# 1: Description

The ceramic being discussed in this report is an archaeological earthenware belonging to the Saffron Walden Museum. It was composed of three separate pieces and had undergone a substantial loss (see figures 1a-c). When complete the circumference around the middle measures approximately 53cm, with the height at 24cm.

Figure 1a


Figure 1b

Figure 1c

*Figures 1a-c show the three remaining pieces of the pot*

### *1.1: Form*

However these remaining pieces still allowed the original form to be visualised. The small handle, long neck and rounded shape of the bottom take the common form of a Roman

flagon. These vessels were normally used to hold wine, and would have been equally familiar to both Emperor and peasant (www.readingmuseum.org.uk).

This flagon could be further categorised as a coil pot through observing the spiral pattern most visible on the inner side of the base (refer back to figure 1a). Pots of this nature are made by working together layered ropes of clay. This ancient method allowed pottery to be made in sizes and shapes that would have taken many years to acquire the skill to throw (Fournier, 2000).

### *1.2: Finish*

Half way down the base shard a drastic colour change could be observed. The bottom half was charcoal in colour and felt slightly less porous to the rest of the body. This most likely occurred as a result of a reducing atmosphere during firing. Reduction occurs when there is a restriction of air within the kiln, causing it to be starved of oxygen. In these circumstances the fire usually burns with a sooty flame which can be carried in to the pot as soot (Hodges, 1989). The effects of this environment could also be seen inside and around the neck (see figure 2).

Figure 2*: The results a reducing atmosphere had on the inner neck.*

These conditions induce varied colour changes to ceramic bodies, and are often utilised to create decoration. However the position of the colour change suggests that this was not done intentionally.

# 2: Condition:

***2.1: Surface dirt:***

As the pot had not undertaken any previous restoration, the surface was still extremely dirty (see figure 3a-c).

Figure 3a*: Surface dirt on the inside base*

Figure 3b*: Dirt on the outer surface*

Figure 3c*: Deposits along the inner break edge*

The porosity of the pot meant that soil could easily become engrained within the surface. However as it is soluble in water, this caused no major concern. The dirt was evenly distributed across the surface, with additional hardened deposits on the inner side. These were only present on the charcoal surfaces where the finish appeared less porous.

### *2.2: Running Crack:*

Within the base segment a running crack was visible travelling towards the centre (see figure 4). The crack was considerably larger towards the break edge, becoming more prominent when handled. Although it was relatively stable when stationary, any small amount of mishandling could create further breakages.

*Figure 4: Running Crack*

# 3: Treatment Proposal

Before conservation could take place, an initial plan of anticipated treatments had to be decided. The proposal was as follows...

### *3.1: The removal of surface dirt*

Cleaning will commence physically by dusting the surface with a hard brush, which should remove loose dirt and small encrustations. Any deposits which are unsuccessfully removed during this process will be gently lifted with a scalpel, ensuring that small and inconspicuous deposits are lifted first. This is to be confident that no damage to the surface will ensue as a result.

Once all the loose dirt is removed, the pot will be cleaned shard by shard with a solution of water and symperonic. Due to its stability, each shard will be immersed in the solution and scrubbed with a toothbrush. It is important that the solution will be replaced on regular intervals. This is to avoid the removed soil repositioning within the surface, or making the water abrasive. After treatment the shards will be left for 24 hours in order to thoroughly dry before continuing with any proposed treatment.

### *3.2: Stabilising the running crack*

A mixture of Paraloid B72 and acetone will be used to stabilise the running crack. It is perfectly suitable for this task due to its fast tack and fluid state. It will be applied by dripping in small amounts from the tip of a cocktail stick. Due to the large gap at the break edge, the two sides will be gently pushed together and held until dry. As due to its position a clamp would be unsuitable; highlighting the need for a quick tack adhesive.

### *3.3: Bonding the shards*

The shards will be bonded using Paraloid B72 as it is reversible, strong and colourless. It will be applied neat to all break edges using a small paint brush. This will maximise the strength of the adhesive, which is important due to the missing support of absent shards.

### *3.4: Filling*

#### *3.4.1: Choosing an area to fill*

Instruction from Saffron Walden Museum specified that potential fills should be added for support only. Therefore to do a complete fill would be unnecessary and unjustified. However other considerations needed to be included when choosing which area to fill. For example what impact the positioning of the fill would have on its display (see figures 5a-c).

Figure 5a Figure 5b Figure 5c

Figure 5: *Diagrams of potential fills.*

In order to visualise the possible areas to fill, the pot was tacked together with cellotape. Figures five a-c illustrate the relevance the positioning of the pot has to the potential size of the fill. In order for the true nature of the pot to be understood, it is important that the full shape is seen.

