# Hold onto your hats! Developing time and cost efficient, adaptable internal support forms for the storage of headwear in museum collections.

Becky Doonan

Submitted in partial fulfilment of the requirements for the Masters of Philosophy in Textile Conservation in the School of Culture and Creative Arts, University of Glasgow, August 2018.

Word count: 14740

## Abstract

This dissertation outlines the development of a standardised, adaptable internal mount form for the storage of hats in museum collections. A literature review highlighted the lack of non-custom mount options currently in use, as well as the prevalent use of acid free tissue paper puffs. A collection survey at the stores of National Museums Scotland (NMS) evaluated current hat mounts, concluding that tissue paper puffs are often insufficiently supportive for this type of object. The collection survey and interviews with museum professionals were used to define working parameters for developing a mount form that is more standardised in design and more time efficient than traditional custom mount forms, but that also offers more support than tissue puffs. Several design ideas were initially explored, and the most promising of these was tested on a representative sample of the hats surveyed at NMS. This mount form out-performed tissue puffs in terms of quality of fit and support. This, together with its simple construction method, gives this mount form the potential to be a viable alternative to more time consuming custom mounts options.

**Acknowledgements**

There are a number of people to whom I owe thanks for their contribution towards this dissertation project. Firstly, my dissertation supervisor Frances Lennard and CTC tutors Karen Thompson and Sarah Foskett for their advice and encouragement throughout this programme. Also to my fellow classmates; your friendship means the world.

I would like to thank Lynn McClean, Principle Conservator, and Emily Taylor, Assistant Curator, for their help in accessing the headwear collection at NMS and answering my many hat-related questions. My thanks also to all those willing to be interviewed; Maggie Dobbie, Textile Conservator at Glasgow Museums, Rebecca Quinton, Costume and Textile Curator at Glasgow Museums, Roisin Morris, Textile Conservator at the Victoria and Albert Museum, Kelly Rennie, Collections Technician at NMS, as well as interviewees who preferred to remain anonymous. Your combined knowledge and experience has been an invaluable help.

I am indebted to the June Baker Trust for their financial contribution towards travel costs incurred over the course of this project. I am also grateful for the support of the Textile Conservation Foundation, the Anna Plowden Trust, the McGlashan Charitable Trust, The York Foundation for Conservation and Craftsmanship, the Altrusa Careers Trust, the Zibby Garnett Travel Fellowship and the Yorkshire Ladies Council of Education over the past two years of study.

Last but by no means least, to Tom – the constant supply of tea and support that has kept me going throughout.

## Table of Contents

**List of Figures** ..... **1**

**List of Tables** ..... **2**

**Glossary** ..... **3**

List of Abbreviations ..... 3

Hat terminology ..... 3

**Chapter 1: Introduction** ..... **4**

1.1. Research Question ..... 4

1.2. Aims and Objectives ..... 4

1.3. Report Outline ..... 5

**Chapter 2: Literature Review** ..... **6**

2.1. Introduction ..... 6

2.2. Custom mounts ..... 6

2.3. Rehousing projects ..... 7

2.4. Practical “how-to” guides for storage devices ..... 9

2.5. Conclusion ..... 10

**Chapter 3: Interviews** ..... **11**

3.1. Introduction ..... 11

3.2. Outcomes ..... 12

3.2.1. Which roles within institutions are directly involved in mount making activities? ..... 12

3.2.2. What time and monetary budgets are commonly available within an institution for mount making? ..... 12

3.2.3. What materials are commonly available within an institution for mount making? ..... 12

3.2.4. What is the role of volunteers in activities such as mount making and the production of storage devices? ..... 14

3.2.5. What are perceived or experienced limitations on making mounts for three dimensional objects? ..... 15

3.2.6. What factors make a mount for a three dimensional object such as a hat effective? ..... 15

3.3. Conclusion ..... 15

**Chapter 4: Collection survey** ..... **17**

4.1. Introduction ..... 17

4.2. Outcomes ..... 18

4.2.1. What storage mounts are currently in use? ..... 18

4.2.2. Information on shape and style variation ..... 20

4.2.2.1. Forming a categorization system ..... 20

4.2.3. What range of hat sizes does the collection cover? ..... 22

4.2.4. Further information on storage context ..... 23

4.2.5. Hat condition relating to the current storage mounts ..... 24

4.3. Conclusion ..... 24

**Chapter 5: Development of mount forms** ..... **26**

5.1. Introduction ..... 26

5.2. Examples from literature ..... 26

5.2.1. Stuffed forms ..... 26

5.2.2. Arched forms ..... 27

5.2.3. Using flat materials to create three dimensional forms ..... 28

5.3. Working parameters identified from interviews and the collection survey ..... 30

5.3.1. Materials ..... 30

5.3.2. Time and cost ..... 30

5.3.3. Techniques ..... 31

5.4. Initial ideas ..... 31

5.4.1. Stuffed forms ..... 32

5.4.2. Arched forms ..... 33

5.4.3. Flat, folded forms ..... 34

5.4.3.1. Plastazote® expanding sheet forms ..... 34

5.4.3.2. Quilted forms ..... 35

5.4.4. Evaluating initial ideas ..... 36

5.5. Refining the stuffed form ..... 37
5.5.1. Guide for making ..... 37
5.5.1.1. Materials/equipment ..... 37
5.5.1.2. Preparing the templates ..... 38
5.5.1.3. Making the mount form ..... 39
5.5.2. Notes for use ..... 41
5.5.2.1. Achieving different shapes ..... 41
**Chapter 6: Testing the mount form ..... 44**
6.1. Introduction ..... 44
6.1.1. Choosing the sample ..... 44
6.2. Testing criteria ..... 44
6.3. Results ..... 45
6.3.1. Quality of internal fit ..... 46
6.3.2. Quality of support ..... 46
6.3.3. Stability ..... 48
6.3.4. Time needed to position each hat on the mount form ..... 48
6.3.5. Ease of use ..... 48
6.4. Evaluation of performance ..... 49
**Chapter 7: Conclusion ..... 50**
7.1. Recommendations for future research ..... 51
**Bibliography ..... 52**
Unpublished sources ..... 52
Books ..... 52
Journal articles and Conference Post-prints ..... 52
Online resources ..... 53
Material suppliers ..... 54
**Appendices ..... 55**
Appendix 1: Interview transcripts ..... 55

Appendix 2: Collection survey results ..... 66

Appendix 3: Testing results ..... 79

Appendix 4: Mount form templates ..... 84

Appendix 5: Risk assessment ..... 86

## List of Figures

Figure 1 - Jean Muir hat on a carved Ethafoam® custom mount form. By kind permission of National Museums Scotland ..... 18

Figure 2 - A tissue puff as an internal support for a felt hat. By kind permission of National Museums Scotland ..... 18

Figure 3 - Bar chart showing the relative suitability of different types of internal support observed during the collection survey at NMS. ..... 19

Figure 4 - Deformation in the crown, due to lack of support from tissue puff. By kind permission of National Museums Scotland ..... 19

Figure 5 - A bicorn hat that folds flat, so has no need for internal support. By kind permission of National Museums Scotland ..... 20

Figure 6 - Example of hat profile sketches made during the collection survey at NMS ..... 20

Figure 7 - Location of measurements ..... 22

Figure 8 - A scatter graph showing the spread and distribution of hat height relative to circumference in the hats surveyed at NMS ..... 23

Figure 9 - Hat storage in bakers trays, interleaved with acid free tissue paper. By kind permission of National Museums Scotland ..... 23

Figure 10 - Wide brimmed hat demonstrating distortion in brim and crown areas. By kind permission of National Museums Scotland ..... 24

Figure 11 - Ogden and Frisina's example of moccasin internal supports, http://www.mnhs.org/preserve/conservation/reports/textiles_storage.pdf ..... 26

Figure 12 - Arched forms used to store bonnets at the MFA, Boston. http://www.mfa.org/collections/conservation/feature_costumeaccessories. ..... 27

Figure 13 - A method for mount making using rolls of polyethylene foam. http://stashc.com/the-publication/supports/malleable/support-for-wide-brimmed-basketry-hats/. ..... 28

Figure 14 - Cardboard mounts used at the MFA, Boston. https://www.mfa.org/collections/conservation/feature_costumeaccessories_hatsandheadware_simple. ..... 29

Figure 15 - Top, the unfilled stockinette sleeve with running stitches shown in grey thread. Below left, the filled form. Below right, the filled form with running stitch lines pulled tight. ..... 32

Figure 16 - Left, the cut out plastazote® shape, laid flat. Top right, the form when curved in half. Centre right, the plastazote® form covered with a stockinette sleeve. Bottom right, demonstrating the flexibility in shape of the final form. ..... 33

Figure 17 - Manipulating the shape of an expanded plastazote® sheet. ..... 34

Figure 18 - Top, flat quilted sheet. Bottom left, quilted sheet rolled and folded. Bottom right, the rolled sheet, covered with a stockinette sleeve. ..... 35

Figure 19 - A guide to the stitch lines on the main template ..... 38

Figure 20 - The cutting line in relation to the stitch line ..... 39

Figure 21 - The stitch lines in progress, with template still inserted in stockinette sleeve ..... 40

Figure 22 - Left, wadding as cut from a roll. Right, wadding after being pulled apart by hand ..... 40

Figure 23 - The base of the form, when stitch line 1 is pulled closed ..... 41

Figure 24 - The tied thread ends on the finished form ..... 41

Figure 25 - Tucking in excess fabric to achieve a flatter top ..... 41

Figure 26 - Shape profile options ..... 42

Figure 27 - Hat profiles, with shaded areas showing areas where mount is unable to reach ..... 46

Figure 28 - Top left, hat on its existing tissue puff support. Top right, the mount form adjusted to fit the hat. Bottom, the hat on the adjusted mount form. ..... 47

## List of Tables

Table 1 - A list of materials commonly available in selected institutions and their related Oddy Test results ..... 13

Table 2 - Oddy Test Key ..... 14

Table 3 - Categorising the hats from NMS by profile type. ..... 21

## Glossary

### List of abbreviations

- CTCTAH – The Centre for Textile Conservation and Technical Art History at the University of Glasgow
- EDFAS – The Edinburgh Decorative Arts Society
- GMRC – Glasgow Museums Resource Centre, Glasgow
- MFA – Museum of Fine Arts, Boston, USA
- NMS – National Museums Scotland, Edinburgh
- V&A – The Victoria and Albert Museum, London

### Hat terminology

These definitions are taken from the Oxford Dictionary[1] and are listed here for clarity, and to ensure consistency throughout this dissertation.

- Beret – a round cloth hat, flattish in shape.
- Bicorn – a hat with two points, often associated with military uniforms.
- Boater – a flat topped, stiff straw hat with brim.
- Bonnet – a hat with a brim that frames the face, often tying under the chin.
- Brim – the projecting edge around the base of a hat.
- Chin strap – a cord or tie to hold a hat on the wearers head by tying underneath the chin.
- Cloche – a close fitting, bell shaped hat.
- Crown – the main dome of a hat that sits on top of the wearers head.
- Grosgrain ribbon – a woven, ribbed tape commonly used in hat making for the headband.
- Headband – the internal strip of tape or fabric that sits around wearers head, attached to the base of the hat on the inside. Often made of grosgrain ribbon.
- Pill box hat – a round, straight-sided, flat topped hat with no brim.
- Tricorn - a hat with three points, often associated with military uniforms.

[1] https://en.oxforddictionaries.com/english

## Chapter 1: Introduction

Degradation and distortion of textile objects can be hugely exacerbated by poor or inadequate storage. Three dimensional objects such as hats are particularly vulnerable; their internal cavity space often requires some form of internal support, but their complex and varied shapes and materials can present a challenge for mount makers.

Making custom mounts for such objects requires skill and can be time consuming, and with more and more conservators working for institutions on a project basis[2], storage aspects can be easily overlooked in terms of funding allocations. Acid free tissue paper puffs are commonly used as a quick method to pad out three dimensional objects, but these are not universally suitable in the support they provide[3]. A lack of adequate storage mounts within a collection can lead to objects being in a far more deteriorated condition than would otherwise be the case; not only are they experiencing the natural aging and weakening of materials, but they also need to contend with gravity and its potentially harmful consequences[4]. This research project will focus specifically on headwear (hats and bonnets) because within the category of headwear the majority of objects are three dimensional and yet still exhibit a wide spread of styles and shapes. However, it is hoped that the outcomes of this research will also be more broadly applicable for use with other three dimensional textile objects with internal cavities requiring support. This project will attempt to develop an internal storage mounting solution that is more effective in the support it provides than tissue paper puffs and yet is simpler and more time efficient to make than custom mounts currently being used in practice.

### 1.1. Research Question

The research question for this project is as follows:
Can a standardised yet adaptable storage solution be developed for the storage of three-dimensional headwear in museum collections?

### 1.2. Aims and Objectives

The aim of this dissertation is to develop a standardised storage solution for items of headwear that prevents/minimises damage and improves on existing practices. To be a viable option for implementation across whole collections, this needs to time and cost efficient, and easily

[2] UKIC, "Conservation and the project culture," in *Postprints from the UKIC 2004 conference in Liverpool* (London: UKIC, 2004).
[3] Gwen Spicer, 'Supporting textile artifacts without tissue paper - Save a tree!,' http://insidetheconservatorsstudio.blogspot.co.uk/2013/02/supporting-textile-artifacts-without.html.
[4] Hayley Robb, 'A mount a day keeps the conservator away,' https://nmc.ca/a-mount-per-day-keeps-the-conservator-away.

reproducible. In order to achieve this aim and to answer the research question outlined above, the following steps will be taken:

- Undertake a literature review to identify common storage issues and gather examples of solutions that other institutions have implemented in response to these issues.
- Assess a collection of headwear to determine the variables and differing support needs of the objects in that collection.
- Identify realistic time, skill and material parameters for the making of storage mounts. This will be done through a series of interviews conducted with conservation and museum professionals involved in mount making activities.
- Use examples identified from the literature to develop appropriate storage mount solutions that address the variables of the assessed headwear collection, within the defined parameters identified.
- Test the performance and suitability of the developed mount solution on a representative sample of hats from the previously surveyed collection.

### 1.3. Report Outline

This dissertation consists of seven chapters, of which this introduction is the first. The second chapter comprises a review of the relevant literature in this area. Chapter three summarises and discusses the outcomes of interviews conducted with conservation and museum professionals, in relation to mount making. Chapter four evaluates the outcomes of the collection survey, leading onto chapter five which discusses the process of developing mount forms. The testing of these mounts and the corresponding results are discussed and compared in chapter six. Chapter seven concludes this dissertation by summarising the outcomes of each previous section and evaluating the project as a whole. Suggestions for future work are also included here.

## Chapter 2: Literature Review

### 2.1. Introduction

This literature review will investigate texts relating to storage solutions for three-dimensional objects within museum collections. Although this dissertation is focussed on solutions for storage of headwear, this literature review will widen its remit to include other three-dimensional objects that exhibit a similar need for internal support. This will help to identify common storage issues and gather examples of solutions that other institutions have implemented in response to these issues. Whilst these issues and solutions will not necessarily be universally applicable, they will form a broad theoretical base that can then be tailored and focussed for this specific project.

The literature falls roughly into three categories; the making of custom mounts for storage and/or display, large scale museum re-housing projects, and practical "how-to" guides for common storage devices such as padded hangers. Each of these will be reviewed in the following sections. Where relevant, mount design examples from the literature will be highlighted. These will be objectively compared and reviewed in Chapter 5, section 5.2. of this dissertation, in order to inform the development of new designs.

### 2.2. Custom mounts

Custom mounts are often made for display purposes, in order for an object to be exhibited safely and shown to full effect. Those mounts that are the subject of articles tend to be more innovative or unusual designs, or those associated with high profile exhibitions. One such article is that by Roisin Morris[5], which details the range of mounts used for the touring Victoria and Albert Museum exhibition, *Hats: An Anthology by Stephen Jones* in 2009. The particular value of this article lies in the wide range of hat styles that it covers, and the discussion of the practical issues these presented and how they were overcome. Aspects such as veiling and makers' labels were identified as commonalities, and systems were developed to accommodate these. However, the mounting is presented as part of the conservation treatment, and as such, each hat mount is very much tailored to the individual hat. This was partly due to the transportation and aesthetically discreet display requirements that the mounts had to fulfil, in addition to providing physical support.

[5] Roisin Morris, "Not just a load of old hat: the preparation of a hat exhibition for display and transport," *Journal of the Institute of Conservation* 34:1 (2011): 66-79.

Museum or conservation studio blog posts are a common source of mount making case studies. Barbara Owens' blog post[6] is a thorough example of this, showing the use of mounts for object stabilisation in storage, mounts to enhance objects while on display, and also the use of mounts as a means of reintroducing broken elements. Although not written in a peer reviewed article format like Morris', it nevertheless provides a useful and visually packed overview of custom made mounts for various hats, each pertaining to their physical, display and/or storage needs.

Within the realm of custom mounts, there is much written specifically on costume mounting. These range from how-to guides to case studies. Case studies vary in the amount of detail they convey, with some focussed on the visual transformation that costume mounting can produce[7] , whilst others, such as Cecilia Voss' blog post for National Museums Scotland[8], explain the physical process through a logical step-by-step approach. How-to guides such as Lara Flecker's book *A Practical Guide to Costume Mounting*[9] provide an outline of commonly used techniques. Whilst this is an invaluable tool for anyone attempting costume mounting, it is generally a fairly complex undertaking and therefore requires a certain amount of skill and professional judgement in addition to written guidelines. Blog posts and articles also rarely mention the mounting of costume accessories except in passing, as the focus is usually on the main garment. Kiera Miller and Sam Gatley indirectly discuss the mounting of hats when considering the role of hair in the wearing of hats[10], highlighting why the mounting of hats is not as simple as just storing them on mannequin head forms.

**2.3. Rehousing projects**

Documentation of large scale museum rehousing projects, whether in the form of reports, blog posts or articles, are a useful source of storage mount ideas, because many adopt a suite of adaptable solutions in order to increase efficiency. These are generally all based on the same methodology, but are capable of adaption to meet the variation within a collection. Christina Margariti and Polytimi Loukopoulou present a good example of this in their approach for the storage of archaeological

[6] Barbara Owens, 'Conserving, Storing and Mounting Hats, Caps, and Various Headgear,' http://insidetheconservatorsstudio.blogspot.co.uk/2017/10/conserving-storing-and-mounting-hats.html.
[7] Kiera Miller, 'Not just a load of white dresses,' https://www.vam.ac.uk/blog/here-come-brides/not-just-load-white-dresses.
[8] Cecilia Voss, 'Inside the textile conservation studio: mounting a 19th century muslin dress,' https://blog.nms.ac.uk/2015/11/07/inside-the-textiles-conservation-studio-mounting-a-19th-century-muslin-dress/.
[9] Lara Flecker, *A Practical Guide to Costume Mounting* (Oxford: Butterworth-Heinemann, 2007).
[10] 'Kiera Miller and Sam Gatley, 'Keep your hair on! The development of conservation friendly wigs,' http://www.vam.ac.uk/content/journals/conservation-journal/spring-2011-issue-59/keep-your-hair-on-the-development-of-conservation-friendly-wigs.

fragments[11]. Fragments were categorised by size and shape. A standardised tray system was then devised that could be appropriately modified for each category. Although not strictly relevant to the internal support of three-dimensional objects, this article nevertheless offers a clear and logical approach to the decision making step of the mount making process. Gemma Aboe[12] similarly outlines a standardised storage and handling system for archaeological basketry, clearly breaking down the purpose of each element and its benefits to the overall system.

Sherelyn Ogden and Ann Frisina[13] also write about mount making for a collection rather than for individual objects. However, while their paper contains a well justified rationale and some nice examples of solutions (including a basic internal support for moccasin shoes, simple enough to be produced by volunteers), the written structure and haphazard placement of images makes it hard to read.

The Field Museum in Chicago produced an article about their recent rehousing project[14], giving examples of storage mounts that were made for various objects. All mounts were made from the same basic group of materials, and commonalities within the collection were identified in order to design various storage systems (e.g. polyethylene foam cone shapes for the storage of dance masks[15]). However, the mounts made were still essentially custom-made for each object, in order to accommodate variation in size and shape.

Whilst the Field Museum article briefly covers a range of mounts made for various types of ethnographic objects, the Museum of Fine Arts in Boston presents a much more object specific, visual showcase of storage mounts made during a rehousing project, both on their website[16] and via an online presentation[17] - both easily accessible resources. Objects are grouped by type, and for each, the basic mount designs are outlined and appropriately justified. For hats, designs range from custom-made carved ethafoam® forms, to more standardised cardboard forms. The latter is a particularly effective example of a simple storage mount that can be adjusted to suit various styles

[11] Christina Margariti, and Polytimi Loukopoulou, "Storage solutions for excavated textiles: tending to their recalcitrant behaviour," *Journal of the Institute of Conservation* 39:2(2016): 153-155.
[12] Gemma Aboe, "Packaging and storage solutions for archaeological basketry: a selection of practical designs," *Journal of the Institute of Conservation* 35:1 (2012): 105-109.
[13] Sherelyn Ogden, and Ann Frisina, 'Storage for Textiles,' http://www.mnhs.org/preserve/conservation/reports/textiles_storage.pdf.
[14] Catherine Sease, and Catherine Anderson, "Preventive conservation at the Field Museum," *Studies in Conservation*, 39:sup2 (1994): 44-47.
[15] Ibid., 46.
[16] 'Conservation Project: costume accessories,' http://www.mfa.org/collections/conservation/feature_costumeaccessories.
[17] Karen Gausch and Joel Thompson, 'Conservation in action: preserving hats and headwear at the MFA Boston,' https://artsandculture.google.com/exhibit/wAKCMTQv7r5NKA.

of hat with the easy addition or subtraction of padding[18]. Some of these mounts bear stylistic similarities to the mounts for flying helmets detailed in a case study in *Conservation of Leather and Related Materials* by Kite and Thomson[19].

### 2.4. Practical "how-to" guides for storage devices

Practical, instructional guides for the making of storage devices often appear in leaflet or pdf formats, are easily accessed, and can be aimed at either museum professionals or members of the public involved in collections care (whether for their own private objects or as museum volunteers). As previously mentioned, guidelines for activities such as costume mounting are readily available[20], although these still generally require some amount of professional judgement to execute effectively and so are probably more appropriate for a conservator or costume mounter audience. Similarly, a website for the sharing of storage solutions set up by the Foundation of the American Institute for Conservation of Historic and Artistic Works (*stashc.com*) has many instructional pages for the making of storage devices, including Greene's wide brimmed hat solution[21]. Because these have been made and uploaded by various museum professionals, these are pages are fairly unstandardised. Nevertheless, they offer an excellent platform on which to share ideas.

Instruction sheets for making padded hangers are one of the more commonly found guides[2223]. Padded hangers are ideally suited to this instructional format, as they are generic enough to be able to be made from a set of instructions, and can be easily varied in style to suit the different needs of different styles of costume. They require sewing skills, but not the level of professional judgement that would be needed for making a custom mount. They are thus at a level suitable for some volunteer workforces to produce in bulk, as Lynn McClean attests in her blog post[24] for National Museums Scotland. Although not the most recent publication on padded hanger making, the pdf

[18] 'Conservation Project: Costume Accessories, Hats: Simple Board Mounts,' https://www.mfa.org/collections/conservation/feature_costumeaccessories_hatsandheadware_simple.
[19] Marion Kite and Roy Thomson, "The mounting of a collection of flying helmets," in *Conservation of Leather and Related Materials* (Oxford: Elsevier Ltd., 2006), 297-301.
[20] Flecker (2007).
[21] Virginia Greene, 'Support for wide brimmed basketry hats,' http://stashc.com/the-publication/supports/malleable/support-for-wide-brimmed-basketry-hats/.
[22] Ruth E. Norton, *Studies and Documents on Cultural Heritage. Storage and display of textiles for museums in South East Asia* (UNESCO, 1984), 24-29.
[23] 'How to create a padded coathanger,' https://maas.museum/app/uploads/2017/02/how_to_create_a_padded_coathanger.pdf.
[24] Lynn McClean, 'Helping hands: the volunteers making a difference to textile storage at the museum,' https://blog.nms.ac.uk/2015/10/14/helping-hands-the-volunteers-making-a-difference-to-textile-storage-at-the-museum/.

produced by the National Park Service[25] is an excellent example of how to condense and present this type of instructional information in a clear, easy to follow layout. The simple diagrams are particularly useful and are much clearer than the poor quality photographs used by other guides[26]. The inclusion of a cut-out pattern for readers is an added bonus.

