvas attached to the auxiliary support (e.g. tacks, staples)?

Condition: fabric supports

- Are there distortions in the fabric (e.g. ripples, draws, bulges)?
- Are there distortions in the canvas along the lower stretcher bar? This may indicate the presence of trapped keys, dirt or debris between the canvas and the stretcher bar.
- Is the fabric stretched taut or is it slack?
- Are there holes or tears in the fabric?
- Is the fabric evenly attached to the auxiliary support?
- Does the fabric seem brittle?
- Is the fabric clean, discoloured, dirty or stained?
- Are there signs of exposure to water (tide marks)?

- Are there signs of insect damage?
- Are there signs of mould (especially check near auxiliary support bars or in proximity to water staining)?
- Are the original tacking margins present? (If not, then the painting is either fully or partially lined [attached] to a secondary fabric support.)
- Do the tacking margins appear strong, or is the fabric weak and brittle or does it have multiple holes from previous stretching?
- Are some of the tacks or staples holding the canvas to the auxiliary support rusty or missing?
- If there is some rusting, has this degraded the canvas in these areas?

8. Secondary or auxiliary support

Description of stretcher or strainer for paintings on fabric supports

- What type of auxiliary support was used (stretcher with keys or turnbuckles[1], or strainer)?
- Identify the type of wood used, if possible (e.g. softwood, hardwood).
- Are there any cross members?
- How are the corners joined (e.g. mitred, square joint, keyed, nailed or turnbuckles [also known as expansion bolts])?
- Is there a bevel on the stretcher bars?
- Is there a backing board (rigid wood-based or plastic panel) secured to the back of the stretcher or strainer?

Condition: auxiliary support

- Are the auxiliary support bars straight, warped or split?
- In the case of keyed stretchers, are tenons protruding?

[1] The turnbuckle refers to the hardware set into the four corners of a stretcher that allows for expansion at these corners. This specialized turnbuckle hardware comprises a ball nut, set within a sleeve, into which is threaded a bolt (either a tightening bolt with a terminal static flange or a screw-type hanger bolt). By turning the ball nut, the threaded bolt opens or closes the corner joint. “Expansion bolt stretcher” is a more generic term for this type of auxiliary support. Within this Note, “turnbuckle stretcher” will be used to describe this form of auxiliary support.

- Are the corners sound (e.g. are tenons split, cracked)?
- Are all keys present in the stretcher (e.g. four of four, or if some are missing: five of eight)?
- Have keys been secured to the stretcher (e.g. with nails, thread, silicone or acrylic caulk)?
- If this is a turnbuckle stretcher, in what condition is the hardware?
- Is the wood dusty or dirty?

9. Frame

Description of material and construction

- What materials were used (e.g. wood with gesso, metal)?
- What is the decorative finish (e.g. gilded, painted)?
- Is the frame made up of flat mouldings or a combination of flat mouldings and decorative elements?
- Is there a liner or a glazing material?
- If there is a glazing, is this glass or acrylic?
- What method was used to attach the painting to the frame?
- What frame hanging mechanisms are present?

Condition of frame

- Does the frame appear to be structurally stable?
- Are the corners secure?
- Are there gaps at the corners?
- Are there splits or cracks?
- Are all elements of the decorative finish intact (includes both raised decoration and surface finish)?
- Has the frame been refinished (non-original surface finish) and are repairs clearly visible?

- If constructed from wood, does the frame show signs of insect damage, and if so, could insects still be present?
- If glass glazing is present, is it chipped, cracked or scratched?
- If acrylic glazing is present, is it scratched or abraded?
- Is there a separator between the glazing and the painting?
- If no glazing is present, is the frame or liner rabbet padded?
- If a liner is present, is it well secured to the outer frame?
- Does the painting fit well into the frame? Consult CCI Note 10/8 *Framing a Painting* for guidance on proper fitting of paintings on stretchers or strainers, wood panels and hardboard.
- Is the frame dirty or grimy?
- Are the hanging mechanisms secured firmly to the outer frame? Are these strong enough to take the full weight of the frame, painting and glazing layer?
- Is the wire, if present, in good condition or is it frayed and brittle?
- If a backing board is not present on the back of the auxiliary support, is there one on the back of the frame?

10. Recommendations

This section of a condition report outlines the requirements for handling, storage and display of a painting. Any treatment required should be identified here for both the painting and frame.

11. Name and date

The examiner must identify him or herself and clearly state the date when the painting was examined.

Condition reports form an important part of the overall documentation of a painting. These should always be kept with the painting if it changes hands. Not only do the condition reports provide necessary information on the well-being of the work of art at a particular point in time, but when systematized (kept together), they allow for an invaluable history of the state of preservation of the work of art. Condition reports may also provide relevant information in the case of questions of provenance and research into the work of art.

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By Leslie Carlyle
Revised by Wendy Baker and Helen McKay in 2016 and by Wendy Baker in 2018

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