The fill demonstrates in figure 5b will be selected as it illustrates an informative positioning, but only uses a small fill to create the necessary support. It will be altered slightly by increasing the size of the fill towards the back, thus creating more depth. This will allow the pot to be viewed from the side, as this angle is usually visible in most standard display cabinets.

*3.4.2: Method*

The chosen area will be filled using dental plaster for its ease of application, reversibility and soft finish. The softer the plaster the less time and abrasion is needed to sand the fill to a desirable finish. It is important as any contact between porous ceramics and plaster dust leaves permanent staining.

To create the fill a mould will first need to be taken from the undamaged side of the pot. Dental wax will be used by softening it in hot water, working it in to place and leaving it to harden. The mould will then be taped across the designated area and filled from the inside. Due to the size of the fill area, it will be done in two steps which both follow the same procedure.

*3.4.3: Protecting the surface*

Protecting the flagon from plaster dust is crucial in maintaining the beauty of the original surface. Wrapping the pot with cling film proficiently is mandatory, as the dust can expertly lodge into the most miniscule of gaps. For extra precaution, liquid latex will be layered with a paint brush along either side of the break edges adjacent to the fill. As their irregular shape and multiple layers deemed covering them with masking tape problematic.

Latex is widely used for varying purposes within ceramic conservation. Its flexibility and unreactive state allows it to be used successfully in mouldings and coatings without the risk of staining. Furthermore, research shows it to be compatible with most sound ceramics including earthenware (Buys, Oakley 1993). For these reasons latex will be used as it will not only expertly mould to the surface, but also utilise time.

***3.5: Colour Matching***

Colour matching will be carried out using a mixture of powdered pigments and liquid golden acrylic paint. The base coat will be applied first, and then with a stippling brush the blue and dark brown tones will be worked over. Small amounts of fumed silica will be added to the paint to create a slightly dry powdered texture. This will help to successfully imitate the texture of the porous body.

### *3.6: Time keeping*

In order to complete the proposed treatment plan in the designated time given, a plan in the form of a Gantt chart was designed. This can be seen in appendix 1.

# 4: Treatment

### *4.1: The removal of surface dirt:*

Surface dirt was removed successfully in coalition with the treatment plan. Dry brushing removed a substantial amount, and removing deposits with a scalpel caused no damage to the surface. However it was the symperonic solution that caused the most drastic results, revealing a beautiful multi tonal surface which could not have been appreciated prior to cleaning (see figures 6a & b).

Figure 6a: *Shard after cleaning*

Figure 6b: *Detail from shard showing pigmentation*

Figure 6b illustrates the unexpected amount of blue and grey included across the body, an attractive affect which would have developed during firing.

### *4.2: Stabilising*

As proposed the crack was stabilised using a mixture Paraloid B72 and acetone. It was applied along the whole crack, adding an increasing amount of acetone as it became needle thin. This method allowed the crack to be successfully impregnated without the thick adhesive laying on the surface. The amount of acetone was reduced when stabilising the beginning of the crack along the break edge. Either side was held tautly together until an adequate tack was achieved, this was then left to dry overnight. On later inspection the process appeared successful, meaning the bonding of the shards could commence with confidence.

### *4.3: Bonding*

Bonding the shards with Paraloid B72 was done successfully in one session. A sticking order was not necessary due to the small amount of shards available. They locked together perfectly and were bonded edge to edge. To reduce the possibility of the shards misaligning, the pot was supported upright to utilise the effects of gravity whilst drying. The results can be seen in figure 7.

Figure 7: Bonded pot

### *4.4: Filling*

The fills were carried out in two parts following the process specified in the treatment proposal. The pot was overzealously wrapped, as the pale body of the ceramic would be unforgiving to staining. However once sanding commenced the latex dislodged with minimum contact, leaving an open space for plaster dust to reach the surface. Therefore it was quickly removed with any resulting dust being quickly brushed away before it settled.

Removal of the latex however revealed entirely unforeseen staining. Although this faded considerably within hours, it far from disappeared (see figures 8a and b)

Figure 8a: *Application of liquid latex* Figure

8b: *Staining as a result of liquid latex*

As the liquid latex is completely unreactive, the resulting staining came as a shock. Logically it could be explained as the result of lifting dirt from deep within the surface. However due to the orange tone of the stain this explanation seemed unsatisfactory. But unfortunately due to time constraints, this phenomenon had to be declared as unexplainable. Therefore the use of latex was abandoned, and replaced with small strips of masking tape (see figure 9).