**2.5. Conclusion**

The requirements placed on mounts vary widely according to both object and context. Even in re-housing situations where time efficiency is an important consideration, a certain amount of customisation is usually present. However, in formulating a suite of solutions, collections can be tackled more efficiently through identifying commonalities within the collection and forming some sort of grouping system to which a limited number of solutions can then be applied.

Although falling more into the category of storage devices rather than storage mounts, padded hangers offer an example of a standardised solution. They are simple enough to be reproduced using brief written guidelines and can easily be adjusted for size with the simple addition or subtraction of padding. In simplifying the method, one lowers the skill level required and thus opens up the activity to a potentially larger workforce. This is therefore where this project aims to sit: a headwear solution that requires no more than a padded-hanger-type level of expertise and time, thus making it a more feasible option to implement on a collection-wide scale than traditional custom mounts.

[25] "Storage Techniques for Hanging Garments: Padded Hangers," Conserv O Gram no.4/5 (July 1994): https://www.nps.gov/museum/publications/conserveogram/04-05.pdf.
[26] 'Creating a padded hanger,' https://www.philamuseum.org/doc_downloads/conservation/hangerInstructions.pdf.

## Chapter 3: Interviews

### 3.1. Introduction

Interviews were conducted with a range of professionals involved in collection storage activities; museum textile conservators, freelance textile conservators, museum curators and museum collections care technicians. The majority of these interviews were conducted face to face and were relatively informal, to allow for conversation of the points raised. However, where face to face interviews were not possible due to time or geographical constraints, participants were emailed a list of the interview questions to fill out. In total, 6 participants from three different institutions were interviewed. Some of these were happy to be identified and some preferred to remain anonymous. Although only those participants (and their corresponding institutions) willing to be identified have been named in the sections below, the discussion of the interview outcomes reflects all responses given.

The interview questions aimed to answer the following points:

- Which groups of people/roles within institutions are directly involved in mount making activities? This is to better understand the wider context of mount making in institutions and to ascertain who is responsible for which aspects.
- What time and monetary budgets are commonly available within an institution for mount making?
- What materials are commonly available within an institution for mount making?
- What is the role of volunteers in activities such as mount making and the production of storage devices?
- What are the perceived or experienced limitations on making mounts for three dimensional objects?
- What factors make a mount for a three dimensional object such as a hat effective?

Questions were relatively open, to encourage discussion of the points. Responses were intended to provide a comparative view of the context for mount making in selected institutions, rather than to attempt to show a wide overview of mount making in museums more generally – hence the small number of participants.

### 3.2. Outcomes

#### 3.2.1. Which roles within institutions are directly involved in mount making activities?

Overall, responses to this question from participants were not vastly different, varying only slightly between institutions. This variation is perhaps partly due to different naming conventions being used for certain job or department titles. All respondents cited the involvement of curatorial and conservation staff in mount making activities. Staff at NMS also listed the Collections Care department (which includes technicians) and Facilities Management for the wider context surrounding the storage of collections. GMRC staff listed the Logistics department and technicians. They also highlighted the input from students at the CTCTAH, as certain objects from the GMRC collection have been conserved as part of student projects and returned to storage on custom made mounts.

Whilst all of the departments listed above may have an involvement in the storage of collections, the interview responses made it quite clear that each of these departments has a slightly different focus. Technicians take responsibility for some of the more day to day, heavy duty activities such as packing and transporting objects between sites, while conservators tend to more commonly make custom mounts for display rather than storage alone, as this reflects their project based work programme. The curatorial department may be involved in mount making as part of other curatorial activities such as repacking boxes and reorganisation of the stores. Whilst the exact divide of these tasks will vary between institutions, the responses given here illustrate an example of the basic structure of job roles involved in storage and mount making.

#### 3.2.2. What time and monetary budgets are commonly available within an institution for mount making?

Cost and budgetary information was harder to gain specific information on, possibly because this varies so widely between projects, even within the same institution. However, there was a general consensus that although time is generally not explicitly allocated for mount making, it often falls under the remit of other projects, and can be budgeted as such.

#### 3.2.3. What materials are commonly available within an institution for mount making?

Designing a time and cost effective mount solution should take into account what materials institutions commonly have available. This project will aim to use only those materials already in common usage in museums, negating the time needed to source different materials that might perhaps be less commonly available. Interview participants were therefore asked what materials are

routinely used in their institution. The following table compiles the findings from interviews and the author's observations when visiting museum stores (this will be discussed in more depth in Chapter 4). Information has been organised by institution, for greater clarity. Responses from participants wishing to remain anonymous have been omitted from this table. It should be noted that this list of materials is not exhaustive, but instead reflects those materials most commonly used by participants. Materials listed have been cross referenced on the British Museum's Oddy Testing Database[27], to check their suitability for use in long term storage. A key is provided below the table. Question marks indicate where Oddy test results could not be found for a specific material.

**Table 1 A list of materials commonly available in selected institutions and their related Oddy Test results.**

| **Material** | **NMS** | **Glasgow Museums** | **Oddy Test Result** |
|---|---|---|---|
| Ethafoam® polyethylene foam[28] | | ✔ | **P** |
| Plastazote® LD45[29] polyethylene foam | ✔ | ✔ | **P** |
| Polyester wadding | ✔ | ✔ | **P** |
| Cotton Jersey | ✔ | ✔ | **P** |
| Cotton stockinette tubing | ✔ | ✔ | **P** |
| Unbleached cotton calico fabric | ✔ | ✔ | **F**[30] |
| Tyvek® polyethylene fabric[31] | ✔ | ✔ | **P** |
| Scrim/wheatstarch paste | | ✔ | **?** |
| Acid free unbuffered tissue paper | ✔ | ✔ | **?** |
| Polythene sheeting | ✔ | | **?** |

[27] 'Database of Material Test Results,' http://www.britishmuseum.org/pdf/How%20to%20use%20the%20database_web_final.pdf.
[28] 'Ethafoam Foam Planks,' https://www.preservationequipment.com/Catalogue/Conservation-Materials/Other-Materials/Foam-Blocks.
[29] 'Plastazote LD45,' https://www.preservationequipment.com/Catalogue/Packing-Materials/Materials-Foam/Plastazote-LD45.
[30] Keira Lauren Ahmed Miller, "Materials maketh the mannequin: an investigation into the material properties of papier-mache torsos for conservation mounting" (MPhil dissertation, Centre for Textile Conservation and Technical Art History, University of Glasgow, 2017), 63.
[31] 'Tyvek rolls - 1622E,' https://www.preservationequipment.com/Catalogue/Conservation-Materials/ShippingPacking/Tyvek-1622E.

| | | | |
|---|---|---|---|
| Bubble wrap | ✔ | | **F** |
| Pins | ✔ | ✔ | **?** |
| Cotton tape | ✔ | ✔ | **T** |
| Fosshape[32®] | | ✔ | **T** |

**Table 2 Oddy Test Key[33]**

| | |
|---|---|
| **P** | Pass - Suitable for permanent use |
| **T** | Temporary - Suitable for temporary use (less than six months) |
| **F** | Fail - Unsuitable, do not use |

### 3.2.4. What is the role of volunteers in activities such as mount making and the production of storage devices?

Volunteers within museums offer a workforce that exists somewhat outside normal staff budgetary constraints. Whilst volunteers should not be used for work that could be done by a paid professional[34], they can be invaluable in aiding with large scale collections storage projects and commonly undertake standardised activities such as making padded hangers for the hanging of costume, although staff supervision time and material costs should still be taken into account.

All participants said that their institution has had volunteer involvement in the implementation of improvements to the storage of its collections. It was generally agreed that volunteers fall into several categories in terms of personal background, reasons for volunteering, and skillsets. Both NMS and GMRC regularly have both pre-programme and current students volunteering in order to expand their experience of museum work. Skill sets and interests vary widely between individuals and can be utilised and met accordingly. The other core volunteer demographic constitutes groups such as the Edinburgh Decorative and Fine Arts Society (EDFAS), who volunteer on a regular basis, with individuals sometimes having volunteered at an institution for many years. Often retirees with an interest in textiles, they choose to give their time and in turn can benefit from the social aspect of the group and the enjoyment of the work they are asked to undertake. Maggie Dobbie, textile

[32] 'Fosshape Heat Mouldable Fabric,' https://www.preservationequipment.com/Catalogue/Display-Products/Display-Supports/Fosshape-Heat-Activated-Fabric.
[33] 'Database of Material Test Results,' http://www.britishmuseum.org/pdf/How%20to%20use%20the%20database_web_final.pdf.
[34] Sarah Gates and Beth Szuhay, "A volunteer tradition: the evolving role of volunteers in the textile conservation department at the Fine Arts Museums of San Francisco," in *Textile Conservation Advances in Practice*, ed. Frances Lennard and Patricia Ewer (Oxford: Butterworth-Heinemann, 2010), 28.

conservator at GMRC, raised the point that many of this demographic have a background in dressmaking, and so tend to be more comfortable with activities such as sewing and following patterns. Emily Taylor, curator at NMS, echoes this, and follows with a recent example where EDFAS volunteers were asked to cut plastazote® to fit drawers. Many of the volunteers did not feel confident with this task, whereas activities such as sewing padded hangers and Tyvek bags are commonplace.

### 3.2.5. What are perceived or experienced limitations on making mounts for three dimensional objects?

A lack of time was unanimously agreed to be the principal barrier to mount making for three dimensional objects. Custom mounts were flagged up for the amount of time and professional judgement needed to make them – as one respondent said, "*they are not time effective."* The skill needed to work with different object shapes was also raised as an issue. Kelly Rennie, technician at NMS, highlighted the issue of aging; not only materials and knowledge becoming outdated as the conservation field develops, but also the physical aging of materials over time and how this affects their material properties.

### 3.2.6. What factors make a mount for a three dimensional object such as a hat effective?

Several participants mentioned the need for hats (particularly wide brimmed ladies' hats) to be raised up slightly on a mount to prevent them sitting on their brims. Hat brims are often slightly curved, and sitting flat on a shelf can distort their natural shape. Several respondents also felt that it was important that the mount be easy to use; the object may need to be accessed for study, for example, and the mount should ideally aid accessibility rather than hinder it. This is also an important point with regards to safe handling of objects, as if the mount is difficult to insert or remove, this could result in accidental damage to the object. Related to this, the mount should be stable. This was highlighted by GMRC staff, as GMRC has a separate study room which necessitates objects moving between this room and the main storage rooms when requested for study. GMRC staff also stressed that space in museum stores is often limited and that a mount should therefore where possible avoid growing the footprint of the object.

## 3.3. Conclusion

The interviews succeeded in clarifying aspects of the context for mount making in the participants' institutions. They revealed the overlapping and distinct interests and roles of the main departments involved in collection storage and indicated that the decision making power with regards to the making of mounts is likely to lie mostly with the conservation and curatorial departments.

Discussions on time and financial budgets were less precise in nature, partly due to the wide variation between projects, but also because budgets for mount making often seem to fall under the scope of wider projects and are therefore difficult to separately define. However, time was very definitely cited by participants as the biggest limitation on making mounts and general consensus was that volunteers offer a possible workaround in this respect for large scale projects, as long as the tasks they are given fit their interests and skill level. Standardisation was raised as a key point to consider when planning tasks suitable for a volunteer workforce, with padded hangers forming a good example of such a task.

Interviews also generated other factors to consider when designing a storage mount for hats; it should aim to raise the hat off its brim, be safe and easy to use (thereby aiding accessibility), be physically and materially stable (both currently and long term), and it should also aim to avoid growing the footprint of an object.

## Chapter 4: Collection Survey

### 4.1. Introduction

A collection survey was conducted of the headwear collection at National Museums Scotland (NMS) in order to determine more precisely the practical and physical needs that a mount solution would need to fulfil.

NMS was chosen to be the focus of this collection survey for several reasons. Firstly, its size; as a national museum with a comprehensive fashion and textile collection, it includes a wide variety of headwear styles. This is important, as this project aims to be applicable to a general headwear collection rather than just limited to specific styles or periods. Furthermore, although the collection is large, it was still of a manageable size to feasibly assess within the timeframe of this dissertation project. Secondly, it was possible to access and study the objects within the store, meaning that the survey could encompass both the individual objects themselves, and the wider storage context of the collection as a whole. Finally and crucially, the hats in the collection have not been part of any recent rehousing project, meaning that their storage is likely to be more representative of the average museum storage situation.

The aims of this survey were as follows:

- To gain a clearer idea of what storage mounts are currently in use.
- To gather shape and style information that can be used to as a basis for categorisation.
- To determine the range of sizes (height, diameter and circumference) within the collection.
- To gain further insight into the wider storage context of the collection, supplementing the information gathered about this through interviews.
- To evaluate the relative condition of the collection, identifying common condition issues.

109 hats were surveyed in total. This selection was made based partly on access practicalities; the headwear at NMS is spread widely throughout the store, as part of various sub-collections. The hats surveyed were chosen because they can all be found located in nearby aisles of the store, increasing the efficiency of the survey process (a key consideration, due to limited access time). These therefore represent only a portion of the collection at NMS. However, it was felt that this selection is representative of the variation in styles and periods of the collection as a whole. Both male and female items of headwear have been included in the survey, as this was felt to be more representative of the whole collection.

### 4.2. Outcomes

#### 4.2.1. What storage mounts are currently in use?

The hats surveyed had one of three internal mount options:

- No internal mount.
- Custom made internal mounts (see Fig.1.). In discussion with the curator Emily Taylor, it became clear that these were more likely to have been made for display purposes and then reused for storage of the object than actually made just for storage. These mounts varied slightly in design but were generally comprised of a carved ethafoam block, padded with polyester wadding and covered in a layer of cotton stockinette or jersey fabric.
- Acid free tissue paper puffs (see Fig.2.). Hat crowns were filled with one or two puffs and hats with wider brims sometimes had an additional larger puff to sit slightly under the brim.

**Figure 1 Jean Muir hat on a carved ethafoam® custom mount form. By kind permission of National Museums Scotland.**

**Figure 2 A tissue puff as an internal support for a felt hat. By kind permission of National Museums Scotland.**

The quality of support being given by these mount options to each hat was assessed, and they were divided into two categories; sufficiently supportive and not sufficiently supportive. The suitability of the support depends largely on the relative material properties of both the hat and the internal mount. For example, if an unstructured but heavy fabric hat is placed on an easily crushed support such as tissue, the tissue may not provide adequate structure to hold the hat in its correct shape, and therefore would be deemed not sufficiently supportive. The supportiveness of mounts was inferred by visual observation of the structural condition of each hat. The bar chart below summarises the results of this assessment of support quality.

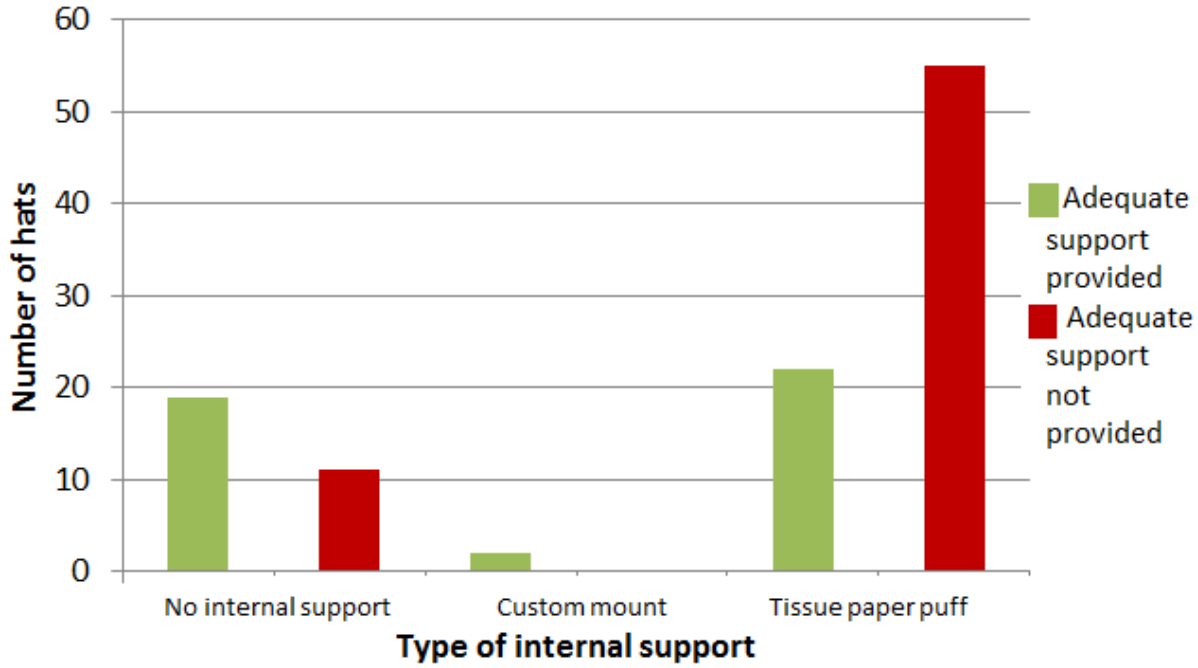



**Figure 3 Bar chart showing the relative suitability of different types of internal support observed during the collection survey at NMS.**

From this bar chart it can be seen that tissue paper puff supports make up the majority of those used within the surveyed collection. This is understandable; they are more materially inexpensive than custom mounts, and crucially, much quicker and simpler to make, as they do not require the same level of judgement that, for example, carving a well-fitting ethafoam® mount would need. However, the results of the survey also show that, whilst for many hats a tissue puff may offer more support than nothing at all, for 71.4% of the tissue puff supported hats surveyed, this support was insufficient. When newly made, tissue puffs can help pad textiles to prevent creases forming. However, because they are not solid forms, they can become crushed over time and so do not provide reliable long term support[35] - something that was highlighted as an issue during interviews and discussed in Chapter 3, section 3.2.5. This was the case for many of the hats at NMS; the tissue puffs had collapsed downwards inside the hats, leaving the top of the crown unsupported internally (Fig.4.).

**Figure 4 Deformation in the crown, due to lack of support from tissue puff. By kind permission of National Museums Scotland.**

[35] Gwen Spicer, 'Supporting textile artifacts without tissue paper - Save a tree!' http://insidetheconservatorsstudio.blogspot.co.uk/2013/02/supporting-textile-artifacts-without.html.

The relatively low number of custom mounts within the surveyed collection reflects the time and skill required to make them. However, those seen gave very good internal support and fitted the hats well.

Those hats with no internal mount were very mixed in style, and these styles often correlated with whether or not an internal mount was needed. Many of the very flat hats or very structurally solid hats do not require additional internal support, either because of the shallowness of their internal cavity or their natural material resistance to distortion. However, in some cases, the lack of mount was due to elements of the hat (such as crown linings) being particularly fragile, and thereby preventing tissue from being inserted safely. In many of these cases, some kind of mount would have been desirable to prevent structural distortion.

**Figure 5 A bicorn hat that folds flat, so has no need for internal support. By kind permission of National Museums Scotland.**

#### 4.2.2. Information on shape and style variation.

During the collection survey, in addition to notes, photos were taken of each hat to capture further information about shape and style, in order to build an overall impression of the variation within the collection. However, in some cases the photos struggled to convey the complexity of internal structures that many of the hats exhibited, so quick sketches of the profile of each hat were also made in order to simplify the information (see Fig.6.). These sketches were later used to help form a categorisation system (see section 4.2.2.1.).

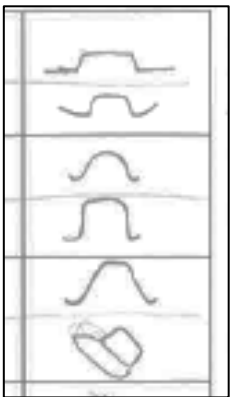


**Figure 6 Example of hat profile sketches made during the collection survey at NMS**

#### 4.2.2.1. Forming a categorisation system.

The literature on rehousing projects discussed in Chapter 2, section 2.3., suggests that identifying commonalities within a collection can help to focus the solutions, so that even if one overarching solution is not possible, a suite of complimentary options can be designed to streamline the work process. With this in mind, it seemed desirable to form a categorisation system that could be applied

to the headwear collection at NMS, both in order to design a mount solution, and to ensure that the solution could be tested on the widest variety of hat styles possible.

Headwear categories used traditionally to describe different styles of hats have been researched, but these are too numerous and specific to be used practically in this study. Many of these traditional categorisations are based on historic manufacture techniques or fashion styles that have little bearing on their mounting needs, so are not relevant here. For the purposes of this study, headwear will therefore be grouped based on similar structural features – particularly focussing on those with a bearing on what type of support they would need. Using the profile sketches made during the collection survey, the hats surveyed were grouped into five categories (see Table 3). 100 out of 109 hats were sorted into these categories; the 9 that were omitted were styles such as bicorn hats that have no need for support as they fold completely flat and so have no internal cavity when closed. It can be seen that the majority of hats surveyed fall into the domed crown category, followed by a quarter exhibiting flatter crown tops. Categories C, D and E were less represented, but still present.

**Table 3 Categorising the hats from NMS by profile type.**

| Category | Name/description | Hat profile | Number of hats surveyed of each hat category |
|---|---|---|---|
| A | Domed crown top |  | 54 |
| B | Flatter crown top |  | 25 |
| C | Sits on the back of the head rather than just on the top (e.g. bonnets) |  | 8 |
| D | Very shallow crown (those hats with an internal height of 5.5cm or less) |  | 7 |
| E | Hats with a smaller circumference at the headband than at the widest point of the crown (e.g. berets) |  | 6 |

#### 4.2.3. What range of hat sizes does the collection cover?

Internal height and internal diameter measurements were taken from each hat surveyed (see Fig.7.). Internal height has been quantified as being the measurement from the lowest point of the internal headband to the highest point on the inside of the crown. With regards to diameter, it should be noted that some styles of hat have sloped or curved sides or taper as they go up and so the diameter at the top of the crown is often much smaller. For consistency, diameter measurements were therefore taken at the internal headband of each hat. In the case of oval or asymmetric hats where the diameter varied, the largest and smallest diameter measurements were taken. Measuring the internal circumference proved difficult without excessive handling of the hats, so circumference measurements have been calculated from the diameter. Where a hat had two diameter measurements, the mean average of these was taken to calculate the circumference.

