



BR
EST. 1990

Broadwater Farm Estate

Mural mosaic

Cutting Line proposal
Test Trial for removing of tesserae
Recommendations
Preventative work
August 2023

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Introduction

During the condition survey in August 2023, DBR Conservation conducted an investigation using a line level laser to determine the possible cut lines in order to give a proposal for the cutting of the mural mosaic (see drawing attached).

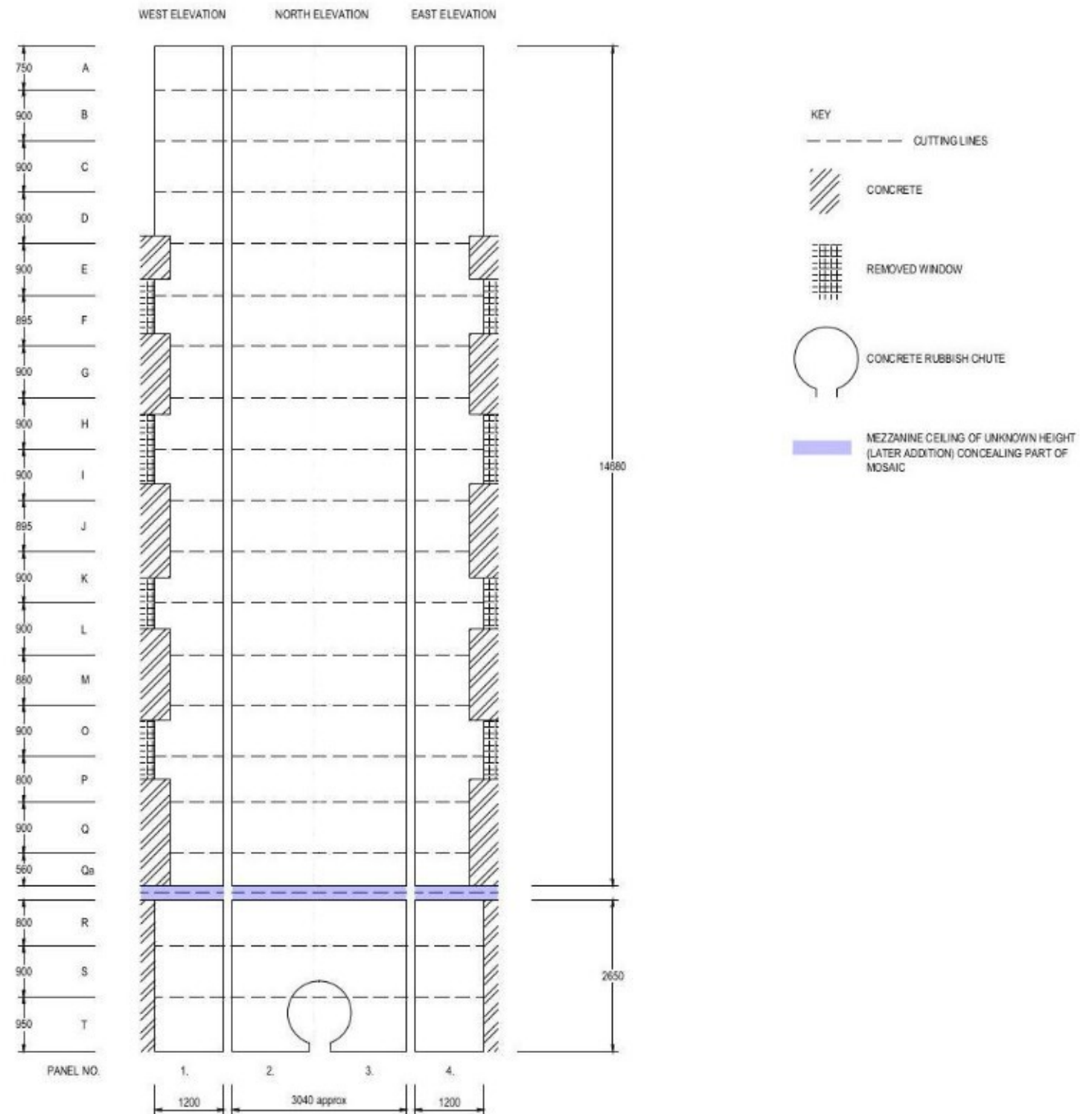
Every marked line (18nr in total + 1 inaccessible because situated between the screed of the mezzanine ceiling) was chosen according to the existing original joints made by the artist during the laying process*. Unfortunately, while in some cases the laser level followed the existing joints, in other cases it exceeded them.