Figure 9: *Taped fill edges*

Although this process was tedious, the outcome drastically overweighed the aspect of staining. The pot was wrapped again with cling film, and sanding commenced. The small hole pictured in figure 8 was delicately filled with flugger and blended in to the main fill using fine grade micromesh

### *4.5: Colour Matching*

Colour matching commenced by applying a fluid wash to create an even base colour. Then by using a mixture of golden acrylic paint and powdered pigments, a thicker layer was layered on top. This was applied using a stippling brush in order to imitate the textured body of the flagon. Once the tone and texture was satisfactory, the varying pigments adorning the surface of the pot were worked in to the fill (see fig 10).

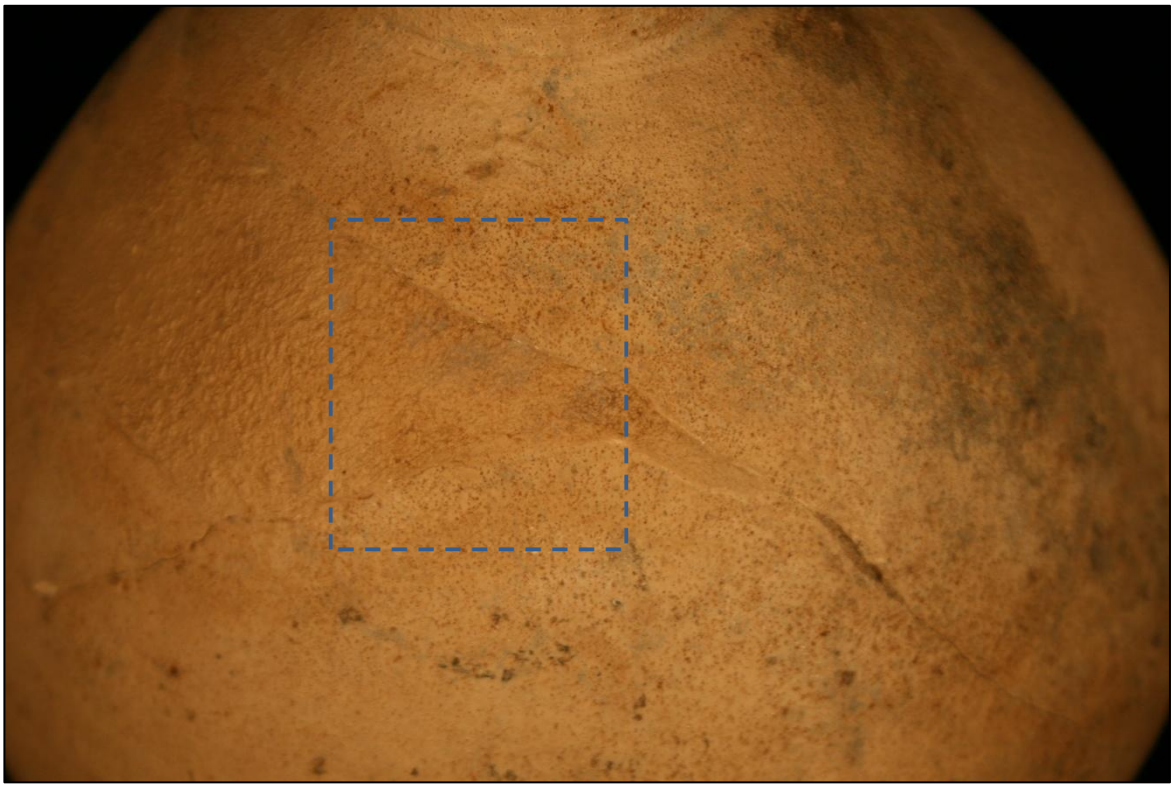


Figure 10: *The use of pigment within the fill*

Figure ten illustrates how the blue and dark brown pigments within the surface of the pot were carried in to the fill. This was applied using a large stippling brush to create an even mottled effect, which in turn created a more fluid progression between the pot and the fill.

Heavier and more detailed stippling was applied to the edge where the charcoal pigment within the surface was more dominant (see figure 11).

Figure 11: *Detail of fill*

This was applied using a smaller brush to create more concentrated detail. A stippling effect was used again, but with a slighter thicker and drier solution of paint. This was created by adding small amounts of fumed silica to the paint.

*4.5.1: Final Images*

The resulting effects were very pleasing, and the final results can be seen in figures 12 and 13.