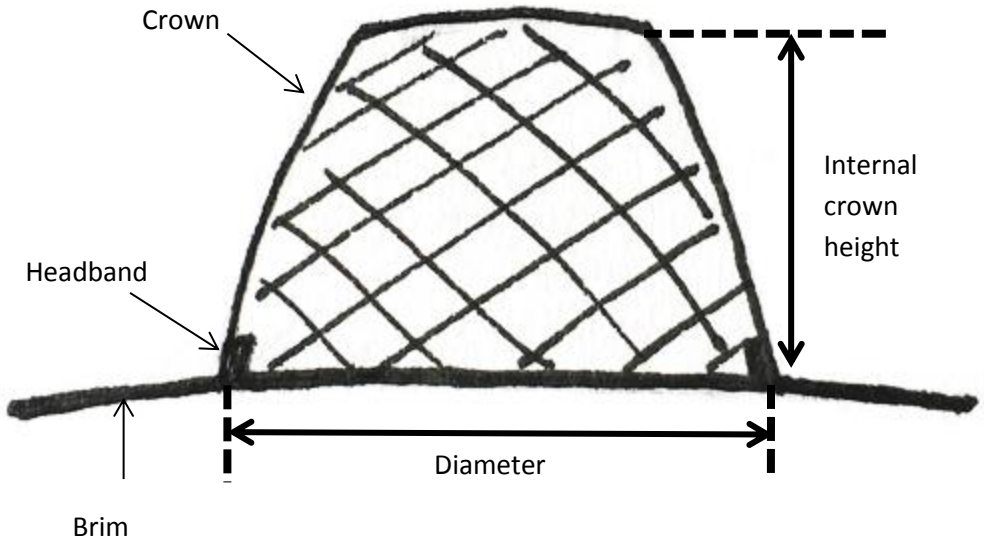



**Figure 7 Location of measurements**

The size ranges are summarised as follows:

- Internal height range: 1.5 – 15cm
- Internal diameter range (including information from hats with a small and large diameter): 11.5 – 25cm
- Internal circumference range: 31.4cm – 64.4cm

The spread and distribution of internal height and internal circumference are shown in Fig.8. It shows that although both height and circumference have a few more extreme outliers, the majority of hats fall within the central range.

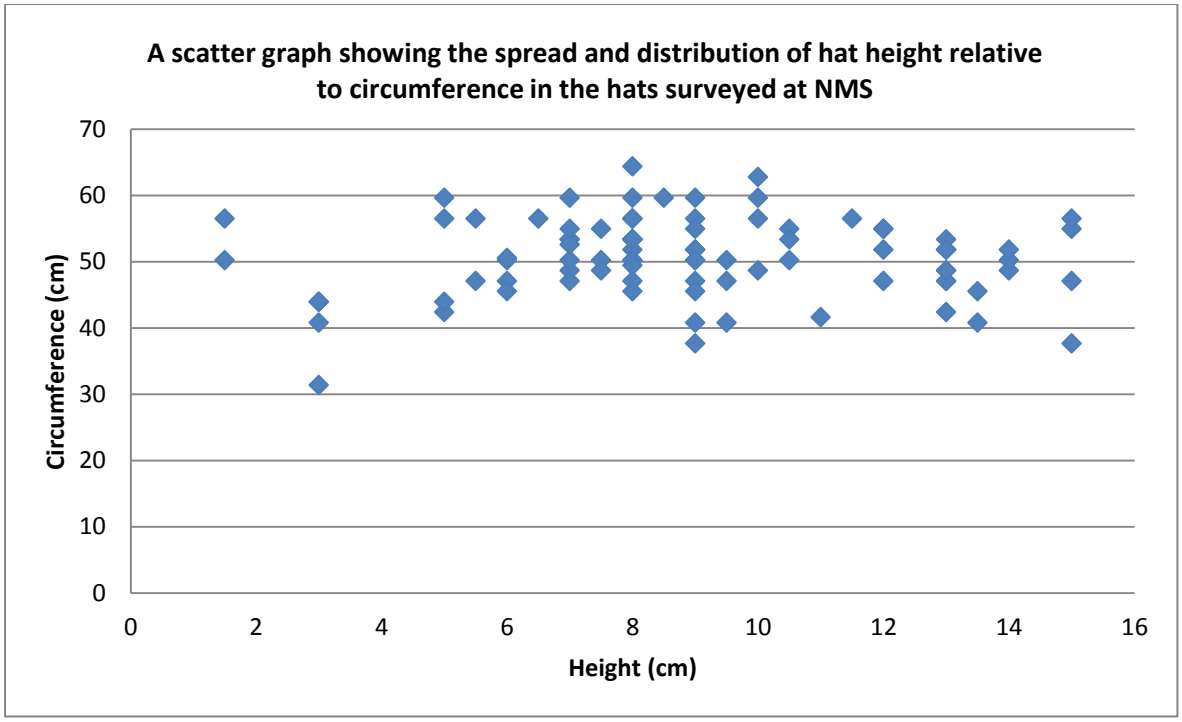



**Figure 8 A scatter graph showing the spread and distribution of hat height relative to circumference in the hats surveyed at NMS.**

### 4.2.4. Further information on storage context

103 hats out of the total 109 surveyed are stored in shallow plastic bakers trays that slide into the roller racking system used in the textile store. Each bakers tray is lined in acid free tissue paper and houses between 1 and 7 hats (dependent on size of hat). Some trays have additional tissue paper puffs in between hats, though this varies throughout the trays. The brims of hats overlap where larger, and some flatter hats are stored in two layers within a tray, separated with a layer of tissue paper (see Fig.9.).

**Figure 9 Hat storage in bakers trays, interleaved with acid free tissue paper. By kind permission of National Museums Scotland.**

Three of the hats surveyed are stored in acid free archival cardboard boxes. One of these hats is packed alone, padded with a layer of spider tissue and additional tissue puffs; this hat is on a custom display mount and was repacked in its own box to accommodate its larger size when mounted. The other two boxed hats are packed together in one box, interleaved with tissue paper and packed with additional tissue puffs.

Three hats surveyed are stored flat on a shelf of the roller racking system. This is due to the oversized nature of their brims which prevents them fitting in the standard bakers trays.

#### 4.2.5. Hat condition relating to the current storage mounts.

Of the hats surveyed, the most common condition issues were identified as follows:

- Denting or structural inward collapse/deformation of the top of the crown.
- Creasing or other structural collapse of crown sides.
- Distortion of the hat brim.

The first two issues can be directly related to a lack of internal support. The third is usually caused by hats sitting directly on their brims in storage; brims are often slightly curved or shaped, and are therefore not always suited to bearing the weight of the rest of the hat. Bonnets can be particularly vulnerable to this, as they have even less of a side on which to naturally sit. This was a point that came up during the interviews in Chapter 3, section 3.2.6., when it was highlighted that ideally hats should be stored slightly raised up off the brim.

**Figure 10 Wide brimmed hat demonstrating distortion in brim and crown areas. By kind permission of National Museums Scotland.**

### 4.3. Conclusion

The collection survey at NMS was successful in gathering useful information about both individual hats and about the collection as a whole. It provides an overview of the size and shape range that a mount solution should aim to cover, whilst also considering additional factors such as how proposed mount solutions would fit in with the current storage context. The small number of custom mounts and widespread use of tissue puffs within the collection reflects the time limitations placed on staff,

as previously discussed in Chapter 3, section 3.2.5. It was also clear from studying the collection that there were no mount solutions in use that sit somewhere between tissue puffs and custom made mounts – i.e. something more supportive than tissue puffs but less time consuming to make than custom mounts.

Despite the wide spread of shapes and styles, by looking at a relatively large cross section of hats it has been possible to group these in relation to structural similarities and their support requirements. These five categories will be vital in aiding the development of suitable mount designs and will allow for an objective evaluation of finished designs on each category at the testing stage.

## Chapter 5: Development of mount forms

### 5.1. Introduction

This chapter will document the prototype mount forms developed. Mount examples identified from literature have been used as a starting point for development, and these will be discussed and reviewed. Working parameters within which a mount solution should ideally fit have been identified from the interviews conducted with conservation and other museum staff, as well as from information collected during the collection survey at NMS. These include; materials, time/cost, and techniques of making. Initial ideas are outlined and evaluated, and refinement of the final form prior to testing is discussed.

### 5.2. Examples from literature

Key mount design examples have been identified from the literature examined in Chapter 2. These have been grouped based on similar techniques of making, and each of these groups is examined in the following three sections.

#### 5.2.1. Stuffed forms

Stuffing a stockinette or jersey sleeve with polyester wadding or other fibre fill material is a common technique for padding out small textile objects to give support. Ogden and Frisina[36] and Davis[37] both suggest similar methods for creating internal supports for moccasin shoes. A cotton jersey sleeve is inserted empty or partially filled into the shoe cavity, and then filled to the required fullness with additional wadding.

The benefits of this are that the shoe can be padded to fit its exact and particular shape. It also negates the issues of sliding the mount into the shoe; the natural curve of shoes can often make getting a solid foot shaped form inside

**Figure 11 Ogden and Frisina's example of moccasin internal supports, http://www.mnhs.org/preserve/conservation/reports/textiles_storage.pdf.**

[36] Sherelyn Ogden, and Ann Frisina, 'Storage for Textiles,' http://www.mnhs.org/preserve/conservation/reports/textiles_storage.pdf.
[37] Nancy Davis, 'Internal supports for pliable artifacts,' http://stashc.com/the-publication/supports/malleable/internal-supports-for-pliable-artifacts/.

difficult, as a real foot bends and flexes when being put into a shoe. For this reason, shoe mounts are sometimes made in two pieces[38]. Another benefit is that the jersey sleeves can be mass produced beforehand, without needing access to the objects for specific size and shape information. This gives the potential to streamline and thereby speed up the mount making process, especially when compared with, for example, a carved ethafoam® custom mount, that requires measurements from the object, time for carving and time for trial fittings in order to adjust and refine the carved shape.

One downside of these internal mounts is that they can be over or under filled, much like using acid free tissue paper puffs. Under filling results in inadequate support, whilst over filling can add stress to the object and cause distortion. The filling therefore requires a level of professional judgement in order to be effective. Another issue is that the final filling requires the handling of loose polyester wadding near to the object, which may result in fibre debris on the object.

It is not clear how effective this method would be for items of headwear, as they generally have a larger internal cavity than shoes. It is also probable that one would need to turn a hat upside down in order to fill the internal jersey sleeve effectively, and this level of handling may not be appropriate for all hats, depending on style and condition.

### 5.2.2. Arched forms

There are several examples in the literature of arched forms being used as a flexible but firm internal support for headwear such as bonnets that have no natural surface on which to sit. The Museum of Fine Arts (MFA), Boston, has a particularly effective example of this[39] from a recent rehousing project. A strip of archival card is arched over and the ends slotted into an ethafoam® base (see Fig.12.).

**Figure 12 Arched forms used to store bonnets at the MFA, Boston. http://www.mfa.org/collections/conservation/feature_costumeaccessories.**

[38] Penny Hughes, "Developing inner supports for the storage and display of womens shoes at the National Boot and Shoe Collection, Central Museum and Art Gallery, Northampton" (Textile Conservation diploma course dissertation, Textile Conservation Centre, 2000), 45.
[39] 'Conservation Project: costume accessories,' http://www.mfa.org/collections/conservation/feature_costumeaccessories.

Similarly, Kite and Thomson present a plastazote® variant of this, made for a collection of military flying helmets[40].

These arched forms are lightweight, use only relatively simple making techniques, and are quick to make (provided the group of objects are relatively similar in size and style). They are effective in raising the object up so that it is not sitting directly on a surface – a point highlighted by participants in the interviews outlined in Chapter 3, section 3.2.6. as important for preventing brim distortion.

The drawback of these arched forms is that they still need to be customised to each specific object, in order to fit correctly. The extent of this customisation is reduced somewhat if a collection is made up of similar shapes and styles (as demonstrated by the flying helmets[41]), but these mounts are perhaps less suited to a more general and varied headwear collection. They work well with bonnet styles because the mount follows and supports the curve of the brim, but seem unlikely to provide suitable support for hats of other styles.

### 5.2.3. Using flat materials to create three dimensional forms

The third grouping of mount examples encompasses several different designs, but with a general theme of creating three dimensional mounts out of flat sheet materials, whether by folding, slotting together sections, or rolling. The first is a method developed by Virginia Greene for the storage support of wide brimmed basketry hats (see Fig.13.), as a more time efficient alternative to carved ethafoam® internal supports[42]. A strip of polyethylene foam sheeting is rolled to create a central core which forms the main crown support. This is then placed inside the hat and the centre of the roll pushed up or down until it conforms to the inside of the hat. This is repeated for the brim, and the outcomes are then covered in a layer of polyester batting and cotton jersey. Whilst each mount is still very much made for a specific object, the idea of using the materials in such a way as to be adjusted to each hat interior is highly effective. It allows the process to be standardised,

**Figure 13 A method for mount making using rolls of polyethylene foam. http://stashc.com/the-publication/supports/malleable/support-for-wide-brimmed-basketry-hats/.**

[40] Marion Kite and Roy Thomson, "The mounting of a collection of flying helmets," in *Conservation of Leather and Related Materials* (Oxford: Elsevier Ltd., 2006), 297-301.
[41] Ibid., 297.
[42] Virginia Greene, 'Support for wide brimmed basketry hats,' http://stashc.com/the-publication/supports/malleable/support-for-wide-brimmed-basketry-hats/.

whilst still allowing the outcomes to be specifically tailored to each individual hat. The author also suggests using offcuts of polyethylene foam from other projects for the strips, in order to economise material usage. These mounts support not only the crown but also the brim, raising the hat up to avoid it resting directly on a flat surface. They have the potential to provide a good internal fit to a variety of shapes and sizes of hats with less judgement than is needed for carving a form to fit. However, it does still require the hat to be present throughout the making process and also necessitates some handling of the hat during this. The process could possibly be streamlined further by pre-making rolls of foam and standardised jersey covers, so that these mounts could be fitted in batches rather than made one by one.

In addition to their arched bonnet supports, the MFA, Boston also produced cardboard hat stands for the storage of hats and bonnets in their collection[43]. These are very much custom to each object, but are made using a standard methodology. Cardboard pieces are slotted together to form a kind of skeletal structure, which raises the height of the bonnet or hat. This is then supplemented with padded shapes made of polyethylene foam, polyester wadding and covered in silk jersey. It is on these padded areas that the hat then rests.

**Figure 14 Cardboard mounts used at the MFA, Boston. https://www.mfa.org/collections/conservation/feature_costumeaccessories_hatsandheadware_simple.**

The cardboard structure offers a possible advantage in that, like the arched form, it negates the need for a solid form, thus saving on the volume of material used and keeping it lighter in weight. The hat is raised up, and padding can be added only where needed so there is less risk of over filling, unlike with the stuffed forms.

The disadvantage is the time needed to implement these mounts on a varied collection. While they have the potential to be adapted for a wide variety of headwear styles, each hat would require a different cardboard profile and amount of padding. This would not only necessitate measuring each individual hat, but also would need a high level of judgement and experience making such mounts, so as to achieve a suitable level of fit quality.

[43] 'Conservation Project: Costume Accessories, Hats: Simple Board Mounts,' https://www.mfa.org/collections/conservation/feature_costumeaccessories_hatsandheadware_simple

### 5.3. Working parameters identified from interviews and the collection survey

#### 5.3.1. Materials

In order to make a mount solution that is as accessible to make as possible, only materials commonly used in museum settings will be considered. Although the interviews conducted as part of this project do not aim to comprehensively represent the practices of all UK based institutions, they do offer an indication of those materials available. The materials listed below are those used at both NMS and GMRC, and will therefore form the choice available to use for forming a mount solution. Materials that failed the Oddy test have been omitted from this list, as have those where Oddy test results were not available.

Materials to use for mount solutions:

- Plastazote® LD45[44] polyethylene foam
- Polyester wadding
- Cotton jersey fabric
- Cotton stockinette tubing
- Tyvek® polyethylene fabric

#### 5.3.2. Time and cost

Staff time and cost are intrinsically linked, as time spent on a project directly impacts the cost of a project overall. Specific information on monetary budgets was not obtainable from the interviews undertaken, partially because of variation between projects, but also because mount making is often done as part of other projects and so is not always easily separated from the wider context of a project. The focus for this project will therefore be on time. This encompasses not only the time taken to physically produce a mount, but also on the efficiency of the making process as a whole. Precise making times for any given project will vary between individuals due to skill level and other personal attributes. Therefore, to make this a more broadly applicable measure, this will not be judged purely by numerical time taken. Instead, the efficiency of the process and the number and skill level of the steps involved will be evaluated. Special consideration will also be given as to the efficiency implications of implementing such a process on a larger collection-wide scale.

The padded hanger instructional pamphlet produced by the National Park Service[45] will be used as a base line with which mount solutions can be compared for efficiency and ease of making. Padded

[44] 'Plastazote LD45,' https://www.preservationequipment.com/Catalogue/Packing-Materials/Materials-Foam/Plastazote-LD45.

hangers represent an example of a storage device of high enough quality and design to be effective in use, but easy and quick enough to make that they can be produced on a larger scale. A mount solution for hats that sits at this skill level and process length would be ideal.

### 5.3.3. Techniques

Techniques of making should aim to be simple enough to be easily followed from a short set of instructions, without requiring a huge amount of professional judgement or prior experience of mount making. As with the time parameters outlined in section 5.3.2., padded hanger instructional pamphlets can be taken as an appropriate level of guide. As a storage device commonly made by museum volunteers, this opens up the potential for a large number of units to be produced with minimal staff input time. By designing a hat storage mount that requires a similar skill level and uses similar techniques to those used in padded hangers, this also has that potential.

In discussion with interview participants, it became clear that several different volunteer demographics exist, each with differing skillsets and interests. However, Chapter 3, section 3.2.4. highlights that the core groups at both NMS and GMRC tend towards a home sewing and/or dressmaking skillset and are generally comfortable with activities such as sewing (both hand and machine) and following patterns. An emphasis was also placed on instructions being clear and simple to follow, to aid reproducibility and continuity between makers. Activities such as cutting plastazote® and using equipment such as hot glue guns were deemed suitable for specific volunteers, but not for the majority. Working with measurements seems likely to add complexity, so where possible, a simple pattern that can be drawn or cut around would be preferable.

## 5.4. Initial ideas

Taking the mount examples gathered from the literature as a starting point, several different mount making approaches were initially trialled. The sections below briefly outline each of these approaches and are followed by an evaluation of their effectiveness and suitability. Due to the time constraints of this project, it was not possible to fully test all of these initial forms, and so only the most promising form has been carried forwards to the testing stage in Chapter 6. Evaluations in this section are therefore based on the experience of making (with reference to the parameters outlined in section 5.3.), and any foreseen benefits or drawbacks of each mount.

[45] "Storage Techniques For Hanging Garments: Padded Hangers," Conserv O Gram no.4/5 (July 1994): https://www.nps.gov/museum/publications/conserveogram/04-05.pdf.

### 5.4.1. Stuffed forms

The first mount trialled uses the same basic idea as those discussed in section 5.2.1.; a stockinette sleeve, filled with polyester wadding. However, in order to avoid needing the object present when deciding how full to fill the outer sleeve, parallel horizontal and vertical lines of running stitch are stitched into the outer sleeve before it is filled with wadding (see Fig.15.). These lines of running stitch can then be pulled tight, constricting the wadding to create a variety of shapes. This allows a standardised form to be essentially customised to fit each individual hat by pulling on different combinations of threads to gather different sections. A disk of plastazote® is also placed inside the sleeve underneath the wadding, with the stockinette gathered at the bottom to close the form, the plastazote® ensuring a flat base.

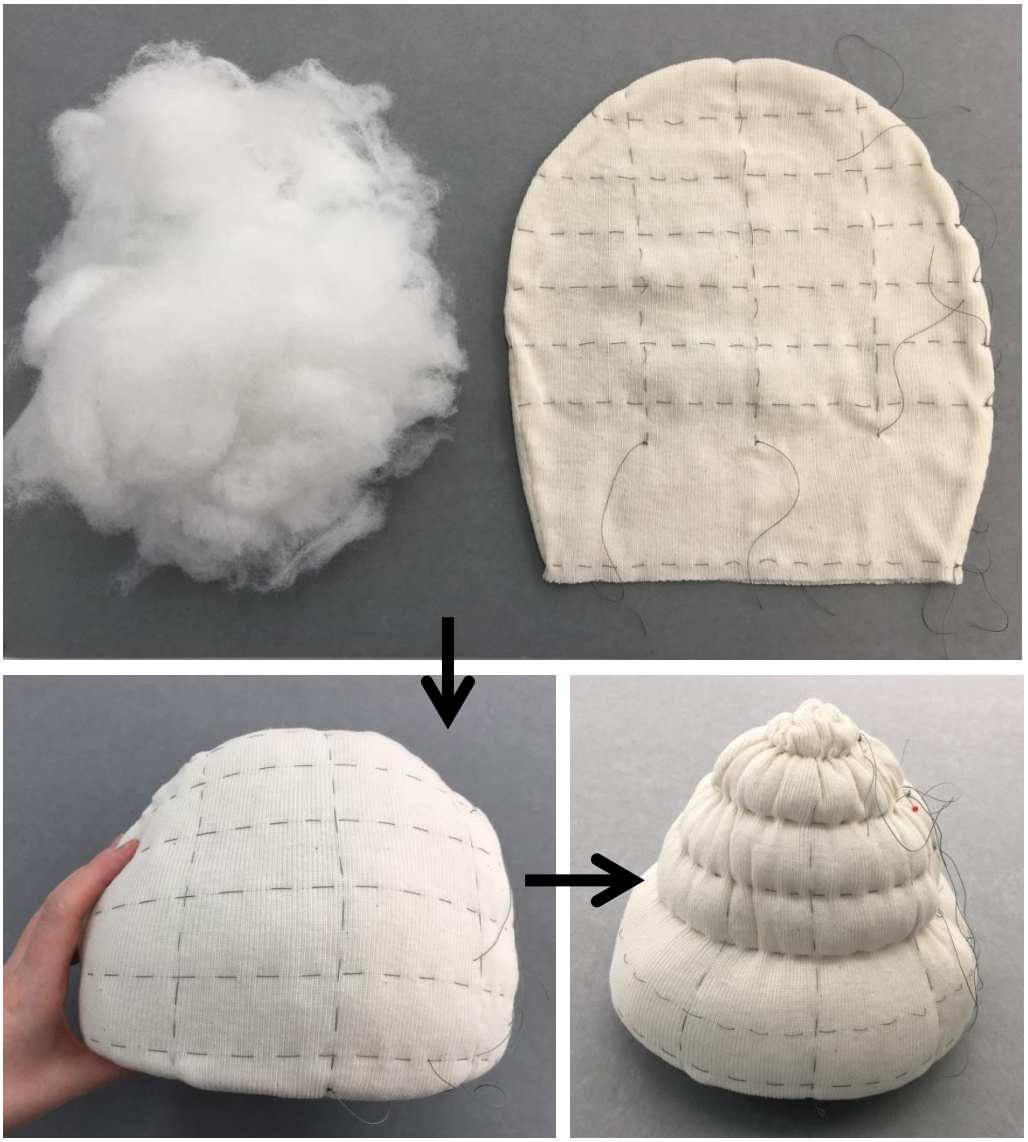


**Figure 15 Top, the unfilled stockinette sleeve with running stitches shown in grey thread. Below left, the filled form. Below right, the filled form with running stitch lines pulled tight.**

### 5.4.2. Arched forms

Experimenting with using the natural flexibility of plastazote®, this idea is an extension of the arched forms discussed in section 5.2.2. Fig.16. shows how the flat shape arches over to create a front-to-back curve. Sideways curve is created through the plastazote® "feathers" that extend out on each side. These can splay outwards or overlap, depending on the size of the hat cavity they are required to fill. The plastazote® form is then covered with a sleeve of stockinette, to smooth the surface of the overall mount and reduce friction against the inside of the hat. Because of the way this form is cut, it creates a flexible three dimensional form that can be compressed in multiple directions.