Afterwards, the templates were made using tracing technique, placing strips of tracing paper sheets directly onto the mosaic and, the contour of at least two rows of tesserae above and below the line was traced using a pencil. A colour chart was made and a code was created for each colour, and marked according to tesserae onto the tracing paper. The result was a perfect copy of each tessera, its shape, colour and exact position on the proposed cut line.

A tesserae removing trial was also carried out to determine if the method of removing a band of tesserae along the cut line was acceptable and if it is be the right way forward before cutting the mural blocks. The trial sample was carried out at the top of the mural at the East return elevation, along the first original joint (which coincides with the first proposed cut line). The tesserae were numbered and safely stored so that they could be re-used.

*For the entire photographic documentation of the cut lines, please refer to the folder “Cut lines” attached. Note that, for photographic purposes, each line 1 – 18, was further divided into sections a, b, c & d for more detailed investigation and mapping.

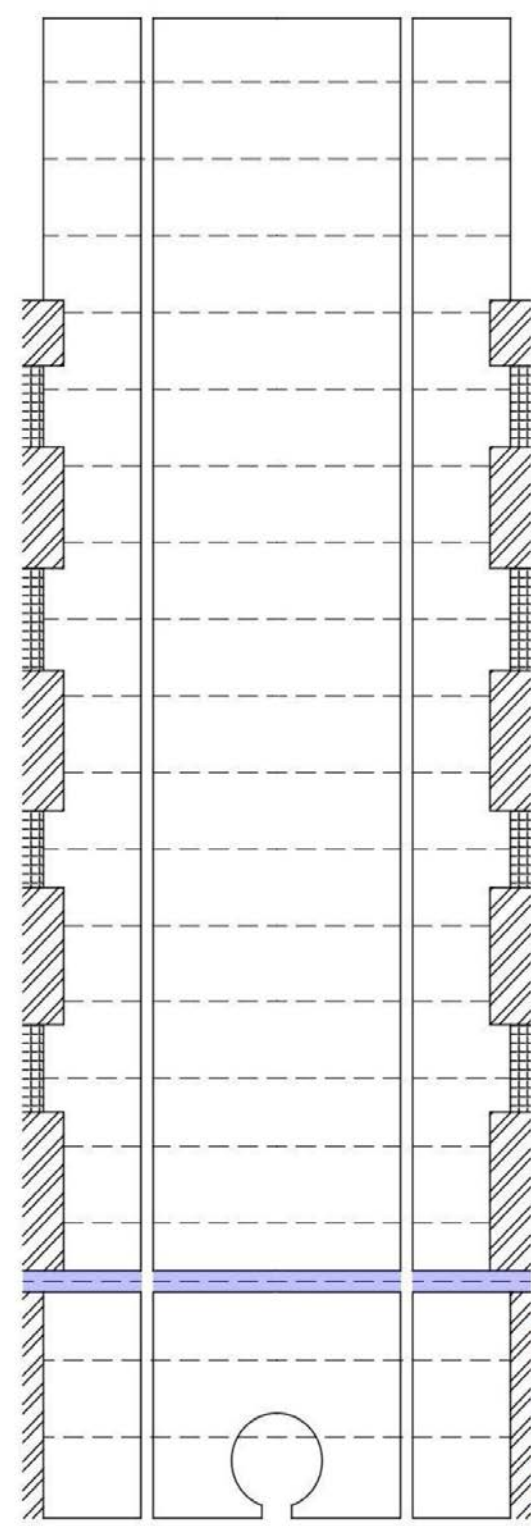
Elevation views
Scale 1:75@A3





750	A
900	B
900	C
900	D
900	E
895	F
900	G
900	H
900	I
895	J
900	K
900	L
880	M
900	O
800	P
900	Q
560	Qa
800	R
900	S
950	T

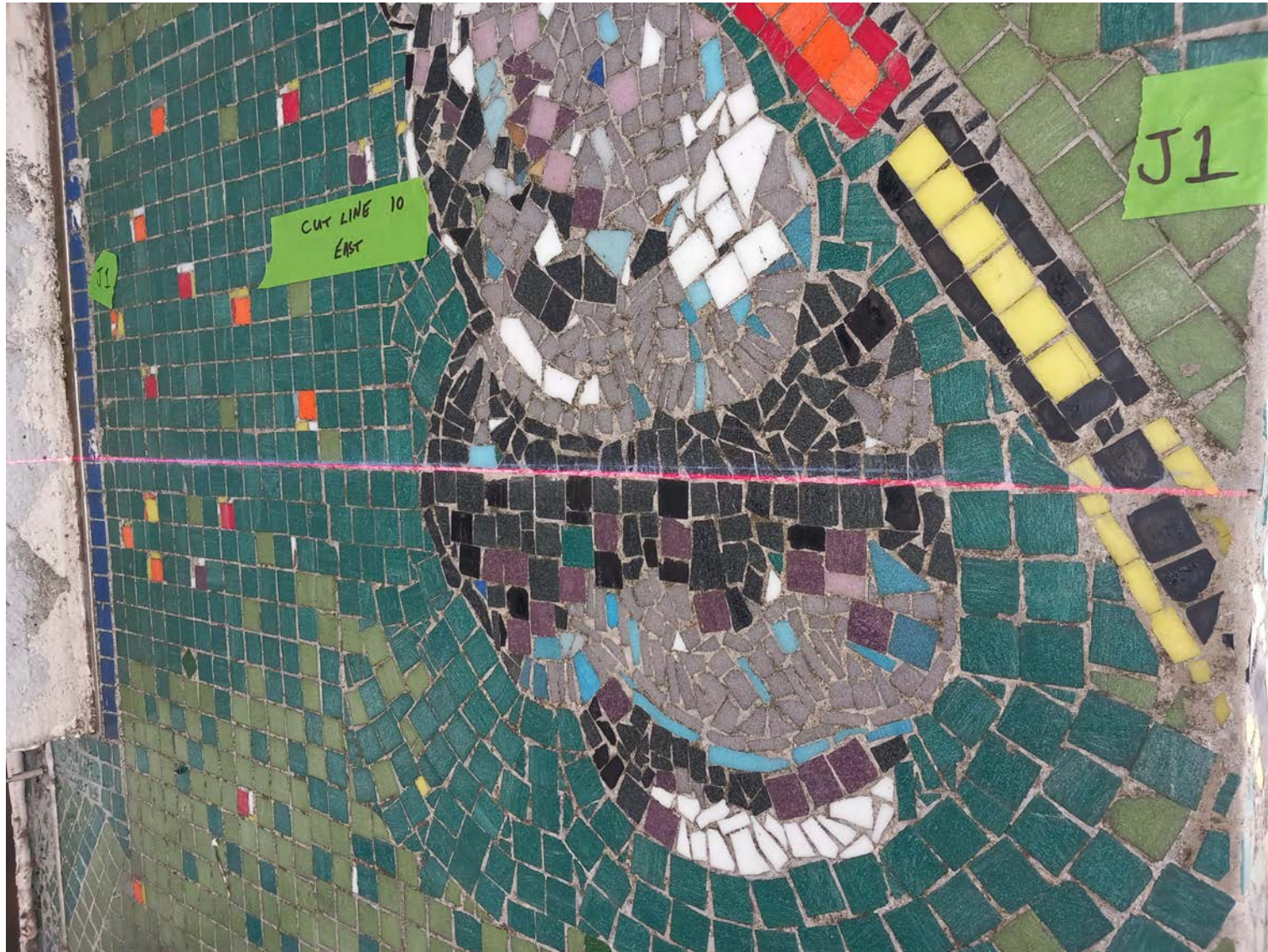
PANEL NO.