Figure 12: *Final front view*


Figure 13: *Final side view*

# 5: Health and Safety procedures

Throughout treatment certain health and safety regulations had to be followed. These were as follows:

- Keeping a tidy work space: this was important to avoid accidental spillages or possible breakages.
- Wearing a lab coat at all times to protect clothing and avoid any unnecessary contact with harmful materials.
- Wearing latex gloves where necessary, and when not making sure hands were thoroughly washed on a regular basis, as greasy residues could have been damaging to the pot.

Any specific health and safety requirements for hazardous materials were studied before treatment commenced. These were recorded on COSHH sheets which can be viewed in appendix 2.

# 6: Evaluation

### *6.1: Unforeseen results or problems*

As stated within the treatment, the staining as a result of the liquid latex was completely unexpected. If time permitted, a further study into its explanation would have been beneficial. This research would have been enlightening certainly to myself, but also possibly to others. Fortunately the staining did fade, and with selective use of pigments within the fill, the definition of the line decreased dramatically.

### *6.2: Time management*

All processes were completed in accordance to the proposed time plan mapped out within the Gantt chart in appendix 1. Fortunately no major setbacks arose which encroached into time set aside for other purposes. Therefore the flagon was restored to the level at which was anticipated within the treatment proposal.

Overall the treatment was very successful. It was completed to a level that suited the specification, and satisfied my personal goals.

# 7: After care

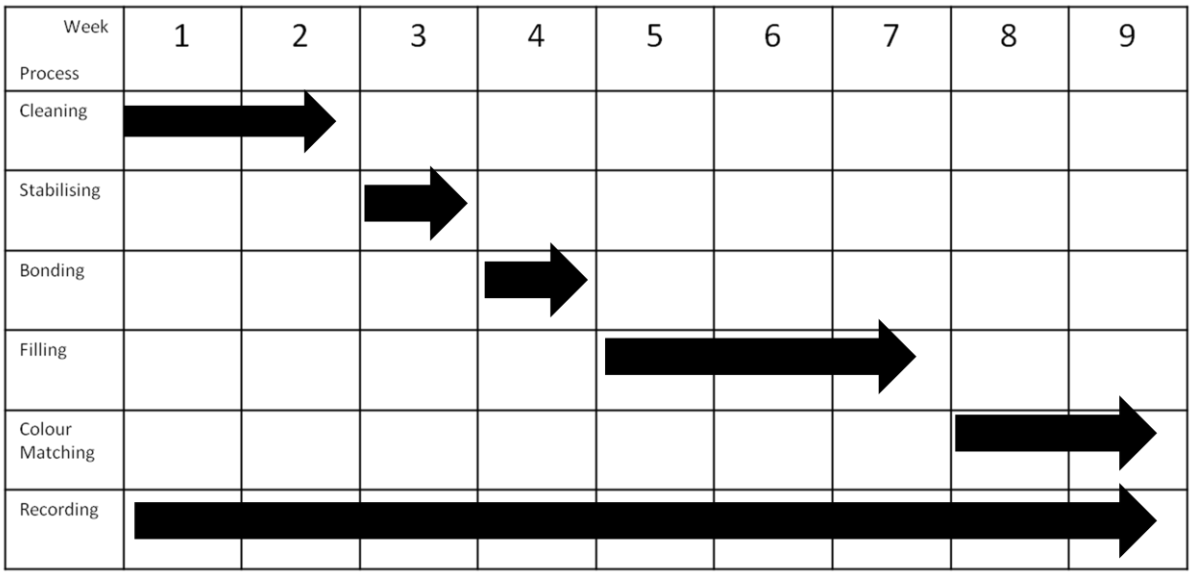
Due to the brittle nature of ceramics, most damage they suffer is physical. Careless handling may result in chipping, or disastrous breakages. Therefore the following guidelines should be followed in order to maintain a high level in care.

- If being displayed, the cabinet should be placed in an area which is not susceptible to large measures of vibrations. It should also not be over crowded with objects.

- If being placed into storage, the flagon should be appropriately supported and covered to avoid the development of further surface dirt. Again this storage should not be overcrowded, as this may lead to accidents (National Trust, 2006).
- Ceramics can tolerate a wide range of RH and temperature, however drastic or regular fluctuations may cause surfaces to spall. Therefore these must be kept constant.
- However to prevent the growth of fungus or bacteria especially on the packaging, RH must be kept under 65% (Cronyn, 1990).

To accompany the flagon, a treatment record card was created outlining the processes and materials used during restoration. Documentation is important to aid any further restoration, and make sure it undergoes the appropriate care (see appendix 3).

# Appendix One: Gantt chart



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