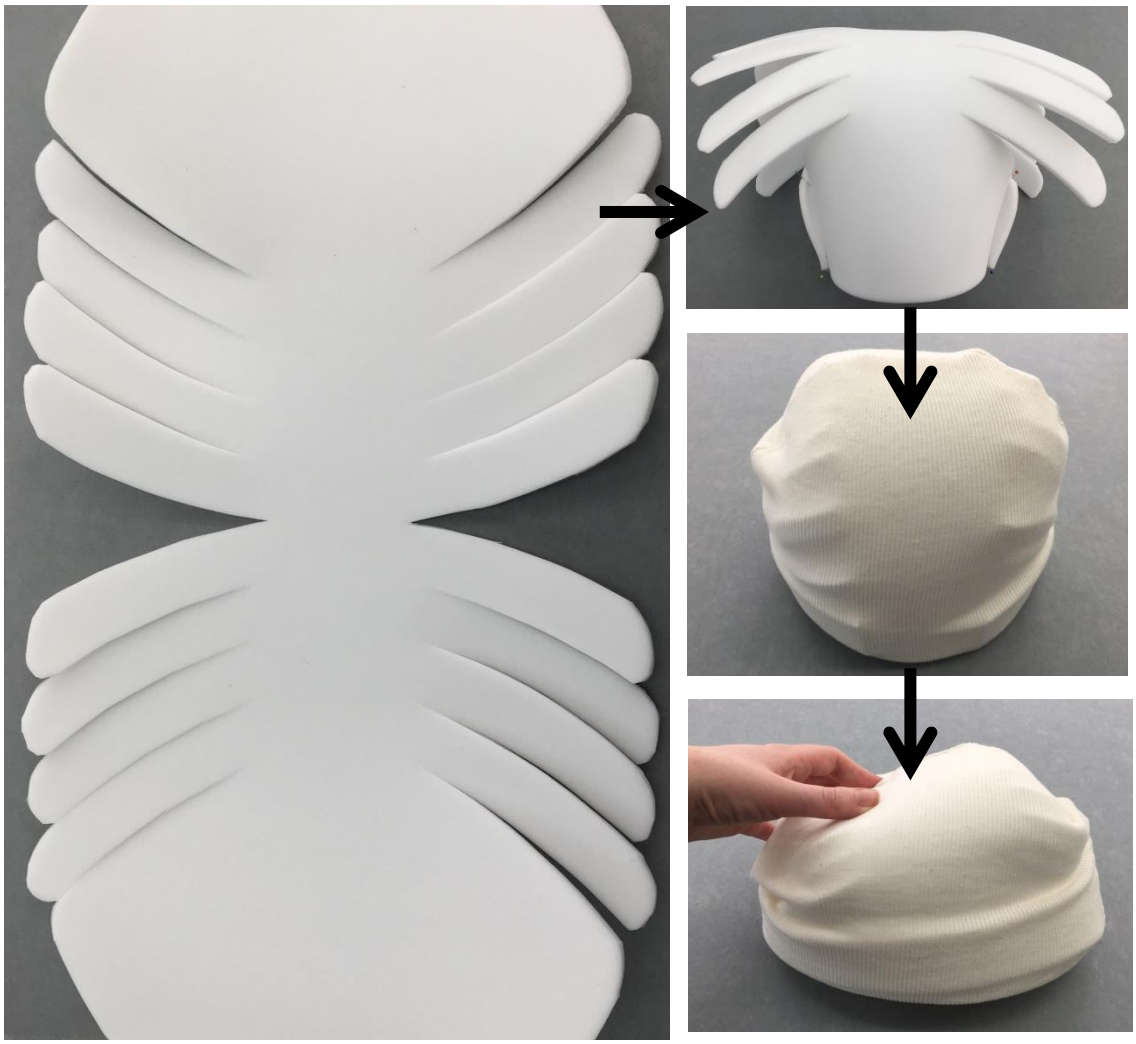


**Figure 16 Left, the cut out plastazote® shape, laid flat. Top right, the form when curved in half. Centre right, the plastazote® form covered with a stockinette sleeve. Bottom right, demonstrating the flexibility in shape of the final form.**

### 5.4.3. Flat, folded forms

The way in which three dimensional tissue paper puffs are created from a flat piece of tissue paper provided the starting point for the following ideas. The rolled support for wide brimmed hats[46] discussed in section 5.2.3. also contributed, with the concept of manipulating a flat material so that it conforms to an internal cavity.

#### 5.4.3.1. Plastazote® expanding sheet forms

The idea of adding dimensional flexibility to a flat sheet material through folding and cutting is a concept often utilised in origami and paper craft[47], and found more widely within industrial and product design[48]. One such concept is expanded paper[49]. This is made by making parallel rows of small slits in the paper. These rows of slits are staggered slightly, so that when pulled, the slits expand widthways. This in turn allows the paper to be expanded and curved into three dimensional shapes. This technique was tried on 0.5cm thick plastazote® sheet (see Fig.17.). 4cm long cuts were made, at a distance of 1cm from each other, with 0.5cm spacing between rows. Plastazote® was chosen because of its flexibility and structural nature, the idea being that it could be folded, rolled or bundled up to fit inside a hat's internal cavity.

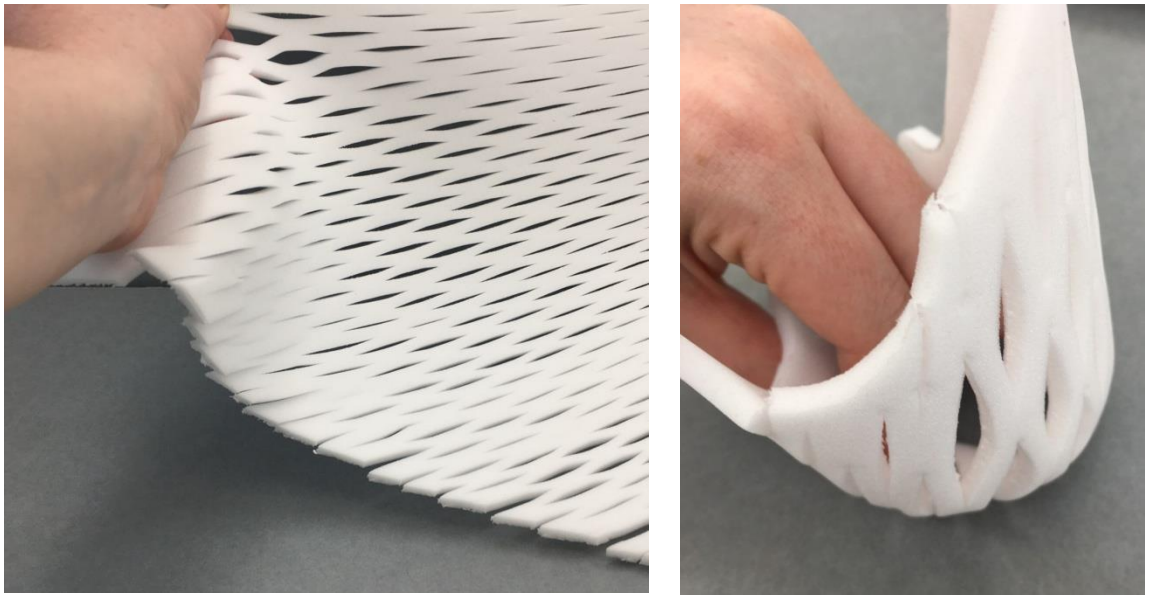


**Figure 17 Manipulating the shape of an expanded plastazote® sheet.**

[46] Virginia Greene, 'Support for wide brimmed basketry hats,' http://stashc.com/the-publication/supports/malleable/support-for-wide-brimmed-basketry-hats/
[47] Thelma R. Newman, Jay Hartley Newman and Lee Scott Newman, *Paper as art and craft* (London: George Allen and Unwin Ltd., 1973), 113 – 114.
[48] Paul Jackson, *Folding techniques for designers, from sheet to form* (London: Laurence King Publishing, 2011), 9.
[49] Newman, Newman and Newman, 120.

### 5.4.3.2. Quilted forms

As an alternative to plastazote®, this form explored ways of creating structure with fabric. A layer of polyester wadding was sandwiched in between two layers of cotton jersey and all layers were machine stitched in a quilted diamond pattern. Morris gives an example of quilting being used in making hat mounts and highlights the utility of its structural yet soft characteristics[50]. Here, the quilted sheet can be folded and rolled into the desired shape (see Fig.18.), before being covered with a stockinette sleeve, to help maintain the shape and provide a smooth surface against the interior of the hat.

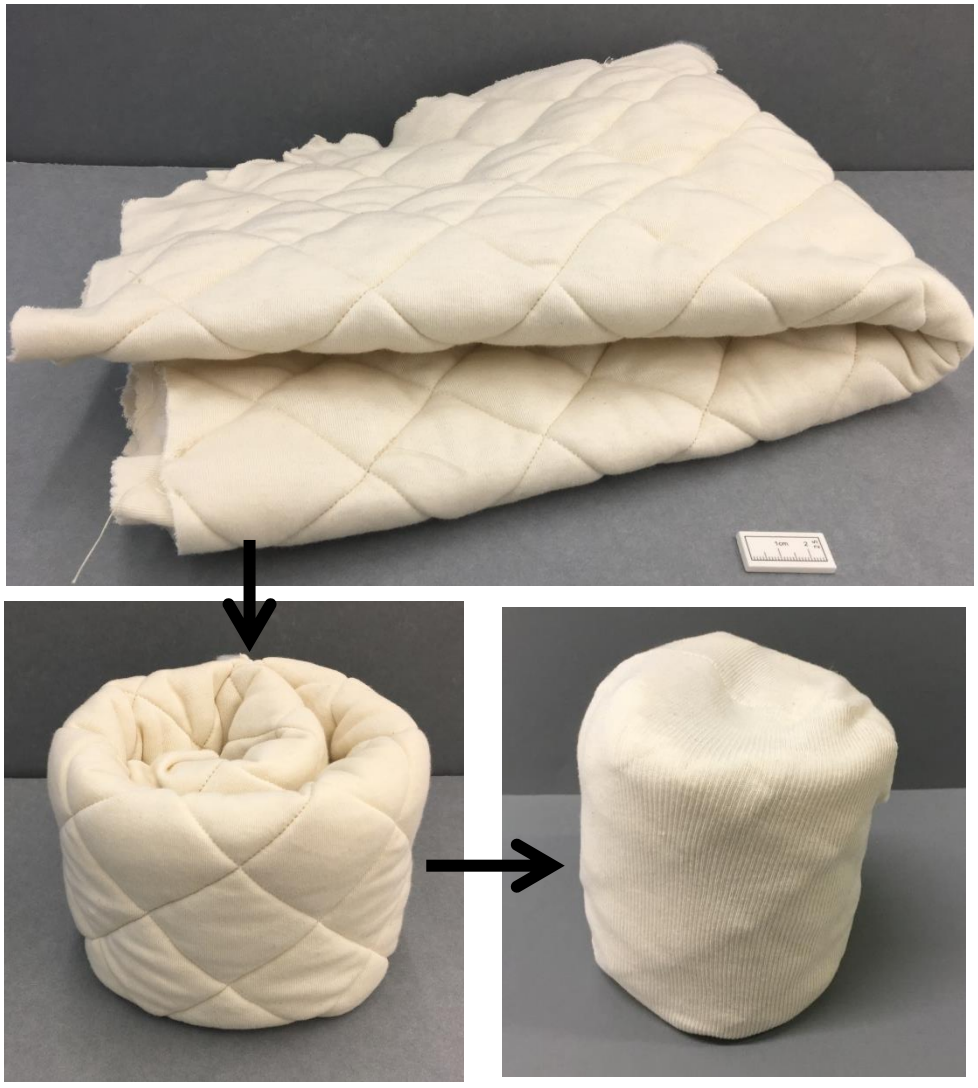


**Figure 18 Top, flat quilted sheet. Bottom left, quilted sheet rolled and folded. Bottom right, the rolled sheet, covered with a stockinette sleeve.**

[50] Roisin Morris, "Not just a load of old hat: the preparation of a hat exhibition for display and transport," Journal of the Institute of Conservation 34:1 (2011): 69.

### 5.4.4. Evaluating initial ideas

All of the mount forms prototyped in section 5.4 meet the material parameters outlined in section 5.3.1., using only those materials listed.

The stuffed form uses a number of steps in its production that reflect those used in making padded hangers; stitching the outer sleeve and then filling with polyester wadding. Production time is lengthened because of the inclusion of the hand stitching that allows the form to be gathered. However, despite this, the time and techniques of making are similar to padded hangers and can be further simplified by creating a template to aid with positioning the hand-stitched lines of running stitch. The shape of the finished form is easily adjusted by pulling the gathering threads in differing combinations. Only at this point does the hat need to be present for fitting; the mount forms themselves can be produced without any need for specific object measurements. A large variety of shapes seem possible, and the suitability of these will be tested in Chapter 6.

In terms of making time, the arched plastazote® form with stockinette sleeve is the quickest and simplest to produce. The 0.5cm thick plastazote® is thin enough to be cut easily with scissors, thus negating the need for using knives, and a template can be made to further simplify the process. A template can also be used for making the stockinette sleeve. However, because the form itself is flexible in multiple directions it is not dimensionally stable and would therefore be unsuitable for hats that needed a more static support. It also seems likely that this flexibility combined with the springy nature of the plastazote® could cause areas of adverse pressure against the interior of the hat.

The two flat sheet forms (the expanded plastazote® sheet and the quilted sheet) were both more time consuming to produce than the arched form, but slightly quicker than the stuffed form. However, this is due to the repetition of simple processes rather than because of any complexity of making. The expanded plastazote® does involve cutting with a knife (a technique identified as an issue for some volunteers in section 5.3.3.), although this can be simplified by using a stencil or template. The quilted form uses only basic machine stitching. The expanded plastazote® proved too springy to be easily manipulated into a suitable support form shape. The quilted form rolls and folds easily to form different shapes, although the variety is limited and smooth domed forms are more difficult to achieve due to the angular nature of folding.

Because of time constraints, only one form will be taken forward to the testing stage. Of the initial ideas, the stuffed form appears the most promising. Although not the quickest to make, it is still comparable with the time input needed for making a padded hanger. The techniques needed in its

making also fit the parameters outlined in section 5.3.3. However, perhaps more importantly, it has the highest potential for variety in shape of the initial ideas, making it more likely to fit a wider variety of hat styles.

### 5.5. Refining the stuffed form

Sizing for the stuffed form mount was calculated based on the dimensional data gathered from the collection survey. A piece of stockinette was measured in both stretched and un-stretched states and was found to have a vertical stretch of 104% and a horizontal stretch of 200% (when orientated with ribbing vertical). This stretch was factored in when determining the dimensions of the template to use for making the form, in order for the finished form to be suitable for use with both the large and small extremes of hat sizes identified in the collection survey at NMS.

The plastazote® base is very slightly oval, to better accommodate both round and oval shapes. It has a small hole in the centre, into which the gathered end of the stockinette sleeve fits, to create a flat base. Strong thread (also known as buttonhole or topstitching thread) is recommended for the running stitch lines, as this negates the risk of a thread breaking when pulled. The stuffed form pictured here has these running stitch lines stitched in grey thread, to aid visibility for photos. However, in practice a white, cream or undyed thread would be preferable to a coloured one, to reduce the risk of dye transfer from the thread to the object being mounted.

The following sections outline how to make the form and provide notes on how to use it.

#### 5.5.1. Guide for making

##### 5.5.1.1. Materials/equipment

- 2x pieces of stockinette, each approx. 25cm wide and 27cm high (with ribs running vertically)
- 1x piece of stiff cardboard, approx. 25cm x 27cm (for template)
- Sheet of 1.2cm thick Plastazote® polyethylene foam, approx. 21cm x 19cm
- Strong thread, such as buttonhole or topstitching thread
- Poly/cotton thread suitable for use with a sewing machine
- Approx. 80g Polyester wadding (non-adhesive, non-fusible)
- Sewing machine capable of a zigzag or stretch stitch
- Pencil
- Needle and pins
- Glue stick or equivalent

- Scissors for paper and fabric
- Craft knife and cutting mat

#### 5.5.1.2. Preparing the templates

Print two copies of the main template in Appendix 4, at 100% magnification. Glue one copy to the piece of cardboard and cut around the outline, through both paper and card. Cut out the other printed copy and glue on the reverse side of the cardboard so that the sides mirror each other. Print one copy of the base template and cut around the outline. The templates are now ready to use.

NB. The lines marked on the main template are hand stitching lines. On the diagram below (Fig.19.) letters B to D refer to vertical stitching lines, whilst numbers 1 to 6 refer to horizontal stitching lines. A refers to a line of stitching done around the outside seam of the stockinette. The dashed line between lines 1 and 2 is the stuffing line, which indicates the level to which the form should be filled with polyester wadding.

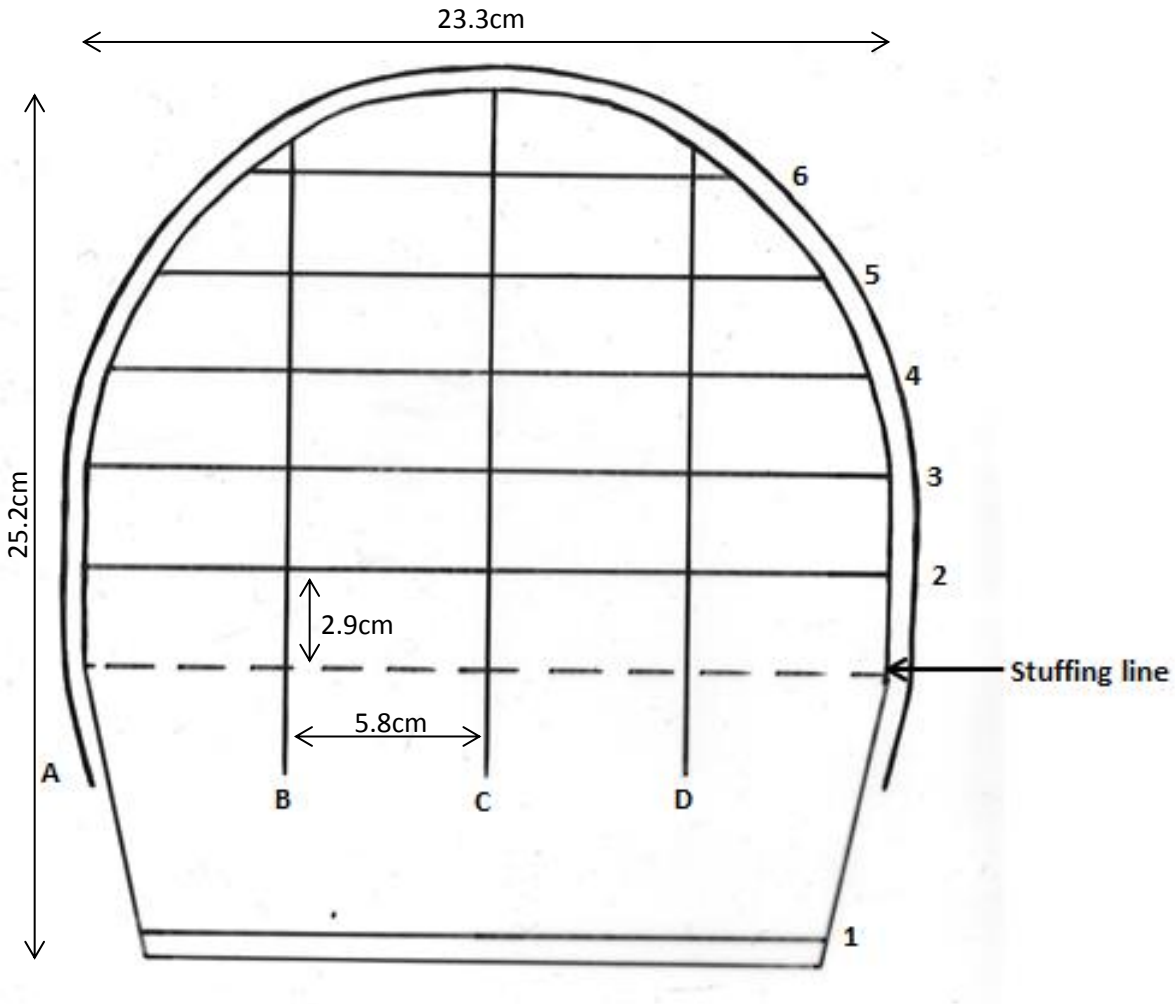



**Figure 19 A guide to the stitch lines on the main template.**

#### 5.5.1.3. Making the mount form

1. Lay out both pieces of stockinette, one on top of the other. Place the template on top and draw around the outer edge onto the top piece of stockinette, using a pencil.
2. Pin along the pencil line, through both layers of stockinette. Do not cut along this line yet – machine stitching along the edge of stretch fabrics can cause puckering, and a cleaner shape is achieved by cutting along the outside of a stitch line AFTER sewing.
3. Machine stitch along the pencil line using a zigzag or stretch stitch. Leave the bottom edge open – this will be where the wadding goes in later. Now cut along the outside of the stitched line (see Fig.20.). The basic stockinette sleeve is now complete.

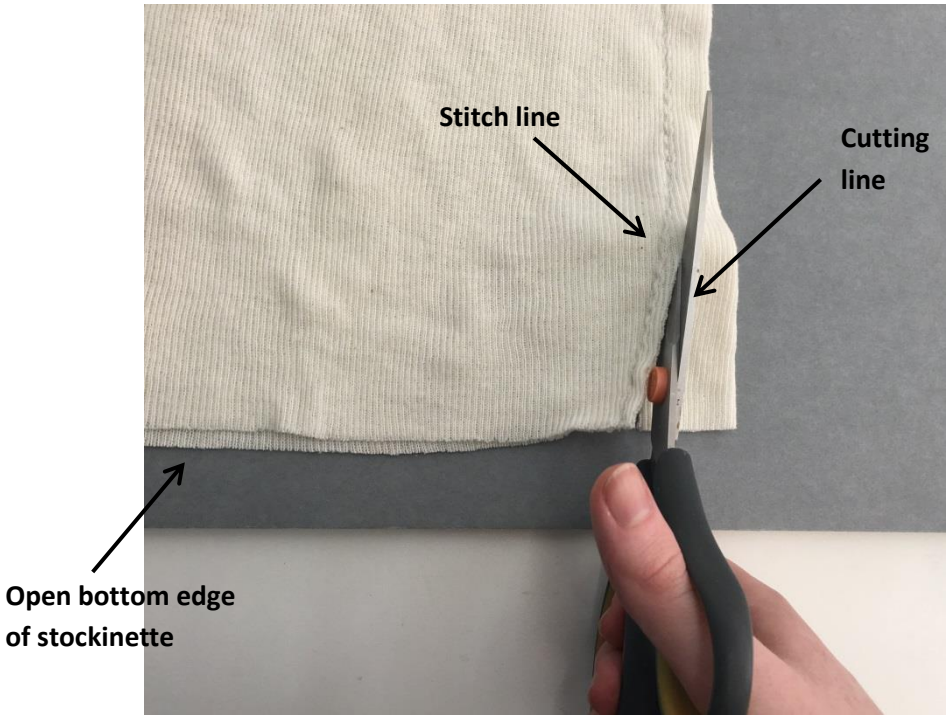



**Figure 20 The cutting line in relation to the stitch line.**

4. Turn the stockinette sleeve inside out and insert the template. The horizontal and vertical lines of the template should be visible through the stockinette.
5. Begin with the horizontal stitch lines on the front side. Using the strong thread, measure a piece of thread approx. 4 times the length of stitch line 1. Working from the right side seam, stitch large running stitches (approx. 1cm each) along the horizontal stitch line, leaving the starting end of the thread approx. 20cm long and unknotted – this will be one of the threads that can be pulled to alter the shape of the finished form. When the left side seam is reached, over-stitch 4 times to create a secure anchor point. Turn over the stockinette sleeve to the reverse side and continue the line of running stitch along the corresponding

stitch line. When the left side seam is reached, leave the thread end loose and do not cut or tie off. Turn the stockinette sleeve over so that the front side is facing upwards again.