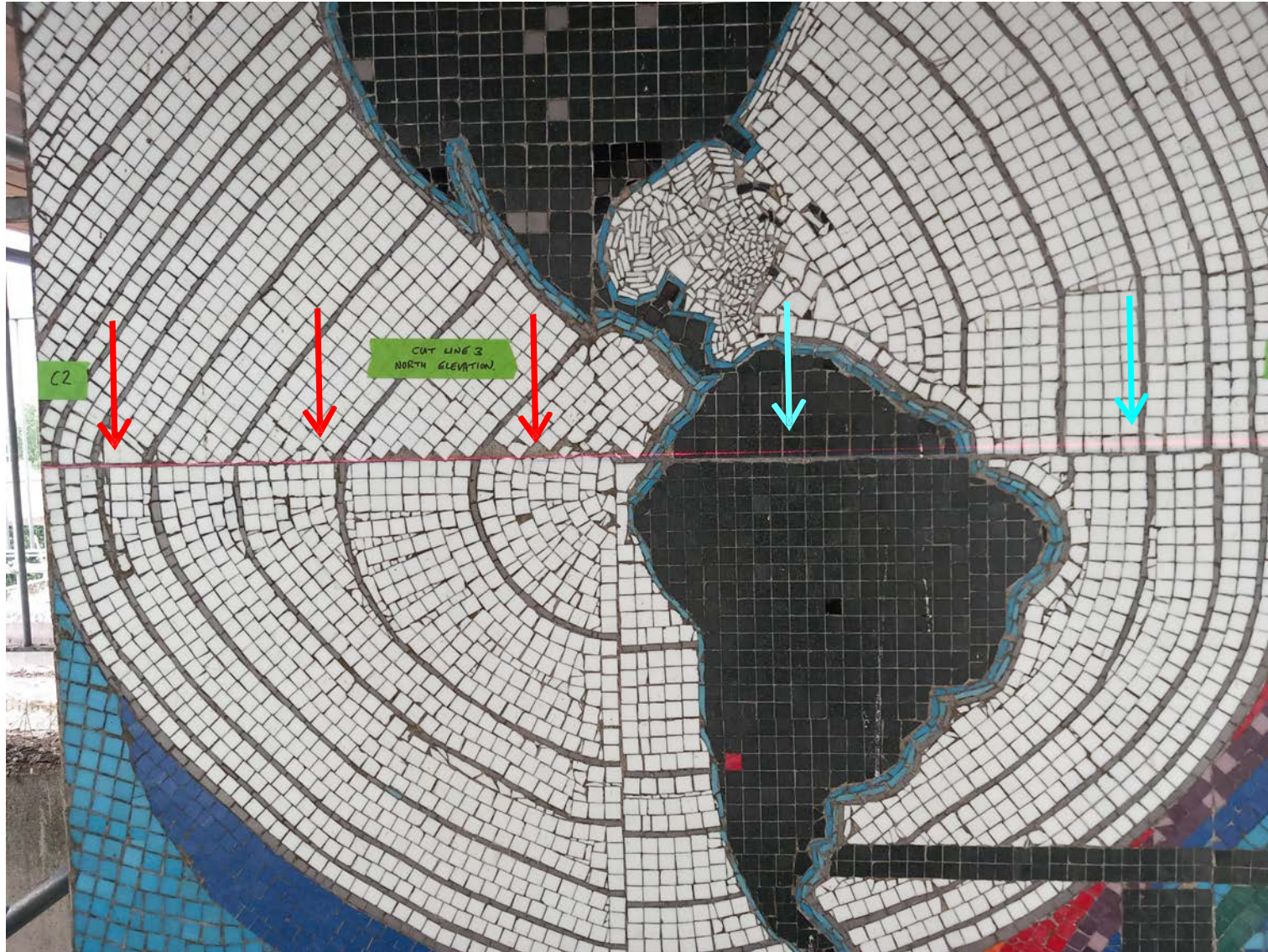
- KEY
- CUTTING LINES
 - CONCRETE
 - REMOVED WINDOW
 - CONCRETE RUBBISH CHUTE
 - MEZZANINE CEILING OF UNKNOWN HEIGHT (LATER ADDITION) CONCEALING PART OF MOSAIC