6. Repeat step 5 for each of the horizontal lines, except the stuffing line.
7. Make large tacking stitches around the stuffing line, both front and back. These serve as markers for how full to fill the form, and will not be used for gathering or altering the shape of the form.
8. Starting at the bottom end of each line, stitch vertical lines B, C and D in the same way as for the horizontal lines, leaving the starting end of the thread approx. 20cm long and unknotted. Again, thread should be cut approx. 4x the length of each line and used at single thickness. As for the horizontal lines, over-stitch in the seam area before turning the stockinette sleeve over and continuing the line of running stitch down the reverse side. Leave the thread end loose and do not cut or tie off.

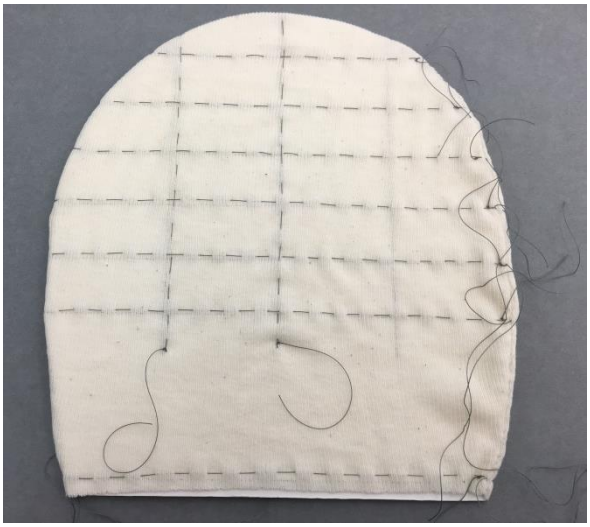


**Figure 21 The stitch lines in progress, with template still inserted in stockinette sleeve.**

9. Repeat step 8 for stitch line A, this time following the seam line as a guide instead of a drawn line. Overstitch at the approximate top centre of the seam line, where A intersects with stitch line C.
10. Line the stockinette sleeve with a thin layer of wadding (approx. 25cm x 50cm). This helps to smooth the overall shape of the mount form.
11. Pull apart a sheet of wadding with your hands until it is in a fluffier form (Fig.22.). This helps to avoid lumps forming when stuffing.
12. Fill the wadding-lined stockinette sleeve with fluffy wadding pieces until it is filled up to the stuffing line.
13. Place the oval shaped base template on the sheet of plastazote® and draw around in pencil. Also mark the hole in the centre of the template. Cut out the plastazote® base using a craft knife and cutting mat.

**Figure 22 Left, wadding as cut from a roll. Right, wadding after being pulled apart by hand.**

14. Insert the plastazote® base into the stockinette sleeve so that it traps the wadding. Wadding may require some rearrangement at this point to insure a smooth final shape.
15. Pull the loose threads of stitch line 1 until the opening of the stockinette sleeve is closed. Secure the thread ends by knotting together, and tuck these and the gathered edge of the stockinette into the hole in the plastazote® to create a smooth base (Fig.23.).

**Figure 23 The base of the form, when stitch line 1 is pulled closed.**

### 5.5.2. Notes for use

**Figure 24 The tied thread ends on the finished form.**

Sitting the stuffed form flat on its base, simply pull the loose thread ends to alter the shape, as required. The over-stitching on the opposite seam will prevent these threads from pulling out. Thread ends can be tied in place once the required shape is achieved. The shape can be further manipulated by redistributing the polyester wadding filling by squashing the stuffed form between the hands and then refining the shape using the gathering threads. The form can be easily reused or reshaped by untying the gathering threads and gently plumping the form with the hands until it returns to its original shape. Flatter topped shapes can be achieved by tucking excess fabric into the mount, underneath gathered stitch lines (see Fig.25.)

**Figure 25 Tucking in excess fabric to achieve a flatter top.**

#### 5.5.2.1. Achieving different shapes

The following pages provide a basic guide for creating a variety of different shapes with the stuffed mount form. This list is not exhaustive of the shape options that it is possible to achieve with this form, but are intended as a useful starting point. The shape profiles pictured are numbered. These numbers correspond with a list of basic instruction of which threads to pull (see Fig.19. for thread positionings).

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

11.

12.

13.

14.

15.

**Figure 26 Shape profile options**

Shape profile instructions:

1. The stuffed form in its original form, threads un-pulled.
2. Threads 3, 4, 5 and 6 pulled. Excess fabric above thread 6 is tucked in.
3. Threads 3 and 5 pulled. Excess fabric above 5 tucked in.
4. Thread 4 pulled. Excess fabric above 4 tucked in.
5. Threads 5 and D pulled. Excess fabric above 5 tucked in.
6. Threads 6, C and D pulled.
7. Threads B and D pulled, with each side slightly tucked into the main body of the mount.
8. Threads B, C and D pulled. Sides slightly tucked into the main body.
9. Threads 5, A, B, C and D pulled. Excess fabric above 5 tucked in.
10. Threads 3, 4, 5, A, B, C and D pulled. Excess fabric above 5 tucked in.
11. Threads 2, 3, 4 and 5 pulled. Excess at top corners slightly tucked in.
12. Thread 2 very slightly pulled, stuffing squashed upwards.
13. Threads 2, 3, 4, 5, 6 pulled. Stuffing squashed to create rounder shape, then threads A, B, C and D pulled slightly, to produce a firmer, smoother shape.
14. Threads 5 and 6 pulled. Excess fabric above 6 tucked in. Stuffing squashed upwards and then compressed by pulling threads A, B, C and D.
15. Threads 6 and B pulled, with stuffing squashed towards the right side.

## Chapter 6: Testing the mount form

### 6.1. Introduction

This chapter evaluates the performance of the stuffed mount form as a method for internally supporting hats during storage. A sample of the hats surveyed at NMS were selected, and the mount form was then adjusted to fit each of the selected hats. The following sections outline how the sample was chosen, the testing criteria, results of testing, and a discussion of how the mount performed during testing.

#### 6.1.1. Choosing the sample

The hats surveyed at NMS were each sorted into one of the five shape profile categories outlined in Chapter 4, section 4.2.2.1.:

A. Hats with a domed crown shape.
B. Hats with a flatter crown top.
C. Hats that sit on the back of the head rather than predominantly on the top (e.g. bonnets).
D. Hats with a very shallow crown depth (those hats with an internal height of 5.5cm or less).
E. Hats with a smaller circumference at the headband than at the widest point of the crown (e.g. berets).

During the collection survey, the current internal support (e.g. tissue puff, custom mount) inside each hat was judged to be either sufficiently supportive or insufficiently supportive. Those hats which are already sufficiently supported by their current internal support were omitted when choosing a representative sample for testing, as the benefits of a new mount form to these hats were felt to be minimal. Each qualifying hat was then numbered, and two from each category were chosen at random, using an online random number generator. The only exception was category D, where only one hat of this type was identified as insufficiently supported. Therefore, the stuffed form mount was tested on a total of 9 hats, representing each of the five categories.

### 6.2. Testing criteria

Testing criteria were developed in order to assess the suitability of the stuffed mount form for use on a hat collection containing a variety of styles and shapes. For each of the 9 selected hats, the mount form was judged against the following criteria:

- **Quality of internal fit (scale 1 – 10):** How well does the mount form conform to the inside of the hat? Is it too tight or too loose and are there any gaps where the mount form cannot reach?

  1 = badly, no conformity. 10 = perfectly conforms.
- **Quality of support (scale 1 – 10):** How well does the mount internally support the hat? E.g. does the mount provide solid enough support to prevent sagging/distortion? This has been subdivided into crown support and overall support (including brim), in order to provide a clearer picture of any issues in terms of support provided.

  1 = completely unsupported. 10 = completely supported.
- **Stability (scale 1 – 10):** How stable is the hat when on the mount? E.g. Is the mount (with hat in place) in danger of tipping over? This is an important point in relation to storage situations; for example, would it be stable enough to sit securely on the shelf of a moveable roller rack system?

  1 = cannot stand up unaided. 10 = very stable, no danger of tipping over.
- **Time needed to position each hat on the mount form (approx. measure in minutes):** This includes both the time needed for adjusting the mount to fit each hat and the time needed to place the hat physically on the mount.
- **Ease of use (scale 1 – 10):** How easy or difficult is it to use the mount? This point encompasses the ease/difficulty of both the adjustment of the mount for each hat, and the physical placing and removal of each hat on the mount. The number of people needed for handling purposes is also noted.

  1 = very difficult. 10 = very easy.

In addition to the numerical scales used for the majority of the criteria, notes were taken regarding any difficulties encountered or points of interest raised.

### 6.3. Results

The results of testing have been subdivided into the testing criteria outlined in section 6.2. These are summarised in the following sections. The full results of testing are detailed in Appendix 3.

### 6.3.1. Quality of internal fit

Quality of internal fit of the mount form inside each hat was directly compared with the quality of fit of the existing internal support of that hat. In 8 out of the 9 hats, the existing internal supports in place were tissue puffs, whilst the remaining hat had no existing support. Both mount form and existing internal support were rated on a scale of 1 to 10 for each hat to aid clear comparison, and additional notes were taken.

For all 9 hats tested, the quality of fit of the mount form was rated as better than that of the existing internal support. Even where the mount form scored below 5/10, there was still a visible improvement. Generally, the mount form was able to be altered to produce a good fit inside the headband and up to the top of the crown. Its limitations were that it could not conform to sharp angles and could not expand to fill crowns wider than the circumference of the headband (such as those hats in category E). Whilst the form could be made into the correct shape to completely fill these styles of hats, it would not then be possible to insert and remove the form from the hat. These limitations are shown in Fig.27., the grey shaded areas representing areas that the form is unable to reach.

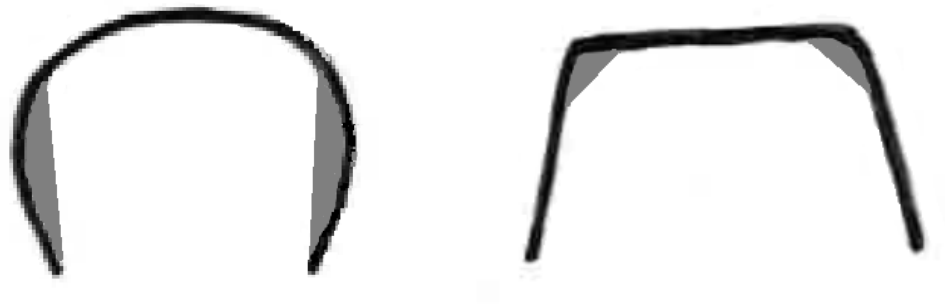


**Figure 27 Hat profiles, with shaded areas showing areas where mount is unable to reach**

### 6.3.2. Quality of support

As for quality of internal fit, quality of support of the mount form was numerically compared against the quality of support given by the existing internal support inside each hat. For all 9 hats tested, the mount form was a significant improvement on the existing internal support. This improvement was particularly high for the two category B hats.

Several key benefits of the support given by the mount form were identified. Firstly, the mount form raises hats up off their brims. Distortion of brims from sitting flat on a surface was identified as a common condition issue in the results from the collection survey (detailed in Chapter 4, section

4.2.5.), and this can be negated by raising the hat up slightly, thereby alleviating pressure on the brim. Even where brims were not fully raised off the table surface, the small amount that they were raised already made a significant difference to them being able to sit in their natural curve. Secondly, the mount provides even support for the top of crown. This proved the case for all 9 hats tested, in spite of the large shape variation of these crowns. Indents and structural deformity in the top of the crown were among the most common condition issues found in the collection survey, as well as the most visually jarring. Supporting the top of the crown has the added benefit of preventing the weight of the crown from resting on and compressing the side walls of the crown. Even for those hats where the mount did not fully fill out the sides of the crown, the sides benefited from the mount's presence. Benefits to both brim and crown can be seen in Fig.28.

**Figure 28 Top left, hat on its existing tissue puff support. Top right, the mount form adjusted to fit the hat. Bottom, the hat on the adjusted mount form.**

The mount form's limitations in terms of the quality of support it provides mostly comprise the areas that it cannot reach, as outlined in section 6.3.1. However, as explained above in relation to the side walls of the crown, the impact of this is minimal. The mount form also offers no support for large floppy brims, as this falls outside its scope as a mount designed to support the main internal cavity of a hat.

### 6.3.3. Stability

Overall, the stability of the hats when on the mount form were relatively good, with all scoring over 5/10. The lower the hat sat and the lighter in weight it was, the more stable the hat and mount were overall. Any instability was mainly the result of the mount base deforming when the gathering threads were pulled more tightly. This is likely due to the fact that 0.5cm thick plastazote® was used. This was used because it can be easily cut with scissors. It is also a soft base, and this was used in preference over a rigid material like Correx® corrugated board because of the way in which many of the hats are stored at NMS; in bakers trays, often slightly overlapping. It was therefore felt that a soft rather than hard base would minimise risk to other hats in the eventuality that hats were placed on top of one another. However, stability testing made clear the need for increased rigidity, and so a thicker sheet of plastazote® (1.2cm) is recommended for the base, as a compromise that still retains much of the softness of the original.

### 6.3.4. Time needed to position each hat on the mount form

The whole process of adjusting the mount dimensions using the threads and positioning the hat on the mount took between 4 to 10 minutes per hat. Hats with particularly unusual shapes took slightly longer to adjust the mount form for. Speed noticeably increased with practice, as one gets better at judging the shape and size that will best fit each specific hat. Because of this, it is predicted that the process may be quicker than those times recorded here if it was repeated on a larger scale.

### 6.3.5. Ease of use

Ease of use depends largely on the condition and structure of each hat. The actual altering of the mount form size and shape is a relatively simple task of pulling threads in different combinations until the correct shape is achieved. This does require a level of judgement, but becomes easier with practice. This would also be further simplified by using an instructional guide on how to achieve different shape profiles, such as the one outlined in Chapter 5, section 5.5.2.1. However, the real variation with regards to ease of use depends on how easy or difficult each hat is to handle. It was predicted that some hats may require more than one person to be present for positioning them on the mount, due to extreme size or fragility. However, it was found that only one person was needed

for each of the 9 hats tested. Several of the hats have stiffly set-in distortions, and this made easing them onto the mount form slightly more difficult.

Overall, despite slight difficulties due to hat condition and structure, the mount form was deemed relatively easy to use, scoring between 6/10 and 10/10.

**6.4. Evaluation of performance**

Overall, tests showed that the stuffed mount form provided a significantly better fit and quality of support than the existing internal supports currently in place. Limitations to the fit of the mount form were identified, but it was concluded that the impact of these to the overall support is minimal. In terms of quality of support given, the mount form provides a solution to two of the major condition issues identified during the collection survey; structural deformation of the crown top, and the issue of brim deformation due to sitting directly on a flat surface.

There were some slight issues with stability due to the deformation of the plastazote® base, but this should be easily rectified by substituting a thicker grade of plastazote®. Both the time needed for adjusting the mount and the ease of adjusting the mount were deemed aspects that become significantly quicker and easier with practice. The physical processes involved are simple and a relatively low level of judgement of shape is needed. The fact that the gathering threads can be tied and retied makes it a more forgiving process than, for example, carving an ethafoam® mount. The main factor that reduced the ease of use was the condition and structure of the hats themselves, rather than the mount form.

In conclusion, the mount form adapted to each of the different profile categories well, showing its suitability for a wide range of styles and sizes. With minor adjustments to the making process, stability can be improved. Overall, use proved relatively easy and time efficient. These factors combine to make the stuffed mount form a potentially viable mount option for implementation across a varied hat collection.

## Chapter 7: Conclusion

This project aimed to develop a standardised yet adaptable internal mount form suitable for use in the storage of hats in museum collections. This mount form needed to offer a higher quality of support than tissue paper puffs, but be more time efficient to make and more easily reproducible than the type of custom made mounts currently being used in practice.

The literature review clarified the types of mounts commonly used for objects such as hats in museum settings. These can be divided into custom mounts for specific, individual objects, and groups of custom mounts using the same making techniques and methodology, often forming part of large scale rehousing projects. Within the latter group, some standardisation was found in the making processes, but the outcomes were still reliant on object specific measurements. Widening the field of research revealed the standardisation and reproducibility of storage devices such as padded hangers, and this set a base line for this project; to develop a mount solution that embodies these qualities of standardisation and reproducibility, on a level similar to that of padded hangers.

Interviews with museum professionals and the collection survey at NMS were instrumental in refining realistic parameters into which a mount solution needed to fit and in gaining a clearer sense of the wider context of creation and use of such mount forms. Using mount examples from the literature as a creative starting point, various mount ideas were explored and evaluated in relation to the defined parameters extrapolated from the interviews and collection survey. Of these, the stuffed mount form showed the greatest potential.

Not only does the stuffed mount form use a similar set of techniques as making a padded hanger, but its standard shape and size (when unadjusted) negate the need for object specific measurements. This lends it the potential for bulk production by, for example, a volunteer workforce, thus increasing the efficiency of production, especially when compared to a custom made carved mount form that is reliant on object specific measurements and accurate, skilled carving. The inclusion of a simple set of guidelines for making and a cardboard template with stitch lines marked on further simplify the making process. When tested on a representative sample of the hats surveyed at NMS, the stuffed mount form was shown to be easily adaptable to each of the shape profile categories present amongst the 109 hats surveyed. Whilst adjusting the form does require a level of judgement to achieve a good fit within each hat, providing a visual instructional guide showing how to create a range of basic shapes should aid this process.

The stuffed mount form out-performed acid free tissue paper puffs in terms of quality of fit and support for every hat tested. Whilst this testing is only preliminary, it confirms the adaptability of

this standardised mount form and highlights its potential in providing a time efficient, quality support form for the storage of hats in museum settings.

### 7.1. Recommendations for future research

The outcomes of this project offer several potential routes for future work. Firstly, the inclusion and training of volunteers as a way of realising the implementation of this mount form solution on a larger scale, across a museum collection. Although this was touched upon in this study as a potential way of tackling larger scale changes to museum storage situations, the focus of this project has been on the development of the physical mount form, and did not include the scope for exploring volunteer involvement in great depth.

Related to this, testing the practicalities of implementing the mount form on a larger scale could offer scope for further refining the form and method of making. The preliminary performance tests conducted during this project indicate that this mount form has the potential to be worth pursuing further, but tests on a larger scale would be needed in order to verify its suitability for use on a collection wide scale.

Another potential avenue of investigation is whether a similar approach and making method could be used for creating internal mounts for three dimensional objects other than hats. It would be interesting to explore the transferability of aspects of this mount form and to see if it could be adapted for wider use.

## Bibliography

### Unpublished sources


- Hughes, Penny. “Developing inner supports for the storage and display of womens shoes at the National Boot and Shoe Collection, Central Museum and Art Gallery, Northampton.” Textile Conservation diploma course dissertation, Textile Conservation Centre, 2000.
- Miller, Keira Lauren Ahmed. “Materials maketh the mannequin: an investigation into the material properties of papier-mache torsos for conservation mounting.” MPhil dissertation, Centre for Textile Conservation and Technical Art History, University of Glasgow, 2017.


### Books


- Flecker, Lara. *A Practical Guide to Costume Mounting*. Oxford: Butterworth-Heinemann, 2007.
- Jackson, Paul. *Folding techniques for designers, from sheet to form.* London: Laurence King Publishing, 2011.
- Kite, Marion, and Thomson, Roy. *Conservation of Leather and Related Materials*. Oxford: Elsevier Ltd., 2006.
- Lennard, Frances, and Patricia Ewer, ed. Textile Conservation Advances in Practice. Oxford: Butterworth-Heinemann, 2010.
- Newman, Thelma R., Jay Hartley Newman and Lee Scott Newman. *Paper as art and craft.* London: George Allen and Unwin Ltd., 1973.
- Norton, Ruth E. *Studies and Documents on Cultural Heritage. Storage and display of textiles for museums in South East Asia*. UNESCO, 1984.


### Journal articles and Conference Postprints


- Aboe, Gemma."Packaging and storage solutions for archaeological basketry: a selection of practical designs." *Journal of the Institute of Conservation,* 35:1: 103-111.
- Margariti, Christina and Polytimi Loukopoulou. "Storage solutions for excavated textiles: tending to their recalcitrant behaviour." *Journal of the Institute of Conservation*, 39:2, 145-157.
- Morris, Roisin. "Not just a load of old hat: the preparation of a hat exhibition for display and transport." *Journal of the Institute of Conservation* 34:1, 66-79, DOI: 10.1080/19455224.2011.579482

- Sease, Catherine, and Catherine Anderson. "Preventive conservation at the Field Museum." *Studies in Conservation*, 39:sup2: 44-47.
- UKIC. "Conservation and the project culture." in *Postprints from the UKIC 2004 conference in Liverpool.* London: UKIC, 2004.


**Online resources**


- 'Conservation Project: Costume Accessories, Hats: Simple Board Mounts,' https://www.mfa.org/collections/conservation/feature_costumeaccessories_hatsandheadware_simple.
- 'Conservation Project: costume accessories,' http://www.mfa.org/collections/conservation/feature_costumeaccessories.
- 'Creating a padded hanger,' https://www.philamuseum.org/doc_downloads/conservation/hangerInstructions.pdf.
- 'Database of Material Test Results,' http://www.britishmuseum.org/pdf/How%20to%20use%20the%20database_web_final.pdf.
- Davis, Nancy. 'Internal supports for pliable artifacts,' http://stashc.com/the-publication/supports/malleable/internal-supports-for-pliable-artifacts/.
- Gausch, Karen, and Joel Thompson, 'Conservation in action: preserving hats and headwear at the MFA Boston,' https://artsandculture.google.com/exhibit/wAKCMTQv7r5NKA.
- Greene, Virginia, 'Support for wide brimmed basketry hats,' http://stashc.com/the-publication/supports/malleable/support-for-wide-brimmed-basketry-hats/.
- 'How to create a padded coathanger,' https://maas.museum/app/uploads/2017/02/how_to_create_a_padded_coathanger.pdf.
- McClean, Lynn, 'Helping hands: the volunteers making a difference to textile storage at the museum,' https://blog.nms.ac.uk/2015/10/14/helping-hands-the-volunteers-making-a-difference-to-textile-storage-at-the-museum/.
- Miller, Kiera, and Sam Gatley, 'Keep your hair on! The development of conservation friendly wigs,' http://www.vam.ac.uk/content/journals/conservation-journal/spring-2011-issue-59/keep-your-hair-on-the-development-of-conservation-friendly-wigs.
- Miller, Kiera, 'Not just a load of white dresses,' https://www.vam.ac.uk/blog/here-come-brides/not-just-load-white-dresses.
- Ogden, Sherelyn, and Ann Frisina, 'Storage for Textiles,' http://www.mnhs.org/preserve/conservation/reports/textiles_storage.pdf.

- Owens, Barbara, 'Conserving, Storing and Mounting Hats, Caps, and Various Headgear,' http://insidetheconservatorsstudio.blogspot.co.uk/2017/10/conserving-storing-and-mounting-hats.html.
- Robb, Hayley, 'A mount a day keeps the conservator away,' https://nmc.ca/a-mount-per-day-keeps-the-conservator-away.
- Spicer, Gwen, 'Supporting textile artifacts without tissue paper - Save a tree!,' http://insidetheconservatorsstudio.blogspot.co.uk/2013/02/supporting-textile-artifacts-without.html.
- "Storage Techniques For Hanging Garments: Padded Hangers," *Conserv O Gram* no.4/5. July 1994. https://www.nps.gov/museum/publications/conserveogram/04-05.pdf.
- Voss, Cecilia, 'Inside the textile conservation studio: mounting a 19th century muslin dress,' https://blog.nms.ac.uk/2015/11/07/inside-the-textiles-conservation-studio-mounting-a-19th-century-muslin-dress/.


**Material suppliers**


- 'Ethafoam Foam Planks,' https://www.preservationequipment.com/Catalogue/Conservation-Materials/Other-Materials/Foam-Blocks.
- 'Plastazote LD45,' https://www.preservationequipment.com/Catalogue/Packing-Materials/Materials-Foam/Plastazote-LD45.
- ‘Tyvek rolls - 1622E,' https://www.preservationequipment.com/Catalogue/Conservation-Materials/ShippingPacking/Tyvek-1622E.
- 'Fosshape Heat Mouldable Fabric,' https://www.preservationequipment.com/Catalogue/Display-Products/Display-Supports/Fosshape-Heat-Activated-Fabric.
- ‘Polyester wadding heavy,’ https://www.whaleys-bradford.ltd.uk/polyester-wadding-heavy-see-note-16-25-metre-pieces-only.
- ‘Stockinette tubing,’ http://www.gaylord.com/Preservation/Conservation-Supplies/Wrapping%2C-Lining-%26-Support-Materials/Stockinette-Tubing/p/HYB01363.

## Appendix 1: Interview Transcripts

**Interview with Roisin Morris, Textile Conservator at the V&A, London**

**Q:** Which departments are involved in/responsible for collection storage?

**A:** *Our textile storage is off-site and predominantly housed at the Clothworkers Centre for Study and Conservation of Textiles at Blythe Road House, Olympia. With some additional collections held by the Theatre & Performance and at Bethnal Green, Museum of Childhood.*

*Textile conservation do have a small studio at Blythe house but largely, storage of the collections falls under curatorial care. We advise on solutions and where packing from previous tour or loan has been prepared for travel etc. this is retained and where possible objects are stored like this – for example, hats for the hats tour had bespoke packing and where possible they are still stored in this packing.*

**Q:** In your opinion, what are the current limitations on making storage mounts for 3D objects such as hats?

**A:** *I would say time which also usually means budget restrictions - all 3d mounts are usually bespoke. Our work is almost entirely public programme led and therefore unfortunately we have little opportunity for storage projects.*

**Q:** What do you feel are the strengths and weaknesses of 3D storage mounts that you have encountered in museums? Any examples?

**A:** *Strengths – we have quite a lot of card mounts covered with wadding and cotton in the Asian collection which raise the hat off their brims and work very well to provide support – made some years ago. They are however quite a time-consuming type of mount to make.*

*Using plastazote as a core, roughly cut to shape and padded can provide good support – but a good balance between soft padding and plaz is needed.*

*Weaknesses – not everything has a bespoke support – acid free tissue has been used and this can flatten, fall out and not raise up enough to clear the brim. A hat resting on its brim can cause severe distortions.*

**Interview with Emily Taylor, Curator at NMS, Edinburgh**

**Q:** Which departments are involved in/responsible for collection storage?

**A:** *There is a mix of our collection services team, and curatorial teams as well. The collection services team – that covers technicians and conservation as well. So that's overall collections management. The curatorial teams look after their own specific collections and do that kind of object handling based on curatorial activities.*

**Q:** Is there time budgeted for activities such as mount making and storage devices (eg. padded hangers etc.)? How is this time allocated across the collection (e.g. how are parts of the collection prioritised?)?

**A:** *At the moment that is on a case by case basis, so within art and design, for example, for the textiles collection we don't have specific time put aside within the curatorial team. In the past we have used volunteers to help us make really basic collections devices. We had a volunteer who was making trays that sit within draws, so we can even out how the collections are stored. We have a group of volunteers who work with the textile conservation team and they make padded hangers, Tyvek bags.. They had a go at making the in-drawer trays but they actually weren't that confident with glue guns and things. They didn't really like the cutting. So there is no specific time budgeted, it happens kind of ad hoc, as part of other things. We try to plan in areas we are going to attack in storage but it is on a sort of needs basis and is not heavily prioritised.*

**Q:** Is there a monetary budget for materials for activities such as mount making and storage devices?

**A:** *Yes. We had a departmental restructure some years ago which created the collections services department and now money really now for mounting and storage comes from the collection services budget, which includes the conservation budget. So its not something that the curators control particularly- we put our requests in but we don't really have any control about what gets prioritised necessarily. We can just discuss that with collections services. So sometimes there is a bit of a dry up at the end of the financial year because other things take priority, so smaller projects don't always get what they need.*

**Q:** What materials do you commonly have available for mount making activities?

**A:** *Things that we keep in stock or order in most are plastazote (different grades of white and black plastazote). For textiles we use a lot of wadding and stockinette and Tyvek, those are your main basics. We also have a lot of things like polythene and bubble wrap and packing materials knocking around. But I think really, its Tyvek, plastazote, pins, cotton tape and wadding.*

**Q:** I think you have kind of covered the next question, but do you have volunteers?

- If so, what is their skill level/what kind of tasks are they typically asked to undertake?

**A:** *We have the Edinburgh Decorative Arts Society Volunteers (we call them EDFAS volunteers) and they have been with us for many years. They worked on the Jean Muir archive some years ago and then we kept them on, and now they just come once a month – the first Thursday of every month. They are largely quite elderly, they are all retired ladies. Some of them struggle a bit more than others with eyesight and dexterity, so I think to some extent they pick and choose what activities to do and the quality of what they produce can sometimes vary, but by and large it is good enough for us to use. I think that they are probably less confident with cutting things like plastazote because it can be quite firm. So that where when we were doing the in-drawer trays we ended up giving that to another volunteer who was looking for experience of technician work, so he was actually very happy to try and do that, because it is a bit more what we'd expect a qualified technician to think about doing. And he was actually very good, so we knew he'd be quite good manually before we gave him the task.*

**Q:** In your opinion, what are the current limitations on making storage mounts for 3D objects such as hats?

**A:** *I think we've never really addressed it, just because accessories are sort of on our to do list but they haven't quite got fully addressed yet. The main limitations would probably be knowing what materials we wanted to get in, and how to work with all the different shapes. So it would be quite hard, unless you're using tissue, which doesn't suit everything because of the interior of the hat, then it comes down to having the time to measure, and then you are into techniques like carving, which can be a bit too difficult, I would say, for us just to do on a piece by piece basis – so I think that is why you resort to tissue puffs, as it is just a bit easier to get things done quickly in store. That's probably the main limitation, as a lot of storage movements at the moment, they happen with curatorial staff, and having hat mounts (like doing a proper sort of carving job), that would be something that we would class as a technician job and would be a project in itself.*

**Q:** What do you feel are the strengths and weaknesses of 3D storage mounts that you have encountered in museums? Any examples?

**A:** *I haven't really seen mounts in other institutions so much, unless they were specifically made by conservation technicians for a piece because it was very fragile. In terms of thinking about the way that we store our hats at the moment, the worry is that, because they are all just sitting in trays on their brims, particularly with the ladies hats, they weren't all designed to sit flat, so it is actually*

*squashing the brim and its causing a sort of collapse. And its ok for some of the harder mens' hats but I think that a big problem is making sure its supported as it would have been when worn on a head, and at the moment everything is sat flat on a solid surface. And if its supported by tissue, that's very much dependant on the skill of the person who was putting the tissue in, so sometimes that can have the risk of being over-stuffed or under-stuffed or the person interpreting the object might not have got it quite right. I think that would probably be the main strength and weakness of the way we are doing things at the moment. We are currently using trays but our hope is to have a shelf system and be able to put the hats on shelves, either within boxes or just open on shelves so that they are easily accessible, but it still leaves the problem of brim resting.*

**Interview with Kelly Rennie, Technician at NMS, Edinburgh**

**Q:** Which departments are involved in/responsible for collection storage?

**A:** *It basically goes across the entire institution. Collections care looks over it and maintains it as best we can from the collection point of view. Facilities management looks at it from the building maintenance point of view. But within those storage areas it's the curators and sometimes the conservators as well. On the whole, it is the people that are moving objects or dealing with objects directly, so people like the collection technicians (me) and the rest of the collections care department.*

**Q:** Is there time budgeted within your role for activities such as mount making and storage devices (eg. padded hangers etc.)? How is this time allocated across the collection (e.g. how are parts of the collection prioritised?)?

**A:** *In an ideal world yes, but unfortunately we don't have much spare time for mount making – there is only two of us. We want to do that – we have been waiting to do a barkcloth mount for about two years but we just don't have the time in our schedules. If we had a bigger team, the idea would be to work on long term storage mounts and things. In terms of storage devices, we do a bit but that is more conservation. We get EDFAS ladies that sew cushions and Tyvek covers and hangers, and then as we are in the collection all the time, we identify what we need. It tends to be for a collection that we are working on directly, like for moving or preparing for display. So when we do the projects on the audit collections we do tend to identify what we need made and then we can budget for that.*

**Q:** What materials do you commonly have available for mount making activities?

**A:** *We always have Tyvek and calico, hangers that would get padded, the foam balls to go inside Tyvek cushions. In terms of mounts, we have plastazote. We bought a melting gun to properly cut plastazote, but it is waiting to be PAT tested. We try to obviously avoid wood but we do occasionally*

*need to use it for transport – like when we had to pack the taxidermy monkeys to go to Brussels, we needed wood and foam for that because of the weight and positioning of the branches they had to sit on in the crates.*

**Q:** Do you have volunteers?

- If so, what is their skill level/what kind of tasks are they typically asked to undertake?

**A:** *My department doesn't have a lot of volunteers specific to us, the curatorial departments have that more and I know that conservation does. In our department there is just the two of us and we spend a lot of time moving stuff between sites. I have made mounts but they tend to be temporary because the object needs to get from point A to point B – not that the mounts are any less safe, but they are just not designed for long term use. So you make them sturdy and as safe as they can be for that journey and then at the other end conservation will make something better.*

**Q:** In your opinion, what are the current limitations on making storage mounts for 3D objects such as hats?

**A:** *Peoples time. That is the biggest challenge, as we are under resourced – but what museum isn't.*

**Q:** What do you feel are the strengths and weaknesses of 3D storage mounts that you have encountered in museums? Any examples?

**A:** *The only thing I noticed about storage mounts is that they do age regardless of if you use good materials. Glues get old, materials get old. But I'm talking like 20 years down the line, so I think as long as the mounts are constantly monitored and you check that they are still suitable and capable, its fine. That is what the barkcloth mount is: it is on a mount already and it is safe enough but it could be better, because it is aged now and it is on wood. The plan is to upgrade the mount rather than make a mount for it because it's not safe in the first place. Materials age and technology ages too – we know far more about material aging than we did 50 years ago. We know more materials and practices that are safer. There are also a lot of historic mounts that we try not to use but that can be hard if an object is associated with an historic mount because where do you draw the line between it being part of the object and yet it may be damaging to the object? But for the most part, any new mounts are doing well. And just like anything else, we will need to look at them 20 years down the line and re-evaluate.*

**Joint interview with Maggie Dobbie (MD), Textile Conservator at GMRC, and Rebecca Quinton (RQ), Curator at GMRC**

**Q:** Which departments are involved in/responsible for collection storage?

**A: RQ:** *Here in Glasgow Museums the two main departments will be conservation and logistics. There may or may not be input from curatorial – sometimes that will just be asking for advice but not actively doing anything practical. In some areas the curator might be actively involved in creating storage solutions, but it partly depends on the curator work program and the type of object. Here, for costume and textiles we tend to have a proactive curator involved in storage – actually packing boxes. Whereas if it were say, the curators of paintings, they are not going to be the people screwing onto the backs the hooks used to hang the paintings. That would be done by technicians.*

**Q:** Is there time budgeted for activities such as mount making and storage devices (eg. padded hangers etc.)? How is this time allocated across the collection (e.g. how are parts of the collection prioritised?)?

**A: RQ:** *Time for storage activities comes under other things in terms of projects, so if its mounting for an actual exhibition, it will be budgeted as part of the project planning. So anything, say for the 19th century exhibition, any of the work done for the conserving and mounting of that costume would have come under the time we said that we needed to do that exhibition. And sometimes we might include time in that particular project for packing everything again afterwards, and upgrading it. Other times it is not being budgeted as such, so it might be part of a curatorial work program. If the curator can do it by themselves and not ask anybody else for anything, they don't have to put it through the planning program process, they are just doing it as part of their own work program. But we are finding that increasingly we are being pinched, so it might be that you do turn it into a bigger project. So the thing that might happen now is that you might think, so publishing the collections online, if we are getting objects out to be photographed and we are trying to get all our collections with better descriptions online, it might well be that you are bundling that into a project that is also going to improve the storage. So it would be this amount of time that the curator is going to repack and catalogue, the photographer is going to photograph, and actually, why not put in some money for new boxes.*

**MD:** *I think occasionally you might include mount making as part of a conservation treatment, although generally for display, not storage. But that would just be included. We would budget the time for a mount, say for example, for the Burrell re-display there's this 17th century embroidered jacket that's going to be going on display. As yet we don't know exactly how the designers expect this*

*to be displayed but this might be the moment to get a new mount made for it or for me to make a new mount for it. So that would be factored into the conservation time. The only time I can imagine you would make it just for storage would be if the object was in such a perilous condition that the mount was essential for its support, and then you would do it. Otherwise, the mount making would be limited to display.*

**RQ:** *Yes, and I would have though, from my experience here, the exhibition programme has been quite hefty, and then there was the big tapestry project, so we have only had objects conserved and display mounts made because they are going into a particular exhibition or display. I am not aware of any remedial conservation that has taken place by a revenue funded conservator, just because in fact it is in a weak condition and the object needed it. Because its not going to go on display or be viewed, that sort of remedial work has been offered to the university for student projects, so that's where we are getting small bits and pieces done.*

**Q:** What materials do you commonly have available for mount making activities?

**A: MD:** *Well, in conservation we have ethafoam, plastazote, scrim and wheatstarch mounts, polystyrene heads, polyester wadding, jersey. If we are getting some made we often have Perspex bases for display mounts.*

**RQ:** *And tissue paper, calico and Tyvek. We do have an advantage here that there is a conservation department. I have previously worked in a museum where there wasn't a textile conservator, so the access to materials was much more limited. It was predominantly tissue paper and calico, polyester wadding… partly for the storage space at that time and partly because you weren't putting the big orders in. Sometimes you could possibly have got plastazote because there were displays that may have used it, but it is the advantage here. Curatorially, I have no budget here for packing. The curatorial budget doesn't do anything practical. I can apply to the head of logistics for money for boxes and tissue but otherwise we normally have to look at getting other things from the conservation budget. Which again, if you have no conservator gets tricky because you have no access to that budget. Normally at the end of the financial year, I put a request in to both logistics and conservation, to help them spend the rest of their budget.*

**Q:** Do you have volunteers?

- If so, what is their skill level/what kind of tasks are they typically asked to undertake?

**A: RQ:** *We have also had volunteers, and they are the ones who do the much more standardised, as opposed to bespoke, things. They are the ones who have made all of our padded hangers and if we*

*have got covers that we have needed for garments or frames. So if there is anything we are having done that is modular, in terms of needing mounts of this or this size, that is the sort of thing we might ask the volunteer sewing group to do.*

**MD:** *The conservation volunteers (3 ladies) like to use hand sewing, or machine sewing and they prefer that if it's complicated, that the material is already cut out for them or that they've got a pattern. They want to be told exactly what to do and they don't want it to be too complicated.*

**RQ:** *no. But they don't mind it being repetitive.*

**MD:** *And they are quite elderly. But their skills are basically dressmaking skills. But as long as they are told what to do, they are quite happy with it.*

**RQ:** *I have had volunteers come in and help me with repacking. These are often university students or people trying to get into university or between 1st postgraduate and 2nd postgraduate degrees. They might help with upgrading part of the collection in terms of its cataloguing and its storage – making tissue paper sausages and donuts, that level of thing, just because of the nature of what we have been cataloguing so far. I don't think I have had them stitching things. When we did some lace a while ago, they were prototyping new ways of storing lace but we haven't put them into effect yet. So they have a different skill set to the conservation volunteers. They are often early careers, looking to work in museums. They are quite often from the University of Glasgow, from the Dress Histories course or the Museum Studies course.*

**Q:** In your opinion, what are the current limitations on making storage mounts for 3D objects such as hats?

**A: RQ:** *I suppose the limitations for us are the time and the budgetary resources. Budgets are quite tight, so we would probably prioritise just getting everything into an acid free box, even if it was being supported on tissue paper, before we necessarily undertook the major project of getting all the 3D mounts made – because we have got some objects that are still very much at risk, so it would probably be a wider basic thing, to bring everything up to a level, apart from the individual pieces that get sent off as student projects. It might change depending on where the money is.*

**Q:** What do you feel are the strengths and weaknesses of 3D storage mounts that you have encountered in museums? Any examples?

**A: RQ:** *I think generally 3D ones have been very good. Particularly, we have got one of our collections here that we are trying to make accessible because we have lots of people making appointments to come and see the collection and it is not necessarily the subject specialist curator or a textile*

*conservator who is showing the object. It could be our assistant curator who is handling the whole collection, or our learning and outreach assistant, so having a 3D mount, particularly for hats, enables somebody who doesn't know the material to have a clearer understanding of what it would look like on a head – because even if it has not been stored on a head, the object is oriented in a way that reflects how it would have been worn. Quite often you are just taking the lid off the box or opening the box front or you are lifting a board, without the member of staff having to handle the hat. Everybody can immediately see what it is and how it would have fitted on a head.*

**MD:** *I think that one we looked at this morning that Nora did is a perfect example of how that works and how that doesn't work, because it does exactly what Rebecca has just said. You can just show it to somebody without any handling of the object at all. It is stable, you can move it from the store to the research room (which is on the ground floor here, where they would probably be viewing it). Its weakness is its size. If we could have got that box made into one of the modular sizes that we need for that shelf then that would be ideal storage of a fragile hat, which is still accessible for viewing and study.*

**RQ:** *I think because the collection has been shifting at the moment and we haven't actually got a set place that we keep the hats, when we have been sending hats off to the textile conservation students, they have been looking at them individually. So we have had back very different sizes of box and very different mechanisms, which means that anybody else coming into the collection has to work out different forms of mechanisms, which is a little bit risky as oppose to it being a standard method used throughout. It does mean that when we start looking at long term storage and best use of space in the stores, they might not fit the shelves to the best advantage. Going forwards, once we know where the hats will go we will probably be requesting a modular system where it doesn't always have to be as tight as it can be on the hat, but it is so that the footprint fits with others on a shelf. This will make it easier for us to quantify the amount of space we need for current storage requirements and future expansion.*

**MD:** *to be fair, part of the box making of those hats has been part of the whole project, and they have made the box to fit the hat. In a way we are asking them to make the hat fit one of five sizes of box. Although there aren't five sizes of hat box at Preservation Equipment Ltd. (PEL).*

**RQ:** *No, at the moment PEL only has one hat box size, a square one about the size of the brown ones we looked at earlier. So for all those 1850's and 1860's caps you would have lots of space left over. But it wouldn't actually fit an 1830s hat. And the smaller box sizes, PEL don't do in unbuffered. They do a whole load of very useful sizes but they are buffered, so can't be used with a textile collection –*

*they have been designed for a paper based collection. And we decided not to go down the route of seeing if an object is cellulosic or proteinaceous because that would be too complicated to try and explain to our technicians when they are packing objects. We just try and keep it really simple, so everything for the textile store is going to be unbuffered. But one of the advantages of using PEL is that you can order small quantities. There are places that would do cheaper boxes and in bespoke sizes, but only in large quantities, and we don't have the storage space.*

**RQ:** *Technicians tend to pack when things are going on and off display. Day to day packing is probably done by the conservator or the curator. Or if there was ever an emergency or something like that, the technicians would all be brought in. Technicians don't pack costume much, only because we don't display it as much as other parts of the collection but that's because there is a lot more done with other parts of the collection. I think that as we do more with the costume and textile collection, some of them might need to get more involved.*

**MD:** *I am not sure they feel particularly comfortable with costume*.

**RQ***: and it's the same with our assistant curators. They aren't that happy packing costume and so with the dresses I am trying to pack them in a particular order so that they can get more familiar with the process. So with the hats with the 3D mounts it would be good to get a language that was running throughout – a standardisation, so that they only have to familiarise themselves with, say, four techniques and know that most of the hats can be packed with at least two of those, rather than having to learn a different couple of techniques for each hat.*

**Interview with (anonymous)**

**Q:** Which departments are involved in/responsible for collection storage?

**A:** *Conservation and Collections Care (which are both in the Department of Collections Services) and the curatorial departments are involved in collections storage.*

**Q:** Is there time budgeted for activities such as mount making and storage devices (eg. padded hangers etc.)? How is this time allocated across the collection (e.g. how are parts of the collection prioritised?)?

**A:** *The conservation departments do not have a time allocation for storage.*

**Q:** Is there a monetary budget for materials for activities such as mount making and storage devices?

**A:** *Yes, it is available through Collections Care. It is used for more general storage materials e.g. boxes/acid free tissue but can also be used for other mounts/storage devices.*

**Q:** What materials do you commonly have available for mount making activities?

**A:** *Plastazote/Ethafoam, acid free card (various types), fabrics that are available in textile conservation/Tyvek.*

**Q:** Do you have volunteers?

- If so, what is their skill level/what kind of tasks are they typically asked to undertake?

**A:** *Yes, we have a team of 7 volunteers working on the textile collections. The EDFAS team make padded hangers, Tyvek garment bags, Tyvek covers for furniture for the textile collections. Skill levels vary and they share projects according to skills, expertise and interests.*

**Q:** In your opinion, what are the current limitations on making storage mounts for 3D objects such as hats?

**A:** *Time and people resource*

**Q:** What do you feel are the strengths and weaknesses of 3D storage mounts that you have encountered in museums? Any examples?