Cut lines proposal



Every marked line was chosen according to the existing original joints made by the artist during the laying process.



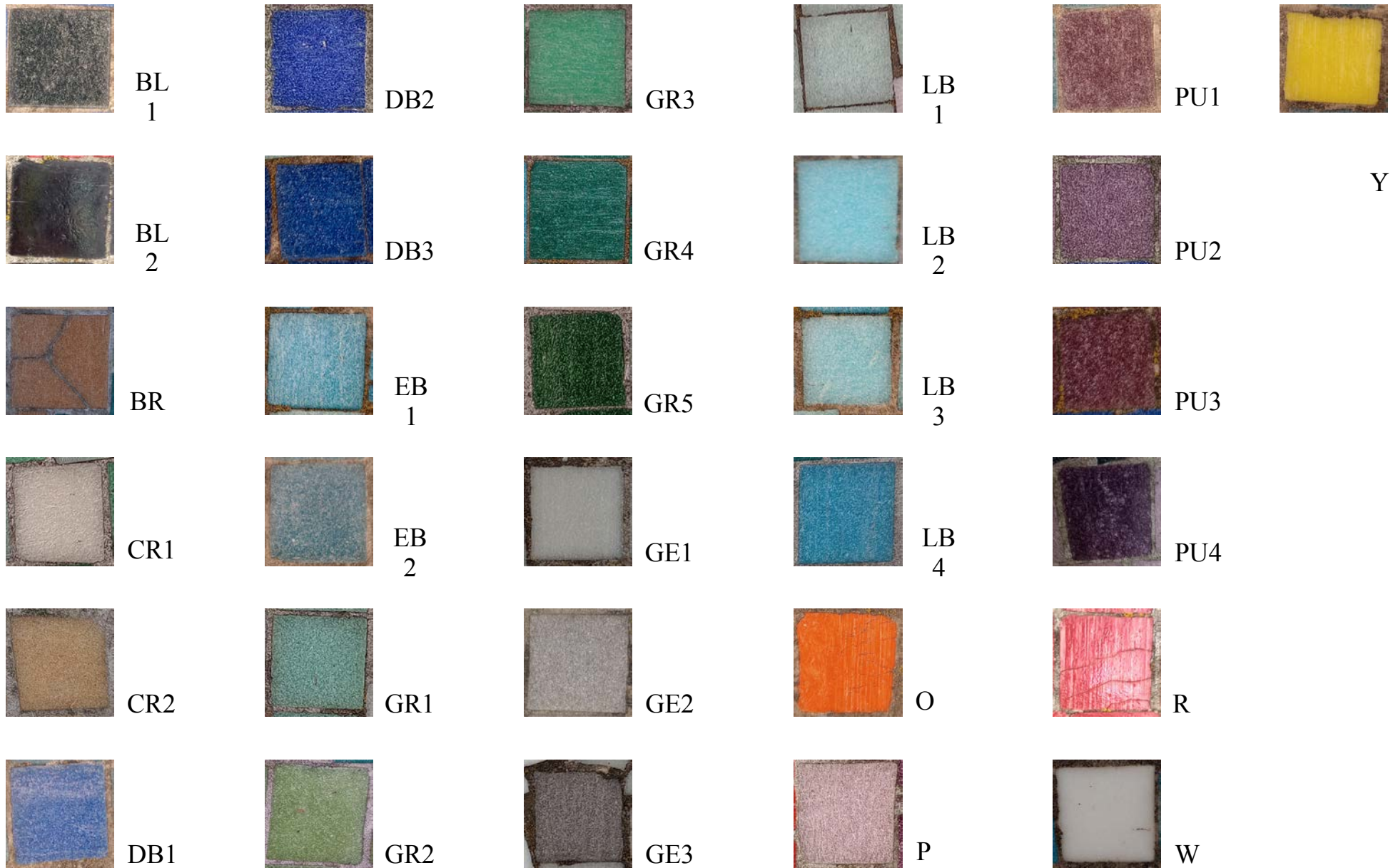
Unfortunately, while in some cases the laser level followed the existing joints (red arrow), in other cases it exceeded them (light blue arrow).