**A:** *Weakness tends to be that one size doesn't fit all, and that most mounts have to be made individually for each hat – which is not time effective.*

**Appendix 2: Collection Survey Results**

| Object name/number | Description | Dimensions (cm) | | Current storage/mounts | Fit for purpose? | Condition |
|---|---|---|---|---|---|---|
| | | H | D | | | |
| Archaeological hat, CAP NA 1042 | Knitted, brown | 15 | 21 | In own box. Custom made mount of Ethafoam (?) covered with polyester wadding and silk jersey. | Yes | Excellent condition. Was previously washed, retains slight flexibility. Good fit on mount. May be hard to remove mount? |
| Pillbox Hat | Navy blue, fabric construction. Lined. Narrow brim 11cm? | 9 | 17 | In box with 2 other hats. Stuffed with tissue puffs, and packed tightly with tissue. Stored brim facing down. | No | Quite distorted and inflexible on crown. Brim is also distorted. |
| Blue velvet hat | Blue velvet hat with purple ribbon. Oval shaped interior. Narrow brim. Lined. | 11 | | In box with 2 others. Second level down. No internal padding, but padded around with tissue puffs. Tightly packed. | No | Very distorted crown, crushed. |
| Woven raffia hat | Woven ribbons/tubes of raffia (?). high flat crown. Brim =7cm | 15 | 16.5 | Bakers tray 4. Tissue padded. | Yes | Slight distortion, but fairly stiff/structural. |
| Black and yellow felt hat | Shallow, asymmetric hat – maybe to sit on the back of the head? Has inner cap separate from brim. Black felt, floppy. Yellow velvet ribbons. Cut out detail – prone to distortion in cut out areas as less structural in these areas. Brim = 6cm at widest point. | 5 | 15 at narrowest, 19 at widest | Bakers tray 4. Tissue padded. | No | Brim folding up slightly – weakened structure due to cut out design, requires static support to prevent these areas being pulled out of shape/forming creases. |
| Yellow knitted cap | Soft, yellow knitted cap with small peak at front, like a flat cap. Not kind of supportive internal structure. | 8.5 | 15 | Bakers tray 4. Tissue puff inside, offering no support. Hat has collapsed onto tissue puff. Headband is smaller in | No | Quite creased and hard to tell what original shape was. |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | diameter than the main body of the hat. | | |
| Navy felt hat | Hard felt hat, stiff. Ribbon bow, wide asymmetric brim = 10.5 at widest point. | | | Bakers tray 4. Tissue padding inside. The tissue is far less structural than the hat itself… | No | Slight dent in top of hat. Brim is not at all flat, but unclear if this is intentional or distortion. |
| Green velvety beret | Solid feeling structure, set in shape. Curling feather decoration. | | | Bakers tray 5. Tissue padding. The tissue is far less structural than the hat itself… | Yes | Structurally sound. However, feathers are vulnerable in current storage situation- even more so because they extend below the edge of the beret. |
| Wide asymmetric straw hat | Very high crown. Ribbon and fabric flower decoration. Wide, asymmetric sloping brim = 15cm at widest point. | 11 (crown) | 12 (at top) | Bakers tray 5. Tissue padded. Brim sits on a large pad of tissue. | No | Crown stable. Brim in danger of distortion – tissue pad underneath looks to be preventing this. |
| Black velvet bonnet | Soft black velvet, with internal wire (?) frame around face. Large plumage of feathers. Narrow brim. | | | Bakers tray 3. Tissue padded. Stored face down, on brim. | No | Back panel is sagging inwards slightly due to lack of internal support. Some distortion on brim due to face down storage. |
| Brown and tan loop cap | Net structure with outer structure of braided raffia, arranged in loops. Elasticated opening, oval shape. | 9 | 18 | Bakers tray 1. Tissue puff | No | The net structure is stiff but slightly distorted. Some loops are flattened. |
| Brown/grey hydrangea cap | Open weave horsehair (?) structure with 3D flowers of same material. Rolled over open edge. | 9 | 14-19 | Bakers tray 1. Tissue puff | Yes | Very stiff fabric, so holding its shape well. |
| Natural fibre coiled cap | Open weave horsehair (?) base with loosely arranged braided cords attached. | 8 | 17 | Bakers tray 1. Tissue puff | No | Top of crown collapsing inwards on one side due to weight of cord decoration. |

| | | | | | | |
|---|---|---|---|---|---|---|
| Brown velvet hat with flowers | Brown velvet oval shaped hat with velvet and satin flowers. Multiple layers, with net sides and the top of the crown in velvet. Strong grosgrain headband. | 11 | 11.5-15 | Bakers tray 1. Tissue puff. | No | Slight dimple in top of crown. Flowers overhang the headband and are slightly crushed. |
| Black ruffle cap | Net base covered in ruffles of black synthetic (?) fabric with small blue fabric flowers tucked into the ruffles. | 8 | 13-20 | Bakers tray 1. Tissue puff. | No | Net structure distorted due to lack of support. |
| Green and blue shiny raffia hat. | Woven strips of wide metallic raffia. Tall crown, very upturned brim and wide grosgrain band. Very structural. | 10.5 | 16 | Bakers tray 2. Tissue puff. | Yes | Very structurally sound. Grosgrain ribbon headband slightly distorted by tissue stuffing. |
| Tiny white flower cap K.1997.70 | Net and organza structure covered with wire stemmed tiny flowers. Small sash on one side. | 9.5 | 16 | Bakers tray 2. Tissue puff, very tightly stuffed. | Yes | Sash is slightly squashed, but the rest of the cap is structurally sound. |
| Green fur hat 1985.536 | High crown with wide brim (9cm). | 13 | 17 | Bakers tray 2. Tissue puff. | No | Slight dent in top of crown. |
| Brown fur and velvet cap | Small pointed velvet cap with fur surround. Very solid layers of velvet. | 13 | 15 | Bakers tray 2. Tissue puff. | No | Dent in top of crown. |
| Peach coloured flat cap K.2001.32 | Single layer of woven straw. Flat cap with small peak at front and covered button at top centre. Has original paper label still attached. | 5.5 | 18 | Bakers tray 3. Tissue puff. | Yes | Stiff, good condition. |
| Modern looking straw bubble hat K.1997.69 | Grey, purple and yellow woven straw hat. Very structural rounded shape, slightly oval. Very solid. | 12 | 16-19 | Bakers tray 3. Tissue puff. | Yes | Very structurally sound. |
| Black velvet and red fur hat | High crown with very upturned brim. Made of thick layers, very stiff. Dent in the top – possibly intentional? | 13 | 16.5 | Bakers tray 3. Tissue puff. | Yes | Slight dent in brim, but internal structure good. |
| Lime green fur hat 1985.534 | Very tall hat with brim (7.5cm) and grosgrain ribbon. Felt lining, stiff. | 13 | 16.5 | Bakers tray 3. Tissue puff. | No | Dented in top and creased in side, possibly from previous storage. |

| | | | | | | |
|---|---|---|---|---|---|---|
| Tricorn hat 1961.8570 | Black felt tricorn hat with silver trim and navy ostrich feathers. Lined with leather, very structural and stiff. | 8 | 16 | Bakers tray 6. Nothing. | Yes | Good condition, very structural. |
| 3D Bicorn hat | Black fur outer, leather lined, very solid. 3D goldwork. Detachable feather plume. | 12 | 15-20 | Bakers tray 6. Nothing. | Yes | Good condition, very structural. |
| Flat Bicorn hat 1 | Black fur and Moiré ribbons, with gold tinsel decorations. Trimmed with white ostrich feathers. Folds flat. | 13 | 0-24 | Bakers tray 7. Nothing because stored flat. | Yes | |
| Flat Bicorn hat 2 | Black fur and Moiré ribbons, with gold tinsel decorations. Trimmed with white ostrich feathers. Folds flat. | 13 | 0-24 | Bakers tray 7. Nothing because stored flat. | Yes | |
| Turkish goldwork ear flap cap | Navy velvet with heavy goldwork embroidery. Square shape, with a flap on each lower edge. Side flaps folded upwards to meet at top of crown. Very heavy construction. | 9 | 13 (square) | Bakers tray 7. Tissue puff. | No | The weight of the goldwork embroidery has caused the top of the crown to collapse inwards slightly. |
| Flat Bicorn hat 3 | Black felt with various ornamentation. Folds flat. | 13 | 0-24 | Bakers tray 8. Nothing because stored flat. | Yes | |
| Flat Bicorn hat 4 | Black felt with various ornamentation. Folds flat. | 13 | 0-24 | Bakers tray 8. Nothing because stored flat. | Yes | |
| Flat Bicorn hat 5 | Black felt with various ornamentation. Folds flat. | 13 | 0-24 | Bakers tray 8. Nothing because stored flat. | Yes | |
| Flat Bicorn hat 6 | Black felt with various ornamentation. Folds flat. | 13 | 0-24 | Bakers tray 8. Nothing because stored flat. | Yes | |
| Flat Bicorn hat 7 | Black felt with various ornamentation. Folds flat. | 13 | 0-24 | Bakers tray 8. Nothing because stored flat. | Yes | |
| Tricorn hat 2 | Black felt, stiff construction. | 8 | 16 | Bakers tray 9. Custom mount of ethafoam covered in polyester wadding and stockinette – for previous display. | Yes | Good supportive mount, good structural condition. |
| Black fur cloche with | High crown and narrow asymmetric | 12 | 15 | Bakers tray 10. Tissue puff. | No | Very soft construction, |

| | | | | | | |
|---|---|---|---|---|---|---|
| buckles | brim (6cm at widest point). Slight peak at the front brim and back turns upwards. Green and yellow grosgrain ribbon around crown, fastened with decorative buckles. Elastic chin strap. | | | | | and brim and crown are slightly dented due to inadequate support. |
| Grey woven straw (synthetic?) hat | Peach coloured feather trim. Blocked in asymmetric folds. Stiff material, oval headspace. | 7 | 13-18 | Bakers tray 10. Tissue puff. | No | Dent in crown due to lack of internal support. |
| Blue/grey felt hat 1985.401 | Asymmetric blocked felt hat with puffed 3D brim. Very oval in shape. | 7 | 13-21 | Bakers tray 10. Tissue puff. | No | Very squashed, hard to tell what original shape would have been. However, the felt is still flexible. |
| Dark green (synthetic?) straw hat 1975.452 | Asymmetric brim (6.5cm at widest point), intentional indent in top of crown, quilted bow. Presumably would have sat towards the back of the head. | 9.5 | 13 | Bakers tray 10. Nothing | No | No internal support is putting strain on flat top of the crown. |
| Large black beret with bow 1984.638 | Felt beret, with excess felt overhanging the headband at the back. Bow also of felt. Quite structural. | 8 | 17 | Bakers tray 10. Tissue puff. | No | Soft dents in the top of the crown, not clear if intentional or not. |
| Navy felt hat with bow at the back 1965.575 | Asymmetric oval shaped hat. Left and right sides shaped differently. Would have sat towards the back of the head. Has elastic chin strap. | 9 | 14-19 | Bakers tray 10. Tissue puff. | No | Dented at the back and brim distorted. |
| Black felt cloche with wired bow and jewel decoration | Narrow brim at front, with large wired bow. Has elastic chin strap. | 7 | 17 | Bakers tray 11. Tissue puff. | No | Soft felt. No signs of dents, but would deform easily. |
| Dark grey straw hat with cream flowers | Wide asymmetric brim edged in black velvet ribbon. Would have sat towards the back of the head. Includes hat pin and elastic chin strap. | 7.5 | 16 | Bakers tray 11. Tissue puff. | No | Brim very distorted but crown in good structural condition. |
| Cream net headpiece with veil 1972.15 | Small loop of unknown material, wrapped in net. Has a chin strap | 3 | 13 | Bakers tray 11. Nothing. | Yes | Not much internal cavity, so tissue support is |

| | | | | | | |
|---|---|---|---|---|---|---|
| | wrapped in more net, acting as a kind of veil. Very little internal cavity. | | | | | adequate. |
| Black fur-edged felt hat with large underneath bows 1975.457 | Asymmetric hat with wide brim (7cm), upturned at edge. Underneath the brim is a large felt bow. Has elastic chin strap. | 8 | 15 | Bakers tray 11. Tissue puff. | No | Crown has lumpy distortions and the large bow is squashed. |
| Stormy blue hat with ridged brim K.1997.17 | Soft floppy crown made of a single layer of woven wool fabric with multiple layers for the narrow brim (5cm). | 6 | 16 | Bakers tray 11. Tissue puff. | No | Crumpled on top of crown. |
| Black straw flat hat 1985.396 | Flat style of hat with very little internal cavity. Very structurally stable. Lace, net and faux flower decoration. Has an elastic chin strap (broken) and would have perched on the head. Brim 5cm. | 3 | 14 | Bakers tray 11. Tissue puff. | Yes | Stiff enough and flat enough to hold its own shape. |
| Green net cap with knitted brim. | Large, shapeless cap with no structural components. The opening is elasticated. | 0 | 15 (at opening) | Bakers tray 11. Tissue puff. | Yes | Has no integral structure of its own to be distorted. |
| Heavily embroidered green velvet cap | Very heavy cap of velvet lined with linen. Front piece is embroidered with a sigil/crest in stump work and goldwork. Embroidered overall, with heavy tassel in centre top of crown. | 9 | 15 | Bakers tray 12. Tissue puff. | No | Dipping slightly in the top of the crown. |
| Black fur top hat c. 1900 | Very solid construction. Very damaged silk moiré lining. Wide leather headband section inside. | 13 | 13-17 | Bakers tray 12. Nothing. | Yes | Structurally very solid. |
| Canvas covered Pitt helmet | Very lightweight (possibly constructed from balsa wood?) but very solid construction. Leather headband inside. | 15 | 15 | Bakers tray 12. Nothing. | Yes | Structurally very solid. |
| Black fur top hat c.1900 2 | Very solid construction. Damaged silk lining. Wide leather headband section inside. | 13.5 | 13-16 | Bakers tray 13. Nothing. | Yes | Structurally very solid. |
| Dark green/black flat | Fabric covered but very solid | 1.5 | 16- | Bakers tray 13. Nothing. | Yes | So flat that internal |

| | | | | | | |
|---|---|---|---|---|---|---|
| hat 2000.476 | construction. Very little internal cavity. Fabric covered wire construction underneath. | | 20 | | | support not necessary. |
| Soft burgundy hat | Felted with a slightly furry finish. Oval in shape, with a slightly asymmetric brim (5cm at widest point). Fabric and feather decoration glued on. Intentional fold in crown. | 7 | 16 | Bakers tray 14. Tissue puff. | No | Slight dimples in crown. |
| Small shiny black flat raffia hat | With black plastic (?) grape and leaf decoration. The raffia has a shiny coating. Asymmetric and curved in shape, with very little internal cavity. | 3 | 10 | Bakers tray 14. Tissue puff. | Yes | Fairly flat, so not much internal support needed. |
| Flat black felt and velvet bonnet | Circular and shallow in shape, with flat back face. Felt back and velvet sides. | 5 | 18 | Bakers tray 14. Tissue puff. | Yes | The tissue puff fits the rounded shape of this bonnet very snuggly. |
| Undyed fabric hat with quilted brim 1965.915 | Linen (?), with a soft crown shaped of 3 pieces. Wide brim (8cm) quilted to add stiffness. | 6 | 15 | Bakers tray 14. Tissue puff. | No | Crown very crumpled, due to soft structure and lack of internal support. |
| Straw hat with long orange veil | Very dense straw hat made of coiled strips of braided straw. Long silk chiffon veil attached, and silk flower. | 9 | 12 | Bakers tray 14. Tissue puff. Veil rolled on tissue rolls. | Yes | Very structurally solid hat. |
| Black transparent spiral hat 1960.2888 | Horsehair (?) stiff woven strips, stitched together in a spiral. Open weave creates transparent effect. Wide brim (11cm). | 7 | 19 | Bakers tray 15. Tissue puff. | No | Collapsed crown with set in distortions. |
| Small black felt hat | Stiff, solid blocked felt hat with intentional dimples in crown. Grosgrain ribbon-wrapped wire decoration on front. Has elastic chin strap. | 5 | 13.5 | Bakers tray 15. Tissue puff. | Yes | Fairly solid construction. |
| Burgundy cut-work felt hat | Cut-work decoration on top of crown. 2 layers thickness of felt, but still fairly flexible. Narrow brim (4cm). | 7 | 15 | Bakers tray 15. Tissue puff. | No | Very distorted. |
| Oval brimmed navy hat NAB180 1957.585 | Made of strips of braided straw stitched together. Oval shaped brim (11cm at | 7.5 | 15-20 | Bakers tray 15. Tissue puff. | No | Collapsed crown top. |

| | | | | | | |
|---|---|---|---|---|---|---|
| | widest point) and crown, with wide velvet ribbon. Crown has silk lining. | | | | | |
| Black loop hat | Asymmetric hat that would have sat towards the back of the head. The solid brim (14cm at widest point) is made of straw strips and the crown is a lattice of braided straw loops. | 6.5 | 16-20 | Bakers tray 15. Tissue puff. | No | Ok on top but the sides of the crown are not supported and are sagging. |
| Geometric horsehair hat TBB35 1960.2886 | Black strips of horsehair woven in a wavy pattern and arranged in geometric folded patterns, with embroidery in between. Very open structure with wide brim (12cm). | 8.5 | 19 | Bakers tray 16. Tissue puff. | No | Very distorted on crown and brim. Very stiff and set in distortion. |
| Black velvet hat with brown moiré bow 1970.1069 | Made of double thickness of velvet, soft construction but with additional stiffening (possibly wire) at brim. Asymmetric brim (7.5cm at widest point). | 9 | 19 | Bakers tray 16. Tissue puff. | No | Crown crumpled a little, but still flexible. |
| Straw cloche hat with peach silk ribbon. | Finely woven straw hat with tall crown and narrow brim (5.5cm), angled downwards. | 15 (20 inc brim) | 15-20 | Bakers tray 16. Tissue puff. | Yes | Fairly structural but slightly flexible. |
| Small red fur hat with 2 grosgrain bands | Very oval in shape with elastic chin strap. Soft structure and narrow brim (4cm). | 13 | 13-20 | Bakers tray 16. Tissue puff. | No | Dented in top of crown and brim bent. |
| Black mixed materials hat | Synthetic (?) straw crown lined with satin and with a narrow asymmetric satin brim (4.5cm). Trimmed with lace and velvet. | 11.5 | 18 | Bakers tray 17. Tissue puff. | No | Slight dents in top of crown. |
| Black felt cloche hat with pin tucks | Tall crown and very narrow brim (3cm). Pin tucks at back for shaping. | 15 | 18 | Bakers tray 17. Tissue puff. | No | Slight dents in top of crown but still flexible. |
| Duck egg blue hat with feathers | Very oval shaped fabric hat made of several layers of fabric, including | 10.5 | 13-22 | Bakers tray 17. Tissue puff. | No | Dents in top of crown. Overhanging feathers |

| | | | | | | |
|---|---|---|---|---|---|---|
| | stiffened layer. Feathers stitched onto the sides. | | | | | very damaged. |
| Dark straw bonnet with raffia embroidery | Very structural with a wide asymmetric brim (10cm). Edged with raffia stitching and decorated with woven and embroidered raffia panels on crown. Acetate (?) lining. | 14 | 14-17 | Bakers tray 17. Tissue puff. | Yes | Very structurally solid. |
| Brown hat with patchwork crown | Synthetic (?) woven dark brown straw with asymmetric brim (10.5cm at widest point). Crown is made up of patchwork fabric shapes, cut away in places. Brown synthetic fabric crown lining. | 9 | 16 | Bakers tray 17. Tissue puff. | No | The sides of the crown are sagging inwards due to lack of support. |
| Autumn red hat with grapes | Red silk with woven red and black horsehair and gold wire mesh overlaid layer. Solid wide brim (10cm), stiffened. Soft crown. | 8 | 19 | Bakers tray 18. Tissue puff. | No | The sides of the crown are collapsing inwards. |
| Pheasant feather cap | Solid brown velvet construction, with outer layers of feathers on skin (e.g. sections of wing). Elastic chin strap. | 5 | 19 | Bakers tray 18. Tissue puff. | Yes | Very solid construction. |
| Black felt hat with tassels | Fairly stiff felt hat. Central strip of grosgrain ribbon along top of crown, with small tassel at each end. Grosgrain ribbon around brim. | 7.5 | 14.5-16.5 | Bakers tray 18. Tissue puff. | No | Dented in top of crown. |
| Black straw turban shaped hat | Brim upturned to create turban shape. Ostrich feather decoration. Very stiff structure. | 10.5 | 15-19 | Bakers tray 18. Tissue puff. | Yes | Very solid, stiff. |
| Purple ostrich feather cap | Black fabric crown with padded velvet brim. Flattish in shape. | 8 | 17-19 | Bakers tray 19. Tissue puff. | No | Soft crown requires support to keep its shape. |
| Snake skin effect straw boater | Flat top with wide brim (8.5cm). Decorated with wide red grosgrain ribbon. Fairly stiff, solid construction. Elastic chin strap. | 7 | 14.5-19 | Bakers tray 19. Tissue puff. Stored upside down (so resting on top of crown). | Yes | Because stored upside down with the flat crown resting on a flat surface, and brim adequately supported, condition is |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | good. |
| Black hat with pink ostrich feathers | Black horsehair hat with brim (8cm). Lined with velvet. | 9 | 13-16 | Bakers tray 19. Tissue puff. | No | Top of crown collapsing in slightly. |
| Harvest time straw hat 1971.246 | Solid construction of golden straw with large fabric poppy and other flower decoration, as well as wheat ears attached to side of crown. Asymmetric brim(10cm at widest point) and intentional hole in top of crown. | 9.5 | 14-16 | Bakers tray 19. Tissue puff. | Yes | Very structurally stable. |
| Blue/grey straw hat | High domed crown with decorative velvet ruffles, bow and feather plume. Has a crown hood. The inner part of the crown is attached separately. Has an internal wire frame around the headband. | 13.5 | 13 | Bakers tray 20. Tissue puff. | No | The inner crown is becoming separated from the outer, and neither is supported adequately. |
| Straw hat with Ikat fabric | Flat top of crown with intentional indent. Draped with fabric. Brim (8cm). | 8 | 14.5 | Bakers tray 20. Tissue puff. | No | Distortion in crown. |
| Black horsehair hat with beige flowers | Crown made of horsehair, blocked into shape and stiff. The asymmetric brim is canvas covered in silk, also stiff. | 9 | 16 | Bakers tray 21. Nothing. | No | Distorted on the sides of the crown. |
| Oval straw boater | Golden straw. Flat top of crown with straight brim (6cm). Crown lined in wool. | 6 | 14.5-17.5 | Bakers tray 21. Tissue puff. | Yes | Very structural. |
| Densely constructed straw hat with purple ribbon | Very solid construction. Wide straight brim (8.5cm), crown lined in wool. | 8 | 14.5-17 | Bakers tray 21. Tissue puff. | Yes | Very structural. |
| Taupe coloured bowler hat, c.1900 | Felt bowler hat of very solid construction. Leather headband on inside. Brim 5cm. | 13 | 14-17 | Bakers tray 22. Nothing. | Yes | Very structural. |
| Black rounded top hat | Felt top hat, very solid construction. Leather headband, brim 5cm. | 14 | 15-17 | Bakers tray 22. Nothing. | Yes | Very structural. |
| Brown Dandies hat early 1800s | Felt, very solid construction. Brim 6cm. | 15 | 11-13 | Bakers tray 22. Nothing. | Yes | Very structural. |

| | | | | | | |
|---|---|---|---|---|---|---|
| Brown satin bonnet | Stiff fabric layers and lined in silk. Trimmed with ostrich feathers. Brim 7cm. | 12 | 14-19 | Bakers tray 23. Tissue puff, face down. | No | Dented in top of crown. |
| Black velvet bonnet | Flat back/top of crown. Soft velvet construction, lined with silk. Wire around brim and back of neck. Trimmed with ostrich feathers. | 14 | 15-18 | Bakers tray 23. Tissue puff, face down. | No | Collapsing inwards at top of crown. |
| Flat black and cream cap 1961.1801 | Flat, heavily wired construction. Difficult to tell what original worn shape was. Mixed materials including lace, chiffon, satin and horsehair. | 1.5 | 16 | Bakers tray 23. Nothing. | Yes | Shapeless and flat, so no internal support needed. |
| Velvet and felt black pillbox hat | Straight sides hat, mainly felt but trimmed with velvet. Brim completely upturned, to mirror sides of crown. Leather headband. | 6 | 13-16 | Bakers tray 23. Nothing. | No | Dented in top of crown. |
| Pillbox hat with long velvet ribbons. | Very structural sides with soft top. Made of horsehair braid and has velvet bow. | 8 | 17 | Bakers tray 23. Tissue puff. Ribbons rolled. | No | Top of crown sagging inwards slightly. |
| Blue paper raffia dandelion bonnet | Woven paper raffia with large bow at back. Covered in fabric flowers. Brim 13cm. Very fragile split silk lining. | 5 | 14 | Bakers tray 24. Nothing due to fragile lining. | No | Very crushed and structurally fragile. |
| Navy straw hat with cornflowers | Asymmetric oval shape with wide brim (15cm at widest point). Fake flowers ringing crown. Stiff but flexible structure. | 8 | 18-23 | Bakers tray 24. Tissue puff. | No | Sides of crown distorted. |
| Huge rabbit fur hat | Wide brim (13cm) and oversized crown with straight sides. Has a much smaller headband inside, to fit head. Very heavy. | 10 | 15-21 | Flat on shelf (B4-4-10). Nothing. | No | Top of crown dipping inwards. |
| Huge black fur hat with ostrich feathers | Wide brim (15cm). Trimmed with pale blue feathers, that sit unconnected to the hat in a ring. | 8 | 18 | Flat on shelf (B4-5-10). Tissue puff. | No | Top of crown dented. |
| Large straw hat with | Wide brim (12cm) and oversized crown | 10 | 17- | Flat on shelf (B4-5-10). | No | Top of crown collapsing |

| | | | | | | |
|---|---|---|---|---|---|---|
| silk roses | with straight sides. Has a much smaller headband inside, to fit head. Stiff construction. | | 21 | Nothing. | | inwards. |
| Large straw and chiffon hat 1966.681 | Wide brim (18cm) and oversized crown. Has a much smaller headband and lining inside, to fit head. Brim lined with chiffon and crown lined with thicker silk. Floppy construction. | 8 | 18 | Bakers tray 25. Nothing, upside down. | No | Very distorted both on brim and crown. Hard to tell what original shape was. |
| Flat horsehair hat with tiny flowers and ginkgo leaves | Horsehair base with pale blue silk over centre and decorative fake flowers/leaves. Shallow crown built into the underside. Very flat, brim 12cm. | 5.5 | 15 | Bakers tray 25. Nothing. | Yes | Flat, so internal support not so necessary. |
| Flamingo wing hat | Very large straw hat covered with a layer of canvas. Very stiff. Brim 9cm. | 10 | 15-25 | Bakers tray 26. Nothing. | No | Dented in top of crown. |
| Burnt orange colour flat bonnet | Velvet crown and wired asymmetric brim (13cm at widest point). Fairly flat. Wired headband. | 3 | 14 | Bakers tray 26. Nothing. | No | Generally crumpled. |
| Black velvet hat with wispy feathers | Soft fabric construction, lined in cotton. Elastic chin strap. Slightly asymmetric brim (4.5cm). | 7 | 17.5 | Bakers tray 27. Tissue puff. | No | Soft top in need of internal support. |
| Large, oval navy velvet and fur hat | Very large and oval. Domed crown, soft structure and wired brim (9cm). | 9 | 12-23 | Bakers tray 27. Tissue puff. | No | Soft structure, shapeless and creased. |
| Violet bonnet with chiffon ribbons/veil piece 1962.1480 | Velvet and silk construction. Ruched back and sides, with velvet ruffle around face and back of neck. Stiffening (maybe wire) around face opening. | 13 | 12-19 | Bakers tray 27. Tissue puff. Stored on its back. | No | Better overall because it has been stored face down, but ribbons slightly flattened. |
| Purple contrast edged bonnet | Made up of several layers of silk, and fully lined. Floppy construction, and crown very shattered and weak. Has a long train of chiffon coming off the crown. | ? | ? | Bakers tray 27. Spider tissue in fragile crown, and the rest stuffed with tissue puffs. Stored on its side. | No | Distorted, not adequately supported. |
| 3x quilted cream colour bonnets | Made of silk, quilted in a grid pattern with wire enclosed in the quilted lines. | 13 | 13.5 | Bakers tray 28. Tissue puffs. Bonnets stacked inside one | No | Crowns squashed and brims very floppy and |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Small triangular crown and very wide brim (19cm). Lies fairly flat when folded naturally in half. | | | another. | | vulnerable. |
| Coarse black cord bonnet with net overlay | Made up of stitched black cording, with wire around face and neck opening. Ribbons rolled underneath. Narrow brim (4.5cm) | 8 | 16-18 | Bakers tray 28. Tissue puff. Stored face down. | No | Brim distorted. |
| Black lacy bonnet with ostrich feather plume | Silk construction, with wired velvet around face and neck opening. Lace ruffle at neck. Brim 7cm. | 10 | 15.5 | Bakers tray 28. Tissue puff. Stored face down, with ribbons rolled up inside. | No | Wonky and distorted. Also, hard to pick up without the ribbons falling out, so difficult to handle. |

## Appendix 3: Testing results

**Key:**

**Quality of internal fit:** How well does the mount conform to the inside of the hat? E.g. too tight? Too loose? 1 = badly, no conformity. 10 = perfectly conforms.

**Quality of support:** How well does the mount internally support the hat? E.g. does the mount provide solid enough support to prevent sagging/distortion? This is subdivided into crown support and overall (including brim). 1 = support not adequate. 10 = completely supported.

**Stability:** How stable is the hat when on the mount? E.g. does the whole thing tip over? Think about this in relation to storage situations; would it be stable enough to sit on the shelf of a roller rack? 1 = cannot stand by itself. 10 = very stable.

**Time needed to position hat on mount:** How much time is needed for things such as adjustment of the mount for size alterations etc.?

**Ease of use** How easy or difficult is it to use the mount? Is more than one person required? Is there any danger of abrasion or other damage occurring during this process? Note down any difficulties encountered or points of interest. 1 = very difficult. 10 = very easy.

**Object Categories:**

**A –** Domed crown **B –** Flatter crown top **C –** sits on back of the head (e.g. bonnet) **D –** Very shallow crown **E –** smaller circumference at headband than at crown

| | **Quality of internal fit** | | **Quality of support** | | **Stability (of hat on mount & mount on surface)** | **Time needed to position hat on mount** | **Ease of use** | **Additional comments** |
|---|---|---|---|---|---|---|---|---|
| | **Mount** | **Tissue puff** | **Mount** | **Tissue puff** | | | | |
| **Category:** A **Object:** Grey woven straw hat | 7**/10** Hat has sculpted dents in the crown that the mount cannot fully reach. | 4**/10** | 6**/10 (crown)** Lowered only due to sculpted areas. 6**/10 (overall, inc. brim)** Brim raised up | 3**/10** | 8**/10** Very light hat and sits fairly low down, so good stability. | 6 **mins** | 9**/10** 1 **person needed**. | Mount provides far better overall support than the tissue puff. |

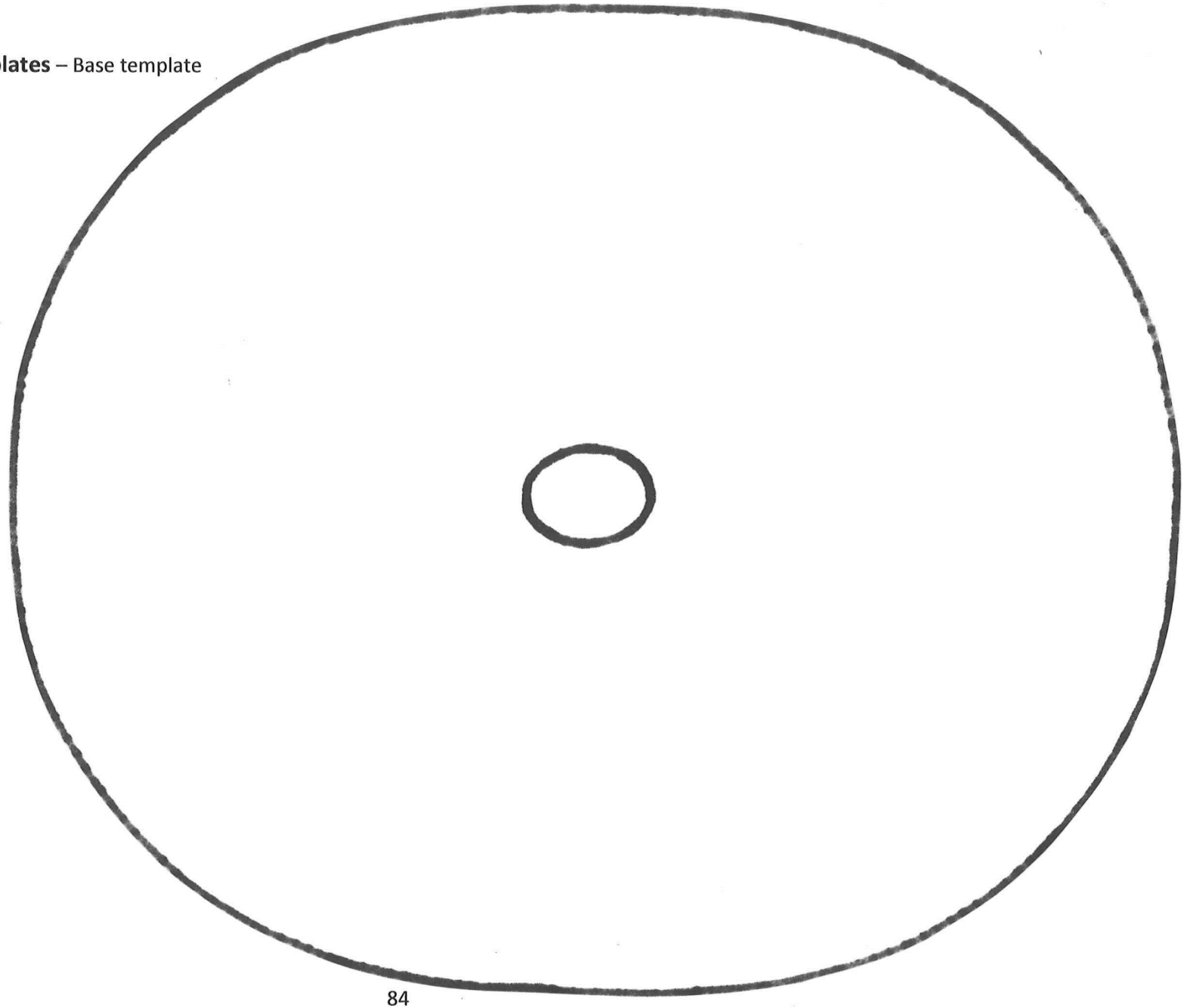
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | However, overall shape fits well and good fit around headband. | | and headband and top centre of crown held in correct shape. | | | | | |
| **Category:** A **Object:** Geometric horsehair hat | 4**/10** Not a close fit because of the stiffness of the distortion of the hat. Good fit at the headband. | 3**/10** | 4**/10 (crown)** Top of crown lightly supported. 5**/10 (overall, inc. brim)** Brim raised up slightly, so much improved. | 3**/10** | 8**/10** Light weight hat and low height so good stability. | 6 **mins** | 6**/10** 1 **person needed**. Made slightly more difficult because of stiffness and distortion of the hat. | Because the hat is so stiffened and distorted, full reshaping is not possible with a mount. However, the mount supports it in its current shape far more than tissue puffs. |
| **Category:** B **Object:** Small red fur hat | 8**/10** Overall really close fit. | 2**/10** | 7**/10 (crown)** Only part of the hat unsupported is the very edges of the crown (too angular for the mount to reach). Top and sides of crown well supported. 9**/10 (overall, inc. brim)** Holds in shape and raises brim up. | 1**/10** | 6**/10** Slight wobble because of distortion of mount base where gathering threads are pulled tight. | 10 **mins** Unusual shape, so took slightly more experimenting to get right. | 9**/10** 1 **person needed**. Sits on very easily. | Tissue was giving no support (just sitting at base, did not extend up to crown), so mount is a huge improvement. |
| **Category:** B | 7**/10** The mount was | 3**/10** | 8**/10 (crown)** Supports top of | 2**/10** | 10**/10** Very stable, but | 10 **mins** | 7**/10** 1 **person** | Good example of how a mount can |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Object:** Autumn red hat with grapes | barely high enough, but generally a good fit. Very slight gaps at the edges of the top of the crown. | | crown well and undoes the crushed distortion of the crown sides.<br>7**/10 (overall, inc. brim)**<br>Raises brim up but still slightly sitting on two edges, as mount not quite high enough. | | still slightly resting on brim so not ideal. | | **needed**.<br>Snug fit because of existing distortion, so needs easing on gently. | help to undo distortion. Support from tissue was inadequate, so mount is a huge improvement. |
| **Category:** C<br>**Object:** Purple bonnet with lilac veil | 8**/10**<br>Very fragile object, so important not to overstuff. The mount is therefore fairly loose fitting, acting as a stand. Good conformity. | 5**/10** | 7**/10 (crown)**<br>Spider tissue already in crown. The overall conformity of the mount allows upright support without creating points of strain in crown.<br>8**/10 (overall, inc. brim)**<br>Overall far better, as the weight of the bonnet isn't resting on any one face like before. | 5**/10** | 7**/10**<br>Tall but relatively stable, as the base of the mount remains flat because the gathering threads have not been pulled too much. | 5 **mins** | 10**/10**<br>1 **person needed**.<br>Loose fit so lifts on and off easily. | When padded with tissue puffs, this lay on its side. When on the mount, it does not sit on a face, but is suspended, crown up. This should help in preventing future creasing/distortion. |
| **Category:** C | 6**/10**<br>Does not reach | 5**/10** | 6**/10 (crown)**<br>Top of the crown | 5**/10** | 8**/10**<br>Relatively low, | 4 **mins** | 9**/10**<br>1 **person** | This bonnet was placed on the |

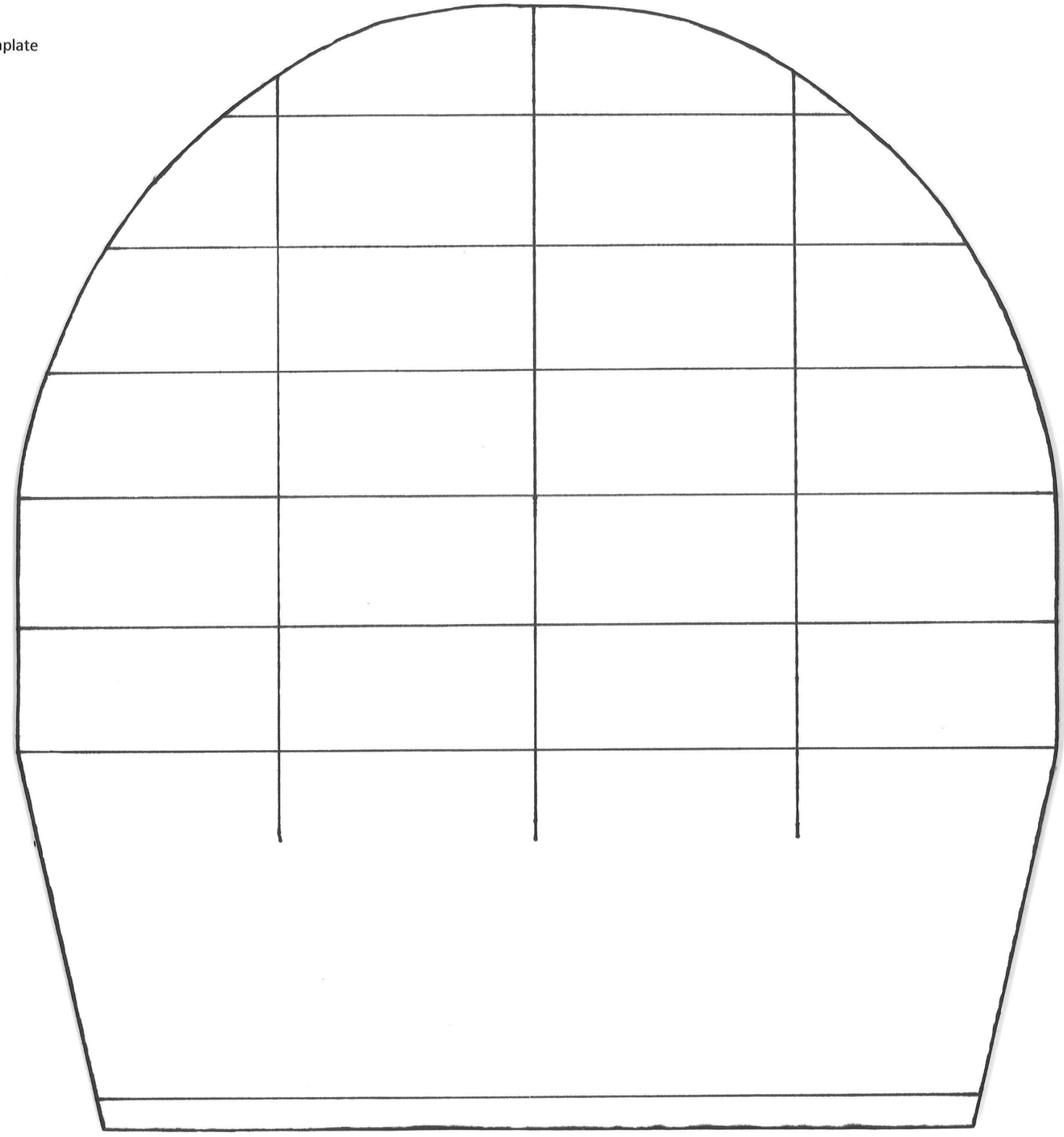
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Object:** Black velvet bonnet | the outer edges of the crown (too angular) but fits well around headband. | | well supported. 7**/10 (overall, inc. brim)** Brim raised up, so big improvement. | | so very stable. | | **needed**. | mount face down. If it had needed to be stored vertically (i.e. as it had been worn), the mount would have needed more height. |
| **Category:** D **Object:** Black and yellow felt hat | 9**/10** Really close fit on the crown and raises the brim up. | 6**/10** | 9**/10 (crown)** Evenly supported, holds crown nicely in shape whilst not being overstuffed. 6**/10 (overall, inc. brim)** Brim would benefit from additional support, but otherwise good. | 4**/10** | 7**/10** Low profile and light, so relatively stable with only slight wobble. | 4 **mins** | 7**/10** 1 **person needed**. The only slight difficulty was handling the attached rolled hat ribbons when moving the hat. | The mount has the added benefit of lifting the hat so that the ribbons can sit alongside it rather than under it, so prevents the ribbons becoming squashed. |
| **Category:** E **Object:** Large black beret | 5**/10** The mount does not reach the overhanging side parts of the hat that are wider than the headband. However, it fits the headband snugly and reaches the top of the crown. | 4**/10** | 6**/10 (crown)** The top of the crown is well supported and this helps keep the sides held up. The lower areas of the crown are less supported where the mount does not reach. 7**/10 (overall, inc. brim)** | 4**/10** | 6**/10** Low profile, so not in danger of falling over. However, slightly wobbly because of base distortion where threads are pulled tight. | 8 **mins** Unusual shape, took longer to judge fit because internal and external shapes are quite different in appearance. | 8**/10** 1 **person needed**. Slightly awkward to pull the hat far enough onto the mount, due to its unusual shape that overhangs the headband – this makes general handling slightly | Mount provides better crown support than tissue, despite not fully filling the internal cavity (tissue puffs were not able to do this fully either). Being raised up off the bow is a huge benefit of the mount. |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Good because raised up slightly, so no longer sitting on the bow underneath the brim. | | | | more difficult than with most hats. | |
| **Category:** E **Object:** Large straw and chiffon hat | 6**/10** Fits the headband well and reaches the top of the crown although there are slight gaps at the sides of the crown where the mount does not reach. Also not quite high enough to prevent the brim resting heavily on the table. | 0**/10** Nothing previously used. | 5**/10 (crown)** The top of the crown is well supported but the sides are not, as the mount does not fully reach them. 7**/10 (overall, inc. brim)** Brim slightly raised, so an improvement from before. However, slightly more would be better still. | 0**/10** Nothing previously used. | 10**/10** Resting on table with extremely wide brim, so very stable. | 7 **mins** Internal and external shapes are quite different in appearance, so slightly harder to judge. | 8**/10** 1 **person needed**. | Difficult to tell exact internal size because of the crown lining. |

**Appendix 4: Mount form templates** – Base template



**Appendix 4: Mount form templates** – Main template



**Appendix 5: Risk Assessment**

| | | | |
|---|---|---|---|
| **Management Unit:** | | **Location: (Site/ Building/ Room)** | Level 3, Robertson Building, Dumbarton Road Glasgow.<br>Stores, National Museums Scotland Collection Centre, Granton. |
| **Assessment Date:** | 14/05/18 | **Review Date:** | May 2020 |
| **Assessors Name:** | Becky Doonan | **Job Title:** | Student |
| **Task / Activity:**<br>Historic items of headwear will be handled whilst conducting a collection survey at NMS Collection Centre.<br>A variety of support mount designs will be made on Level 3 of the Robertson Building, using conservation grade materials. This may involve hand or machine stitching, use of hot glue, and use of craft knives/scalpels. | | | |

| **What are the hazards?** (See list of sample hazards) | **What are the risks?** | **Who might be harmed?** (eg Staff, students, visitors) | **What control measures are required to eliminate or reduce the risks?** | **Risk Evaluation** | | | **Risk Rating** |
|---|---|---|---|---|---|---|---|
| | | | | **Consequence (1 – 3)** | **Likelihood (1 – 3)** | **Overall risk (C x L)** | **Low, Medium or High** |
| Exposure to pesticides and chemicals from object manufacture (for example, mercury was sometimes used in production of felt hats). | Harm to health (chemical) | Me (handling only) | Wear gloves when handling historic items of headwear, to avoid skin contact. | 2 | 1 | 2 | Low |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Electrical hazards | Harm to health (physical) | Students, staff, cleaners, visitors | Unplug and switch off equipment when not in use and avoid trip hazards, ensuring routes in workroom are clear from trailing leads. Ensure equipment is in good working order (including visual check) and has been PAT tested. | 2 | 1 | 2 | Low |
| Risk of burns | Burns | Students, staff, cleaners, visitors | Avoid touching hot end of glue gun. Glue gun to be labelled when hot. | 2 | 1 | 2 | Low |
| Use of sharp hand tools | Cuts | Students, staff, cleaners, visitors | Use cutting mats where appropriate. Follow good practice for cutting. First aid kit in wet room 315. Use surgical blade remover (in chem lab 310) to change blade on scalpels. Dispose of old blades/broken needles in sharps disposal box under the sink in chem lab 310. | 1 | 2 | 2 | Low |
| **Completed by (print name, position, and sign):** Becky Doonan | | | | **Date:** 14/05/18 | | | |
| **Approved by (print name, position, and sign): Frances Lennard** | | | | **Date: 14.05.18.** | | | |

## GUIDANCE ON COMPLETION OF RISK ASSESSMENT

| 1. EXAMPLE HAZARDS THAT MAY BE APPLICABLE TO THE JOB or WORK ACTIVITY | | | |
|---|---|---|---|
| Working at Height | Noise | Hand tools | Vibration |
| Falling objects | Extreme Heat / cold | Confined spaces | Repetitive hand/ arm movement |
| Slippery/ uneven/ worn floors | Radiation | Poor housekeeping / cleaning | Machine operation |
| Obstructions/ projections | Lighting | Vehicle movement | Electro Magnet |
| Manual handling | Compressed air | Fire / explosion | Pressurised systems |
| Mechanical Lifting | Substances / materials | Electricity | **Other (*specify on assessment)*** |

| 2. RISK MATRIX | | Potential consequence of harm | | |
|---|---|---|---|---|
| | | **1 – Minor Injury**<br><br>(e.g. hazard can cause illness, injury or equipment damage but the results would not be expected to be serious) | **2 – Significant Injury**<br><br>(e.g. hazard can result in serious injury and/or illness, over 3 day absence) | **3 – Major Injury**<br><br>(e.g. hazard capable of causing death or serious and life threatening injuries) |
| **Likelihood of harm** | **1 – Unlikely**<br><br>(injury rare, though possible) | **1 – Low** | **2 – Low** | **3 – Medium** |
| | **2 – Possible**<br><br>(injury could occur occasionally) | **2 – Low** | **4 – Medium** | **6 – High** |
| | **3 – Probable**<br><br>(injury likely to occur, can be expected) | **3 – Medium** | **6 – High** | **9 – Extreme** |

### 3. RISK EVALUATION

This is calculated by multiplying the likelihood against the consequence e.g. taking a likelihood of 1, which is classified as Unlikely and multiplying this against a Potential Consequence of 2, which is classified as Significant Injury, would give you and overall Risk Rating of 2, which would result in an overall evaluation as a low risk.

**1 to 2** = **Low risk**

Low risks are largely acceptable, monitor periodically to determine situation changes which may affect the risk, or after significant changes

**3 to 4** = **Medium risk**

Medium risks should only be tolerated for the short-term and then only whilst further control measures to mitigate the risk are being planned and introduced, within a defined time period.

**6 = High risk**

High risks activities should cease immediately until further control measures to mitigate the risk are introduced. The continued effectiveness of control measures must be monitored periodically.

**9 = Extreme Risk**

Work should not be started or continued until the risk has been mitigated. Immediate action is required to reduce exposure. A detailed mitigation plan must be developed, implemented and monitored by senior management to reduce the risk before work is allowed to commence