Templates and tracing



 Templates were made using tracing technique, placing strips of tracing paper sheets directly onto the mosaic and, the contour of at least two rows of tesserae above and below the line was traced using a pencil.



A colour chart was made and a code was created for each colour, and marked according to tesserae onto the tracing paper.





The result was a perfect copy of each tessera, its shape, colour and exact position on the proposed cut line.

Test trial for the removing of tesserae



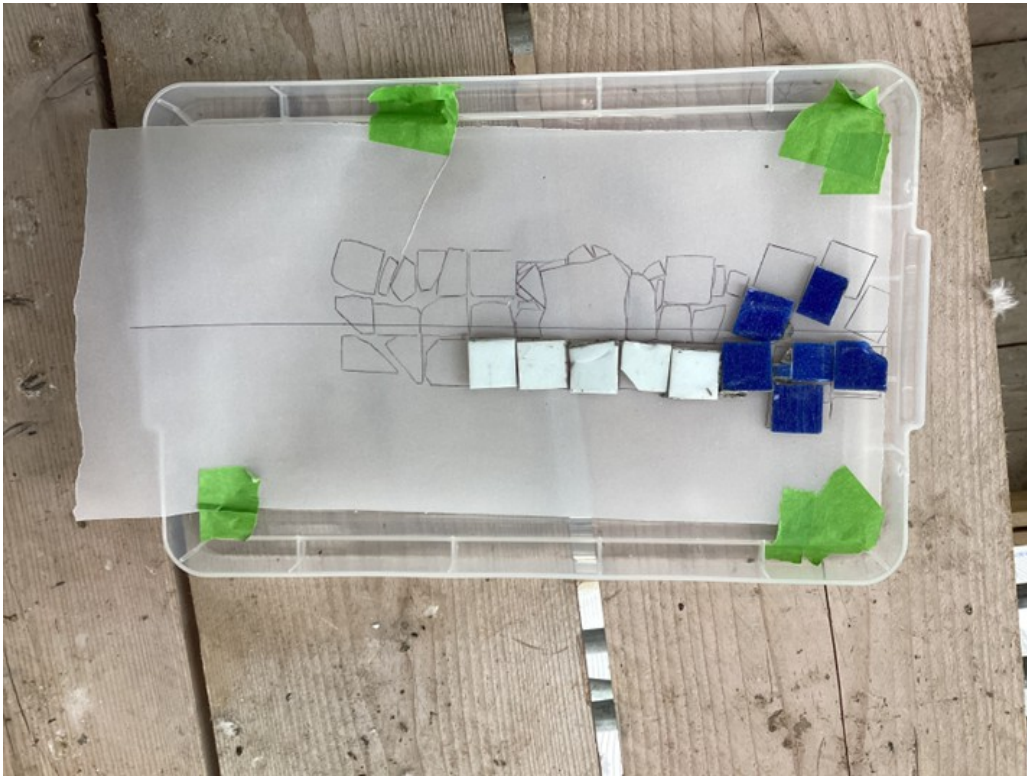
The trial location was on the cut line between panels A1 and B1. The trial area was 300mm x 75mm. This area has irregularly sized and shaped tesserae. The area was photographed and outlines of the tesserae traced before the cutting test commenced.

Tesserae removal



The joints between the tesserae were cut with a Dremmel diamond cutting disc. Then the tesserae were carefully removed with a sharp tungsten chisel and dummy mallet.

Storing of tesserae



Tesserae were placed and numbered on the template as they were being removed to maintain the original design. Then these were safely stored so that they could be re-used.

Results



The mosaic, made of modern cement and concrete, might also be modified by adding polymers that would make these materials incredibly strong. Due to the tesserae being well adhered to the cement, several of them fractured during removal. They will need to be¹⁴ additionally worked on so that the bedding material can be removed before they are re-installed.

Conclusion



Tesserae were difficult to remove with this method due to the bond between tesserae and bedding material. Being in vitreous paste (glass) and very thin (3mm to 4mm), they are very fragile. These have achieved a very secure bond with the bedding mortar so they can only be removed intact with the bedding material attached. Removing this cement later is likely to result in damage and further loss of tesserae.

Recommendations

DBR Conservation recommends as follow:

The removing of tesserae along the cut lines, that was to enable diamond cutting of the structural concrete, resulted in too much loss of individual tesserae. This method should not be considered as a “first option”.

On 16th August 2023 DBR Conservation had a meeting with the diamond cutting company LDD (London Diamond Disk) and the main contractor Hughes and Salvidge regarding the structural concrete cutting methodology.

A new approach was considered as a possible option:

Cutting through the concrete blocks without removing tesserae along cut lines.

The cutting would work as follows:

Cutting with a diamond track saw from the back of the mural in three phases:

- First cut 50mm of concrete
- Second cut 120/150mm of concrete
- Last final slow and accurate cut through the tesserae approaching the diamond disk half way at the front.

This system should allow the maximum control of the cutting process and would sacrifice just the tesserae along the cut line without touching the rows of tesserae above or below it.*

A band of 100mm along the cut line (50mm above and 50mm below), will remain exposed from the protective jacket (see item 4/ on following pages) so to maximise the control on each millimetre of cutting process.

A further waterproof protection (provided by LDD Company) will be included at the front face of the mosaic so to avoid the water running on to the protective jacket which covers the whole mosaic surface.

DBR Conservation recommends using a diamond disk as thin as possible, possibly not segmented so to not stress the mosaic tesserae during the cutting process.

As per LDD recommendation and DBR Conservation approval a non-destructive concrete scanning should be provided so to generate accurate images of the inner concrete to avoid any problems during the cutting process.

*For further technical information regarding the cutting process a further technical report will be provided by LDD and Hughes and Salvidge together with RAMS and technical detail of the diamond cutting machine.

Preventative work prior to cutting of mural mosaic blocks

Once the cutting sections are agreed upon and recommendation reviewed and approved by the Clients, a “preventative” work will cover conservation methodologies for securing the mosaic so not to risk creating any damages during “cutting/removal” phases of the mosaic from the structure.

This will include:

1/General dry cleaning of the mosaic surface using soft-bristle brushes to remove consistent and inconsistent general particles and deposits of salts on the surface.

2/Rinsing of the entire mosaic surface using soft-bristle brushes and a mix of Vulpex detergent and water (1:15).

3/Re-rinsing with clean water and drying of the surface with microfibre cloths so not to leave watermarks on the surface.

4/Preparation and securing of mosaic through application of protective jacket consisting of at least two/three criss-crossed layers of cotton gauze with the aid of a mix of Starch glue and Vinavil glue (20%) diluted in water while paying attention that every layer is perfectly stuck onto the surface.



- A homogeneous layer of silicon rubber with thixotropic additive will be applied with a brush so to create elasticity and soft cushioning. Rubber keys will be applied on top of the silicon rubber in order to receive and hold still the next final covering. The keys will be customised in order to protrude sufficiently outside and lock the following “hard shell”.
- A series of layers (minimum 4 layers, to reach at least 10mm of thickness) of quadaxial fibreglass fabric soaked in Jesmonite AC100 (weather resistant resin) with addition of thixotropic will provide further stability (Sandwich system) and resilience to the “safety jacket”.*

* For more info regarding the methodologies and technical data sheets see RAMS “Protective Jacket”.